ARIZONA DEPARTMENT OF TRANSPORTATION

ADVERTISEMENT FOR BIDS
SPECIAL PROVISIONS
BIDDERS DOCUMENTS

SUBMITTED BY:

_____
(Company or Firm Name)

_____
(Mailing Address)

_____
(City) (State) (Zip Code)

_____
(Street Address - If Different From Above)

_____
(City) (State) (Zip Code)

Arizona Commercial License No. _____

License Classifications(s) _____

TRACS/Proj. No.:

202 MA 040 H867301C CM-202-A(219)T
SANTAN FREEWAY (SR 202L)
(SR 202L, Dobson Road to Ray Road)

Contracts and Specifications Section
1651 West Jackson, Room 121F
Phoenix, Arizona 85007-3217

NOTICE

TO ALL BIDDERS

Read carefully the complete ADVERTISEMENT FOR BIDS and SECTION 102 - BIDDING REQUIREMENTS AND CONDITIONS in the Specifications. Important information is given in both documents which affects the acceptance of your bid proposal. Failure to comply may result in rejection of your bid.

Bids are to be prepared with black ink or typed and any alterations, initials or signatures must be in black ink.

Unit prices must be shown for each item of work in the Bidding Schedule, as well as, the extended bid amount. This applies to all items, including lump sum items.

If goals are established for participation by Disadvantaged Business Enterprises (DBE's), please read carefully the portion of the special provisions which addressed this subject. It is advisable to contact ADOT's Affirmative Action Office for assistance, particularly when bidding infrequently or for the first time.

It is **NOT** advisable to mail bid proposals. Proposals received in Contracts and Specifications Services, 1651 W. Jackson, Room 121F, Phoenix, Arizona 85007, after the designated time for opening will not be accepted regardless of the reason for not being received on time.

IMPORTANT

PRIOR TO SUBMITTING YOUR BID, PRINT COMPANY NAME, ADDRESS, CITY, STATE, AND ZIP IN THE SPACE PROVIDED ON THE COVER OF YOUR PROPOSAL. PLEASE ENSURE THAT THIS DATA IS THE SAME AS SHOWN ON THE BIDDING DOCUMENTS.

ARIZONA DEPARTMENT OF TRANSPORTATION

ADVERTISEMENT FOR BIDS

BID OPENING: Friday, February 26, 2016, at 11:00 A.M. (M.S.T.)

TRACS No.:	202 MA 040 H8673 01C
Project No.:	CM-202-A(219)T
Termini:	SANTAN FREEWAY (SR 202L)
Location:	SR 202L, Dobson Rd. to Ray Rd.

Route No.	MILEPOST	DISTRICT	Item No.
SR 202L	N/A	Central (Phoenix)	43316

The amount programmed for this contract is **$6,300,000.00**. The location and description of the proposed work and the representative items and approximate quantities are as follows:

The proposed project is located on SR 202L from just east of Dobson Road to Ray Road within the City of Chandler and Town of Gilbert in Maricopa County. The proposed work consists of the installation of closed circuit television cameras, dynamic message signs on overhead sign structures, ramp meters, mainline detector stations and the associated conduit, fiber optic cables, power conductors, and other related components.

REPRESENTATIVE ITEMS	UNIT	QUANTITY
Bridge Sign Structure (SD9.52, Type 3F & 4F)	Each	8
Sign Structure Foundation (SD9.20)	Each	8
Sign Structure Foundation (SD9.20, Raised Column)	Each	4
Type A Sand Barrel Crash Cushion	Each	8
Dynamic Message Sign Assembly and Installation	Each	8
0.090" Alkyd, Thermoplastic Pvmt Marking	L.Ft.	3,210
55 Ft CCTV Pole w/ Lowering Device	Each	8
80 Ft CCTV Pole w/ Lowering Device	Each	2
CCTV Field Equipment	Each	10
Elec. Conduit (Trench & Dir. Drill) (Var. Sizes & Config.)	L.Ft.	21,400
No. 7 and 9 Pull Boxes	Each	130
Conductors (Various Gauges)	L.Ft.	134,500
Single Mode Fiber Optic Cable (12 & 144 Fiber)	L.Ft.	116,000
Fiber Optic Transceiver	Each	5
Gigabit Ethernet Switch	Each	37
Cabinet (CCTV, Ramp Meter, Load Center Type IV)	Each	44
Model 2070 Controller	Each	19
Model 200 Load Switch	Each	10
Ramp Meter Assembly	Each	10
Loop Detector (6' X 6')	Each	192

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.

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

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

Proposal pamphlets shall be submitted only in the envelope provided by the Department to:

Arizona Department of Transportation
Intermodal Transportation Division
Contracts and Specifications Section
1651 West Jackson Street, Room 121F
Phoenix, Arizona 85007-3217

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

Engineering Specialist:	Tom Mowery-Racz	(602) 712-6741
Construction Supervisor:	Girgis Girgis	(602) 712-6813

STEVE BEASLEY,
Engineer - Manager
Contracts & Specifications

TRACS No.: 202 MA 040 H8673 01C
Project No.: CM-202-A(219)T
Advertisement Date: December 14, 2015
TM-R

SPECIAL PROVISIONS

FOR

ARIZONA PROJECT

202 MA 040 H8673 01C

CM-202-A(219)T

SANTAN FREEWAY (SR 202L)

SR 202L, DOBSON ROAD TO RAY ROAD

FMS PHASE 14B

EXPIRES 12-31-2015

PROPOSED WORK:

The proposed project is located on SR 202L from just east of Dobson Road to Ray Road within the City of Chandler and Town of Gilbert in Maricopa County. The proposed work consists of the installation of closed circuit television cameras, dynamic message signs on overhead sign structures, ramp meters, mainline detector stations and the associated conduit, fiber optic cables, power conductors, and other related components.

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 2008 (Pub. # 31-066),

Arizona Department of Transportation, Intermodal Transportation Division, Standard Drawings, listed in the project plans, and available on the Department's website,

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

Arizona Department of Transportation, Traffic Group, Traffic Control Design Guidelines, Edition of 2010, available on the Department's website,

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

The Proposal Pamphlet and Non-bid Pamphlet which include the following documents:

These Special Provisions,

Appendix A, Fiber Test Summary Sheet Example,

Appendix B, Western Burrowing Owl Awareness Flyer,

List of Subcontractors, Suppliers, Service Providers and Manufacturers Bidding ADOT Contracts, dated 9/23/10,

Required Contract Provisions Federal-Aid Construction Contracts (Form FHWA 1273 Revised May 1, 2012),

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,

Included in the Proposal Pamphlet only:

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,

Affidavit Disadvantaged Business Enterprises,

BID SUBMISSION:

In submitting a bid, the holder of a Bid Proposal Pamphlet 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, and

Certification With Respect to the Receipt of Addenda.

Affidavit Disadvantaged Business Enterprises.

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 which is furnished to prospective bidders; 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 and Specifications Services.

COPIES OF PROJECT DOCUMENTS:

Distribution of a limited number of plans and Special Provisions will be made to the successful low bidder, at no charge, following confirmation of bid prices and DBE submittal, if applicable. The distribution will be made on the following basis:

Contract Size (Dollars)	Full Size Plans	1/2 Size Plans	Bound Bid Books	Unbound Bid Books
$0 - $10,000,000	2	25	5	25
over $10,000,000	5	50	5	50

These plans and Special Provisions will be set aside and designated for use by the low bidder along with an equal number held in reserve for the responsible District Office. In the event that excess documents remain following bid opening, the additional documents will be evenly split between the low bidder and the A.D.O.T. District Office.

Any additional plans or Special Provisions that the low bidder may require beyond the above distribution will be available at the invoice cost of printing by ordering through the Engineer.

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 Section, located at 1221 N. 21st Avenue, Phoenix, Arizona 85009-3740. 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. Copies of available information may be purchased by prospective bidders.

(EPRISE, 03/15/11)

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 CFR Part 26. The Department has received Federal financial assistance from the U.S. Department of Transportation and as a condition of receiving this assistance, the Department has signed an assurance that it will comply with 49 CFR Part 26.

It is the policy of the Department to ensure that DBEs, 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:

1. To ensure nondiscrimination in the award and administration of USDOT-assisted contracts;
2. To create a level playing field on which DBEs can compete fairly for USDOT-assisted contracts;
3. To ensure that the DBE program is narrowly tailored in accordance with applicable law;
4. To ensure that only firms that fully meet 49 CFR Part 26 eligibility standards are counted as DBEs;
5. To help remove barriers to the participation of DBEs in USDOT-assisted contracts; and
6. To assist in the development of firms that can compete successfully in the market place outside the DBE program.

2.0 Assurances of Non-Discrimination:

The contractor, subrecipient, or subcontractor shall not discriminate on the basis of race, color, sex or national origin in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of 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. The contractor, subrecipient, or subcontractor shall ensure that all subcontract agreements contain this non-discrimination assurance.

3.0 Definitions:

(A) Disadvantaged Business Enterprise (DBE): a for-profit small business concern which meets both of the following requirements:

(1) Is at least 51 percent owned by one or more socially and economically disadvantaged individuals or, in the case of any publicly owned business, at least 51 percent of the stock is owned by one or more such individuals; and,

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

(B) Socially and Economically Disadvantaged Individuals: any individual who is a citizen (or lawfully admitted permanent resident) of the United States and who is:

(1) Any individual who is found to be a socially and economically disadvantaged individual on a case-by-case basis.

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

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

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

(iii) "Native Americans," which includes persons who are American Indians, Eskimos, Aleuts, or Native Hawaiians;

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

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

(vi) "Women;"

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

(C) 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.

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

(E) RACE-CONSCIOUS: a measure or program is one that is focused specifically on assisting only DBEs, including women-owned DBEs.

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

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 Civil Rights Office at the address shown below for assistance in their efforts to use DBEs in the construction program of the Department:

Arizona Department of Transportation
Civil Rights Office
1135 N. 22nd Avenue (second floor), Mail Drop 154A
Phoenix, AZ 85009
Phone (602) 712-7761
FAX (602) 712-8429

5.0 Applicability:

The Department has established an overall annual goal for DBE participation on Federal-aid contracts. The Department intends for the goal to be met with a combination of race conscious efforts and race neutral efforts. Race conscious participation occurs where the contractor uses a percentage of DBEs, as defined herein, to meet the contract-specified goal. Race neutral efforts are those that are, or can be, used to assist all small businesses or increase opportunities for all small businesses. The regulation, 49 CFR 26, defines race neutral as when a DBE wins a prime contract, is awarded a subcontract on a project without DBE goals, and is awarded a subcontract from a prime contractor that did not consider the firm's DBE status.

The contractor shall meet the goal specified herein with DBEs, or establish that it was unable to meet the goal despite making good faith efforts to do so. Prime contractors are encouraged to obtain DBE participation above and beyond any goals that may be set for this project.

The provisions are applicable to all bidders including DBE bidders.

6.0 Certification:

Certification as a DBE shall be predicated on:

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

(2) 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.

(3) The submission of any additional information which the Department may require to determine the firm's eligibility to participate in the DBE program.

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

Applications for certification may be filed with the Department at any time. Both hardcopy submission and online submission is available.

For hardcopy submissions, applications for certification are available at the Department's Civil Rights Office, 1135 N. 22nd Avenue (second floor), mail drop 154A, Phoenix, Arizona 85009, phone (602) 712-7761. Hardcopy applications may also be obtained through the internet at www.azdbe.org. Hardcopy applications must be filed through the Civil Rights Office at the above address.

For online submissions, the online application process may be accessed through the internet at www.azdbe.org.

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

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

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

7.0 General:

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

Each contractor shall also designate a full time employee who shall be responsible for the administration of the contractor's DBE program.

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

8.0 DBE Subcontractor Payment Reporting:

The Department is required to collect data on DBE and non-DBE participation to report to FHWA on Federal-aid projects. The contractor is notified that such record keeping is required by the Department for tracking DBE participation.
The contractor shall submit a report on a monthly basis indicating the amounts earned by and paid to all DBEs and non-DBEs working on the project. In addition, the contractor shall require that all DBE and non-DBE subcontractors verify receipt of payment.

The contractor shall provide all such required information for the current month by the 5th of the following month. The required information shall be submitted electronically through the Department's web-based payment tracking system (https://adot.dbesystem.com).

9.0 Goals:

The minimum goal for participation by DBEs on this project is as follows:

1.87 Percent

The percentage of DBE participation shall be based on the total bid.

10.0 Crediting DBE Participation Toward Meeting Goals:

10.01 General Requirements:

Only the value of the work actually performed by the DBE can be credited toward DBE participation. Credit towards the contractor's DBE goal is given only after the DBE has been paid for the work performed.

The contractor bears the responsibility to determine whether the DBE possesses the proper contractor's license(s) to perform the work. If a DBE cannot complete its work due to failure to obtain or maintain its licensing, the contractor bears the responsibility to immediately request approval to replace the DBE with another DBE and notify the Engineer and the Civil Rights Office.

The Department's certification is not a representation of 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 subcontract, purchase order, hourly rate, rate per ton, etc., as agreed to between parties.

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 toward the DBE goal.

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

All DBE and non-DBE subcontracting activity must be reported by the contractor and counted toward participation. This includes lower-tier subcontracting regardless of whether or not the DBE is under contract with another DBE.

DBE prime contractors must meet the DBE participation goal or demonstrate good faith efforts. This is determined by counting the work the DBE has committed to performing with its own forces, as well as the work that it has committed to be performed by DBE subcontractors and DBE suppliers.

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 the DBE goal 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 toward a DBE goal.

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.

10.02 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.

10.03 Commercially Useful Function:

As a prime contractor, a DBE shall perform a significant portion of the contract work with its own work force in accordance with normal industry practices and Subsection 108.01 - Subletting of Contract of the Standard Specifications.

A prime contractor can credit expenditures to a DBE subcontractor toward DBE goals only if the DBE performs a commercially useful function on the contract. A DBE performs a commercially useful function when it is responsible for execution of the work of a contract and is carrying 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. 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 on the basis of 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. Decisions on commercially useful function matters are subject to review by FHWA, but are not administratively appealable to U.S. DOT.

10.04 Trucking:

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, and there cannot be a contrived arrangement for the purpose of meeting DBE goals.

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 from a non-DBE is entitled to credit for the total value of the transportation services provided by non-DBE lessees not to exceed the value of transportation services provided by DBE-owned trucks on the contract. Additional participation by non-DBE lessees results in 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 only 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. With respect to the other two trucks provided by Firm Z, DBE credit could be awarded only for the fees or commissions pertaining to those trucks Firm X receives as a result of the lease with Firm Z.

10.05 Materials and Supplies:

The Department will credit expenditures with DBEs for material and supplies towards the DBE goal as follows. If the materials or supplies are obtained from a DBE manufacturer, 100 percent of the cost of the materials or supplies is credited. A manufacturer is defined as a firm that operates or maintains 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.

If the materials or supplies are purchased from a DBE regular dealer, 60 percent of the cost of the materials or supplies is credited. A DBE regular dealer is defined as a firm that owns, 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 stock, and regularly sold or leased to the public in the usual course of business. 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. A firm may be a DBE regular dealer in such bulk items as petroleum products, steel, cement, stone or asphalt without owning, operating, or maintaining a place of business, as provided above, if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by a long-term lease agreement, and not on an ad-hoc or contract-by-contract basis. Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not regular dealers within the meaning of this paragraph and the paragraph above.

With respect to materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer, the Department will credit the entire amount of the fees or commissions charged by the DBE for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site, toward DBE goals, provided the fees are determined to be reasonable and not excessive as compared with fees customarily allowed for similar services. The cost of the materials and supplies themselves may not be counted toward the DBE goal.

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.

11.0 Joint Checks:

11.01 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.

1. 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.

2. 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.

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

4. 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.

5. 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.

6. 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.

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

8. 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.

11.02 Procedure and Compliance:

1. The Civil Rights Office must approve the agreement for the use of joint checks in writing.

2. 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.

3. Copies of canceled checks must be submitted with the payment information for the period in which the joint check was issued. Certificates of payment must indicate whether or not joint checks were used.

4. 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.

5. 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.

12.0 Submission with Bids:

All bidders are required to certify in their bid proposal on the "Disadvantaged Business Enterprise Assurances" certificate either:

(1) The established goal for DBE participation has been met and arrangements have been made at the time of bid with certified DBEs or

(2) The bidder has been unable to meet the goal prior to the submission of the bid and has made good faith efforts to do so.

BIDS SUBMITTED WITH ALTERED, INCOMPLETE, OR UNSIGNED CERTIFICATES WILL BE CONSIDERED NON-RESPONSIVE.

Certifications on forms other than those furnished by the Department will be considered non-responsive.

13.0 Bidder Meeting DBE Goal:

13.01 General:

If the bidder indicates in the bid that it has met or exceeded the DBE goal, the DBE Intended Participation Affidavit, its attachments, and a written confirmation from each DBE that it is participating in the contract as provided on the affidavit, shall be submitted as follows:

(1) The DBE Intended Participation Affidavit, its attachments, and the confirmations must be received by the Civil Rights Office no later than 4:00 P.M. on the fifth working day following the bid opening. Copies of this affidavit and the attachments are available from the Civil Rights Office, 1135 N. 22nd Avenue (second floor), mail drop 154A, Phoenix, Arizona 85009, phone (602) 712-7761, or on the internet at http://www.azdot.gov/inside_adot/CRO/DBEP.asp. This affidavit and its attachments shall indicate that the bidder has met or exceeded the DBE goal if this was indicated on the submittal with the bid.

(2) The affidavit and attachments must be accurate and complete in every detail and must be signed by an officer of the contractor(s).

(3) The DBE Intended Participation affidavit must be submitted listing the DBEs used and the creditable amounts.

(4) A separate DBE Intended Participation affidavit attachment must be submitted for each DBE used to meet the goal of the project. The bidder shall indicate each DBE's name, the bid items the DBE will perform, and proposed subcontract amount. All partial items must be explained. If not, the DBE will be considered to be responsible for the entire item.

(5) A written confirmation from each DBE used to meet the goal indicating that it is participating in the contract, as provided on the affidavit, must also be submitted at this time.

(6) A bidder must determine DBE credit in accordance with Section 10 above, entitled "Crediting DBE Participation Toward Meeting Goals." The affidavit will be reviewed by the Civil Rights Office.

(7) Only those DBE firms certified by the Arizona Unified Certification Program (AZUCP) at the time of the bid opening will be considered It shall be the bidder's responsibility to ascertain the certification status of designated DBEs.

(8) The bidder bears the risk of late delivery by the postal service or a delivery service. Late-filed affidavits will not be accepted.

13.02 Failure to Comply:

If the apparent low bidder fails to submit the required information by the stated time and in the manner herein specified, or if the submitted information reveals a failure to meet the requirements of the specifications, the apparent low bidder shall be ineligible to receive award of the contract and the bid will be rejected. The proposal guarantee (bid bond) shall be forfeited if no submission is made or if the State Transportation Board finds the submission was made in bad faith.

14.0 Documented Good Faith Effort:

14.01 General:

If the apparent low bidder has stated in its bid proposal that it has been unable to meet the DBE goal, that bidder must demonstrate, through detailed and comprehensive documentation, that good faith efforts have been made to solicit, assist, and use DBE firms to meet the DBE goal prior to the bid. The bidder cannot change its bid proposal after submission.

Failure to demonstrate good faith efforts to the satisfaction of ADOT will result in the rejection of the bid.

The apparent low bidder who cannot meet the DBE goal at the time bids are opened must submit its documentation of good faith effort to the Civil Rights Office. The bidder's documentation must be received by the Department's Civil Rights Office by 4:00 P.M. on the fifth working day after the bids are opened.

Bidders are encouraged to review Appendix A of 49 CFR Part 26.

In order to be awarded a contract on the basis of good faith efforts, a bidder must show that it took all necessary and reasonable steps to achieve the DBE goal which, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if they were not fully successful. The Department will consider the quality, quantity, and intensity of the different kinds of efforts the bidder has made. The efforts employed by the bidder should be those that

one could reasonably expect a bidder to make if the bidder were actively and aggressively trying to obtain DBE participation sufficient to meet the DBE goal. Mere pro forma efforts are not sufficient good faith efforts to meet the DBE contract requirements.

The contractor shall, as a minimum, seek DBEs in the same geographic area in which it generally seeks subcontractors for a given project. If the contractor cannot meet the goals using DBEs from this geographic area, the contractor, as part of its effort to meet the goals, shall expand its search to a reasonably wider geographic area.

The following is a list of types of efforts a bidder must address when submitting good faith effort documentation.

(1) Soliciting through all reasonable and available means (e.g., attendance at pre-bid meeting, advertising, written notices, and other means) the interest of all certified DBEs who have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow DBEs to respond to the solicitation. The bidder must determine with certainty if the DBEs are interested by taking appropriate steps to follow-up initial solicitations.

(2) Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise prefer to perform these work items with its own forces.

(3) Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

(4) Negotiating in good faith with interested DBEs. It is the bidder's responsibility to make a portion of the work available to the DBE subcontractors and suppliers, and to select those portions of work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBEs that were considered; a description of the information provided from the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform work.

    A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a bidder's failure to meet the DBE goal, as long as such costs are reasonable. Also, the ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. However, prime contractors are not required to accept higher quotes from DBEs if the price

difference is excessive or unreasonable. Documentation, such as copies of all other bids or quotes, must be submitted.

(5) Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The contractor's standing within its industry, membership in specific groups, organizations or associations and political or social affiliations (for example, union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the contractor's efforts to meet the project goal.

(6) Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or contractor.

(7) Making efforts to assist interested DBEs in obtaining necessary equipment supplies, materials, or related assistance or services.

(8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and Federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs.

In determining whether a bidder has made good faith efforts, the Department will take into account the ability of other bidders to meet the DBE goal.

The bidder will not be considered to have made good faith efforts if the bidder failed to contact the ADOT Civil Rights Office prior to the letting, either in writing, by e-mail, or by telephone, to inform the Civil Rights Office of the firm's difficulty in meeting the DBE goals on a given project, and to request assistance. If the bidder contacts the Civil Rights Office by telephone, the contact must be documented in a telephone log indicating the date and time of call, and name of the person to which he spoke. The telephone number for the Civil Rights Office is (602) 712-7761. The contact must be made in sufficient time to allow the Civil Rights Office to provide assistance.

The ADOT Civil Rights Office will analyze the submittal to determine if in fact good faith efforts have been demonstrated consistent with ADOT procedures and the Federal regulations, 49 CFR 26, Appendix A.

The bidder may appeal the determination of the Civil Rights Office to the State Engineer. That appeal must be in writing and personally delivered or sent by certified mail, return receipt requested, to the State Engineer. The protest must be received by the State Engineer no later than seven calendar days after the decision of the Civil Rights Office. Copies of the protest shall be sent by the protestant to every bidder, at the same time the protest is submitted to the State Engineer. Any other interested party may submit a response to the appeal no later than seven calendar days after the appeal is requested. Responses from other interested parties must also be in writing and personally delivered or sent by certified mail, return receipt requested, to the State Engineer. Any interested party submitting such response shall also provide a copy of its response to every bidder, at the same time the protest is submitted to the State Engineer. The State

Engineer shall promptly consider any appeals under this subsection and notify all bidders of the State Engineer's findings and decision.

Any interested party may protest the State Engineer's decision to the Transportation Board, pursuant to the requirements of Subsection 103.10 of the Standard Specifications.

14.02 Failure to Comply:

If the apparent low bidder fails to submit the required information by the stated time and in the manner herein specified, or if the submitted information reveals a failure to meet the requirements of the specifications, the apparent low bidder shall be ineligible to receive award of the contract and the bid will be rejected. The proposal guarantee (bid bond) shall be forfeited if no submission is made or if the State Transportation Board finds the submission was made in bad faith.

15.0 Rejection of Low Bid:

If, for any reason, the bid of the apparent low bidder is rejected, there will be a new apparent low bidder. The Department will notify the new apparent low bidder, and this bidder shall submit its subsequent detailed submission as set forth in paragraph 12 or 13 above.

16.0 Time is of the Essence:

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

17.0 Contract Performance:

Contract items of work designated by the contractor to be awarded to DBEs shall be performed by the designated DBE or a Department-approved DBE substitute. DBE contract work items shall not be performed by the contractor, or a non-DBE subcontractor without prior approval by the Civil Rights Office. The DBE must perform a commercially useful function; that is, the DBE must manage, perform, and supervise a distinct element of work.

The Department reserves the right to inspect all records of the contractor and all records of the DBEs concerning this contract.

The contractor shall provide to the Engineer, at the pre-construction conference, copies of completed and signed subcontracts purchase orders, invoices, etc., with the appropriate DBEs.

Within five (5) working days of the preconstruction conference, the contractor shall also provide electronic copies of signed subcontract agreements to the Civil Rights Office through the Department's web-based payment tracking system (https://adot.dbesystem.com). As part of this submittal, contractors shall be required to log into the system and enter the name, contact information, and subcontract amounts for all subcontractors and vendors performing on the project as verification that scopes of services and commitments made through the DBE Intended Participation Affidavits are being met.

Subcontract agreements shall include all required assurances, including FHWA Form 1273, and the prompt payment and return of retention requirements specified in Subsection 109.06(B) of the specifications. Each page of each required attachment must be dated and initialed by the DBE in order for the subcontract to be considered valid. Contractors executing agreements with subcontractors, DBE or non-DBE, that materially modify federal regulation and state statutes, or prompt payment and retention requirements, through subcontract terms and conditions will be found in breach of contract which may result in termination of the contract, or any other such remedy as the Engineer deems appropriate.

Use of a DBE named on the DBE Intended Participation Affidavit is a condition of award. Substitution will not be allowed without written evidence from the prime contractor and DBE that the DBE is unable or unwilling to perform. Contractors may not terminate a DBE subcontract for convenience, in whole or in part, except to the extent that the Department has eliminated items of work subcontracted to the DBE. All terminations, substitutions, and reductions in scope must be approved by the Civil Rights Office.

18.0 Non-Performance by DBEs:

In the event a DBE is unable or unwilling to fulfill its agreement with the contractor, the contractor will immediately notify the Engineer and provide all facts surrounding the matter. Such failure on the part of a DBE will not relieve the contractor of responsibility for meeting the DBE goal on the contract. The contractor shall immediately make reasonable good faith efforts to obtain another certified DBE to perform an equal or greater dollar value of work to the extent needed to meet the DBE goal. The substitute DBE's name, description of work, and dollar value of work shall be submitted to the Engineer and the Department's Civil Rights Office. Approval of the Civil Rights Office must be obtained prior to the substitute DBE beginning work.

In the event a prime contractor is unable, after a substantial good faith effort, to obtain another certified DBE, the Department's Civil Rights Office may lower the DBE goal on the project. However, the Civil Rights Office must approve this in writing prior to a Non-DBE starting the work which had been subcontracted to the DBE.

19.0 Compliance:

The contractor's achievement of the goal is measured by actual payments made to the DBEs. The contractor shall submit at the completion of the project the "Certification of Payments to DBE Firms" affidavit for each DBE firm working on the project. This affidavit shall be signed by the prime contract and the relevant DBE, and submitted to the Civil Rights Office. At that time, a copy of each completed affidavit shall also be submitted to the Engineer.

Acceptance and final payment to the contractor, in accordance with Subsections 105.20 and 109.09, will not be made until all "Certification of Payments to DBE Firms" affidavits are received and deemed acceptable by the Engineer and the Civil Rights Office.

20.0 Sanctions:

If the Department determines that the contractor has failed to make sufficient reasonable efforts to meet contract DBE goals, or to otherwise carry out these DBE special provisions, such failure shall constitute a breach of contract and may result in termination of the contract, or any other such remedy as the Engineer deems appropriate.

If the Engineer determines that such failure is not cause to terminate the contract, an amount equal to the value of the DBE goal that was not obtained will be deducted from the payment due the contractor. However, if the failure is the first by the contractor, and the Engineer determines the failure was an unintentional error or oversight, the amount to be deducted may be reduced up to one-half (1/2) of the value of the unobtained DBE goal as determined by the Civil Rights Office. In addition to any other sanctions, willful failure of the contractor or a DBE to comply with this contract or with the Federal DBE regulations may result in disqualification from further contracting, subcontracting, or other participation in ADOT projects.

(MENTOR, 02/23/06)

MENTOR-PROTEGE PROGRAM

Description:

Purpose:

The Mentor-Protégé program is an initiative to encourage and develop disadvantaged businesses in the highway construction industry. The program will permit contractors to provide certain types of assistance to certified Disadvantaged Business Enterprise (DBE) subcontractors on highway construction projects.

The program is intended to increase legitimate DBE activities and is not intended to diminish nor circumvent existing DBE rules or regulations. Abuse of this program may be used as the basis for actions against both categories of firms including suspension or debarment.

Policy:

It is the policy of ADOT that contractors and certified DBE subcontractors may engage in a Mentor-Protégé agreement under certain conditions. Such an agreement must be mutually beneficial to both parties and ADOT in fulfilling requirements of 49 Code of Federal Regulations (CFR) Part 23.

Definitions:

DBE: The definition, status, and requirements of DBE firms are defined by 49 CFR Part 23. Please also refer to the special provision entitled "Disadvantaged Business Enterprises".

Mentor: A designated contractor who oversees the development of a designated DBE subcontractor by training, counseling, assisting, and sponsoring the DBE firm in an ADOT approved Mentor-Protégé Program.

Protégé: An ADOT-certified DBE subcontractor who is guided by a mentor through training and specialized assistance to gain experience, develop expertise in highway construction, and attain general business growth in an approved Mentor-Protégé program.

Mentor-Protégé Development Plan: A detailed plan outlining a management agreement between a contractor (who agrees to serve as a mentor) and a DBE subcontractor (who agrees to serve as a protégé).

Implementation:

Approval Process:

(1) When a contractor and DBE agree to engage in a Mentor-Protégé Development Plan Agreement, ADOT Civil Rights Office will be notified by either party for the purpose of (a) reviewing requirements of STAA, 49 CFR part 23, and Mentor-Protégé program; (b) establishing timeline for processing Agreement; (c) preliminary review of Agreement objective(s) and duration; and (d) reporting requirements. (A copy of the suggested form of agreement is included in these special provisions).

(2) A completed Mentor-Protégé Development Plan will be submitted to ADOT within 30 days following the initial review. Approval of the Agreement by ADOT will be in two stages:

a) General approval of Agreement by ADOT within 15 working days following submission of Agreement.

b) Approval of working plan for the designated project where a Mentor-Protégé Development Plan will be implemented.

(3) Duration of a Mentor-Protégé Development Plan may exceed that of a single project, not to exceed three years. Duration of a working plan may exceed that of a single project. However, the continued use of an existing working plan must be approved by the ADOT Civil Rights Office prior to beginning work on a new project.

(4) The Mentor-Protégé program is not intended to provide DBE firms with a means to avoid management and operational responsibilities. Mentors cannot be responsible for the management of DBE protégés. Under the program, all administrative functions must be performed by personnel responsible to or employed by protégé. The protégé must retain final decision making responsibilities.

(5) Mentor and protégé shall agree to an interview by ADOT Civil Rights Office during the development of the Mentor-Protégé Development Plan.

(6) Mentor and protégé shall agree to evaluations by ADOT. The frequency and method will depend on the project.

Content of Mentor-Protégé Development Plan:

A Mentor-Protégé Development Plan Agreement shall address the following:

(1) Areas of Assistance: Identify the specific areas in which the protégé requires assistance.

(2) Schedule of Assistance: Develop an Action Plan which defines the types and scope of assistance the mentor will provide to meet the protégé's needs.

(3) Responsibilities: Define the responsibilities of the mentor and the protégé in each of the activities.

(4) Benchmarks: Include measurable benchmarks to be reached by the protégé at successive stages of the plan.

(5) Evaluation: Provide formal evaluations of the protégé's attainment of benchmarks. Evaluations must be made by both the mentor and the protégé and reviewed by ADOT.

(6) Duration: Specify the maximum time frame the development plan agreement can remain in effect not to exceed three years.

(7) Assurances: Provide assurances that all agreements, oral and written, pertaining to the Mentor-Protégé program do not improperly obtain the benefits of the DBE program.

(8) Key Personnel: Identify mentor's representative(s) responsible for training and/or coordinating the assistance provided to the protégé.

(9) Fees: Identify any fees paid as a condition of the agreement.

(10) Copies of agreements: Attach copies of all bonding, security, lease agreements, notes, contracts, etc., made for the duration of the Mentor-Protégé Plan.

Type of Assistance:

The type of assistance provided by contractors may include, but not be limited to:

(1) Financial:

a) Working Capital Secured by Time Demand Notes or Stocks. Protégés acquiring working capital through the issuance of stocks must maintain no less than 51 percent ownership to maintain DBE certification. Time demand notes may be used to secure working capital. However, any abusive use of recall features will be cause for terminating program. Where working capital is secured by stocks or demand notes, a third party such as a bank could receive progress payments for work accomplished by the protégé, made out jointly to the agent and the protégé and make payments, on behalf of the protégé, to material suppliers or for Federal and State payroll taxes, etc. In no case can the day-to-day control of the firm be relinquished by the disadvantaged owner as a requirement of the loan.

b) Bonding. Mentors may bond the entire job and charge a pro-rata share of the cost to the protégé. Mentors may bond the entire job and carry the protégé by absorbing the cost of the bond. Arrangements of the bonding must be included in the Schedule of Assistance.

(2) Management Technical Assistance:

a) Assist in conducting a Protégé Self-Assessment by areas to be strengthened for long-range planning of the protégé firm.

b) Assist in developing business plan, loan packaging, and financial counseling.

c) Assist the protégé in setting up a cost accounting system and train the protégé's personnel to assume full control.

d) Provide training in plan interpretation, estimating, and materials supply function.

e) Provide guidance in general project management and related areas to make the protégé aware of techniques to improve productivity and competitiveness and broaden knowledge of industry practices.

(3) Operation:

a) Equipment/Facilities Use. Equipment and facilities may be furnished by mentor, provided that separate lease agreements

are made and control over the equipment and facilities are under the supervision of protégé.

b) Training of managers and specialists of the protégé in state-of-the-art methods in the contracting industry.

c) Mentors may provide personnel with specialized expertise for a specific purpose and duration as outlined in the Action Plan. Such personnel must be on the protégé's payroll and under direct supervision of the protégé. Long term, continual, or repetitive use by a protégé of personnel primarily employed by the mentor will be construed as an attempt to artificially inflate DBE participation and may be cause for termination of the Mentor-Protégé agreement and decertification of the DBE.

General Practice:

(1) Agreements may not include exclusive arrangements which limit competition.

(2) DBE firms shall have the latitude to quote bids to other contractors.

(3) The contractor and the DBE involved in a Mentor Protégé agreement must remain separate and independent business entities.

(4) Middlemen or passive conduits which serve no commercially useful function, or subcontractors acting essentially as brokers are unacceptable.

(5) Formal or informal agreements which limit control and management by DBE firms are unacceptable.

(6) Part ownership in a DBE firm by a non-disadvantaged entity, including a mentor, is permitted by the regulations (49 CFR 23) and may be necessary to ensure adequate capital and technical guidance of the DBE participant. However, any financial investment by the mentor must not create a situation wherein the mentor may assume control over the DBE firm.

Modifications:

Modifications to the Mentor-Protégé Development Plan shall be subject to the approval of ADOT.

Termination:

The Mentor-Protégé Development Plan may be terminated by mutual consent by both parties with notice to ADOT. ADOT may terminate approval of the Plan upon determination that:

(1) The protégé firm no longer meets the eligibility standards for certification as a DBE.

(2) Either party has failed or is unable to meet its obligations under the Development Plan.

(3) The DBE is not progressing or is not likely to progress in accordance with the Development Plan.

(4) The DBE has reached a satisfactory level of self-sufficiency to compete without special treatment provided in the Development Plan.

In the event a Mentor Protégé Development Plan is terminated, the contractor will remain responsible for the DBE goals established in the project Special Provisions.

ARIZONA DEPARTMENT OF TRANSPORTATION

Mentor-Protégé Development Plan Agreement

PART ONE: General Agreement

This agreement entered into this _____ day of _____, 20__, in the city of _____, Arizona, by and between _____ (hereafter known as Mentor), and _____ (hereafter known as Protégé), in accordance with rules and regulations of the Arizona Department of Transportation (ADOT) Mentor-Protégé program, and in accordance with the requirements for increased Disadvantaged Business Enterprises (DBE) participation in the Surface Transportation Act of 1982 (STAA) and Surface Transportation and Uniform Relocation Assistance Act of 1987 (STURAA).

This agreement is intended to cover the general relationship between the parties to insure compliance with STAA, STURAA, and ADOT guidelines, and to implement all provisions set forth in the Mentor-Protégé Development Plan.

PART TWO: Assurances

2.1 Both mentor and protégé will remain separate and independent business entities. Protégé shall have the latitude to quote bids to other contractors.

2.2 Protégé is an ADOT-certified DBE firm.

2.3 The Mentor-Protégé program is not intended to provide DBE's with means to avoid management and operational responsibilities.

2.4 All agreements, oral and written, pertaining to this Mentor-Protégé Plan Agreement does not cause the protégé to improperly obtain the benefits of the DBE program.

PART THREE: Content of Plan

Both parties will agree to content of the plan which will include but not be limited to:

3.1 Exhibit A: Areas of Assistance--(Areas identified by both parties as the basis for providing assistance by mentor to protégé.)

3.2 Exhibit B: Schedule of Assistance-- An Action Plan developed by both parties defining the types and scope of assistance; responsibilities of mentor and protégé in each activity; resources to be utilized; and measurable benchmarks to be reached by protégé.

3.3 Exhibit C: Key Personnel-- A list of mentor and protégé representatives responsible for training and/or coordinating the Plan.

3.4 Exhibit D: Lease/Agreement(s)--Full copies of all lease agreements for equipment and facilities; financial agreements; and other agreements between the two parties and/or by third parties.

PART FOUR: Monitoring

4.1 Both parties hereby specifically consent to the monitoring of this contract by the appropriate federal and state officials or their agents, and to agree to cooperate with such agencies.

4.2 Both mentor and protégé agree to evaluate the progress of the Plan at scheduled intervals with the results reviewed by ADOT.

PART FIVE: Duration

The duration of the Plan will coincide with the length of the project for which the plan was intended. Extended agreement plans shall not exceed a period of three years.

PART SIX: Modifications

None of these agreements may be modified except in writing signed by both parties and approved by ADOT.

PART SEVEN: Termination

The mentor or protégé retains the right to terminate this agreement by showing cause in a written notice to all parties and ADOT. ADOT may terminate the approval of this agreement by showing cause in a written notice to mentor and protégé. In the event of termination of agreement or termination of ADOT approval, the contractor will remain responsible for the DBE goals established in the project Special Provisions.

PART EIGHT: Privacy Act Provision

The information contained herein and on attachments is used for the ADOT Mentor-Protégé Program only, and may not be disclosed without the express permission of all parties involved in this agreement.

IN WITNESS WHEREOF, the parties hereto have caused this agreement to be executed by their duly authorized officers on the day and year first above written.

Date	Mentor Firm (Authorized Official Name)	Signature
Date	Protégé Firm (Authorized Official Name)	Signature

April 1987

GENERAL REQUIREMENTS:

Bidders List Requirement:

Bidders shall submit a list of the names of all subcontractors, service providers, manufacturers and suppliers submitting bids, proposals or quotes for this project on the "List of Subcontractors, Suppliers, Service Providers and Manufacturers Bidding ADOT Contracts" form. The form is appended to the Special Provisions.

All bidders must submit the required form, whether or not the bid is the low bid.

Bidders must submit this form with all requested information to the ADOT Civil Rights Office no later than 4:00 p.m. on the fifth working day after bids are opened. Faxed copies are acceptable. The fax number is (602) 712-8429.

The address for the Department's Civil Rights Office is 1135 N. 22nd Avenue (second floor), Phoenix, Arizona 85009.

IF THE BIDDER FAILS TO SUBMIT THE REQUIRED INFORMATION BY THE STATED TIME AND IN THE MANNER HEREIN, THE BIDDER SHALL BE INELIGIBLE FOR AWARD OF THE CONTRACT.

The form must be complete and must include all the names and contact information for all subcontractors, service providers, manufacturers and suppliers that submitted bids, proposals, or quotes on this project regardless of the bidder's intentions to use the sub bid. Information on second tier bids is not required.

Title 49 of the Code of Federal Regulations, Part 26.11, required ADOT to create and maintain a bidders list. The purpose of this list is to develop the list of the DBE and non-DBE firms seeking to work on Federal-aid highway construction contracts. This information is then used to set ADOT's overall DBE goal. The regulation requires the following information be collected: the firm's name; the firm's address; the firm's status as a DBE or non-DBE; the age of the firm; and the annual gross receipts of the firm.

The Civil Rights Office will contact listed firms to obtain information from them that will be used in the agency's annual DBE goal setting process. This information will be maintained as confidential to the extent allowed by federal and state law.

Environmental Mitigation Measures:

These mitigation measures are not subject to change without prior written approval from the Federal Highway Administration.

The contractor shall develop a Stormwater Pollution Prevention Plan, Notice of Intent, and Notice of Termination, and submit it to the Engineer for approval.

The contractor, upon approval from the Engineer, shall submit the Stormwater Pollution Prevention Plan's Notice of Intent and Notice of Termination to the Arizona Department of Environmental Quality.

The contractor shall notify his employees prior to any disturbance where lead is present in the paint below the 0.5 percent US Department of Housing and Urban Development/US Environmental Protection Agency action levels, but above the US Department of Labor Occupational Safety and Health Administration detection level. As part of the notification, the contractor shall make the US Department of Labor Occupational Safety and Health Administration publication number 3142-09R 2003 Lead in Construction (http://www.osha.gov/Publications/osha3142.pdf) available to workers.

If suspected hazardous materials are encountered during construction, work shall cease at that location and the Engineer will be notified. The Engineer will contact the Arizona Department of Transportation Environmental Planning Group hazardous materials coordinator (602.920.3882 or 602.712.7767) immediately, and make arrangements for assessment, treatment and disposal of those materials.

If previously unidentified cultural resources are encountered during activity related to the construction of the project, the contractor shall stop work immediately at that location, notify the Engineer, and shall take all reasonable steps to secure the preservation of those resources. The Engineer will contact the Arizona Department of Transportation Environmental Planning Group Historic Preservation Team (602.712.8636 or 602.712.7767) immediately, and make arrangements for proper treatment of those resources.

To prevent the introduction of invasive species seeds, the contractor shall inspect all earthmoving and hauling equipment at the equipment storage facility and the equipment shall be washed prior to entering the construction site.

To prevent invasive species seeds from leaving the site, the contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.

All disturbed soils not paved that will not be landscaped or otherwise permanently stabilized by construction shall be seeded using species native to the project vicinity.

The contractor shall not cause injury or death to swallows, including eggs and nestlings, and shall avoid work within 100 feet of nesting swallows from February 1 to August 31 of any calendar year. If work will occur within 100 feet of nesting swallows between February 1 and August 31, the contractor shall adhere to the following:

- The contractor shall completely remove all existing swallow nests within 100 feet of work areas after August 31 but prior to February 1 to prevent swallows from reusing those nests.
- The contractor shall implement exclusionary measures to prevent swallows from building new nests within 100 feet of work areas. Exclusionary measures shall be implemented in all areas where swallows are likely to nest, and may include (a) continually removing nesting materials during early nest construction when eggs or nestlings are not present, (b) installing exclusionary netting (wire or plastic mesh 0.75 inch or less in diameter), (c) installing deterrent spike strips, and/or (d) applying an appropriate bird exclusion liquid or gel (per manufacturer's instructions).
- The contractor shall not disturb any active swallow nests (completed or partially completed nests that contain eggs or nestlings). If any active nest is discovered within 100 feet of construction activities, work shall stop and the Arizona Department of Transportation Environmental Planning Group

biologist shall be contacted (602.712.6819 or 602.712.7767) to evaluate the potential for disturbance of nests.

- The contractor shall monitor and maintain the effectiveness of exclusionary measures used. Netting shall be maintained such that it remains in place without any loose areas or openings that could trap and/or entangle birds. Spike strips shall be maintained such that they remain in place. Exclusion liquid or gel shall be reapplied as often as necessary to remain effective (per manufacturer's instructions).
- The contractor shall remove all exclusionary measures after project completion to the satisfaction of the Engineer.

Prior to construction, all personnel who will be on-site, including, but not limited to, contractors, contractors' employees, supervisors, inspectors, and subcontractors shall review the Arizona Department of Transportation Environmental Planning Group "Western Burrowing Owl Awareness" flyer. Flyer is included as attachment in Appendix - B.

If vegetation clearing will occur during the migratory bird breeding season (March 1- August 31), the contractor shall avoid any active bird nests. If the active nests cannot be avoided, the contractor shall notify the Engineer to evaluate the situation. During the non-breeding season (September 1- February 28) vegetation removal is not subject to this restriction.

The contractor shall comply with all local air quality and dust control rules, regulations and ordinances which apply to any work performed pursuant to the contract.

Access to adjacent businesses and residences will be maintained throughout construction.

This project is located within a designated municipal separate storm sewer system. Therefore, the contractor shall send a copy of the Notice of Intent and Notice of Termination to the City of Chandler Public Works Department and the Town of Gilbert Public Works Department.

FMS System Maintenance:

The contractor shall ensure that all existing FMS infrastructure within the project limits remains operational and active during construction, except as approved by the Engineer. No disruption to service shall be permitted as a result of construction activities. The contractor shall repair any damage caused by its operations at no additional cost to the Department. There will be no separate measurement or payment for the cost(s) associated with FMS system maintenance during construction, the cost being considered as included in the cost of the contract items if service interruption is due to construction activities.

Ramp Meter Testing Requirements:

The contractor shall coordinate with the ADOT VISION Field Office and the ADOT PCD ITS Maintenance Division after completing the construction of all new ramp meter systems. ADOT PCD ITS Maintenance will conduct operational testing of the ramp meters, approve and accept the newly constructed ramp meter system in conjunction with the ADOT VISION Field Office. The contractor shall be readily available during the testing period. The testing shall occur twice a day for 7 calendar days.

ADOT Traffic Operations Center (TOC) Access Requirements:

Access to the ADOT TOC will be permitted Monday through Friday from 8am to 5pm. The TOC will not be available for contractor access during State Holidays. A 24 hour advanced notice to the Engineer is required for access. The contractor shall coordinate with the Engineer prior to providing the 24 hour advanced notification.

FMS Pre-Activity Meetings:

The contractor shall schedule pre-activity meetings a minimum of 5 working days prior to the construction activity start date. The contractor shall prepare a detailed plan, schedule, and approved traffic control plans for each of the pre-activity meetings. At a minimum, pre-activity meetings shall take place for the following construction activities:

- Conduit and Fiber Placement
- CCTV Construction
- Mainline Detector Installation
- Load Center Construction
- Ramp Meter Construction
- DMS Construction
- Installations at Pump Stations
- Directional Drilling or Boring
- Fiber Splicing and Testing
- Record Drawing
- Stand Alone Testing (CCTV)
- Stand Alone Testing (DMS)
- Subsystem Testing
- System Acceptance Testing

Grading:

No measurement or direct payment will be made for grading in the vicinity of the DMS support structures, the CCTV foundations, ramp meter foundations, and all cabinet foundations. The cost is considered as included in the price of the contract items.

FMS Device Staking:

The contractor shall survey and stake the locations of the cabinet foundations, DMS structure foundations, CCTV pole foundations, ramp meter pole foundations, and on-ramp stop bar locations in the presence and for approval of the Engineer. The contractor shall give a minimum of 2 working days advanced notice to the Engineer prior to staking the locations.

Landform Graphics:

The existing landform shall be protected in place. No measurement or direct payment will be made for replacing landform graphics damaged by the contractor's construction activities, the cost being considered as included in the conduit installation.

Special Event Work Schedules:

The contractor shall schedule the project work in such a manner as to avoid traffic restrictions during special events. Special events accommodations will be coordinated with ADOT Communications Division, the Phoenix Construction District, neighboring cities or towns such as the City of Chandler and Town of Gilbert, and other project stakeholders. Special events shall be defined as activities which draw in a sizable number of community members and whose attendance/enjoyment may be negatively impacted because of ongoing transportation projects.

(101ABRV, 10/08/08)

SECTION 101 DEFINITIONS AND TERMS:

101.01 Abbreviations: of the Standard Specifications is modified to add:

ARPA	Arizona Rock Products Association
IFI	International Fasteners Institute
ISO	International Organization for Standardization
NICET	National Institute for Certification in Engineering Technologies
NEC	National Electrical Code
NRMCA	National Ready Mixed Concrete Association
NSPS	National Society of Professional Surveyors
PPI	Plastic Pipe Institute

(101DEFN, 7/14/14)

SECTION 101 DEFINITIONS AND TERMS:

101.02 Definitions:

Working Day: of the Standard Specifications is revised to read:

A day, exclusive of Saturdays, Sundays and State-recognized holidays, beginning at midnight, extending for a twenty-four hour period, and ending at midnight. Any Saturday, Sunday, or State-recognized holiday on which the contractor has been approved to work will also be counted as a working day. Working days on which weather conditions do not permit work on the project to proceed, as determined by the Engineer, will not be charged.

(102NOBID, 09/19/12)

SECTION 102 - BIDDING REQUIREMENTS AND CONDITIONS:

102.03 **Suspension from Bidding:** of the Standard Specifications is revised to read:

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; or

(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.

(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.

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, 10/01/90)

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 his or her knowledge and belief, that:

(1) No Federally appropriated funds have been paid or will be paid, by or on behalf of the 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 Services, 1651 W. Jackson, 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, and 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 his or her bid or proposal, which he or she 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, 12/14/09)

SECTION 103 - AWARD AND EXECUTION OF CONTRACT:

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

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 from the State Registrar of Contractors, in accordance with Arizona Revised Statutes 32-1101 through 32-1170.03. 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.

Licensing information is available from:

Registrar of Contractors
3838 N. Central
Suite 400
Phoenix, AZ 85012
Phone: (602) 542-1525

SECTION 104 - SCOPE OF WORK:

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

The contractor shall submit a traffic control plan to the Engineer for approval. Work activities that impact traffic shall not commence until the traffic control plan has been approved. The traffic control plan shall conform to the requirements of Part VI of the 2009 edition of the Manual on Uniform Traffic Control Devices (2009 MUTCD), the Arizona Supplement to the 2009 MUTCD, the Arizona Department of Transportation Traffic Control Design Guidelines dated October 2010 or latest edition, the City of Phoenix Barricade Manual, latest edition, the Standard Specifications and these Contract Documents.

The contractor shall obtain approval from both the Engineer and all affected local municipalities prior to implementing the traffic control within City right-of-way. The contractor shall submit the traffic control plan to the Engineer for approval 14 calendar days in advance of the construction activities.

The contractor shall maintain all lanes on all roadways at all times except as indicated in these Special Provisions for lane closures and full freeway closure unless otherwise approved or accepted by the Engineer.

Construction Schedule:

In addition to the schedule requirements contained in Subsection 108.04 "Prosecution and Progress" of the Standard Specifications, the contractor shall provide separate construction progress schedules for each individual construction activity and the required traffic control for those activities. The schedule shall specify the limits of the work activities and related traffic control plan by station or milepost, by day, and by time of day.

The schedule and the related traffic control shall be developed in such ways that access or alternative access is maintained at all times to all adjacent residences and businesses. The schedule should be developed in such a manner that it can be released to the public. The schedule shall be updated as necessary.

Access Requirements for Pedestrians:

The contractor shall maintain safe and passable walkways on at least one side of the crossroad at all times.

Impacts on Non-Freeway Roadways:

Any complete freeway closures that will result in traffic diverting onto City of Chandler streets shall be planned to minimize impacts and conflicts with the Chandler Fashion Square Mall, and shall be coordinated with the City of Chandler Traffic Operations Center, Ben McCawley (480) 782-3471, a minimum of 5 working days in advance, to allow the City of Chandler proper time to modify traffic signal operations for diversion times and plan to observe traffic during diversion.

Any complete freeway closures that will result in traffic diverting onto Town of Gilbert streets shall be planned to minimize impacts and conflicts and shall be coordinated with the Town of Gilbert Traffic Engineering Department, Leslie Bubke 480-503-6923, a minimum of 5 working days in advance to allow the Town of Gilbert proper time to modify traffic signal operations for diversion times and plan to observe traffic during the diversion.

Traffic diversions affecting non-freeway streets shall be pre-approved by the Engineer, strictly obeying the day/date and time restrictions as shown in the Standard Specifications, these Special Provisions and the project Plans.

Traffic-Related Work Restrictions:

Single lane restrictions, ramp closures, shoulder closures, and full freeway closures shall have approval of the Engineer prior to implementation.

Ramp closures and full freeway closures along SR 202L shall be limited to 10:00 PM on Friday night to 7:00 AM Saturday morning, 10:00 PM on Saturday night to 9:00 AM Sunday morning and, 10:00 PM on Sunday night to 5:00 AM Monday morning.

Full freeway closures on SR 202L shall not occur on Fridays, state-recognized legal holidays, or between the hours of 6:00 AM and 9:00 AM and 3:00 PM and 6:00 PM on any weekday.

Single lane closures for weekend work along SR 202L shall be limited to 10:00 PM on Friday night to 5:00 AM on Monday morning.

Single lane closures on SR 202L shall not occur on state-recognized legal holidays, or between the hours of 6:00 AM and 9:00 AM and 3:00 PM and 6:00 PM on any weekday.

The Engineer shall be notified in writing 10 working days in advance of lane restrictions, ramp closures, and full freeway closures.

At least 2 lanes of traffic on SR 202L shall remain open at all times during lane restriction periods.

The contractor has the option to erect 2 DMS signs, structures and accessories in a single weekend per the single day lane restrictions identified in this section.

Submit to the Engineer all detour routes on all traffic control plans. Detour plans must be communicated and approved by all affected agencies prior to commencing traffic

control for full closure. The contractor shall allow 10 working days for other agency approval of detours.

All lane restrictions shall be submitted for approval to the Engineer two weeks in advance in order to properly notify all parties and the public.

No two sequential ramp closures shall occur at the same time unless both are within an approved full closure.

No road closures or lane restrictions will be allowed during special events or holiday travel times as indicated in these Special Provisions.

Ramp closures shall be considered in the same schedule as lane closures.

No conduit trenches shall be left open overnight. All conduit trenches shall be compacted and backfilled per these Special Provisions prior to leaving the construction site.

Rolling Closures:

The contractor shall submit a traffic control plan and a corresponding DMS structure construction plan for approval by the Engineer.

The contractor shall utilize "rolling" or "temporary" freeway or interstate closures to erect DMS and structures at locations as indicated on the Traffic Control Plans. A rolling closure is a form of traffic control used to close freeways for short periods of time, limited to 30 minutes or less.

The rolling closure begins with off-duty police officers in marked vehicles entering the freeway 3 to 5 miles upstream of the work activity. The officers slow traffic behind them to a speed of 10 mph or less and prevent vehicles from passing them. The traffic eventually comes to a complete stop immediately upstream of the work activity. Any intermediate freeway entrance ramps between where the rolling closure begins and the work zone may also be temporarily closed, as directed by the Engineer.

The contractor shall have a maximum of 30 minutes to complete the construction activities during the rolling closures. Rolling closures shall only be allowed at night from the hours of 12:00 am to 3:00 am on Friday and Saturday nights. Rolling closures shall be limited to Friday and Saturday nights only.

Rolling closures shall be completed using DPS assistance. A minimum of one DPS vehicle per 2 lanes of Interstate or freeway traffic is required.

Although the figure does not specifically pertain to a road closure on an Interstate, Highway or freeway, Figure TA-13 of the 2009 MUTCD, "Temporary Road Closure", can be used as a guide for the contractor when developing traffic control scenarios and plans to accommodate the closure of an Interstate or freeway.

Holiday Restrictions:

No work shall be scheduled between noon the day before and 9:00 AM the day after a holiday weekend, or the day of special events, as directed by the Engineer.

No traffic restrictions will be allowed on and during the following periods, unless otherwise approved by the Engineer.

Holiday	Start Date	End Date
Memorial Day	Friday May 27, 2016	Tuesday May 31, 2016
Independence Day	Friday, July 1, 2016	Tuesday July 5, 2016
Labor Day	Friday September 2, 2016	Tuesday September 6, 2016
Columbus Day	Friday October 7, 2016	Tuesday October 11, 2016
Veterans Day	Thursday November 10, 2016	Monday November 14, 2016
Holiday Moratorium	Friday November 18, 2016	Tuesday January 3, 2017
MLK/Civil Rights Day	Friday January 13, 2017	Tuesday January 17, 2017
President's Day	Friday February 17, 2017	Tuesday February 21, 2017

Due to the fact that all moratorium event dates for 2017 have not been finalized, moratorium periods listed above which occur in subsequent years within the contract time shall be subject to the same restrictions as the moratorium in the preceding year.

As event dates become available or revisions to the above dates occur they will be furnished by the Engineer to the contractor.

(104APA, 02/26/99)

SECTION 104 - SCOPE OF WORK:

104.04 **Maintenance of traffic:** of the Standard Specifications is modified to add:

In order to eliminate the possibility of causing or exacerbating air quality violations resulting from construction activities, any traffic control plans which include temporary traffic detours involving local adjacent streets or alternate routes must be approved by the Engineer.

104.08 **Prevention to Air and Noise Pollution:** of the Standard Specifications is modified to add:

In the event that the Governor declares an air pollution emergency, pursuant to ARS § 49-465.B., which restricts work schedules for all employees of the state and its political subdivisions, the Engineer will direct the contractor suspend all work activities until further notice. The contractor shall discontinue all current work activities as soon as possible, but not later than four hours after notification by the Engineer. The contractor will be compensated for labor costs incurred through the end of the work shift in which the notification occurs. No payment adjustments will be made for equipment or overhead costs resulting from the suspension of work. An extension of the time

allowable under the contract will be granted in accordance with Subsection 108.08 of these specifications. In the event that any local air quality authority declares an air pollution advisory, the cooperation of the contractor is requested in complying with the actions recommended by the local authority to the maximum extent possible.

(104DUST, 11/01/95)

SECTION 104 - SCOPE OF WORK:

104.08 **Prevention of Air and Noise Pollution:** of the Standard Specifications is modified to add:

For work performed within Maricopa County, the contractor will be required to prepare a comprehensive fugitive dust control plan, in accordance with the guidelines established in Rule 310 of Maricopa County Regulation III, Control of Air Contaminants. The contractor may contact Maricopa County, Division of Air Pollution Control, to purchase a copy of the guidelines. The contractor shall complete and submit the control plan with the permit application, and obtain approval prior to construction or any other activities which may produce dust pollutants.

Some of the measures which the contractor may use to control or minimize fugitive dust include: increased use of water or chemical dust suppressants, cease work temporarily during high winds, reducing vehicle speeds and number of trips, maintaining freeboard of three inches or more in hauling, and covering or stabilizing stockpiles. The contractor shall be required to cover haul trucks with tarps or other suitable enclosures.

No separate payment will be made for preparation and implementation of the fugitive dust control plan, the costs being considered as included in the price of contract items.

(104MTBRN, 06/04/96)

SECTION 104 - SCOPE OF WORK:

104.08 **Prevention of Air and Noise Pollution:** the first paragraph of the Standard Specifications is modified to add:

Burning of trash, debris, plant material, wood, or any other waste materials will not be allowed. The contractor shall dispose of such materials in accordance with the requirements of Subsection 107.11.

(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.

(104SWDEQ, 3/11/13)

SECTION 104 - SCOPE OF WORK:

104.09 Prevention of Landscape Defacement; Protection of Streams, Lakes and Reservoirs: of the Standard Specifications is revised to read:

(A) General:

The contractor shall give attention to the effect of the contractor's operations upon the landscape, and shall take care to maintain natural surroundings undamaged.

The contractor shall be responsible to implement the requirements of the Arizona Pollutant Discharge Elimination System (AZPDES) for erosion and sediment control as specified in the "General Permit For Discharge From Construction Activities To the Waters Of The United States," issued by the Arizona Department of Environmental Quality (ADEQ). That document is hereinafter referred to as the AZPDES general permit.

Useful information related to stormwater controls and erosion and sediment control measures is presented in the "Fact Sheet For The Issuance Of An AZPDES Construction General Permit," available from ADEQ, and ADOT's "Erosion and Pollution Control Manual," available on the Department's website at http://www.azdot.gov/inside_adot/OES/Water_Quality/Stormwater/Erosion_Pollution_Control_Manual.asp.

The work shall include providing, installing, maintaining, removing and disposing of erosion and sediment control measures such as gravel filter berms, dikes, catch basin inlet protection, end-of-pipe filtering devices, silt fences, dams, sediment basins, earth berms, netting, geotextile fabrics, slope drains, seeding, stream stabilization, and other erosion and sediment control devices or methods. Erosion control, as hereinafter referenced, shall be deemed to include control of erosion and the mitigation of any resulting sediment. Erosion control measures may be temporary or permanent. The contractor shall also be responsible for the preparation and processing of all documents required in the AZPDES general permit.

The plans will include preliminary erosion control measures and additional information to be included in the project's Storm Water Pollution Prevention Plan (SWPPP), as specified in Subsection 104.09(B). The contractor, with input from the Engineer, shall finalize the SWPPP, file a Notice of Intent (NOI), implement the SWPPP, and file a Notice of Termination (NOT), all as described herein.

Except for the NOI, all signatures required of the contractor by the AZPDES general permit, including those required for the NOT, SWPPP, and inspection reports, shall be provided by a duly authorized representative of the contractor, as defined in Part VIII.J.2 of said permit. Signature of the NOI shall be by a responsible corporate officer, as defined in Part VIII.J.1 of the AZPDES general permit.

No clearing, grubbing, earthwork, or other work elements affected by the erosion control requirements in the SWPPP, shall be started until the SWPPP has been approved, the NOI completed and filed in accordance with Subsection 104.09(C), and the SWPPP implemented.

Submission of the contractor's NOI shall certify that the contractor and its subcontractors have read and will comply with all provisions of the AZPDES general permit.

(B) Stormwater Pollution Prevention Plan (SWPPP):

The plans will include descriptions of temporary and permanent erosion control measures; a project description; percent impervious area, including paved areas, rooftops, and other similar surfaces, for both pre-construction and post-construction conditions; inspection schedule; and site-specific diagrams indicating proposed locations where erosion and sediment control devices or pollution control measures may be required during successive construction stages. The plans may also include an initial schedule detailing the proposed sequence of construction and related erosion control measures.

The contractor shall review the preliminary information, including the erosion control features and phasing, evaluate all SWPPP requirements for adequacy in addressing pollution prevention during construction, and prepare a draft SWPPP for review by the Engineer.

The contractor shall designate an erosion control coordinator, in accordance with Subsection 104.09(D), to be responsible for finalization and implementation of the SWPPP, as well as all other applicable requirements of the AZPDES general permit. The contractor's erosion control coordinator shall be approved as specified in Subsection 104.09(D) before the draft SWPPP can be finalized and submitted to the Engineer. After approval, the contractor shall designate the erosion control coordinator as an authorized representative of the contractor in accordance with Part VIII.J.2 of the AZPDES General Permit.

The draft SWPPP shall include all information required in the AZPDES general permit, including a site map; identification of receiving waters and wetlands impacted by the project; a list of potential pollutant sources; inspection schedule; any onsite or off-site material storage sites; additional or modified stormwater, erosion, and sediment

controls; procedures for maintaining temporary and permanent erosion control measures; a list of the contractor's pollution prevention practices; and other permit requirements stipulated in the AZPDES program as well as other applicable state or local programs. The contractor shall coordinate with the Engineer on all such additional information.

The draft SWPPP shall also identify any potential for discharge into a municipal separate storm sewer system (MS4), including the name of the owner/operator of the system.

Unless otherwise approved by the Engineer, 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 erosion control devices 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 draft SWPPP, along with proposed erosion control measures for each sub-area. The draft SWPPP shall also include the sequence of construction for each sub-area, and installation of the required temporary or permanent erosion control measures.

The contractor shall give installation of permanent erosion control measures priority over reliance on temporary measures. Permanent erosion 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. However, except as specified in Part IV, Section B.2 of the AZPDES general permit and approved by the Engineer, erosion control measures shall be installed no later than 14 calendar days after construction activity has temporarily or permanently ceased for the affected sub-area.

Temporary or permanent sedimentation basins may be required for reducing or eliminating sediment from stormwater runoff. When required, such basins shall be completed before any clearing and grubbing of the site is initiated. The contractor shall evaluate the need and attainability of installing sediment basins as described in the AZPDES permit and, if approved by the Engineer, include the basins into the SWPPP as appropriate. When sedimentation basins are determined to be necessary and feasible, such work will be paid in accordance with Subsection 109.04(D). The plans may also include sediment basins as part of the preliminary information. No additional payment will be made for such basins, the cost being considered as included in contract items.

The draft SWPPP shall also identify and address erosion control at on-site fueling operations, waste piles, material storage sites, and off-site dedicated asphalt and concrete plants, contractor-use areas, storage areas, and support activity locations which are used solely for the project and are covered by the AZPDES general permit. The draft SWPPP shall also accommodate all requirements for the contractor's pollution prevention practices specified in Subsection 104.09(E). In addition, the SWPPP shall specifically identify the erosion control measures proposed by the contractor during any vegetation removal and salvaging phases of the project (such as during timber harvesting or native plant salvaging).

The draft 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 review and approval procedure. The Engineer and contractor shall jointly approve and sign each revision to the SWPPP before implementation. Any subsequent submittals required by the contractor to revise or update the SWPPP will require at least 48 hours for review.

Contractors and subcontractors responsible for implementing all or portions of the SWPPP shall be listed in the draft SWPPP, along with the measures for which they are responsible.

The contractor shall submit two copies of the draft SWPPP, including all information specified herein, to the Engineer at the preconstruction conference if possible, but not later than 14 calendar days from the Department's approval of the contractor's Erosion Control Coordinator.

The Engineer will provide the contractor with the following forms at the preconstruction conference:

- Maintenance, inspection, and site-monitoring report forms;
- Other record keeping forms and procedures, as needed; and
- Notice of Intent (NOI) and Notice of Termination (NOT) forms.

Notice of Intent and Notice of Termination blank forms are also available on the internet at http://azdeq.gov/function/forms/appswater.html#cgp.

Within 10 calendar days from the SWPPP submittal, the Engineer and contractor will jointly review the contractor's draft SWPPP, and include any additional revisions directed by the Engineer. The finalized SWPPP shall meet the terms and conditions of the AZDPES general permit, and be compatible with construction sequencing and maintenance of traffic plans.

When agreement has been reached, the Engineer and contractor's authorized representative will sign the finalized SWPPP. The Engineer's signature will constitute approval of the SWPPP. Upon approval of the SWPPP, the contractor shall file a Notice of Intent (NOI) as specified in Subsection 104.09(C).

After the time period specified in Subsection 104.09(C), the contractor shall implement the requirements of the SWPPP. No clearing, grubbing, earthwork, or other work elements affected by the erosion control requirements in the SWPPP, shall be started until the SWPPP has been approved, the NOIs completed and filed in accordance with Subsection 104.09(C), and the SWPPP implemented.

The contractor shall maintain all related erosion control elements in proper working order throughout the project. Work under this section also includes inspections, record-keeping, and implementation of pollution prevention practices as described in Subsection 104.09(E).

The approved SWPPP shall be updated whenever a change in design, construction method, operation, maintenance procedure, or other activity may cause a significant

effect on the discharge of pollutants to surface waters, or when a change is proposed to the personnel responsible for implementing any portion of the SWPPP. The SWPPP shall also be amended if inspections indicate that the SWPPP is ineffective in eliminating or significantly reducing pollutants in the discharges from the construction site. All necessary modifications to the SWPPP shall be made within seven calendar days following the inspection that revealed the deficiency.

ADEQ may notify the contractor at any time that the SWPPP does not comply with the permit requirements. The notification will identify the provisions of the permit that are not being met and parts of the SWPPP that require modification. Within 15 business days of receipt of the notification from ADEQ the contractor shall make the required changes to the SWPPP and submit a written certification to ADEQ that the requested changes have been made.

The contractor's erosion control coordinator shall maintain the SWPPP along with completed inspection forms and other AZPDES records in a three-ring binder. The erosion control coordinator shall maintain a current copy of the SWPPP, including all associated records and forms, at the job site from the time construction begins until completion of the project. The SWPPP shall be available for inspection by ADEQ, FHWA, and other entities identified in the AZPDES general permit, and for use by the Engineer. The erosion control coordinator shall provide copies of any or all of such documents to the Engineer upon request. When requested, such copies shall be provided within three working days of the request.

The SWPPP (including inspection forms) and all data used to complete the NOI and NOT shall be provided to the Department at the completion of the project. The contractor shall retain its own records for a period of at least three years from the filing of the contractor's NOT.

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

(C) Notice of Intent (NOI):

After the project Storm Water Pollution Prevention Plan (SWPPP) has been approved, the contractor will complete a Notice-of-Intent (NOI) form for the project. The NOI includes a certification statement which must be signed and dated by a responsible corporate officer of the contractor, as defined in Part VIII.J.1of the AZPDES General Permit, and include the name and title of that officer.

The NOIs shall be submitted to the Arizona Department of Environmental Quality (ADEQ) at the following address:

Arizona Department of Environmental Quality
Surface Water Section/Permits Unit/Stormwater NOIs (5415A-1)
1110 W. Washington Street
Phoenix, Arizona 85007
or fax to (602) 771-4528

The submittals shall be made to allow for the seven calendar-day review period required by ADEQ before the anticipated start of construction. The contractor shall also allow sufficient time, depending on the manner of submittal, for the NOIs to be received by ADEQ before commencement of the seven-day review period. An Authorization Certificate will be issued by ADEQ and, unless otherwise notified, the construction activities that are covered by the terms and conditions of the AZPDES permit may begin after the submittal period plus the seven calendar-day review period, or upon receipt of the Authorization Certificate, whichever occurs first. The contractor shall provide a copy of the authorization certificate to the Engineer, and keep a copy with the NOI.

The NOI may also be submitted electronically, through ADEQ's Smart NOI website at http://az.gov/webapp/noi/main.do. Regardless of the method of submittal, the contractor shall provide a copy to the Engineer.

At any time after authorization, ADEQ may determine that the contractor's stormwater discharges may cause or contribute to non-attainment of any applicable water quality standards. If ADEQ makes that determination, the contractor will be notified in writing. The contractor shall develop a supplemental erosion control action plan describing SWPPP modifications to address the identified water quality concerns. If the written notice from ADEQ requires a response, failure to respond in a timely manner constitutes a permit violation. All responses shall be in accordance with the AZPDES general permit.

If there is a potential to discharge into a municipal separate storm sewer system (MS4), a copy of the Authorization Certificate shall be submitted to the owner/operator of the system. Also, contractor's operating under an approved local sediment and erosion plan, grading plan, or stormwater management plan shall submit a copy of the Authorization Certificate to the local authority upon their request.

The contractor shall post its NOI and the information required in the AZPDES general permit on the construction-site bulletin board throughout the duration of the project. A copy of the AZPDES general permit shall also be kept at the construction site at all times.

(D) Contractor's Erosion and Pollution Control Coordinator:

(1) General Requirements:

The contractor shall designate a competent person as the contractor's erosion and pollution control coordinator (referred to elsewhere herein as erosion control coordinator) responsible for finalizing the draft SWPPP from the preliminary information included with the plans. The erosion control coordinator shall also be responsible for implementing, monitoring, and revising the approved SWPPP throughout the project, for making the required inspections, and for implementing any other permit requirements stipulated in the AZPDES general permit. The person shall be knowledgeable in the principles and practice of erosion and sediment controls, and possess the skills to assess conditions at the site that could impact stormwater quality and the effectiveness of the contractor's erosion control measures used to control the quality of the stormwater discharges.

Stormwater runoff from construction activities may contaminate adjacent bodies of water, or otherwise exceed water quality standards, and result in possible major civil and/or criminal penalties. Therefore the Engineer will closely consider the qualifications of the contractor's erosion control coordinator. The contractor shall not assume that the person proposed as erosion control coordinator will be acceptable to the Department merely because the experience and education requirements listed herein have been met.

The contractor bears all risks and liabilities for the failure of its erosion control coordinator to properly implement the requirements of the AZPDES general permit.

The person 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. The erosion control coordinator shall also be familiar with procedures and practices identified in the SWPPP, and shall ensure that emergency procedures are up to date and available at project sites.

The erosion control coordinator shall at all times be aware of the contractor's work activities, schedule, and effect of the work on the environment, and shall, at any time, be accessible to direct the contractor's personnel to replace or repair erosion control measures as necessary. Should the erosion control coordinator not be present at the project site on a full-time basis, the contractor shall establish procedures to ensure that its erosion control coordinator is promptly notified of any damage or displacement of the required erosion control measures, whether from construction, vandalism, or other causes. In addition, the contractor shall provide the Engineer with a phone number through which the erosion control coordinator can be contacted at any time, 24 hours a day, seven days a week, including holidays. The erosion control coordinator must be present at the jobsite within 24 hours of such call being placed.

The erosion control coordinator shall also be aware of and comply with all requirements of the AZPDES general permit to address discharges at the site associated with the contractor's activities other than construction, including contractor staging areas, and other potential pollutant and off-site material storage and borrow areas.

The contractor shall be responsible to provide appropriate training to the contractor's personnel, including employees of any subcontractors, to ensure that all personnel understand requirements of the AZPDES general permit and SWPPP that are applicable to their job functions.

Failure of the contractor to properly maintain the erosion control measures required in the approved SWPPP will be cause for the Engineer to reject the erosion control coordinator and issue a stop work order, as specified in Subsection 104.09(G).

(2) Certification Requirements:

The proposed erosion control coordinator shall have successfully completed the 2-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.

If a current training class certificate is more than three years old, the Erosion Control Coordinator will have until April 30, 2014 to 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.

In order to maintain the training class certification, the refresher class shall be required every three years thereafter, prior to the expiration date listed on the previous certificate. After April 30, 2014, should more than three years elapse from completion of either the training class or refresher class, the contractor's proposed erosion control coordinator shall be required to successfully complete the two-day training class in order to again be eligible for consideration.

In addition, the proposed erosion control coordinator shall have documented experience equal to a minimum of one year from either of the following two categories:

(a) Experience in the development and implementation of Stormwater Pollution Prevention Plans (SWPPP's), as specified in the AZPDES general permit referenced herein, or the National Pollutant Discharge Elimination System (NPDES) for highway construction projects. The proposed erosion control coordinator's experience shall demonstrate full-time responsibility for directly supervising construction personnel in the installation, monitoring, and maintenance of erosion control items.

(b) Experience in re-vegetation or restoration of disturbed areas in environments similar to those on the project. Experience in temporary or permanent stabilization of disturbed areas will also be considered. The proposed erosion control coordinator's experience shall demonstrate full-time responsibility for directly supervising personnel in temporary or permanent re-vegetation or restoration of disturbed areas.

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 erosion control coordinator has completed the training class or refresher class. As specified above, the refresher class shall be required thereafter for each subsequent three-year period.

(3) Acceptance:

The contractor shall submit documentation indicating the qualifications of the proposed erosion control coordinator to the Engineer for approval within seven calendar days of the notice of award of the contract. The Engineer will review the proposed candidate's information within seven calendar days. The contractor may begin development of the draft SWPPP from the preliminary information included with the plans prior to approval of the erosion control coordinator. However no clearing, grubbing, earthwork, or other

work elements that, in the opinion of the Engineer, may be subject to the requirements of the AZPDES general permit shall be started until the erosion control coordinator has been approved, the SWPPP finalized and implemented, and the NOI completed and filed, all as specified herein.

(E) Pollution Prevention Practices and Requirements:

The SWPPP shall also specify the contractor's pollution prevention practices and requirements, including vehicle wash-down areas, onsite and off-site tracking control, protection of equipment storage and maintenance areas, methods to minimize generation of dust, and sweeping of highways and roadways related to hauling activities. The contractor shall show each planned location of service and refueling areas on the SWPPP's site map. Changes to the contractor's pollution prevention practices that are related to construction phasing shall also be shown on the SWPPP.

The contractor shall take aggressive actions, considering all conditions, to prevent pollution of streams, lakes, and reservoirs with fuels, oil, bitumens, calcium chloride, fresh Portland cement, fresh Portland cement concrete, raw sewage, muddy water, chemicals or other harmful materials. None of these materials shall be discharged into any channels leading to streams, lakes or reservoirs. The SWPPP shall include the implementation of spill prevention and material management controls and practices to prevent the release of pollutants into stormwater. The SWPPP shall also provide storage procedures for chemicals and construction materials; disposal procedures; cleanup procedures; the contractor's plans for handling such pollutants; and other pollution prevention measures as required.

Machinery service and refueling areas shall be located away from streambeds or washes, and in a manner which prevents discharges into steams or washes.

Waste materials from blasting, including explosives containers, shall be disposed of off-site in accordance with applicable federal regulations. Other waste materials, such as used cans, oils, machine and equipment parts, paint, hazardous materials, plastic and rubber parts, discarded metals, and building materials, shall be removed from the construction site and disposed of according to applicable state and federal regulations.

Where the contractor's working area encroaches on a running or intermittent stream, barriers shall be constructed and maintained between the working areas and the stream bed adequate to prevent the discharge of any contaminants. The SWPPP shall identify the location of streams that may be affected and the specific types of barriers proposed for protecting these resources.

Unless otherwise approved in writing by the Engineer, fording of running streams with construction equipment will not be permitted; therefore, temporary bridges or other structures shall be used whenever an appreciable number of crossings is necessary.

Temporary bridges or other structures proposed by the contractor shall be designed to accommodate the ten-year storm event if to remain in place for up to a one-year period. If a structure is planned to remain in place for longer than one year, the hydraulic conveyance may be subject to more stringent requirements. The contractor shall be responsible for all permits, authorizations, and environmental clearances that may be

necessary to approve the use of such structures. The contractor shall submit the design and all required documentation to the Engineer for approval. The contractor is advised that the review and approval process for such structures could be lengthy. Unless otherwise provided for in the contract, the contractor shall be responsible for all costs associated with the design and construction of such structures. Also, no extension of contract time will be allowed for any review and approval periods, or for the time required to construct temporary bridges proposed by the contractor.

Mechanical equipment shall not be operated in running streams.

Material which is to be stockpiled or disposed of off-site shall be in accordance with Subsection 107.11.

Streams, lakes and reservoirs shall be cleared of all falsework, piling, debris or other obstructions resulting from the contractor's activities, inadvertently placed thereby or resulting from construction operations, within 24 hours from the time the obstruction was observed.

Spill prevention, containment and counter-measures shall be included in the SWPPP if the volume of project-site fuel in a single container exceeds 660 gallons, or if the total fuel storage volume at any one site exceeds 1,320 gallons.

In the event of a spill of a hazardous material, the contractor shall follow the provisions of Subsection 107.07. In addition, the erosion control coordinator shall modify the SWPPP as necessary within 14 calendar days of the discharge. The SWPPP shall be modified to include a description of the release, the circumstances leading to the release, and the date of the release.

The contractor shall assist in any efforts to clean up hazardous material spills, as directed by the Engineer or other authorities. Soil contaminated from spills shall be disposed of according to applicable state and federal regulations.

(F) Inspections:

(1) General:

The Engineer and the erosion control coordinator shall inspect the project at least every 14 calendar days, and also within 24 hours after any storm event of 0.50 inches or more. The inspections shall include disturbed areas that have been temporarily stabilized, areas used for storage of materials, locations where vehicles enter or exit the site, and all of the erosion and sediment controls included in the SWPPP. 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 submitted to the Engineer on a weekly basis.

For each inspection, the contractor's erosion control coordinator shall complete and sign a Compliance Evaluation Report as described in the permit. Copies of the completed reports shall be retained on-site in the SWPPP file throughout the construction period. The erosion control coordinator shall also provide a copy of the report to the Engineer following each inspection.

All inspections shall be made jointly with the Engineer.

(2) Adjustments:

When deficiencies are noted during scheduled inspections, the contractor shall take immediate steps to make the required corrections as soon as practical. Deficiencies shall be fully corrected, to the satisfaction of the Engineer, within four calendar days or by the next anticipated storm event, whichever is sooner. Deficiencies noted between designated inspections shall be corrected within the time period directed by the Engineer, but not later than four calendar days after observation.

Direct inflows of sediment into a watercourse shall be corrected by the end of the same day or work shift in which the inflow was observed.

In accordance with Subsection 104.09(G), failure to implement adjustments within the specified time periods may be cause for the Engineer to reject the contractor's erosion control coordinator and issue a stop work order for the affected portions of the project.

(G) Non-Compliance:

The Engineer may reject the contractor's erosion control coordinator if, in the opinion of the Engineer, the conditions of the AZPDES general permit or the approved SWPPP are not being fulfilled. Rejection of the contractor's erosion control coordinator shall be for failure to complete any of the following:

(1) 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 erosion control coordinator shall fully implement, to the satisfaction of the Engineer, the requirements of the approved SWPPP within three working days.

(2) Should any corrective measures required in Subsection 104.09(F)(2) not be completed within the time periods specified therein, the Engineer will notify the contractor in writing. The contractor's erosion control coordinator 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.

(3) Should the Engineer determine that routine maintenance of the project's erosion control measures is not being adequately performed, the contractor will be notified in writing. Within three working days, the contractor's erosion control coordinator shall demonstrate, to the satisfaction of the Engineer, that such steps have been taken to correct the problem.

In the event of the erosion control coordinator's failure to comply with any of the above requirements, the Engineer will direct the contractor to stop all affected work and propose a new erosion control coordinator as soon as possible. However, all erosion and pollution control items 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

erosion control coordinator 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 erosion control coordinator to properly fulfill the requirements of the approved SWPPP.

(H) Record of Major Construction And Erosion Control Measures:

In addition to the compliance evaluation report, the contractor shall keep records of the major construction activities, including the erosion control measures associated with these activities. In particular, the contractor shall keep a record of the following activities:

- The dates when major grading activities (including clearing and grubbing, excavation and embankment construction) occur in a particular area or portion of the site.
- The dates when construction activities cease in an area, temporarily or permanently.
- The dates when an area is stabilized, temporarily or permanently.

Such information shall be noted within two working days of the occurrence of any of the listed activities, and a copy of the report shall be included in the SWPPP. The contractor shall also provide one copy of such records, and any subsequent up-dated information, to the Engineer within three working days of completion or amendment of the report.

(I) Notice of Termination (NOT):

Upon final acceptance by the Engineer in accordance with Subsection 105.20, and as specified herein, the contractor shall complete and mail a Notice-of-Termination (NOT) for the project to the address shown below. The NOT submitted by the contractor includes a certification statement which must be signed and dated by an authorized representative of the contractor, as defined in Part VIII.J.2 of the AZPDES General Permit, and include the name and title of that authorized representative.

Arizona Department of Environmental Quality
Surface Water Section/Stormwater & General Permits (5415A-1)
1110 W. Washington Street
Phoenix, Arizona 85007
or fax to 602 771-4528

The NOT may also be submitted electronically, through ADEQ's Smart NOI website at http://az.gov/webapp/noi/main.do. Regardless of the method of submittal, the contractor shall provide a copy to the Engineer.

When the approved SWPPP includes the use of Class II seeding as an erosion control measure, seeded areas shall be maintained for 45 calendar days, as specified in the special provisions, and approved by the Engineer before the contractor's NOT can be submitted. Seeding, when used in the SWPPP as an erosion control measure, will not be considered as part of any Landscape Establishment Phase that may be included with the project.

(J) Measurement and Payment:

Measurement and payment for work specified in the SWPPP will be made in accordance with the requirements of Section 810. Erosion control and pollution prevention work specified in the contract which is 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 erosion control is included in the bidding schedule, the contractor may be reimbursed for such additional erosion control items proposed by the contractor but not included with the plans or specifications. Such additional erosion control items must be approved in writing by the Engineer before use. Erosion control items 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 Storm Water Pollution Prevention Plan (SWPPP), including the monitoring plan, 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, or the contractor's pollution prevention practices and requirements, the costs being considered as included in contract items.

Unless otherwise specified, no measurement or payment will be made for maintenance of temporary and permanent erosion 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 Arizona Pollutant Discharge Elimination System (AZPDES) for erosion control due to storm water runoff during construction, as specified above in Subsection 104.09, Prevention of Landscape Defacement; Protection of Streams, Lakes, and Reservoirs.

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 also erect any necessary temporary structures, signs or other facilities. During such period of suspension of work, the contractor shall properly and continuously maintain in an acceptable growing condition

all living material in newly established plantings, seedings and soddings, furnished under its contract and shall take adequate precautions to protect new tree growth and other important vegetative growth against injury.

(105PLNS, 10/18/10)

SECTION 105 CONTROL OF WORK:

105.03 **Plans and Working Drawings:** the thirteenth paragraph of the Standard Specifications is revised to read:

All working drawings or prints shall be 22 inches in height and 34 inches in length. There shall be 1 1/4-inch margins on the left and right sides, and 3/4-inch margins on the top and bottom. A blank space, four inches wide by three inches high, shall be left inside the margin in the lower right hand corner. All drawings shall be made in such a manner that clear and legible copies can be made from them. When half-size copies are required, they shall be provided on standard 11 by 17 inch sheets.

(105FNL, 03/11/11)

SECTION 105 CONTROL OF WORK:

105.20(B) **Final Acceptance:** the second paragraph of the Standard Specifications is revised to read:

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory or not complete, the Engineer will give the contractor written notice of the unsatisfactory or incomplete work and the contractor shall immediately correct such work. In such case, the Engineer will also give the contractor written notice as to whether or not the work is substantially complete.

Final acceptance will not be made until all completed plans and working drawings as required in Subsection 105.03 have been submitted and deemed acceptable by the Engineer. In addition, final acceptance will not be made until all "Certification of Payments to DBE Firms" affidavits, as required in the contract documents, have been submitted and deemed acceptable by the Engineer and the Civil Rights Office.

(106APL, 02/10/12)

SECTION 106 - CONTROL OF MATERIAL:

106.14 **Approved Products List:** of the Standard Specifications is revised to read:

The Approved Products List is a list of products which have been shown to meet the requirements of these Standard Specifications. The Approved Products List is maintained by the Department and updated monthly. Copies of the most current

version are available on the internet from the ADOT Research Center, through its Product Evaluation Program.

The contractor shall verify that any products chosen for use from the Approved Products List are selected from the version which was most current at the time of the bid opening.

Unless otherwise specified in the Special Provisions, products not appearing on the Approved Products List at the time of the bid opening may be used if they meet the requirements of the plans and specifications.

When the Special Provisions limit product selection to only those listed on the Approved Products List, other products will not be evaluated or approved.

(106CERT, 09/14/12)

SECTION 106 CONTROL OF MATERIAL:

106.05 Certificates: of the Standard Specifications is revised to read:

(A) General:

The contractor shall submit to the Engineer an original or copy of either a Certificate of Compliance or a Certificate of Analysis, as required, prior to the use of any materials or manufactured assemblies for which the specifications require that such a certificate be furnished.

Certificates shall be specifically identified as either a "Certificate of Compliance" or a "Certificate of Analysis".

The Engineer may permit the use of certain materials or manufactured assemblies prior to, or without, sampling and testing if accompanied by a Certificate of Compliance or Certificate of Analysis, as herein specified. Materials or manufactured assemblies for which a certificate is furnished may be sampled and tested at any time, and, if found not in conformity with the requirements of the plans and the specifications, will be subject to rejection, whether in place or not.

Certificates of Compliance and Certificates of Analysis shall comply with the requirements specified herein, the ADOT Materials Testing Manual, and applicable ADOT Materials Policy and Procedure Directives.

(B) Certificate of Compliance:

A Certificate of Compliance shall be submitted on the manufacturer's or supplier's official letterhead, and shall contain the following information:

(1) The current name, address, and phone number of the manufacturer or supplier of the material.

(2) A description of the material supplied.

(3) Quantity of material represented by the certificate.

(4) Means of material identification, such as label, lot number, or marking.

(5) A statement that the material complies in all respects with the requirements of the cited specifications. Certificates shall state compliance with the cited specification, such as AASHTO M 320, ASTM C 494; or specific table or subsection of the Arizona Department of Transportation Standard Specifications or Special Provisions. Certificates may cite both, if applicable.

(6) A statement that the individual identified in item seven below has the legal authority to bind the manufacturer or the supplier of the material.

(7) The name, title, and signature of the responsible individual. The date of the signature shall also be given.

Each of the first six items specified above shall be completed prior to the signing of the certificate as defined in item seven. No certificate will be accepted that has been altered, added to, or changed in any way after the authorized signature has been affixed to the original certificate. However, notations of a clarifying nature, such as project number, contractor, or quantity shipped are acceptable, provided the basic requirements of the certificate are not affected.

A copy or facsimile reproduction of the original certificate will be acceptable; however, the original certificate shall be made available upon request.

(C) Certificate of Analysis:

A Certificate of Analysis shall include all the information required for a Certificate of Compliance and, in addition, shall include the results of all tests required by the specifications.

(106DMAT, 2/15/11)

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

106.15 Domestic Materials and Products:

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

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

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

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

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

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

(106QCMAT, 10/03/14)

SECTION 106 CONTROL OF MATERIAL:

106.04(A) **General:** the fourth and fifth paragraphs of the Standard Specifications are revised to read:

The sampling, testing, and acceptance of materials shall be in accordance with the requirements of the specifications, in conjunction with the following:

- The ADOT Materials Testing Manual.
- The ADOT Materials Policy and Procedure Directives Manual.
- Applicable Federal, AASHTO, or ASTM specifications or test designations.
- Applicable specifications or test designations of other nationally recognized organizations.

Unless otherwise specified, whenever a reference is made to an Arizona Test Method or an ADOT Materials Policy and Procedure Directive, it shall mean the test method or policy and procedure directive in effect on the bid opening date.

106.04(C)(2) **Quality Control Laboratory:** the first paragraph is revised to read:

All field and laboratory sampling and testing shall be performed by a laboratory or laboratories approved by the Department. The requirements for approval of laboratories are specified in ADOT Materials Policy and Procedure Directive No. 19, "ADOT System for the Evaluation of Testing Laboratories". Approved laboratories, and

the test methods for which they are approved to perform, are listed in the "ADOT Directory of Approved Materials Testing Laboratories". Approved test methods listed in the "ADOT Directory of Approved Materials Testing Laboratories" do not include field sampling and testing procedures. When field sampling and testing procedures are performed, the appropriate valid Arizona Technical Testing Institute (ATTI) and/or American Concrete Institute (ACI) certification(s) are required. ADOT Materials Policy and Procedure Directive No. 19, "ADOT System for the Evaluation of Testing Laboratories" and the "ADOT Directory of Approved Materials Testing Laboratories" may be obtained on the internet from the ADOT Materials Quality Assurance Section website.

106.04(C)(6) Weekly Quality Control Reports: of the Standard Specifications is revised to read:

The contractor shall submit Weekly Quality Control Reports to the Engineer. The weekly reports shall be complete and accurate, and shall state the types of work which have been performed during the report period. The report shall also include the process control measures taken to assure quality. The report shall provide sample identification information for materials tested during the report period, including sample number, date sampled, sample location, first and last name of person obtaining sample, and original source of material. The report shall also provide the results for all required tests and any retests, corrective actions, and other information relevant to quality control. The report shall include daily diaries for each day of testing, a weekly summary, the ADOT TRACS number, and the testing laboratory's project identification number.

Except as stated in the following paragraph, the weekly quality control report shall be prepared using standard forms provided by the Department. The standard forms are available on the Department's website at www.azdot.gov. After accessing the Department's website, select "Business", "Engineering and Construction", "Construction", "Contractors' Information", "Forms and Documents", and then "Weekly Quality Control Forms". Except for the daily diaries, all documentation and information required on the forms shall be typed. Daily diaries may be hand-written if acceptable to the Engineer. The weekly report shall be submitted to the Engineer in paper form with a transmittal letter signed by the contractor's quality control manager.

In lieu of using the standard weekly quality control forms available on the Department's website, the contractor or testing laboratory may prepare the weekly report using proprietary or other software, if acceptable to the Engineer, provided that all required information is included, the format is comparable to the Department's standard format, and the report is submitted in paper form with the required transmittal letter.

The report period shall end at midnight of each Friday, and the report shall be submitted to the Engineer no later than 5:00 p.m. of the following Wednesday. The Engineer will verify that the report is timely, complete and accurate.

Reports that are not submitted by the above-referenced deadline shall be considered delinquent. Reports that are submitted by the above-referenced deadline, but are not complete and accurate, shall also be considered delinquent. In either case monies shall be deducted from the contractor's monthly estimate in accordance with the requirements for Contractor Quality Control, as specified in these special provisions.

(107INS, 7/10/12)

SECTION 107 - LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC:

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

Prior to the execution of the contract, the contractor shall file with the Department a certificate or certificates of insurance evidencing insurance as required by this contract has been placed with an insurer authorized to transact insurance in the State of Arizona pursuant to ARS Title 20, Chapter 2, Article 1, or with a surplus lines insurer approved and identified by the Director of the Department of Insurance pursuant to ARS Title 20, Chapter 2, Article 5.

All insurers shall have an "A.M. Best" rating of A- VII or better.

The State of Arizona in no way warrants that the above-required minimum insurer rating is sufficient to protect the contractor from potential insurer insolvency.

The contractor's submission of the required insurance certificates constitutes a representation to the Department that:

1. The contractor has provided a copy of these specifications to every broker who has obtained or filed a certificate of insurance and has communicated the necessity of compliance with these specifications to the broker; and

2. To the best of the contractor's knowledge, each certificate of insurance and each insurance coverage meets the requirements of these specifications.

The contractor shall provide the Department with certificates of insurance (ACORD form or equivalent acceptable to the State of Arizona) as required by the contract. The certificates for each insurance policy shall be signed by a person authorized by that insurer.

(107SWRSP, 01/28/03)

SECTION 107 - LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC:

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

(A) General:

The contractor's attention is directed to the requirements of Arizona Revised Statutes Section 40-360.21 through .29 requiring all parties excavating in public streets, alleys or utility easements to first secure the location of all underground facilities in the vicinity of the excavation.

The contractor shall review copies of existing ADOT permits, subject to availability, prior to start of construction, to assist the contractor in determining the location of any utilities, which the Department may have record of and which are not otherwise shown in the contract documents. Utility locations obtained from the Department are for information only and shall not relieve the contractor of responsibility for identifying, locating and protecting any existing utility lines. Copies of permits may be obtained from the ADOT Area Permit Supervisor in the District in which a project is located.

The contractor shall contact the owners of the various utilities prior to the start of construction and shall obtain from them any information pertaining to existing utilities that will either supplement information shown on the project plans or will correct any such information that may be incorrect. The contractor shall furnish the Engineer with evidence that the contractor has contacted the utility companies. Such evidence shall be submitted at the preconstruction conference, and shall include a copy of the information received from each utility as a result of such contacts.

If the contractor learns from either the owner of the utility or from any other source of the existence and location of properties of railway, telegraph, telephone, fiber optics cable, water, sewer, septic tanks or systems, electric, gas and cable television companies either omitted from or shown incorrectly on the project plans, the contractor shall immediately notify the Engineer and shall not disturb the utilities. Relocation or adjustment of such utilities, if deemed necessary, will be either performed by others or shall be performed by the contractor in accordance with the provisions of Subsection 104.02.

The contractor shall cooperate with the owners of any underground or overhead utility lines in their removal and rearrangement operations in order that these operations may progress in a reasonable manner, that duplication of rearrangement work may be reduced to a minimum and that services rendered by these parties will not be unnecessarily interrupted.

Temporary or permanent relocation or adjustment of any utility line or service connection desired by the contractor for its convenience shall be its responsibility. The contractor shall obtain the approval of both the Engineer and the utility company and upon approval shall make all necessary arrangements with the utility company and shall bear all costs in connection with such relocation or adjustment. The contractor shall also submit a Sewer Discharge Prevention Plan, as specified in Subsection 107.15 (C) (1), describing each anticipated relocation or adjustment involving existing sanitary sewer lines. No work on a particular facility shall begin until all approvals for that facility have been received.

(B) Contractor Qualifications for Water and Sewer Lines:

Breakage of active sanitary sewer lines may result in the potential spread of disease, contamination of the site and any adjacent bodies of water, and other hazards to the public. Substantial cleanup costs may be associated with such breakage, as well as possible major civil and/or criminal penalties. Therefore, the Engineer will closely consider the qualifications of any personnel proposed by the contractor to oversee or perform work involving active sanitary sewer lines. The contractor shall not assume that

the personnel assigned to perform such work will be acceptable to the Department merely because they meet the experience requirements listed herein.

The contractor, or the subcontracting firm assigned to perform the water and sewer work, shall have a minimum of five years of experience in the installation and construction of underground large diameter (18-inch or above) water and sewer improvements.

In addition, the key personnel assigned by the contractor to perform any work on water or sewer lines, whether from the prime contractor or a subcontracting firm, shall also have at least five years of experience in the installation and construction of underground large diameter (18-inch or above) water and sewer improvements. A minimum of two such people shall be designated by the contractor. The designated personnel may have the title of foreman or superintendent; however, at least one of these people shall be present at all times at the location of any work being performed at or near an active sanitary sewer line.

For both the firm and the key personnel, the experience shall include working with and around water and sewer utility lines that are in service. The contractor shall submit the following documentation to the Engineer for review and approval:

(1) A list indicating that the designated key project personnel have at least five years of applicable experience, as specified above. The list shall be accompanied with resumes for each of the key people. The resumes shall include the following information, and demonstrate compliance with the specified requirements:

   (a) Detailed relevant experience for a minimum of two projects, including project description, date of work, actual work performed by the individual, and references (a minimum of one for each project).

   (b) Level of applicable formal training.

   (c) Number of years of relevant experience in performing like construction.

(2) A list of water and sewer construction projects completed by the firm performing the water or sewer work, as specified above, indicating a minimum of five years of applicable experience. Include the dates of work, type of work, description of the project, amount of work performed by the contractor/subcontractor, and the name and phone number of a contact with the owning company or agency for which the work was completed.

(3) List of equipment that will be used for this project. The list shall include, as a minimum, equipment type, date of manufacture, and if contractor-owned or rented.

(4) A list of all violations and citations in the past five years of applicable water and wastewater laws and statutes for both the prime contractor and the subcontractor responsible for the utility work.

The contractor shall submit this documentation to the Engineer for approval at least 21 calendar days prior to any anticipated work involving active sanitary sewer lines, whether new or existing.

(C) Protection of Existing Utility Lines:

At points where the contractor's operations are adjacent to right-of-way properties or easements for railway, telegraph, telephone, water, sewer, electric, gas and cable television companies, hereinafter referred to as utilities, or are adjacent to other facilities and property, damage to which might result in considerable expense, loss, inconvenience, injury or death, work shall not be commenced until all arrangements necessary for the protection thereof have been made.

The exact locations and depths of all utilities that are underground or the location of those on or near the surface of the ground which are not readily visible shall be determined. Such locations shall be marked in such a manner so that all workmen or equipment operators will be thoroughly apprised of their existence and location. It will be the contractor's responsibility to see that every effort possible has been made to acquaint those actually involved in working near utilities not only with the type, size, location and depth, but with the consequences that might follow any disturbance. No trenching or similar operation shall be commenced until the Engineer is satisfied that every possible effort has been taken by the contractor to protect utilities.

The contractor shall coordinate with others working near new or existing sewer lines or other utilities on the procedures to be followed to prevent damaging of these utilities.

(1) Sewage Discharge Prevention Plan (SDPP):

For any work which may impact active sanitary sewer pipes, whether new or existing, the contractor shall prepare a Sewage Discharge Prevention Plan (SDPP) which shall describe the contractor's procedures and work plan for such lines. The Sewage Discharge Prevention Plan shall also describe the precautions that the contractor shall take to prevent unplanned breakage or spills, and the procedure which the contractor shall follow if breakage or a spill occurs.

The contractor's method of work described in the SDPP shall ensure that any work done in or near any active sewer line is performed in a safe and controlled manner resulting in no accidental discharges. As a minimum, the contractor's equipment and procedures shall be appropriate for the intended work, and shall conform to standard industry practices.

The SDPP shall include information, as specified below, for all portions of the project which involve the following work activities, and for any other element of work which may involve contact with an active sanitary sewer line:

- Interrupt, divert, relocate, plug, or abandon a sewer line or service connection, or

- Brace, or tie into a sewer line or service connection.

Construction activities in the vicinity of active sanitary sewer lines or service connections shall also be included in the SDPP if any of the following conditions exist:

(1) Any work crossing beneath the pipe, at any angle, regardless of vertical separation.

(2) Any work crossing over the pipe, at any angle, within two feet of the top of pipe.

(3) Work located parallel to the pipe within the following areas:

(a) For the area from the bottom of the pipe to two feet above the top of the pipe, any work within two feet horizontally of the pipe wall.

(b) For the area below the bottom of the pipe, any work located below an imaginary line beginning at the pipe springline and progressing downward at a slope of 1.5 feet vertically to 1.0 feet horizontally.

The contractor's Sewage Discharge Prevention Plan shall address each of the items tabulated below, as applicable, for every location where construction activity will involve an active sanitary sewer line.

(2) Required Elements of the Sewage Discharge Prevention Plan:

The following elements shall be addressed in the SDPP:

(a) Describe the proposed work in general, including the reasons for the work, scope, objectives, locations, dates, and estimated times the work will be conducted. Include project plan sheets detailing the proposed work, and indicating the peak flow rates of active sewer lines, determined as specified.

(b) For all existing sanitary sewer pipes, determine whether the lines are active or abandoned, and the peak flow rates of lines in service, as provided by the owner of the utility.

(c) List the key personnel (crew foreman, superintendent, and manager) and field office that are proposed to perform the work (include phone numbers).

(d) Describe the work in step-by-step detail for each location, including excavation plans and how both the new and existing structures and utilities will be identified and protected.

(e) Provide a detailed listing of any hardware, fittings, pipe plugs, flex couplings, tools, and materials needed to accomplish the work, and note the status of these items (on-hand, to-be-fabricated, on-order with

expected delivery date, etc.). Include any manufacturer's specifications or recommendations, especially for any pipe plugs, sewer line fittings, and patching materials.

(f) List all major equipment to be used to perform the work. Include in this item any pumps that will be used to perform the work and the rated capacity of the pumps at the anticipated suction head.

(g) List all equipment to be used in the event of an unplanned release and specify how the equipment will be used. The locations of standby pumps shall be specified in this item. The plan shall indicate that all standby equipment to be used in the event of an unplanned discharge can be delivered to the site and put into service within two hours of identification of any unplanned flow.

(h) List the safety equipment to be used, and describe any unique safety procedures. Cite the applicable OSHA standards covering the work.

(i) Describe any contingency plans the contractor will implement in the event of unplanned releases and/or damage to existing facilities. List all personnel and subcontractors that will be responsible for responding to unplanned releases or damaged lines. Provide qualifications for all such personnel and subcontractors, including education, formal training, and relevant experience.

(j) Describe how the public will be protected during the work, and include or cite any applicable traffic control plans.

(k) Describe the quality control procedures that will be used in the field.

(l) Discuss how temporary plugs or flow control devices will be secured, monitored, and removed.

The SDPP shall be in written form, and shall include any diagrams or sketches necessary for clarity. When possible, diagrams and sketches should be shown using the applicable project plan sheets.

The contractor shall modify the SDPP as necessary throughout the project to include any new or revised information relevant to the items listed above. The contractor shall resubmit the revised SDPP to the Engineer for approval in each case.

(3) Sewage Discharge Prevention Plan Approval:

The SDPP shall be submitted to the Engineer at least 21 calendar days before any work involving an active sewer line is to be done. The Engineer will review the plan, solicit comments from the owner/operator of the sewer line, and return the plan to the contractor within 14 calendar days from original submittal.

No work involving active sanitary sewer lines shall be done until a final SDPP meeting all the requirements specified in Subsection 107.15 (C) (2) has been approved by the Engineer.

Approval of the contractor's Sewage Discharge Prevention Plans, personnel, or construction methods and operation shall not relieve the contractor from its responsibility to safely perform the work included in this contract, nor from its liability for damage resulting, either directly or indirectly, from its work performed under this contract.

(D) Service Connections:

(1) General:

In the event of interruption to water, sewer, or utility services as a result of accidental breakage or as a result of lines being exposed or unsupported, the contractor shall promptly notify the proper authority and shall cooperate with the said authority in the restoration of service. When service is interrupted, repair work shall be continuous until the service is restored. No work shall be undertaken around fire hydrants until provisions for continued service have been approved by the local fire authority.

(2) Unidentified Water and Sewer Connections:

The contractor shall protect unidentified, undamaged water or sewer service connections encountered during excavation. The contractor shall immediately notify the Engineer when an unidentified service connection is encountered.

The contractor shall immediately repair unidentified water or sewer service connections that are damaged during excavation. Any damaged service connections shall be reported to the Engineer, including all remedial actions taken.

(E) Repairing Damaged Lines:

When the operations of the contractor result in damage to any utility line or service connection, the location of which has been brought to the contractor's attention, the contractor shall assume full responsibility for such damage.

Should an unplanned breakage occur in an active sewer line as a result of the contractor's operations, the contractor shall immediately notify the Engineer, and begin repairs to halt any flows and restore normal service, in accordance with the procedures described in the approved Sewage Discharge Prevention Plan. The contractor shall also immediately notify the affected utility company and the appropriate regulatory agencies. The contractor shall be responsible for repairing the damaged pipe, restoring any interruptions in service, and cleaning up the affected areas within 24 hours of the beginning of the spill. Sewage discharge damage assessments, as specified in Subsection 107.15 (F), will be charged to the contractor for any unplanned breakage which results in a discharge.

The contractor shall be responsible to repair any breakage, in accordance with requirements of the broken line's owner/operator, and clean up the site per applicable

codes and regulations of the Environmental Protection Agency, OSHA, Arizona Department of Environmental Quality (ADEQ), and all other agencies' specifications, at no additional cost to the Department.

(F) Sewage Discharge Damage Assessments:

The Department will assess liquidated damages in accordance with the Table 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 liquidated damages assessed is based on the type and quantity of effluent discharged as determined by the Engineer.

These liquidated damages 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 for late completion of the project.

Liquidated damages assessed by the Department 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 1

Liquidated Damages (each 24 hour period, or portion thereof)

Volume of Discharge	Raw Sewage or Industrial Wastewater	Treated Effluent
Less than 10,000 gallons	$5,000.00	$1,000.00
10,000-99,999 gallons	$10,000.00	$2,000.00
100,000-1 million gallons	$25,000.00	$3,000.00
Greater than 1 million gallons	$40,000.00	$5,000.00

Liquidated damages shall be assessed for each 24 hour period, or portion thereof, until the contractor has completed all of the following tasks:

(A) Stopped the discharge.

(B) Repaired the damaged pipe.

(C) Restored normal service.

(D) Fully cleaned and disinfected the site to the satisfaction of the Engineer.

REDUCTION OF LIQUIDATED DAMAGES: Upon completion of tasks A, B, and C above, and prior to completion of Task D, the liquidated damages assessed for the current 24-hour period shall be at the rate shown in Table 1. However, for each subsequent 24-hour period, the assessment will be one half of the rate shown in Table - 1.

Damages 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 A, B, and C 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:	$10,000.00
Second 24-hour period:	$10,000.00
Third 24-hour period:	$5,000.00

For this example, the total liquidated damage assessment will be $25,000.00 ($10,000 + $10,000 + $5,000).

(107UTIL, 04/09/15)

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:

The contractor shall be ADOT's Blue Stake field locator, and perform all requirements as prescribed in A.R.S. 40-360.21 through .29, for all underground facilities that have been installed by the contractor on the current project, until the project is accepted by ADOT.

At least two working days prior to commencing excavation, the contractor shall call BLUE STAKE CENTER, between the hours of 7:00 a.m. and 4:30 p.m., Monday through Friday for information relative to the location of buried utilities. The number to be called is as follows:

Projects In Maricopa County (602) 263-1100

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

CENTRAL (PHOENIX) MAINTENANCE DISTRICT:

(602) 712-7521
(602) 712-7522

2140 W. Hilton Avenue
Phoenix, AZ 85009

The contractor is cautioned to use care when operating near any utility facilities. The contractor shall determine the exact location of the utilities, in accordance with Arizona Blue Stake Law, and notify the below-mentioned utility companies prior to construction operations at least two working days prior to commencing work on the project unless otherwise noted.

The following utility companies have facilities within the project limits, but are not anticipated to be in conflict:

Utility Company	Utility	Contact	Phone Number
AGL Networks dba Zayo Group	Communications	Matt Burke	678-666-2517
AT&T	Communications	Eric Nowicki	480-510-8107
CenturyLink	Communications	Dennis Aust	480-768-4547
City of Chandler	Local	Ben McCawley	480-782-3471
Cox Communications	Communications	Joel Rushing	623-328-3627
El Paso Natural Gas	Gas	Greg Gill	719-520-4774
Kinder Morgan Energy	Gas	Pipeline Inquiries	714-560-4400
Level 3 Communications	Communications	Masood Zeerak	720-888-8568
MCI	Communications	Dean Boyers	972-729-6322
Roosevelt Water Conservation District	Irrigation	Greg New	480-748-6416
SRP Communications Engineering	Communications	Mike Unser	602-236-8501
SRP Customer and System Improvement Distribution	Power	Chris Ybarra	602-236-0834
SRP Distribution Planning	Power	Sherm Hall	602-236-0982
SRP Land Rights Management	Power	Cincie Bannerman	602-236-8186
SRP Line Asset Management	Power	Wayne Darby	602-236-4882
SRP Transmission Planning	Power	Jeff Loehr	602-236-0972
SRP Water Engineering	Water/Irrigation	Susana Ortega	602-236-5799
Southwest Gas	Gas	Scott Suaso	480-730-3852
Spectrum Irrigation Water Delivery District	Irrigation	Shannon Ellerbusch	480-726-8080
Sprint Communications	Communications	Colin Sword	602-417-0970
Town of Gilbert	Traffic/Signals Interconnect	Leslie Bubke	480-503-6923

Town of Gilbert	Water Distribution	Andrew Jackson	480-503-6480
Town of Gilbert	Water Production	Jason Bobko	480-503-6371
Town of Gilbert	Wastewater	Mark Horn	480-503-6420

However, it shall be the contractor's responsibility to determine the exact location of the utilities, in accordance with Blue Stake Law. Blue Stake must be called at least two working days prior to commencing any construction activities on the project and protect all existing utilities in place.

CenturyLink

CenturyLink has facilities crossing SR202L at Dobson Rd, Alma School Rd, Arizona Ave, at 3 locations in between Arizona Ave and McQueen Rd, at McQueen Rd, Cooper Rd, Gilbert Rd, Lindsay Rd, Val Vista Dr, Santan Village Pkwy, and Williams Field Rd.

Blue staking for location of CenturyLink facilities must be completed prior to any construction. When crossing CenturyLink facilities the contractor must pothole to determine the depth and maintain a minimum of 12 inch vertical and horizontal separation from the facilities. Support and protection is required for all CenturyLink facilities during construction.

City of Chandler

Conflicts can be avoided by determining the exact location and elevation of the City of Chandler facilities. The City of Chandler does not provide depth information on its facilities; the City recommends that the contractor evaluates each potential conflict location by potholing and exposing the facility. The Contractor shall guard and protect City of Chandler facilities.

The Contractor shall immediately notify the appropriate City of Chandler Department of any discrepancies or conflicts. The Contractor shall allow a minimum of 30-days to resolve conflicts that arise as a result of the construction of this project. The City of Chandler does not maintain installation records of customer service laterals that may conflict with this project. The Contractor shall notify The City of Chandler Transportation & Development Department, Ben McCawley 480-782-3471, of all utility coordination meetings, pre-construction meetings and construction schedules including the NTP date.

Cox Communications

The contractor must notify Cox Communications Engineering Department of all utility coordination meetings, pre-construction meetings and construction schedules including the NTP date.

Kinder Morgan Energy

The contractor must adhere to applicable provisions in Kinder Morgan's L-OM200-29 "Guidelines for Design and Construction" relating to proposed projects affecting Kinder Morgan (KM) pipelines.

Exact pipeline location can only be determined by pothole at maximum 50 feet intervals (or as required by the onsite KM representative). The pothole work must be performed by hand excavation and in the presence of a pipeline representative.

Notify KM Right of Way Specialist, Heath Townsend (480) 261-0333, at least two weeks prior to commencement of the pothole work. Mr. Townsend will arrange for a pipeline representative to be present during work near the pipeline.

Roosevelt Water Conservation District (RWCD)

The contractor shall conform to current RWCD General Notes located online at www.rwcd.net and on the project plans, paying special attention to Section 5: Utility Crossings.

The contractor shall obtain a copy of the RWCD Crossing Permit. All work authorized by the RWCD permit shall be completed within six (6) months from the date of the Responsible Party's signature. Contractor shall contact Greg New at (480) 748-6416 no later than 24 hours prior to beginning construction. An RWCD approved set of plans along with a copy of the approved RWCD crossing permit shall be onsite at all times while construction is in progress.

Permittee shall indemnify and hold harmless Roosevelt Water Conservation District, its agents and employees from any claims of liability from permittee's use of the RWCD crossing permit and the privileges granted therein.

At no time shall permittee block access to RWCD facilities without prior approval from RWCD. RWCD access shall remain open and unencumbered 24/7 throughout the duration of the permit.

Salt River Project

The contractor must adhere to any and all requirements set forth in the SRP ADOT SANTAN Freeway (202L) – Dobson Road to Ray Road *CONSENT TO USE OF EASEMENT AGREEMENT/ADOT*. Contact ADOT right-of-way section for a copy of this agreement.

Southwest Gas

The contractor must be aware there may be abandoned steel gas lines within the project limits that are potentially coated or wrapped with unidentified materials. Southwest Gas treats its entire steel gas pipe with unidentified coating/wrapping materials as potentially containing asbestos. Accordingly, whenever such pipe is in direct conflict and requires removal, it must only be done so by one of Southwest Gas' NESHAP certified contractors. Care must also be taken when working near and exposing these lines. The costs associated with such removal will be the responsibility of the contractor. The contractor must contact Southwest Gas in advance to coordinate any removal.

Spectrum Irrigation Water Delivery District (SIWDD)

Should excavations be needed in the area of the SIWDD facilities, the contractor shall contact SIWDD to request a locate of their facilities.

Town of Gilbert

At each interchange within the Town of Gilbert, the project will provide conduit connection to the Town's fiber optic network for future communication interconnectivity, as shown on the project plans. The contractor shall contact Leslie Bubke (480) 503-6923 at least two business days prior to scheduled activities in these locations to coordinate access and field review.

Union Pacific Railroad

The Union Pacific Railroad (UPRR) crosses the SR 202L Santan Freeway at two locations within this project; just east of Arizona Avenue at approximate milepost 47.5 and near Ray Road at approximate milepost 39.8. At the UPRR location at approximate milepost 47.5, the SR 202L mainline travels over UPRR tracks via freeway bridge. At the UPRR location at approximate milepost 39.8, the UPRR tracks travel over the SR 202L mainline via railroad bridge. The contractor's work in these locations includes pulling new fiber optic communications cable through the existing conduit within the SR 202L mainline. The contractor shall not enter UPRR right-of-way for any reason and shall remain on the SR 202L bridge (at approximate milepost 47.5) or the SR 202L underpass (at approximate 39.8) at all times.

(107FINA, 09/19/12)

SECTION 107 - LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC:

107.19 Federal Immigration and Nationality Act: of the Standard Specifications is revised to read:

(A) General:

The contractor and all subcontractors shall comply with all federal, state and local immigration laws and regulations, as set forth in Arizona Executive Order 2005-30, relating to the immigration status of their employees who perform services on the contract during the duration of the contract. The State shall retain the right to perform random audits of contractor and subcontractor records or to inspect papers of any employee thereof to ensure compliance.

The contractor shall include the provisions of Subsection 107.19 in all its subcontracts.

In addition, the contractor shall require that all subcontractors comply with the provisions of Subsection 107.19, monitor such subcontractor compliance, and assist the Department in any compliance verification regarding any subcontractor.

(B) Compliance Requirements for A.R.S. § 41-4401, Government Procurement, E-Verify Requirement; Sanctions:

By submission of a bid, the contractor warrants that the contractor and all proposed subcontractors are and shall remain in compliance with:

(1) All federal, state and local immigration laws and regulations relating to the immigration status of their employees who perform services on the contract, and
(2) A.R.S. Section 23-214, Subsection A (That subsection reads: "After December 31, 2007, every employer, after hiring an employee, shall verify the employment eligibility of the employee through the E-Verify program.").

A breach of a warranty regarding compliance with immigration laws and regulations shall be deemed a material breach of the contract, and the contractor and subcontractors are subject to sanctions specified in Subsection 107.19(D).

Failure to comply with a State audit process to verify the employment records of contractors and subcontractors shall be deemed a material breach of the contract, and the contractor and subcontractors are subject to sanctions specified in Subsection 107.19(D).

(C) Compliance Verification:

The State may, at any time and at its sole discretion, require evidence of compliance from the contractor or subcontractor.

Should the State request evidence of compliance, the contractor shall complete and return the State Contractor Employment Record Verification Form and Employee Verification Worksheet, provided by the Department, no later than 21 days from receipt of the request for such information.

Listing of the compliance verification procedure specified above does not preclude the Department from utilizing other means to determine compliance.

The State retains the legal right to inspect the papers of any employee who works on the contract to ensure that the contractor or subcontractor is complying with the warranty specified in Subsection 107.19(B).

(D) Sanctions for Non-Compliance:

For purposes of this paragraph, non-compliance refers to either the contractor's or subcontractor's failure to follow immigration laws or to the contractor's failure to provide records when requested. Failure to comply with the immigration laws or to submit proof of compliance constitutes a material breach of contract. At a minimum, the Department will reduce the contractor's compensation by $10,000 for the initial instance of non-compliance by the contractor or a subcontractor. If the same contractor or subcontractor is in non-compliance within two years from the initial non-compliance, the contractor's compensation will be reduced by a minimum of $50,000 for each instance of non-compliance. The third instance by the same contractor or subcontractor within a

two-year period may result, in addition to the minimum $50,000 reduction in compensation, in removal of the offending contractor or subcontractor, suspension of work in whole or in part or, in the case of a third violation by the contractor, termination of the contract for default.

In addition, if a contractor is in non-compliance three times within a two-year period, the Department will revoke the contractor's prequalification for a minimum of one year. Subcontractors and suppliers who are in non-compliance three times within a two-year period will be prohibited from participating in Department contracts for a minimum of one year.

Subcontractors who are in non-compliance three times within a two-year period, and who are prequalified with the Department as prime contractors, will also have such prequalifications revoked for a minimum of one year.

After the minimum one-year suspension, contractors, subcontractors, and suppliers may be considered eligible to participate in Department contracts, but only after successful demonstration, to the satisfaction of the Department, that their hiring practices comply with the requirements specified herein. If considered eligible, contractors shall be required to re-apply for prequalification and be accepted prior to bidding on Department contracts. Subcontractors interested in bidding on Department contracts as prime contractors shall also be required to re-apply for prequalification and be accepted prior to bidding. For purposes of considering suspension: (1) non-compliance by a subcontractor does not count as a violation by the contractor, and (2) the Department will count instances of non-compliance on other Department contracts.

The sanctions described herein are the minimum sanctions; in case of major violations the Department reserves the right to impose any sanctions up to and including termination, revocation of prequalification, and prohibition from participation in Department contracts, regardless of the number of instances of non-compliance.

Contractors, subcontractors, and suppliers may appeal the sanctions to the State Engineer. That 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 Department's determination. The State Engineer shall promptly consider any appeals and notify the interested party of the State Engineer's findings and decision. The State Engineer's decision shall be considered administratively final.

Any delay resulting from a compliance verification or a sanction under this subsection is a non-excusable delay. The contractor is not entitled to any compensation or extension of time for any delays or additional costs resulting from a compliance verification or a sanction under subsection 107.19.

An example of the minimum sanctions under this subsection is presented in the following table:

Offense by:			**Minimum** Reduction in Compensation
Contractor	Subcontractor A	Subcontractor B	
First			$10,000
	First		$10,000
	Second		$50,000
		First	$10,000
	Third		$50,000 *
* Will, in addition, result in removal of the subcontractor, prohibition from participating in Department contracts, and revocation of any Department prequalifications that the subcontractor may have obtained.			

(108PRCN, 10/03/14)

SECTION 108 PROSECUTION AND PROGRESS:

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

The contractor shall submit a traffic control plan in accordance with Subsection 701-1. The contractor shall designate an employee who is competent and experienced in traffic control to implement and monitor the traffic control plan. The qualifications of the designated employee must be satisfactory to the Engineer. After June 30th, 2015, such designated employee shall have successfully completed a recognized traffic control supervisor training and certification program. The traffic control supervisor training certification provided by the American Traffic Safety Services Association (A.T.S.S.A.) or the International Municipal Signal Association (IMSA) shall be acceptable. Certification through other programs must be approved in advance by the Engineer. The contractor shall submit proof of the proposed individual's certification at the preconstruction conference. The certification shall be current, and must be valid throughout the duration of the project.

(108TIME, 10/12/01)

SECTION 108 - PROSECUTION AND PROGRESS:

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

The time allowed for the completion of the work included in the contract will be **240 Working Days** and will be known as the "Contract Time."

(108FCWT, 7/01/14)

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	$ 100,000	$ 430	$ 600
100,000	500,000	640	900
500,000	1,000,000	1,000	1,400
1,000,000	2,000,000	1,290	1,800
2,000,000	5,000,000	1,860	2,600
5,000,000	10,000,000	2,710	3,800
10,000,000	20,000,000	2,790	3,900
20,000,000	30,000,000	3,570	5,000
30,000,000	60,000,000	5,500	7,700
60,000,000	90,000,000	9,430	13,200
90,000,000	———	9,430	13,200

(109FORCE, 02/20/08)

SECTION 109 - MEASUREMENT AND PAYMENT:

109.04(D)(3)(a) **Rental Rates (Without Operators):** of the Standard Specifications is modified to add:

The Rental Rate Blue Book adjustment factor (F) will be **0.933**.

(109RET, 7/01/14)

SECTION 109 - MEASUREMENT AND PAYMENT:

109.06(C) **Payroll Submittals:** of the Standard Specifications is revised to read:

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 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 written 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 liquidated damages. Such $500.00 retentions will not relieve the contractor of its responsibility to provide each required payroll, complete and correct, as specified above. These liquidated damages shall be in addition to all other retention or liquidated damages provided for elsewhere in the contract.

109.07 **Partial Payment for Material on Hand:** the fifth paragraph of the Standard Specifications is hereby deleted.

(201MTBRN, 10/18/10)

SECTION 201 - CLEARING AND GRUBBING:

201-3.02 **Removal and Disposal of Materials:** the second and third paragraphs of the Standard Specifications are revised to read:

In the disposal of all tree trunks, stumps, brush, limbs, roots, vegetation and other debris, the contractor shall comply with the requirements of Title 49, Chapter 3, of the Arizona Revised Statutes, and with the Rules and Regulations for Air Pollution Control, Title 18, Chapter 2, Article 6, adopted by the Arizona Department of Environmental Quality pursuant to the authority granted by the Arizona Administrative Code.

Burning of trash, debris, plant material, wood, or any other waste materials will not be allowed.

(202RMVL, 10/03/14)

SECTION 202 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS:

202-3.07 **Removal of Embankment Curb:** the second paragraph of the Standard Specifications is revised to read:

Asphaltic concrete obtained from sources approved by the Engineer shall be used to fill and repair voids on the existing pavement surface that result from the removals.

202-3.09 **Removal of Guardrail:** the first paragraph of the Standard Specifications is revised to read:

All guardrail to be removed shall become the property of the contractor unless otherwise specified on the project plans. Guardrail removal shall include complete removal of posts, concrete foundations, and foundation tubes, and subsequent backfill of the remaining holes with moist soil in compacted lifts, as approved by the Engineer.

202-5 **Basis of Payment:** the first paragraph of the Standard Specifications is revised to read:

Payment for the accepted quantities of removal of structures and obstructions will be made by lump sum or by specific removal items or by a combination of both. Payment for removal of structures and obstructions not listed in the bidding schedule, but necessary to perform the construction operations designated on the project plans or specified in the Special Provisions shall be considered as included in the prices of contract items.

When saw cutting is not included as a contract pay item, full compensation for any saw cutting necessary to perform the construction operations designated on the plans shall be considered as included in the price of contract items.

ITEM 2020021 REMOVAL OF CONCRETE CURB AND GUTTER:

Description:

The proposed work under this item shall consist of removing concrete curb and gutter as shown on the plans. This work is required near DMS foundation at station 2488+50 to lengthen the existing jersey barrier and protect the DMS foundation. The work shall be in accordance with the requirements of subsection 202-3.04 of the Standard Specifications.

Method of Measurement:

Removal of Concrete Curb and Gutter will be measured per linear foot in accordance with the contract plans and these special provisions.

Basis of Payment:

The accepted quantity of Removal of Concrete Curb and Gutter, measured as provided above, will be paid for at the contract unit price, which shall be full compensation for the work.

The work shall include all excavation and subsequent backfill incidental to removal, all as shown on the plans and as specified in these special provisions.

(606OHST, 9/08/11)

SECTION 606 OVERHEAD SIGN STRUCTURES:

606-1 **Description:** the first paragraph of the Standard Specifications is revised to read:

The work under this section shall consist of furnishing and installing overhead sign structures in accordance with the details shown on the plans and in accordance with the requirements of the specifications.

606-2.07 Reinforcing Steel: of the Standard Specifications is revised to read:

Reinforcing steel bars shall conform to the requirements of ASTM A 615. Unless otherwise specified, steel bars meeting the requirements of ASTM A 706 may be substituted for ASTM A 615 steel bars. When ASTM A 706 bars are used, tack welding of the reinforcement will not be permitted unless approved in writing by the Engineer. Reinforcing steel wire shall conform to the requirements of ASTM A 82.

ITEM 6060036 BRIDGE SIGN STRUCTURE (SD9.52, TYPE 3F, DMS):
ITEM 6060037 BRIDGE SIGN STRUCTURE (SD9.52, TYPE 4F, DMS):

Description:

The work under these items shall consist of the fabrication of new sign structures as shown in the project plans and as described in these special provisions.

Materials:

All materials for the sign structure shall be in accordance with the requirements of Subsection 606-2 of the Standard Specifications and the ADOT SD Details 9.52 series Dynamic Message Sign Tubular Frame and ADOT SD Details 9.20 series Tubular Sign Structures Tubular Frame for bridge sign structures.

Construction Requirements:

The sign structure shall be constructed in accordance with the requirements of Subsection 606-3 of the Standard Specifications and the ADOT SD Details 9.52 series Dynamic Message Sign Tubular Frame and ADOT SD Details 9.20 series Tubular Sign Structures Tubular Frame for bridge sign structures.

The contractor shall ground the inside DMS post (median side) at the compression of the nut of the anchor bolt against the bottom of the tubular structure upright.

Method of Measurement:

The work will be measured as each sign structure furnished and erected in accordance with the contract plans and these special provisions.

Basis of Payment:

The accepted quantities of Bridge Sign Structure (SD9.52, Type 3F, DMS) and Bridge Sign Structure (SD9.52, Type 4F, DMS), measured as provided above, will be paid for at the contract unit price, which shall be full compensation for the work, complete in place.

The work shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in furnishing and erecting the sign structures complete in place, including painting, galvanizing if necessary,

furnishing and placing non-shrink grout, furnishing sign mounting brackets, and all necessary hardware except for anchor bolts which are considered as part of the foundations, all as shown on the plans and as specified in these special provisions.

ITEM 6060080 FOUNDATION FOR BRIDGE SIGN STRUCTURE (SD9.20, TYPE 3F, DMS):

Description:

The work under this item includes installing new sign structure median and shoulder foundations, as shown in the project plans and as described in these special provisions.

Materials:

All materials for the sign structure foundations shall be in accordance with the requirements of Subsection 606-2 and Section 609 Drilled Shaft Foundations of the Standard Specifications and the ADOT SD Details 9.52 series Dynamic Message Sign Tubular Frame and ADOT SD Details 9.20 series Tubular Frame.

Concrete for the foundations shall conform to the requirements of Section 1006 of the Standard Specifications. Reinforcing steel and wire mesh shall conform to the requirements of 1003 of the Standard Specifications.

Construction Requirements:

Constructed sign structure foundations shall be in accordance with the requirements of Subsection 606-3 of the Standard Specifications and the ADOT SD Details 9.52 series Dynamic Message Sign Tubular Frame and ADOT SD Details 9.20 series Tubular Frame.

Constructed sign structure foundations and barrier pedestals shall be in accordance with the requirements of Subsection 606-3 of the Standard Specifications and the ADOT SD Details 9.52 series Dynamic Message Sign Tubular Frame and ADOT SD Details 9.20 series Tubular Frame.

The contractor shall survey and stake the locations of the sign structure foundations in the presence and for approval of the Engineer. The contractor shall give a minimum of 2 working days advanced notice to the Engineer prior to staking the locations.

Method of Measurement:

Foundation for Bridge Sign Structure (SD9.20, Type 3F, DMS) will be measured per each sign structure foundation constructed in accordance with the contract plans and these special provisions.

No additional measurement or payment will be made for maintaining existing median lighting as the cost is considered included with the installation of the foundation.

No additional measurement or payment will be made for excavation, site grading and preparation in the vicinity of the foundation. The cost is considered as included in the price of the foundation.

Basis of Payment:

The accepted quantity of Foundation for Bridge Sign Structure (SD9.20, Type 3F, DMS), measured as provided above, will be paid for at the contract unit price, which shall be full compensation for the work, complete in place.

The work will include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in constructing foundations, complete in place, including steel reinforcement, furnishing and installing anchor bolts, all necessary excavation, backfilling and disposing of excess excavated material, all as shown on the plans and as specified in these special provisions.

ITEM 6060081 FOUNDATION FOR BRIDGE SIGN STRUCTURE (SD9.20, TYPE 3F, DMS WITH RAISED COLUMN):

Description:

The work under this item shall include constructing new sign structure median foundations with 4'x4' square raised foundation columns that will comply with any future concrete median barrier installation, as shown on the project plans, as described in these special provisions, and as directed by the Engineer.

The new DMS bridge sign structures that will have new median foundations with 4'x4' square raised foundation columns are: DMS No. 129 (station 2664+73), DMS No. 133 (station 2687+65), DMS No. 134 (station 2802+00), and DMS No. 135 (station 2808+00).

Materials:

All materials for the sign structure foundations shall be in accordance with the requirements of Subsection 606-2 and Section 609 Drilled Shaft Foundations of the Standard Specifications and the ADOT SD Details 9.52 series Dynamic Message Sign Tubular Frame and ADOT SD Details 9.20 series Tubular Frame.

Concrete for the foundations shall conform to the requirements of Section 1006 of the Standard Specifications. Reinforcing steel and wire mesh shall conform to the requirements of 1003 of the Standard Specifications.

Construction Requirements:

Constructed sign structure foundations and the square raised column pedestals shall be in accordance with the requirements of Subsection 606-3 of the Standard Specifications and the ADOT SD Details 9.52 series Dynamic Message Sign Tubular Frame and ADOT SD Details 9.20 series Tubular Frame.

Excavation shall conform to the requirements of Section 203-3.03 of the Standard Specifications. Site grading and subgrade preparation shall conform to the requirements of Section 205-3.04 of the Standard Specifications. Concrete for the 4'x4' square raised column additions shall conform to the requirements of Section 601 of the Standard Specifications. Concrete shall be Class S, f'c = 4,000 psi. Steel reinforcement for the 4'x4' square raised column additions shall conform to the requirements of Section 605 of the Standard Specifications and ASTM Specification A615. All steel reinforcement shall be Grade 60.

The contractor shall survey and stake the locations of the sign structure foundations, in the presence and for approval of the Engineer. The contractor shall give a minimum of 2 working days advanced notice to the Engineer prior to staking the locations.

Method of Measurement:

Foundation for Bridge Sign Structure (SD9.20, Type 3F, DMS with Raised Column) will be measured per each sign structure foundation constructed in accordance with the contract plans and these special provisions.

No additional measurement or payment will be made for maintaining existing median lighting as the cost is considered included with the installation of the foundation.

No additional measurement or payment will be made for excavation, site grading and preparation in the vicinity of the foundation. The cost is considered as included in the price of the foundation.

No separate measurement or payment will be made for disposal of materials, concrete, or steel reinforcement. The cost is considered as included in the price of the foundation.

Basis of Payment:

The accepted quantities of Foundation for Bridge Sign Structure (SD9.20, Type 3F, DMS with Raised Column), measured as provided above, will be paid for at the contract unit price, which shall be full compensation for the work, complete in place.

ITEM 6060083 FOUNDATION FOR BRIDGE SIGN STRUCTURE (SD9.20, TYPE 4F, DMS):

Description:

The work under this item includes installing new sign structure median and shoulder foundations, as shown in the project plans and as described in these special provisions.

Materials:

All materials for the sign structure foundations shall be in accordance with the requirements of Subsection 606-2 and Section 609 Drilled Shaft Foundations of the

Standard Specifications and the ADOT SD Details 9.52 series Dynamic Message Sign Tubular Frame and ADOT SD Details 9.20 series Tubular Frame.

Concrete for the foundations shall conform to the requirements of Section 1006 of the Standard Specifications. Reinforcing steel and wire mesh shall conform to the requirements of 1003 of the Standard Specifications.

Construction Requirements:

Constructed sign structure foundations shall be in accordance with the requirements of Subsection 606-3 of the Standard Specifications and the ADOT SD Details 9.52 series Dynamic Message Sign Tubular Frame and ADOT SD Details 9.20 series Tubular Frame.

Constructed sign structure foundations and barrier pedestals shall be in accordance with the requirements of Subsection 606-3 of the Standard Specifications and the ADOT SD Details 9.52 series Dynamic Message Sign Tubular Frame and ADOT SD Details 9.20 series Tubular Frame.

The contractor shall survey and stake the locations of the sign structure foundations in the presence and for approval of the Engineer. The contractor shall give a minimum of 2 working days advanced notice to the Engineer prior to staking the locations.

Method of Measurement:

Foundation for Bridge Sign Structure (SD9.20, Type 4F, DMS) will be measured per each sign structure foundation constructed in accordance with the contract plans and these special provisions.

No additional measurement or payment will be made for maintaining existing median lighting as the cost is considered included with the installation of the foundation.

No additional measurement or payment will be made for excavation, site grading and preparation in the vicinity of the foundation. The cost is considered as included in the price of the foundation.

Basis of Payment:

The accepted quantity of Foundation for Bridge Sign Structure (SD9.20, Type 4F, DMS), measured as provided above, will be paid for at the contract unit price as each, complete in place.

The contract unit price paid per unit for each item will include full compensation for furnishing all labor, materials, tools, equipment, maintaining median and shoulder lighting, and incidentals, and for doing all the work involved in constructing foundations, complete in place, including steel reinforcement, furnishing and installing anchor bolts, all necessary excavation, backfilling and disposing of excess excavated material, all as shown on the plans and as specified in these special provisions.

(607POST, 9/08/11)

SECTION 607 ROADSIDE SIGN SUPPORTS:

607-1 **Description:** the first paragraph of the Standard Specifications is revised to read:

The work under this section shall consist of furnishing and installing roadside sign supports in accordance with the details shown on the plans and the requirements of the specifications.

607-2.05 **Concrete:** the last paragraph of the Standard Specifications is revised to read:

Reinforcing steel bars for breakaway sign post foundations shall conform to the requirements of ASTM A 615. Unless otherwise specified, steel bars meeting the requirements of ASTM A 706 may be substituted for ASTM A 615 steel bars. When ASTM A 706 bars are used, tack welding of the reinforcement will not be permitted unless approved in writing by the Engineer. Reinforcing steel wire shall conform to the requirements of ASTM A 82.

(608PANEL, 02/02/10)

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:

- Flat Sheet Aluminum Sign Panels With Direct-Applied, Digitally-Imaged, Electronic-Cut, or Screen-Printed Characters

- Warning, Marker, and Regulatory Sign Panels

608-2.01 **General:** of the Standard Specifications is modified to add:

Signs shall be fabricated in accordance with the recommendations established by the manufacturer of the sign sheeting. All processes and materials used to make a sign shall in no way impact the performance, uniform appearance (day and night), or durability of the sheeting, or invalidate the sign sheeting manufacturers' warranty.

All sheeting used for background and legend shall be from the same manufacturer, and shall be covered with a protective or anti-graffiti film from the same manufacturer. Protective and anti-graffiti film other than those specified by the manufacturer will not be allowed. Protective overlays and anti-graffiti films shall be applied according to the manufacturers' recommendations.

All text and numerals shall all be installed at the same orientation: either zero degrees or 90 degrees.

Design of letters and numbers shall be in accordance with the project plans with a tolerance of ± 1/16th of an inch.

608-2.07 Flat Sheet Aluminum Sign Panels With Direct-Applied or Silk-Screened Characters: the title and text of the Standard Specifications are revised to read:

608-2.07 Flat Sheet Aluminum Sign Panels With Direct-Applied, Digitally-Imaged, Electronic-Cut, or Screen-Printed Characters:

Panels shall be fabricated from 0.125-inch thick 5052-H36, or 5052-H38 Aluminum Alloy conforming to the requirements of ASTM B 209.

Panel facing shall be prepared and covered with retroreflective sheeting in accordance with the recommendations of the sheeting manufacturer. The color of the sheeting shall be as specified on the plans or as shown in the Manual of Approved Signs.

All surfaces not covered shall be etched to reduce glare from reflected sunlight.

The retroreflective sheeting shall conform to the requirements of Section 1007. Splicing of retroreflective sheeting shall not be allowed on sign panels having a minimum dimension up to and including four feet.

Messages shall be reflectorized white or, if called for on the plans, opaque black, and shall be produced by either screen printing, direct-applying, digital imaging, or electronic cutting, as specified under Subsections 608-2.15 and 608-2.16.

608-2.09 Warning, Marker, and Regulatory Sign Panels: of the Standard Specifications is revised to read:

Panels shall be fabricated from flat sheet aluminum and shall be reflectorized as specified herein.

Panels shall be fabricated in one piece from 0.125-inch thick 5052-H36, 5052-H38, or 6061-T6 Aluminum Alloy conforming to the requirements of ASTM B 209.

All surfaces of panels to be covered with retroreflective sheeting shall be prepared in accordance with the recommendations of the sheeting manufacturer. Surfaces not covered shall be etched to reduce glare from reflected sunlight. Retroreflective sheeting shall conform to the requirements of Section 1007.

Warning signs shall be reflectorized with fluorescent yellow retroreflective sheeting.

Regulatory signs shall be reflectorized with white retroreflective sheeting.

Reflectorized red signs shall be reflectorized with white retroreflective sheeting. The red color shall be produced by screen printing.

Regulatory signs with reflectorized red circles and slashes shall be reflectorized with white retroreflective sheeting. The red color shall be produced by screen printing.

Interstate route markers shall be cut to shape. The colors and legend shall be as shown on the plans and shall be reflectorized with white retroreflective sheeting. The Interstate route colors shall be screen-printed. The numerals may be screen-printed, electronic-cut, or direct-applied characters.

United States, State Route, and Cardinal Direction markers shall be reflectorized with white retroreflective sheeting unless otherwise shown on the plans.

Splicing of retroreflective sheeting shall not be allowed on sign panels having the minimum dimension up to and including four feet.

608-2.13 **Retroreflective Sheeting, Inks and Opaque Film:** the second and third paragraphs of the Standard Specifications are hereby deleted.

608-2.14(A) **General:** the second paragraph of the Standard Specifications is revised to read:

Flat sheet aluminum substrates used for characters and borders shall be either aluminum alloy 3105-H14, 3003-H14, 5052-H36, or 5052-H38 as specified in ASTM B 209. Characters produced from the flat sheet aluminum alloy shall sit flat on the face of the sign panel without visible gap or deformation.

608-2.14(B) **Sheeting and Colors:** the third, fourth, and fifth paragraphs of the Standard Specifications are revised to read:

The color for demountable letters, numbers, symbols, and route shields on green, blue, and brown background signs shall be white, and shall conform to the requirements of Section 1007. Demountable legends on white and yellow background signs shall be black, and shall be opaque and non-reflective. Black characters shall be finished with laminated black opaque acrylic film.

When borders are used with demountable characters, white legend and border shall be used on green, blue, or brown sign backgrounds, and black legend and border shall be used on white or yellow sign backgrounds. Sign sheeting conforming to Section 1007 shall be used for white borders. Black borders shall be laminated black opaque acrylic film.

Laminated black opaque acrylic film to be used for characters or borders, as specified above, shall be applied in accordance with the coating manufacturer's recommendations. The contractor shall provide copies of any warranties provided by the manufacturer to the Engineer.

608-2.15 Silk-Screened or Direct-Applied Characters: the title and text of the Standard Specifications is revised to read:

608-2.15 Screen-Printed, Direct-Applied, and Electronic-Cut Characters:

Screen-printed letters, numerals, arrows, symbols, and borders, shall be applied on the retroreflective sheeting background of the sign by direct or reverse screen process. Messages and borders of a color darker than the background shall be applied to the retroreflective sheeting by direct process. Messages and borders of a color lighter than the sign background shall be produced by the reverse screen process.

Opaque or transparent colors, inks, and paints used in the screen process shall be of the type and quality recommended by the manufacturer of the retroreflective sheeting.

The screening shall be performed in a manner that results in a uniform color and tone, with sharply defined edges of legends and borders and without blemishes on the sign background that will affect intended use.

Signs, after screening, shall be air dried or baked in accordance with the manufacturer's recommendations to provide a smooth hard finish. Any signs on which blisters appear during the drying process will be rejected.

Direct-applied letters, numerals, symbols, borders, and other features of the sign message shall be cut from black opaque or retroreflective sheeting of the color specified and applied to the retroreflective sheeting of the sign background in accordance with the instructions of the manufacturer of the retroreflective sheeting.

Direct-applied legend may be moved vertically 1/2 inch to avoid placing only a small amount of material over the adjacent extruded panel. The bottom of all characters for a line of legend shall line up within 1/8 of an inch.

Electronic-cut characters shall be cut from translucent acrylic sheeting using computerized automated cutting processes.

608-2 Materials: of the Standard Specifications is modified to add:

608-2.16 Digitally-Imaged Characters:

Digitally-imaged characters shall consist of characters produced through ultraviolet jet-printing or thermal transfer. Signs with digitally-imaged characters shall be manufactured using matched component ink, transparent electronic-cuttable film, and/or overlay film as supplied by the reflective sheeting manufacturer. For digitally-imaged copy on white sheeting, the coefficient of retroreflection shall be not less than 70 percent of the original values for the corresponding integral color. When characters are spread over two adjacent extruded panels, the characters shall align with each other within 1/16th of an inch.

608-3.02 Installation of Sign Panels: of the Standard Specifications is revised to read:

The sign panels shall be installed on overhead sign structures and roadside sign supports in accordance with the details shown on the plans and in accordance with the recommendations of the manufacturers of the sign panel components.

Minor scratches and abrasions resulting from fabrication, shipping and installation of panels may be patched; however, patching shall be limited to one patch per 50 square feet of sign area with the total patched area being less than five percent of the sign area. Panels requiring more patching than the specified limit will be rejected. Patches shall be edge sealed by a method approved by the retroreflective sheeting manufacturer.

Sign panels shall be attached to the posts with hex head bolts as shown in the Standard Drawings; slotted head bolts shall not be used. A cadmium-plated fender washer shall be placed between the bolt head and panel face.

For flat sheet panels, bolts shall be fastened with a cadmium-plated fender washer and two standard nuts. The fender washer shall be placed against the sign post, the first nut shall be tightened against the fender washer, and the second nut shall be tightened against the first nut. Bolts shall be tightened from the back by holding the bolt head stationary on the face of the panel. Twisting of the bolt head on the panel face will not be allowed.

The contractor shall provide two copies of a detailed list of all new signs installed on the project to the Engineer. The list shall include the sign identification code, the date each sign was installed (month and year), the fabricator of the sign, and the materials used to make the sign (manufacturer, type of sheeting, ink and film). The list shall be provided in a commonly used electronic spreadsheet format, such as EXCEL, and the two copies shall be submitted on CD-ROM disks. Signs shall be listed in numerical order by route, direction, and milepost and, where more than one sign is installed at the same general location, a letter subscript.

Sign panels within the same sign assembly shall be placed at the same orientation along the roadway so that the entire legend of the signs appear uniform under normal viewing conditions, both day and night.

Upon fabrication or installation of each sign, the contractor shall place information on the back of the sign showing the sign identification code, the sign fabricator, the manufacturer of the sheeting used, and the month and year of the installation. The formatting of the required information shall be as shown on the standard drawings. The information shall be positioned to be readily visible from a vantage point outside the flow of traffic and not obstructed by sign posts, extrusions, stringers or brackets. All letters shall be made of a long life material such as a black opaque acrylic film. Signs not marked as required will not be eligible for payment.

Temporary traffic control signs are exempt from the installation information requirement unless noted otherwise on the project plans.

608-3.04 **Inspection:** the second paragraph of the Standard Specifications is revised to read:

Each sign panel face shall be cleaned thoroughly just prior to the inspection by a method recommended by the manufacturer. The cleaning material shall in no way scratch, deface or have any adverse effect on the sign panel components.

608-5 **Basis of Payment:** first and second paragraphs of the Standard Specifications are revised to read:

The accepted quantities of each type of sign panel designated in the bidding schedule, measured as provided above, will be paid for at the contract unit price per square foot, complete in place, regardless of the type of sheeting or type of character used on the sign panel. Payment shall be made on the total area of each type of sign panel to the nearest square foot.

No measurement or payment will be made for Route Shields and EXIT ONLY Panels (for installation on sign panels), the cost being considered as included in the contract unit price for the sign panel.

(701PDMPT, 9/26/14)

SECTION 701 - MAINTENANCE AND PROTECTION OF TRAFFIC:

701-1 **Description:** the third paragraph of the Standard Specifications is revised to read:

When a traffic control plan is included in the project plans, this plan shall govern unless an alternate plan, acceptable to the Engineer, is submitted by the contractor. If no traffic control plan is provided or if the contractor desires to deviate from the provisions for maintaining traffic as described in this section, it shall submit to the Engineer for approval a proposed sequence of operations and a compatible method of maintaining traffic. After June 30th, 2015, such submittal shall be prepared by an employee of the contractor that has successfully completed a recognized traffic control supervisor training and certification program, as specified in Subsection 108.03. A traffic control plan proposed by the contractor may also be prepared by an individual that is not an employee of the contractor provided the individual is also currently certified through the traffic control supervisor training and certification program specified in Subsection 108.03. However, the contractor bears all responsibility for any such contractor-submitted traffic control plan, whether prepared by its direct employee or other individual.

The contractor's proposal shall be submitted early enough to allow at least two weeks for review and approval before use of the proposed traffic control plan.

701-2.01(B)(1) General Requirements: item (d) of the second paragraph of the Standard Specifications is revised to read:

(d) The name, title and signature of a person having legal authority to bind the manufacturer or supplier of the Category I and II devices. The binding authority shall be in accordance with the applicable requirements of Subsection 106.05(B).

701-2.03 Temporary Concrete Barrier: the second paragraph of the Standard Specifications is revised to read:

The contractor shall provide, at the preconstruction conference, a certificate of compliance, conforming to the requirements of Subsection 106.05, stating that any temporary concrete barrier to be used on the project conforms to Signing and Marking Standard Drawing C-3. The contractor shall include the project number on the submittal.

701-2.04 Temporary Impact Attenuation Devices: the second paragraph of the Standard Specifications is revised to read:

Temporary impact attenuation devices shall also meet evaluation criteria for Test Level 3 per NCHRP (National Cooperative Highway Research Program) Report 350, or for Test Level 3 per MASH (AASHTO Manual for Assessing Safety Hardware). The contractor shall provide, at the preconstruction conference, a certificate of compliance, conforming to the requirements of Subsection 106.05, certifying that any temporary impact attenuation devices to be used on the project will meet the above requirement. The contractor shall include the project number on the submittal.

701-3.05 Temporary Pavement Markings (Application and Removal):

(C) Preformed Pavement Markings: the first paragraph of the Standard Specifications is revised to read:

Preformed pavement markings for temporary applications shall be Type II (Temporary-Removable) and III (Temporary-Nonremovable) and shall conform to the requirements of Section 705 of the specifications.

701-3.07 Truck-Mounted Attenuator: the title and text of the Standard Specifications are revised to read:

701-3.07 Truck-Mounted and Trailer-Mounted Attenuators:

The contractor shall provide trucks and truck-mounted attenuators, or trailer-mounted attenuators and host vehicles, at the locations shown on the project plans and/or as directed by the Engineer.

Truck-mounted or trailer-mounted attenuators shall meet either NCHRP Report 350, Test Level 3 criteria, or MASH (Manual for Assessing Safety Hardware), Test Level 3 criteria, passing both mandatory and optional tests. The truck and attenuator combination shall only be used in the configuration tested. Trailer-mounted attenuators

shall be used with a host vehicle meeting the minimum weight requirements specified in the MASH or NCHRP tests. A truck being used for a truck-mounted attenuator shall have a sequential arrow display panel or changeable message board.

Truck-mounted attenuators that require chocking or blocking of the vehicle to meet NCHRP Report 350 or MASH certification shall not be used.

Truck–mounted attenuators shall have rear-mounted, black and yellow chevron stripes and a standard trailer lighting system, including brake lights, turn signals, ICC-bar lights, and two yellow rotating beacons or strobe lights mounted on opposite rear corners of the truck approximately 4-1/2 feet above the bottom of the tires. A Type C arrow panel or changeable message board shall be provided on the truck, and shall be designed for truck installation. There shall be a minimum of seven feet from the roadway to the bottom of the panel or board. Frame work shall be an integral part of the truck and be permanently mounted in such a way as to prevent the unit from separating from the truck in the case of a collision.

Trailer-mounted attenuators shall include rear-mounted black and yellow chevron stripes.

For each proposed truck-mounted or trailer-mounted attenuator, the contractor shall provide a Certificate of Compliance, in accordance with Subsection 106.05, to the Engineer for approval prior to use. For truck-mounted attenuators, the certificate shall also include the certified weigh bill for the truck, and for trailer-mounted attenuators the certificate shall state the minimum weight for the host vehicle. The certificate shall state that the attenuator meets the specified criteria, and shall clearly state the roll-ahead distance. A copy of this documentation shall be kept in the truck cab or host vehicle, available for immediate inspection when requested by the Engineer.

When in use for attenuation, trucks with attenuators shall be used exclusively as truck-mounted attenuators. Such trucks shall not be used to carry or store equipment or devices, secured or unsecured. No modification in configuration or use shall be allowed without a resubmitted certified weigh bill for the Engineer's approval.

Truck-mounted or trailer-mounted attenuators used as shadow vehicles per the MUTCD shall be positioned at a distance greater than the roll-ahead distance in advance of the workers or equipment being protected so that there will be sufficient distance, but not so much that errant vehicles will travel around the shadow vehicle and strike the protected workers and/or equipment.

The contractor shall cease operations when a truck-mounted or trailer-mounted attenuator is damaged. The contractor shall not resume operations until the attenuator has been repaired or replaced, unless authorized by the Engineer.

701-3.08 Changeable Message Board: of the Standard Specifications is revised to read:

Changeable message boards shall be furnished and maintained by the contractor at the locations shown on the plans and as specified by the Engineer. The operations and messages programmed into the board controller shall be as directed by the Engineer.

The changeable message board shall be a complete and operational portable unit which shall consist of a wheeled trailer with an adjustable, changeable message board, board message controller and self-contained power supply.

The power supply for the changeable message board shall be a fully independent self-contained trailer-mounted system. The changeable message board power supply shall be battery operated and rechargeable from a solar panel mounted above the changeable message board.

The message characters shall be delineated by either electromagnetically actuated reflective dots or optically enhanced light emitting diode pixels (LED) operating under the control of a digital computer.

The contractor shall submit, at the pre-construction conference, a Certificate of Compliance that the changeable message board to be used on this project shall be as described herein.

The character formation system and components shall conform to the following requirements:

(1) The changeable message board shall be programmable, and shall be capable of displaying a minimum of three lines of message copy, with a minimum of eight characters per line, in various alphanumeric combinations.

(2) The changeable message board matrix configuration shall be 35 dots or pixels per character in a five horizontal by seven vertical arrangement of the dots or pixels.

(3) The dot or pixel size shall be a 2.5-inch high by 1.625-inch wide rectangle (minimum), or equivalent area.

(4) Each character shall be 18 inches in height and 12 inches in width (minimum).

(5) The horizontal character separation shall be three inches or more.

(6) Dot color shall be fluorescent yellow upon activation and flat black when not activated. The LED pixels shall emit amber light upon activation and be dark when not activated.

(7) The line separation shall be five to 12 inches.

(8) Changeable message boards shall be protected with a clear lexan-type or equivalent shield that shall not interfere with or diminish the visibility of the sign message.

(9) The programmable message board shall be capable of displaying moving arrow patterns as one of the operator-selected programs.

(10) The message board shall also be capable of displaying up to two messages in sequence, with variable timing in a minimum of quarter-second increments.

(11) The message board shall be clearly visible and legible from a distance of 800 feet under both day and night conditions. The dot-matrix board shall have an internal illumination system that shall automatically activate under low light conditions to achieve the visibility requirements. The LED-pixel matrix board shall adjust light output (pulse width modulation) to achieve the visibility requirements.

(12) The power supply achieved from the battery and solar panel recharging system shall have sufficient capacity to operate the changeable message board for a minimum of 20 days without direct sunshine. The solar panel array shall be capable of recharging the batteries such that 2.5 to 3.5 hours of direct sunshine shall provide for a minimum of one 24-hour period of usage. Additionally, the battery recharging controller shall have an ambient temperature sensing device which will automatically adjust the voltage supplied from the solar panels to the batteries. The sensing device shall ensure that the batteries are properly charged in hot or cold weather and shall provide the sign with sufficient power to operate the sign as specified.

When in operation, the changeable message board trailer shall be offset a minimum of eight feet from the nearest edge of pavement. If the trailer is located behind temporary concrete barrier, a minimum offset of six feet will be required. Should the specified shoulder width not be available, a minimum two-foot offset from the nearest edge of pavement or temporary concrete barrier shall be required. When positioned on the highway, the changeable message board trailer shall be delineated with a minimum of 10 Type II barricades or vertical panels with Type C steady burn lights at a spacing of 10 to 20 feet, or as shown on the approved traffic control plan.

When not in operation, the changeable message board shall be moved a minimum of 30 feet from the edge of pavement.

The changeable message board trailer shall be placed on a level surface and be secured as recommended by the manufacturer and as directed by the Engineer. The contractor shall provide any necessary incidental grading and clearing work required to provide a level surface and clear area for the sign.

701-3.10 Sign Sheetings: of the Standard Specifications is revised to read:

Sign sheeting for all temporary work zone signs shall conform to the requirements of Section 1007.

701-3.13 Flagging Services: of the Standard Specifications is revised to read:

Flagging services shall consist of either civilian, local enforcement officers and their vehicles, or DPS (Department of Public Safety) officers and their vehicles. Flagging Services can be used only after approval of the Engineer. The Engineer will determine

the type of flagger needed, and may adjust the relative number of hours of each type of flagger specified in the traffic control plan.

If available, only DPS officers shall be used on Interstate Highways and Urban Freeways. DPS officers shall also be used on other construction projects except when a local law enforcement agency has jurisdiction, in which case a local law enforcement officer and vehicle shall be used.

The contractor shall be responsible to procure civilian flaggers, DPS officers, and local enforcement officers. When procuring DPS officers, the contractor shall contact DPS at least two business days 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.

A DPS or local enforcement officer shall not work more than 12 consecutive hours 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 shall be acceptable. Certification through other programs offering flagger training must be approved by the Engineer. Flagger certification must be current. Training and certification shall be required at least once every four years.

701-4.03(E) **Limitation of Measurement:** the second paragraph of the Standard Specifications is revised to read:

Measurement will be made after the initial installation and once weekly thereafter for items in continuous use and at any other times changes are made in the use of traffic control elements listed under Subsection 701-4.01(B). The contractor shall notify the Engineer when any changes are made in the use or location of traffic control elements.

701-4.04 **Measurement of Work Elements:** Sub-paragraph (A) of the Standard Specifications is revised to read:

(A) Temporary concrete barrier will be measured by the linear foot along the center line of the uppermost surface upon its initial installation (Complete-in-Place), and upon any subsequent relocations, as defined in Subsection 701-5.01. Barrier will be measured by linear foot for each 24-hour day for the "In-Use" condition.

701-4.04 **Measurement of Work Elements:** Sub-paragraph (C) of the Standard Specifications is revised to read:

(C) Truck-Mounted Attenuators, including driver, and Trailer-Mounted Attenuators, including host vehicle and driver, will be measured by the day for each 24-hour day that a truck-mounted or trailer-mounted attenuator and operator are used to protect the work site.

701-4.04 **Measurement of Work Elements:** Sub-paragraph (F) of the Standard Specifications is revised to read:

(F) Civilian flagging services will be measured by the hour for each hour that a civilian flagger is provided. Flagging services by DPS officers and local enforcement officers will be measured for each hour that a uniformed, off-duty DPS officer or law enforcement officer with vehicle is employed directly by the contractor as a flagger within the project limits, when authorized in advance by the Engineer. Quantities will be rounded to the nearest 0.5 hour.

Civilian, DPS, or local enforcement flagging services and traffic control devices required to permit contractors' traffic to enter safely into normal traffic within the project limits will be paid under their respective items. Flaggers required by a written local permit agreement will be measured for payment under this item. Additional civilian, DPS, or local enforcement flagging services used within the project limits shall be measured for payment under this item, subject to the approval of the Engineer.

Civilian, DPS, or local enforcement flagging services and traffic control devices used outside the project limits will be measured under their respective items. The Department will pay 50 percent of the unit bid price for such flaggers and traffic control devices used as described in this paragraph, subject to the approval of the Engineer. The project limits are defined as the construction work zone as shown on the approved traffic control plan for the specific section of highway under construction.

701-5.01 **Temporary Concrete Barrier (Installation and Removal):** of the Standard Specifications is revised to read:

Temporary concrete barrier, 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, as specified herein and as shown on the plans, including furnishing, placing, dismantling, and removal. The price bid shall also include any required connection devices, barrier markers, and glare screen.

Fifty percent of the contract unit price for temporary concrete barrier will be paid upon satisfactory installation.

Should it be necessary to dismantle, pick up and relocate a portion of the barrier installation during construction, whether laterally or vertically, that portion of the

removed and relocated barrier will be considered a new installation and paid for at 100 percent of the contract unit price.

Fifty percent of the contract unit price will be paid upon final removal.

No payment will be made for portions of the barrier which the contractor can adjust or realign without dismantling and picking up, such cost being considered as included in the bid price for Temporary Concrete Barrier "Installation and Removal." The Engineer will be the sole judge as to whether devices are to be dismantled, picked up and reinstalled, or are to be adjusted or realigned.

701-5.02 Temporary Impact Attenuators (Installation and Removal): of the Standard Specifications is revised to read:

Temporary Impact Attenuation Devices shall include Sand Barrels and Energy Absorbing Terminals. Temporary Impact Attenuation Devices, 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, as specified herein and as shown on the plans, including furnishing the devices with replacement parts, installing, removing and stockpiling the devices.

Fifty percent of the contract unit price for temporary impact attenuators will be paid upon satisfactory installation.

Should it be necessary to dismantle, pick up and reinstall attenuation devices during construction, the work of removing and reinstalling the devices will be considered a new installation and paid for at 100 percent of the contract unit bid price.

Fifty percent of the contract unit price will be paid upon final removal.

The Engineer will be the sole judge as to whether devices are to be dismantled, picked up and reinstalled or are to be adjusted or realigned. No additional payment will be made for devices which are adjusted or realigned, the cost being considered as included in the contract unit price paid for Temporary Impact Attenuator "Installation and Removal."

Measurement and payment for furnishing materials, equipment and labor and repairing attenuation devices that are damaged by the traveling public will be made in accordance with the requirements of Subsection 109.04 of the specifications.

No measurement or direct payment will be made for furnishing replacement parts and repairing devices damaged by other than the traveling public.

701-6.05 Truck-Mounted Attenuators: of the Standard Specifications is revised to read:

The accepted quantities of truck-mounted attenuators or trailer-mounted attenuators, measured as provided above, will be paid for at the unit bid price for truck-mounted attenuators per day of work site protection, which rate shall be full compensation for the work, complete, including, but not limited to, furnishing all materials; equipment;

attached arrow panel or changeable message board; and labor (including the operator); and maintaining and repairing the truck and truck-mounted attenuator, or trailer-mounted attenuator and host vehicle, as specified herein and on the project plans. No adjustment to the unit bid price for truck-mounted attenuators will be made when trailer-mounted attenuators are provided, such price being considered as full compensation for the work, as specified herein, regardless of which type of attenuator is used to protect the work site. It shall be the contractor's responsibility to replace any damaged or destroyed parts of the truck-mounted attenuator or trailer-mounted attenuator and host vehicle at no additional cost to the Department.

701-6.06 Flashing-Arrow Panels, and Changeable Message Boards: the second paragraph of the Standard Specifications is revised to read:

The accepted quantities of changeable message boards, measured as provided above, will be paid for at the unit bid price per day, which price shall be full compensation for the work, complete, including incidental grading; furnishing, operating, maintaining, and relocating the boards on the work site; and providing all necessary labor. Signs, sign stands, Type II barricades, or vertical panels and lights that are used to delineate changeable message boards shall be paid for at the respective unit bid prices.

701-6.07 Pilot Services, and Flagging Services: the last paragraph of the Standard Specifications is revised to read:

The accepted quantities of flagging services provided by the DPS officers, measured as provided above, will be paid for at the predetermined hourly rate of $65.26, as shown in the bidding schedule. Of this amount, $44.00 per hour shall be remitted to the DPS officer, and $12.75 per hour shall be remitted to DPS. The remaining $8.51 per hour represents profit and overhead for both the prime contractor and subcontractor. Such price shall be considered full compensation for the work. No additional payment will be made for costs in excess of the predetermined rate, for overtime hours, and for travel time to and from the project, such costs being considered as included in contract items.

(704THRMO, 8/24/11)

SECTION 704 - THERMOPLASTIC PAVEMENT MARKINGS:

704-1 Description: of the Standard Specifications is revised to read:

The work under this section shall consist of cleaning and preparing pavement surfaces and furnishing and applying either white or yellow thermoplastic reflectorized pavement markings using extrusion or ribbon dispensing devices of the required shape and thickness to the prepared pavement surface at the locations and in accordance with the details shown on the project plans, the manufacturer's specifications, and the requirements of these specifications.

704-2.02 Composition: of the Standard Specifications is revised to read:

(A) General:

The thermoplastic composition shall conform to the following requirements:

Component	Percent by Weight	
	White	Yellow
Binder (Min.)	20	20
Titanium dioxide (Min.)	10	-----
Yellow Lead-Free Pigment (Min.)	-----	1.5
Reflective glass inter-mix beads	30 – 45	30 – 45
Calcium carbonate or equivalent filler	20 – 42	20 - 42

The ingredients of the thermoplastic composition shall be thoroughly mixed and in a solid or sectionalized block, or free-flowing granular form. When heated in a melting apparatus, the material shall readily liquefy into a uniform solution. This solution shall be free from all skins, dirt, foreign objects or any other ingredient which would cause bleeding, staining, blotting, or discoloration when applied to the bituminous or concrete pavement surfaces.

The thermoplastic formulation shall utilize an alkyd binder. The alkyd binder shall consist of a mixture of synthetic resins, at least one of which is solid at room temperature, and of high-boiling-point plasticizers. At least 1/3 of the binder composition and no less than 8 percent by weight of the entire material formulation shall be solid maleic-modified glycerol ester resin or solid maleic-modified pentaerythritol ester resin. The alkyd binder shall not contain any petroleum-based hydrocarbon resins.

(B) Reflective Glass Beads:

In addition to incorporating glass beads in the thermoplastic mix, glass beads shall be evenly applied to the surface of the molten material as specified in Subsection 704-3.02(G).

(C) Filler:

The filler shall be a white calcium carbonate or equivalent filler with a compressive strength of at least 5,000 pounds per square inch.

(D) Titanium Dioxide:

Titanium Dioxide shall conform to the requirements of ASTM D 476 for Type II (92 percent).

(E) Yellow Pigment:

The yellow pigment shall be heat resistant and lead free. The type of yellow pigment shall be at the option of the manufacturer provided that the material conforms to all color

requirements in a stable and durable fashion as specified herein.

704-2.03(C) Retroreflectance: of the Standard Specifications is revised to read:

The white and yellow thermoplastic materials shall have the following minimum retroreflectance values at 86.5 degrees illumination angle and 1.5 degrees observation angle as measured by the Department, using an LTL-X Delta Retrometer or similar device, within 30 days after application to the roadway surface:

Product	Retroreflectance (millicandelas)
White	350
Yellow	200

704-2.03(E) Water Absorption and Specific Gravity: the last paragraph of the Standard Specifications is revised to read:

The specific gravity of the material, as determined by Section 16 of AASHTO T 250, shall be between 1.85 and 2.15.

704-2.03 Physical Characteristics of the Composition: of the Standard Specifications is modified to add:

(P) Color Stability:

Using accelerated weathering per ASTM G 155, Cycle 1, white color stability shall be measured for no color change after 500 hours of exposure, and yellow color stability shall be measured for no color change after 1000 hours of exposure.

704-2.04 Physical Requirements for Glass Beads: the second paragraph of the Standard Specifications is revised to read:

The inter-mix beads shall conform to AASHTO M 247 Type I, and may be coated or uncoated as recommended by the manufacturer. If uncoated beads are used, the thermoplastic formulation shall be configured to minimize settling of the intermix beads when the material is heated and applied.

Drop-on beads shall conform to the gradation requirements of AASHTO M 247 for Type I and Type III beads.

704-3.02(B) Material Selection and Compatibility: the second, third, and fourth paragraphs of the Standard Specifications are revised to read:

All materials shall be properly packaged and stored. Each container to be used on the project shall be clearly labeled to indicate the following information:

Nature, type, and formulation of the material;
Manufacturer, batch number, and date of manufacture;
Application requirements and constraints; and

Compatibility requirements and constraints, particularly those pertaining to equipment, storage, and other materials to be used.

Preparation and application equipment shall be in accordance with the plans and specifications, and shall conform to the recommendations of the materials manufacturer.

704-3.02(G) Thermoplastic Application: the first and second paragraphs of the Standard Specifications are revised to read:

The thermoplastic pavement marking material shall be extruded on to the pavement surface at a material temperature between 385 and 415 degrees F, depending on manufacturer's recommendations, ambient air and pavement temperatures, and the nature of the pavement surface. The contractor shall verify temperature requirements with a non-contact infrared thermometer as directed by the Engineer.

The thermoplastic material temperatures shall not exceed 450 degrees F. Material temperatures exceeding 440 degrees F shall be allowed for short periods of time; however, in no case shall the material be held for more than 4 hours at temperatures above 440 degrees F. Total heating time for any batch of material shall not exceed six hours. The contractor shall note in the temperature log the time when each batch of thermoplastic material is first heated. The start of heating time shall also be marked on the side of the kettle to which it applies.

704-3.02(G) Thermoplastic Application: the fifth and sixth paragraphs of the Standard Specifications are revised to read:

Drop-on glass beads shall be mechanically deposited into the thermoplastic material immediately after the thermoplastic marking is applied, using a double drop method. Each drop shall be comprised of a minimum of six pounds of glass beads per 100 square feet of line (200 linear feet of 6-inch stripe). One drop shall be Type I glass beads and the other drop shall be Type III glass beads. The contractor shall determine which type of glass bead is to be applied in each drop; however, both types shall be used. Double drop methods using all Type I or Type III beads will not be allowed.

The dispensers shall evenly distribute the beads in the thermoplastic material. Both Type I and Type III glass beads shall be embedded in the surface of the thermoplastic to a depth of between 50 and 60 percent of the bead diameter. If the glass beads do not adhere to the thermoplastic marking, operations shall be stopped until the problem has been corrected. All markings which do not meet the requirements of Subsection 704-2.03(C), as determined by the Engineer, shall be removed by the contractor and replaced at no additional cost to the Department.

Unless otherwise specified, all thermoplastic pavement markings shall be extruded, and shall be 0.090 ± 0.002 inches thick. The thermoplastic thickness shall be uniform and consistent throughout the total length of the marking project.

704-3.02(G) Thermoplastic Application: the last two paragraphs of the Standard Specifications are revised to read:

The finished thermoplastic line shall have well defined edges and be free from waviness. Lateral deviation of the thermoplastic line shall not exceed one inch in 100 feet. The longitudinal deviation of a painted segment and gap shall not vary more than 6 inches in a 40-foot cycle. The actual width of line shall be within the limits specified in the following table, according to the width of line called for on the plans:

Plan Width	Actual Width
4 inches	4 to 4-1/2 inches
8 inches	8 to 9 inches
Over 8 inches	± 1 inch

After application and sufficient drying time, the thermoplastic marking shall show no appreciable deformation or discoloration under local traffic conditions with air and road temperatures ranging from -10 to 180 degrees F. The drying time shall be defined as the minimum elapsed time, after application, when the thermoplastic pavement markings shall have and retain the characteristics required herein, and after which normal traffic will leave no impression or imprint on the newly applied marking. When applied within a temperature range of 400 ± 15 degrees F and thickness of 0.090 inches, the material shall set to bear traffic in not more than two minutes when the air and pavement surface temperatures are approximately 50 ± 3 degrees F and not more than 10 minutes when the air and road surface temperatures are approximately 90 ± three degrees. The Engineer may conduct field tests in accordance with ASTM D 711 to verify actual drying times.

ITEM 7310190 POLE (55 FT CCTV POLE WITH LOWERING DEVICE):
ITEM 7310191 POLE (80 FT CCTV POLE WITH LOWERING DEVICE):

Description:

The work under these items shall include, but is not limited to, furnishing all materials, tools, equipment, and labor necessary to install new CCTV poles and lowering devices as shown in the ITS Standard Drawings and project plans and these project Special Provisions.

Materials:

All materials and products shall comply with applicable ASTM specifications.

(A) Poles:

Tapered steel poles for CCTV cameras shall include pole shafts, pole-top mounting plates, and base plates, as shown in the ITS Standard Drawings and project plans.

Material standards for CCTV camera poles shall be in conformance with the current edition of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals. Each pole shall be designed to accommodate a

CCTV camera assembly, electrical hardware, mounting hardware, cabinets, and enclosures, as shown in the ITS Standard Drawings and project plans.

All CCTV camera poles shall withstand a wind speed of 80 mph, with gust factor of 30 percent.

All support structures shall conform to the requirements of Section 604 and 731. All support structure foundations shall conform to the requirements of Section 609 and the ITS Standard Drawings. The support structures shall accommodate a pole mounted field equipment cabinet with all required conduits and attachments as shown in the ITS Standard Drawings and Project Plans.

All CCTV camera poles shall conform to the requirements of Sections 604 and 731.

The CCTV camera poles shall accommodate a pole-mounted field equipment cabinet with all required conduits, lowering device, cable weights and attachments as shown in the ITS Standard Drawings, project plans and these specifications.

The CCTV camera poles shall be able to provide a means of routing the required conductors inside the structure from the base of the structure. These conductors shall not be exposed between ground level and the base of the tilt/pan unit nor between the pole-mounted field equipment cabinet and ground level.

When lifting/lowering devices are used, all cables and conductors shall be able to be stored within the pole and extend up and down within the pole, as the lowering device is used, without getting caught on other items within the pole shaft.

Pole heights shall be as shown on the project plans. CCTV camera poles shall be constructed of a uniformly tapered, 2-piece round tubular pole, conforming to the ITS Standard Drawings. Lengths of individual vertical tube shafts may be allowed to vary from lengths shown on the Standard Drawings if structural requirements are met, at the discretion of the Engineer.

The pole shaft shall conform to ASTM 595, Grade A, with a minimum yield strength of 55 kpsi, or ASTM A572 with a minimum yield strength of 55 kpsi.

CCTV camera poles, with all equipment mounted, shall have a maximum deflection in any direction of 1 inch at the top of the pole in a typical wind speed of 30 mph. This deflection shall be measured at the top of the support structure, at the point where the base of the tilt/pan drive is attached.

CCTV poles shall have standard bases, dimensioned as shown in the ITS Standard Drawings and project plans. Standard bases shall be 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.

Prior to pole fabrication, the contractor shall submit detailed shop drawings for each type of support structure and foundation, that includes material specifications and structural calculations that show stresses and deflection, in accordance with Sections

604 and 731, and the ITS Standard Drawings and project plans. The contractor shall submit drawings and design calculations that are stamped, sealed, and signed by a Civil or Structural Engineer registered in the State of Arizona.

Anchor bolts shall be 2-inch diameter, and conform to the requirements of ASTM F1554 Grade 55. The upper 12 inches of the bolts shall be hot dip galvanized per ASTM A153. The strength of the nuts shall be equal or shall exceed the proof load of the bolts.

(B) CCTV Camera Lowering Device:

The CCTV lowering device shall incorporate a vandal-resistant means to limit access to the operating the lowering device to authorized personnel.

The CCTV camera lowering device shall be equipped with a locking mechanism. This locking mechanism shall securely hold the movable portion of the CCTV camera lowering device and the CCTV camera system. The locking mechanism shall be operable from the base of the pole. When in the locked position, all weight shall be removed from the lowering cable.

The CCTV camera lowering system shall contain cable guides to prevent contact between the lowering/lifting cables and the CCTV camera electrical cables.

The CCTV camera lowering device shall be compatible with the type and orientation of the camera used, resulting in an upright orientation of camera image.

All electrical connectors shall be rain tight and suited for operation at 120 VAC with a current carrying capacity not less than 15 Amperes. The electrical connectors shall contain a minimum of 14 contacts including a ground. Data contacts shall be designed to handle 1V peak to peak NTSC video signals, RS-232 and RS-485 control signals, and Ethernet.

All moving parts of the CCTV camera lowering device system shall be designed for a minimum of 10,000 lowering and lifting operations. All components shall be corrosion resistant, self-lubricating and sealed to achieve the required number of lowering/lifting cycles.

The interface and locking components shall be made of metal. All external components of the lowering device system shall be made of corrosion resistant materials, powder coated, galvanized, or otherwise protected from the environment.

The CCTV camera lowering device system shall incorporate a field adjustable counterweight system to minimize the amount of effort required to raise the CCTV camera.

The CCTV camera lowering device shall not obscure the CCTV camera's range of vision.

(1) Lowering Device Tool:

The CCTV camera lowering device shall be operated by the use of a portable lowering tool. The tool shall consist of a lightweight metal frame and winch assembly operated by a variable speed electric drill motor or hand crank at the user's option. The CCTV camera lowering system shall include clutches and brakes to prevent the free-fall of the CCTV camera and over tensioning of the lowering device cable.

One lowering tool per each type of lowering device used shall be delivered to the Engineer upon project completion. The lowering tool shall have the appropriate gearing to facilitate using a hand crank for lowering and lifting of the CCTV camera system.

(2) CCTV Camera Junction Box:

The CCTV camera lowering device system shall include a junction box mounted at the top of the pole which will facilitate the connection of CCTV camera power, video, and camera control. The junction box shall be water resistant and in accordance with NEMA 3R requirements.

Construction Requirements:

(A) Base Plates and Poles:

All CCTV camera poles shall be plumbed to the vertical with all camera equipment installed. The pole shall be installed per subsection 731-3 of the Specficiations.

Holes shall be drilled and nippled at each site per the project plans and ITS Standard Drawings. Touch-up of field drilled hole galvanizing damage shall be by hot-stick method.

(B) Removing and Replacing Improvements:

Any damage caused by the contractor activity shall be repaired by the contractor at no cost to the Department.

(C) CCTV Camera Lowering Device:

The CCTV camera lowering device system shall be designed to support and lower/raise a standard CCTV camera system. The CCTV camera lowering device system shall consist of the pole, pole top-mounted equipment, and a lowering tool. The CCTV camera lowering system shall be designed to self-align to ensure that the CCTV camera will not rotate under any condition including, but not limited to, high wind conditions.

The CCTV camera lowering system shall be designed to securely support CCTV camera systems weighing up to 100 lbs.

(D) CCTV Pole Hand Hole:

The CCTV pole hand hole opening shall be reinforced with a minimum 2 inch wide hot rolled steel rim. The nominal outside dimension of the hand hole shall be 6 by 27 inches. The hand hole shall have a tapped hole for mounting the portable winch.

The hand hole shall be positioned on each CCTV pole such that the hand hole is not in conflict with the CCTV pole mounted cabinet and associated 1 inch mogul elbow. The hand hole shall also be positioned such that the CCTV camera si not directly above the user when operating the lowering tool.

(E) CCTV Camera Lowering Device Cable Guides and Supports:

Each CCTV pole equipped with a lowering device shall include all required cable guides and supports to relieve strain from lowering/raising and CCTV cables, and to retain the pole top-mounted hardware.

(F) Grounding Requirements:

Each CCTV pole shall be bonded to form a continuous grounding system. The contractor shall bond and ground each CCTV pole per Subsection 732-3.03, and as shown in the ITS Standard Drawings.

(G) Training Requirements:

In the even the contractor submits a CCTV camera lowering device system which is not currently in use by ADOT, the contractor shall arrange for and provide a training course for the CCTV camera lowering device system components. The course shall be of adequate duration to cover the subject matter and shall have an instructor competent in the technical aspects of the CCTV camera lowering device system. The training course shall provide training to up to 12 Department personnel.

The contractor shall submit a syllabus, training materials and a schedule for the CCTV camera lowering device training course to the Engineer for review and approval 45 days prior to the proposed start of training. The Engineer will notify the contractor of acceptability within 30 days of submittal. The contractor shall schedule the training no sooner than 14 days from receipt of the approved syllabus unless otherwise noted in the approval. Training materials shall include the course outline, material describing the course, and operations and maintenance manuals with any additional information needed to adequately describe the subject being taught. Training materials shall not be copyrighted.

(H) FAA Requirements:

During design, Form 7640-1 – Notice of Proposed Construction or Alteration was filed with the Federal Aviation Administration (FAA) for all CCTV poles within the project. Within 5 days after the construction of each of the CCTV poles with camera and lowering device reach their final height, the contractor shall submit or e-file FAA Form 7460-2 – Notice of Actual Construction or Alteration to the FAA for each CCTV pole.

Method of Measurement:

CCTV camera poles will be measured as a unit for each type CCTV pole furnished and installed.

Basis of Payment:

The accepted quantities of CCTV camera poles, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work described and specified herein and on the plans, including all labor, materials, tools, equipment and incidentals, for the type of pole designated in the bidding schedule, complete in place, and for doing all the work involved in furnishing and erecting the CCTV camera poles complete in place, including any painting and galvanizing if necessary, CCTV pole-top mounting plates, lowering device, and all necessary hardware to complete the work.

ITEM 7310371 POLE FOUNDATION (FOR 55 FT CCTV POLE):
ITEM 7310372 POLE FOUNDATION (FOR 80 FT CCTV POLE):

Description:

The work under these items shall include, but is not limited to, furnishing all materials, tools, equipment and labor necessary to install new CCTV pole foundations as shown in the ITS standard drawings, project plans, and the project Special Provisions.

Foundations under this item shall include, but are not limited to, furnishing all materials, tools, equipment and labor necessary to install new CCTV foundations, conduit, elbows, anchor bolts, grounding wire, reinforced steel and any grading adjustments necessary to accommodate impacts to existing drainage patterns as a result of foundation placement, as shown in the ITS standard drawings and project plans.

Materials:

Anchor bolts shall conform to the requirements of ASTM F1554 Grade55. The upper 12 inches of the bolts shall be hot dip galvanized per ASTM A153. The strength of the nuts shall be equal or shall exceed the proof load of the bolts.

All CCTV pole foundations shall conform to the requirements of Section 609 and the ITS standard drawings.

The CCTV pole foundations shall have reinforcing steel as shown in the ITS standard drawings or project plans. Concrete shall be Class S, 3,000 psi.

Prior to pole fabrication, the contractor shall submit detailed shop drawings for each type of support structure and foundation, that includes material specifications and structural calculations that show stresses and deflection, in accordance with Sections 604 and 731, and the ITS Standard Drawings and project plans. The contractor shall submit drawings and design calculations that are stamped, sealed, and signed by a Civil or Structural Engineer registered in the State of Arizona.

Construction Requirements:

Prior to excavation, the contractor shall survey and stake the exact location of each foundation to be installed for field review and approval by the Engineer. The contractor shall give a minimum of 2 working days advanced notice to the Engineer prior to staking the locations. Pruning of plant material may be required to provide construction and maintenance access or for optimal viewing of the CCTV camera without vegetation impacting view. The pruning shall be performed by trained and experienced landscape personnel. The pruning methods and locations shall be approved by the Engineer, prior to any pruning.

CCTV camera pole foundations shall be set flush with the existing or new curb and sidewalk for flush with the finished grade where there is no curb or sidewalk, except in sloped areas. The dimensions and locations of foundations shall be as specified on the project plans. However, the Engineer may direct that changes be made in locations due to obstructions, to avoid utilities, or other existing conditions.

In the event the soil is not stable, and a foundation hole cannot be augured, the contactor shall auger or excavate, fill with bentonite slurry, and redrill the foundations through the slurry at the contractor's expense. The redrilled foundation shall be of the proper size and dimension and shall be rigid and securely braced. Forms and the bottoms of foundation holes shall be thoroughly moistened prior to placing the concrete.

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 a minimum of seven days prior to pole installation.

Any damage caused by accident or contractor activity shall be repaired according to section 107.11 and as may be modified by the project Special Provisions.

Method of Measurement:

CCTV Pole Foundations will be measured as a unit of each foundation furnished and installed.

No additional measurement will be made for any grading necessary to mitigate drainage impact as directed by the Engineer, and is considered included in the installation of the foundation.

No additional measurement will be made for restoring landscaping or decomposed granite to existing conditions.

Basis of Payment:

The accepted quantities of CCTV pole foundations, measured as provided above, will be paid at the contract unit price, which price shall be full compensation for the work described and specified herein and on the plans, including all labor, materials, tools, equipment and incidentals for the type of pole designated in the bidding schedule, complete in place, and for doing all the work involved in furnishing and placing non-

shrink grout and all necessary hardware, conduit, anchor bolts, reinforcing steel, wire, excavation, backfill and surface restoration.

SECTION 732 - ELECTRICAL UNDERGROUND MATERIALS:

732 – 1 Description: of the Standard Specifications is modified to add:

The work under this section shall consist of furnishing and installing conduit, pull boxes, bonding and grounding systems, fiber optic cable systems, cable tray systems, and equipment racks as shown on the project Plans or required by the project Special Provisions. The work shall include excavation, installation of conduit, removal of spoils, backfill, compaction of directional drilling and jack and bore pits, warning tape, detectable pull tape, connectors and fittings, locating existing conduit when new is to be intercepted with existing, and restoration of the surface to existing condition, including the replacement of decomposed granite and other landscaping items where appropriate.

732 – 2.01B(3) IMSA Cable: of the Standard Specifications is modified to add:

IMSA No. 19-1, or approved equal, four-conductor, No. 14 AWG, solid conductor, shall be used for the ramp metering signals and beacons.

All electrical conductors that are left un-terminated shall be coated by a waterproofing method that is approved by the Engineer.

732 – 2.02 Electrical Conduit and Warning Tape: of the Standard Specifications is modified to add:

All conduit, innerduct, and fiber optic cable installations that require a pull tape shall use pull tape with a minimum of 2,500 lbs pulling tension.

732 - 2.03 Pull Boxes: of the Standard Specifications is modified to add:

During pulling, all cables shall be lubricated at each No. 7 with extension and No. 9 pull box.

2.03 Pull Boxes: the fourth paragraph of the Standard Specifications is revised to read:

No. 7 and No. 7 w/extension pull box covers shall be marked as follows: "ADOT FMS" in one-inch letters. Unless otherwise stated on the Plans. All No. 7 pull boxes shall be 18 inches in height.

732 - 3.01 Installation of Electrical Conduit and Pull Boxes: tenth paragraph of the Standard Specifications is revised to read:

All underground conduits shall be at a minimum depth of 30 inches, unless noted otherwise on the project Plans. Where conduit in protected and open areas cannot be installed at the minimum depths, it shall be encased in Class B concrete.

All new and existing conduits shall be cleared by pulling through a metal-disc mandrel

with a diameter of 90 percent of the conduit inside diameter for PVC conduit, or a ball mandrel with a diameter of 80 percent of the conduit inside diameter for HDPE.

732 - 3.01 Installation of Electrical Conduit and Pull Boxes: of the Standard Specifications is modified to add:

A minimum of three feet shall separate any expansion coupling on any PVC conduit from the pipe sleeve the PVC enters. Expansion couplings shall be staggered to keep the PVC entering the pipe sleeve as straight as possible.

Conduits containing communication cable shall follow NEC guidelines for power conduits with regard to installation.

The contractor shall positively identify all exposed power and communication cables in each pull box using color coded labels attached within 3 feet of the cable entry into a pull box, and on both sides of a splice.

Prior to any trenching, the contractor shall verify, with utility record drawing information, the existence of any cathodic protection in all existing utilities and take all possible precautions to maintain existing cathodic protection.

732-5.03 Conduits: of the Standard Specifications is modified to add:

Payment for conduit shall include, but not limited to: materials, labor, excavation, backfill and compaction, pavement replacement, potholing existing utilities, saw cutting, conduit, warning tape, pull tape, couplings, fittings, expansion fittings, sweeps (36-inch minimum), hangers, core drilling, raking back granite and preserving the existing conditions, replacement of landscaping and other surface improvements as incidental to the bid item for each conduit classification as shown in the bidding schedule. Vertical conduits and conduit sweeps, conduit in pull boxes, conduit in foundations, and clearing and grubbing are not measured and are not paid. The contractor shall account for these conditions in the unit prices bid for other items. The contractor is alerted to the fact that hand digging may be required in the installation of trenches and pull boxes. No extra payments will be made for hand digging.

732-5.04 Pull Boxes: of the Standard Specifications is modified to add:

If a larger pull box is required where an existing pull box is installed, all activities in regard to the removal of the smaller pull box shall be considered included to the installation of the new, larger pull box and will not be measured or paid.

ITEM 7320050 ELECTRICAL CONDUIT (2") (PVC):
ITEM 7320060 ELECTRICAL CONDUIT (2 1/2") (PVC):
ITEM 7320070 ELECTRICAL CONDUIT (3") (PVC):
ITEM 7320072 ELECTRICAL CONDUIT (3 - 3") (PVC):
ITEM 7320073 ELECTRICAL CONDUIT (2 - 3") (PVC):
ITEM 7320074 ELECTRICAL CONDUIT (2 - 3") (PVC)(HALF SACK SLURRY):
ITEM 7320130 ELECTRICAL CONDUIT (2") (RIGID METAL):
ITEM 7320291 ELECTRICAL CONDUIT (2 - 3") (HDPE DIRECTIONAL DRILL):
ITEM 7320292 ELECTRICAL CONDUIT (3 - 3") (HDPE DIRECTIONAL DRILL):
ITEM 7320293 ELECTRICAL CONDUIT (3") (HDPE DIRECTIONAL DRILL):
ITEM 7320294 ELECTRICAL CONDUIT (2") (HDPE DIRECTIONAL DRILL):
ITEM 7320295 ELECTRICAL CONDUIT (2 - 2") (HDPE DIRECTIONAL DRILL):
ITEM 7320296 ELECTRICAL CONDUIT (2 - 2") (PVC):

Description:

The work under these items shall consist of furnishing and installing conduit, including horizontal directional drilling, horizontal directional boring, excavating, backfilling, compacting, warning tape, detectable pull tape, connectors and fittings, locating existing conduit when new is to be intercepted with existing, and restoration of the surface to existing condition, including but not limited to the replacement of concrete slabs, decomposed granite, irrigation and other landscaping items where appropriate, in accordance with the ITS Standard details and as shown on the project plans and these project Special Provisions.

The contractor shall replace or adjust, as requested by the Engineer and based upon the inventory, existing conduit sweeps into pull boxes, conduit orientation and alignment, unusable conduit, bell ends or fittings within the project limits as called for on the project plans and as resulting from an inventory of existing conduit.

Materials:

Conduits are constructed of various materials, including, but not limited to, Polyvinyl Chloride (PVC), Rigid Metal Conduit (RMC), Intermediate Metal Conduit (IMC), and Flexible Metal Conduit, conforming to Subsection 732-2.02, and High Density Polyethylene (HDPE), conforming to the following specifications.

Should the contractor choose to substitute HDPE conduit in place of the installation of direct buried PVC conduit, the HDPE conduit must meet the specifications for HDPE conduit listed below, and the contractor shall provide original data sheets or a Certification of Compliance letter from the HDPE conduit manufacturer to the Engineer stating that the product meets these Special Provisions and obtain the written approval from the Engineer prior to procuring and installing the HDPE conduit.

Unless otherwise shown on the Plans; bends, conduit fittings, expansion joints, 36-inch sweeps and other conduit accessories not specifically mentioned shall be manufactured from a material similar to the connecting conduit.

Conduit elbows intended for new or future fiber optic cable installations shall have a minimum radius of 36-inches. All other conduit elbows shall be a minimum radius of 24-inches.

(A) HDPE Conduit:

HDPE conduit shall have a minimum rating of SDR 11. It shall have a cell classification of PE334470C (for black conduit) and PE334470E (for colored conduit) per ASTM 3350: Standard Specification for Polyethylene Pipe and Fittings Materials.

The polyethylene base resin shall meet the density requirement and melt index properties described herein. The density shall not be less than 0.940 and not more than 0.955 g/CM3 in accordance with ASTM D 1505: Standard Test Method for Density of Plastics by the Density-Gradient Technique. The range for the melt index shall be between 0.05 to 0.5g/10 minutes in accordance with ASTM D 1238: Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer. The HDPE conduit shall have a minimum Flexural Modulus, of 80,000 psi, per ASTM D 790 and a minimum tensile strength at yield of 3,000 psi, per ASTM D-638.

Additives to the base resin shall be included to provide heat stabilization, oxidation prevention and ultraviolet (UV) protection. It shall utilize carbon black in the range of 2 to 3 percent for long term protection against UV degradation. The minimum protection period shall be one year from date of manufacture in unprotected, outdoor storage in accordance with ASTM D 1603: Standard Test Method for Carbon Black in Olefin Plastics.

HDPE conduit and fittings shall comply with ASTM D 2241 and ASTM-F2160-01.

The contractor shall provide the Engineer with manufacturer's certification of analysis and compliance showing that HDPE conduit meets these specifications.

(B) Conduit Warning Tape:

Conduit warning tape shall be a minimum four-mil composite reinforced thermoplastic, with a minimum width of 3 inches and minimum length of 5 feet. Warning tape shall be highly resistant to alkalis, acids, and other destructive agents found in the soil.

Warning tape shall have a continuous printed message warning of the location of underground conduits. The message shall be in permanent ink specifically formulated for prolonged underground use and shall bear the words, "CAUTION - ELECTRIC LINE BURIED BELOW" or "CAUTION – COMMUNICATION CABLE BURIED BELOW" in black letters on a red (electric) or orange (communications) background. Where both electric and communications lines are in a single trench, both tapes, and described above, shall be provided.

(C) Detectable Pull Tape:

Detectable pull tape shall be constructed of fiber and have an imbedded No. 22 AWG conductor. The tape shall be low-stretch and moisture-resistant. The tape shall have nominal pull strength of 2,500 pounds. The tape shall include distance markings at intervals not to exceed two feet.

Construction Requirements:

Construction Requirements shall conform to Section 732, unless otherwise specified in the ITS Standard Drawings, in the ITS Standard Drawings, on the project plans, or

these Special Provisions.

Conduit installation shall conform to Subsection 732-3.01, with the exception of the following requirements and revisions.

(A) Conduit Routing and Underground Obstructions:

The contactor shall restore, repair or replace, as directed by the Engineer, any damaged or contaminated vegetation and/or landscaping features, decomposed granite and irrigation facilities, walkways, utilities, other existing electrical items resulting from its construction activities.

The contractor shall contact the Engineer to arrange and coordinate work in the vicinity of any irrigation lines. Spaghetti lines to vegetation, and feeder hoses may not be Blue Staked, but shall be repaired or replaced if damaged during construction, at no additional cost to the Department.

Excavations shall not be left open over 48 hours unless a plan has been submitted and approved by the Engineer to allow for open excavation. Safety devices used for the protection of excavations shall not be considered as traffic control items.

Conduit shall be placed in accordance with the lines, grades, details and dimensions as shown on the project plans and these Special Provisions, unless otherwise approved by the Engineer.

Conduit runs shown on the plans are depicted to indicate the intended path from point to point. The actual pathway shall be staked prior to any excavation and shall be modified as necessary, as approved and directed by the Engineer, to avoid obstacles and obstructions that will prevent ease of installation, obstacles and future maintenance or conformance with appropriate codes and specifications. Final conduit locations shall be documented and submitted to the Engineer in the form of a record drawing.

(B) Conduit Size:

Changes in the size of the conduit shall, prior to construction, be submitted to the Engineer for approval. All changes in conduit size shall be documented by the contractor in the form of a record drawing.

(C) Conduit Bends and Deflection:

Except for factory bends, conduit bends shall have a radius of not less than that specified in the NEC. Conduit shall be bent without crimping or flattening, using the longest radius practicable. Communications conduits shall not deflect more than one inch per foot (1:12) vertically or horizontally. This is equivalent to a minimum radius of 6 feet.

If the 1:12 rule cannot be achieved, standard factory-made elbows of 11 1/4, 22 1/2, 30 or 45 degrees shall be used if approved by the engineer.

(D) Conduit Ends and Connections:

New runs of HDPE conduit shall be continuous from pull box to pull box, unless otherwise shown on the project plans. HDPE conduit shall not be joined to PVC conduit in the length of the run. At pull boxes and/or cabinets where new HDPE is required to transition into new or existing PVC elbows, the contractor shall submit for approval a manufacturer recommended coupling.

When joining segments of HDPE conduit, the contractor shall utilize non-corrosive, sit-tight, water-tight couplings. Heat fusion, electrofusion fittings and mechanical connections shall be permitted if the HDPE conduit and joining device manufactures recommendations are observed and the internal diameter of the HDPE conduit is not reduced. Extrusion welding and hot gas welding to join HDPE conduits is not permitted.

Upon completion of joining HDPE conduit sections and setting the pull boxes, the contractor shall clean the HDPE conduit with compressed air. The contractor shall demonstrate by pulling a cleaning mandrel or ball mandrel, correctly sized for the conduit (80 percent of the HDPE inside diameter), that the conduit was not deformed during installation. If the mandrel passes through the HDPE the contractor shall install the pull tape in accordance with Section 732 of these Special Provisions. If the mandrel encounters a deformity in the HDPE conduit, the contractor shall replace the entire segment of HDPE between pull boxes with new HDPE at no cost to the Department.

(E) Conduit Expansion Fittings:

Expansion fittings shall be installed in conduit runs which cross an expansion joint in a structure. Approved expansion fittings shall be as shown in the ITS Standard Drawings or project plans. Conduit encased in a structural member shall be installed in accordance with the National Electrical Code, or as approved by the Engineer.

A minimum of three feet shall separate any expansion coupling on any conduit from the pipe sleeve the conduit enters. Expansion couplings shall be staggered to keep the conduit entering the pipe sleeve as straight as possible.

Where bonding is not continuous, expansion fittings shall be provided with a bonding jumper of No. 6 AWG conductor. Allow enough slack conductor to accommodate the range of expansion supported by the expansion coupling.

Where it is not possible to use expansion fittings, sleeves of sufficient size shall be installed to provide a minimum 0.5 inch clearance between the conduit and the inside wall of the sleeve. The sleeve shall be discontinuous at the expansion joints.

(F) Conduit Depth:

Conduits shall be at a minimum cover depth of 30 inches, or as indicated in the project plans. Backfill compaction shall be in accordance with Subsection 203-5.03 (B) (4).

When conduit in protected and open areas cannot be installed at the minimum depths, it shall be encased in Class B concrete, as defined in Section 1006.

(G) Conduit in Trenches:

Immediately after conduits are installed, they shall be sealed to prevent the intrusion of water, mud, gravel, vermin, etc. The conduits shall be sealed after mandrelling, tracer

wire and/or pull tape, cable and/or fiber, installation. Taping the ends of the conduit is not allowed.

All unoccupied conduits on which work is performed shall be sealed with a water-tight, corrosion-proof, removable, reusable, and vermin resistant conduit plug or cap. Prior to use, the conduit plug or cap shall be submitted to the Engineer for approval.

Occupied conduits on which work is performed shall be sealed with a conduit cap, as approved by the Engineer. The conduit cap must be water-tight, corrosion-proof, removable, and vermin resistant.

All unoccupied innerduct on which work is performed extending beyond the end of the capped conduit shall be sealed with a water-tight, corrosion-proof, removable, reusable, and vermin resistant innerduct plug or cap. Prior to use, the innerduct plug or cap shall be submitted to the Engineer for approval.

Occupied innerduct on which work is performed extending beyond the end of the capped conduit shall be sealed with a innerduct cap, as approved by the Engineer. The innerduct cap must be water-tight, corrosion-proof, removable, and vermin resistant.

A three inch "Y" shall be cut into the face of the curb directly over conduit located under rolled or vertical curbs.

The contractor shall place warning tape in all trenches in which new PVC or trenched HDPE conduit is placed. Warning tape is not required in conduit segments where trenchless methods are used for installation. All warning tape shall be buried at a depth of six to eight inches below the finished grade.

(H) Conduit by Trenchless Methods:

Conduit under existing pavement, curbs and gutters, sidewalks, concrete flatwork, textured or decorative surfaces, and at other specified locations, shall be installed by Horizontal Directional Boring (HDB) or Horizontal Directional Drilling (HDD) methods. Use of either method is allowed, subject to approval of the Engineer.

Conduit installation in areas where trenching would typically be allowed may be installed by trenchless method, if preapproved by the Engineer as a means of facilitating installation or mitigating potential damage to existing surface and subsurface elements.

The proposed profile shall be submitted to the Engineer, after the contractor has completed the necessary potholing, and approved prior to beginning the operation at each location.

Directional boring/drilling shall be used to install all conduits along a prescribed path from the surface with minimal impact to the surrounding area. Installation shall be performed in accordance with industry standards and as directed by the Engineer.

The contractor's installation process shall utilize the "walkover" locating system, or other Engineer approved equivalent, for determining the installation profile. The installation equipment shall register the depth, angle, rotation and directional data. At the surface, equipment shall be used to gather the data and relay the information to the equipment operator.

Excavation and backfill of excavated pits shall be in accordance with the requirements of Subsection 203-5.03 (B) (4).

When enlargement of an installation hole is necessary, the hole shall be at least 25 percent larger than the conduit to be installed, unless otherwise specified by the Engineer. Pulling equipment such as grips, pulling eyes, and other attachment hardware external to the conduit will be permitted as long as a wooden dowel is placed inside the conduit to prevent it from collapsing at the point of attachment when pull tension is at its peak. A swivel shall be used with all pulling hardware when pulling back the conduit into the installation path. Drilling fluid shall be pumped down the hole to provide lubrication for the conduit as it is pulled in. The pulling tension for installing conduit into the installation path shall not exceed 75 percent of the conduit manufacturer's tensile strength rating in order to prevent the conduit from "necking down" or deforming.

All final installation profiles shall be submitted to the Engineer.

(I) Detectable Pull Tape:

The contractor shall install detectable pull tape with a minimum of 2,500 lbs pulling tension in all new and existing empty conduits and all conduits with new fiber optic cable.

For all conduits that require detectable pull tape, the detectable pull tape shall terminate at the end of the conduit with a minimum of 2 feet of coiled slack in each pull box. The detectable pull tape traveling through conduit that terminates in a pull box, shall have its wire ends connected together to allow for a continuous locating signal to be used for the entire conduit run.

(J) Conduits Embedded in Concrete Structures or attached to Concrete Structures:

Attachment or embedding conduit in any concrete structure shall require advance approval of the Engineer.

Approved conduit either within an open bridge cell or attached to structures shall be rigid metal conduit (RMC). Where required for esthetic reasons RMC shall be painted to match the color of the existing bridge structure. Painting may require pre-treatment of the RMC and will be done at the direction of the Engineer.

For bridges over 1,000 feet in length, or as indicated on the project plans, intermediate junction boxes should be evenly spaced.

(K) Incorporation of Existing Conduit, Empty or Occupied:

Existing underground conduit to be incorporated into a new system shall be cleaned and blown out with compressed air.

Where cables are to be installed in conduit with existing cables or wires that will remain, the contractor shall disconnect, remove, reinstall, and reconnect the existing cables and wires as determined by the Engineer, to facilitate the installation of the new cable.

Two weeks prior to disconnecting any existing cables, the contractor shall submit a schedule, for approval by the Engineer, with the timeframes of when the existing cables are to be disconnected.

The contractor shall be responsible for any damage to the existing cables or wires caused by this operation. Existing wires and cables shall be considered in good condition unless the contractor demonstrates to the contrary to the Engineer, prior to commencing removal of any cable or conductor from the conduit(s).

No more than one week prior to installation of cable or conductors, all new and existing conduits in which cable or conductors are to be installed shall be cleared/cleaned by pulling through a metal-disc mandrel with a diameter of 90 percent of the conduit inside diameter for PVC conduit, or a ball mandrel with a diameter of 80 percent of the conduit inside diameter for HDPE. The conduit may be brushed or swabbed, if deemed necessary, prior to pulling the mandrel through the conduit.

Where indicated on the plans, the contractor shall remove and dispose of existing cables and/or conductors in existing conduits. Prior to their removal, all cables and/or conductors to be removed shall be identified and marked at all intermediate pull boxes. These cables and/or conductors shall be cut at all intermediate pull boxes before being removed. Conduits to remain empty for future use shall have a detectable pull tape installed.

Where multiple cables, conductors, and pull tape are required to be installed in the same conduit, all the materials shall be installed at the same time.

(L) Utility Conduits:

Installation of conduit for underground utility service shall conform to the utility company requirements, local codes and the Special Provisions.

(M) Conduit Entering Pull Boxes:

Conduit entering pull boxes shall be installed in accordance with the details shown on the project plans and the ITS Standard Drawings.

Conduit ends shall be capped with conduit end cap or plug fittings until wiring or cabling is installed. When end caps or plugs are removed, all new conduit ends in pull boxes shall be provided with an approved conduit end bell, as shown in the ITS Standard Drawings. End bells shall be installed prior to the installation of the conductors or cables. Approved insulated grounding bushings shall be used on steel conduit ends.

(N) Cathodic Protection:

Prior to any trenching, the contractor shall verify the existence of any cathodic protection in all existing utilities and take all possible precautions to maintain existing cathodic protection.

(O) Conduit Reconditioning:

Conduit and innerduct reconditioning shall be completed prior to the start of work on any

other items related to use of existing conduits and innerducts.

(P) Conduit Backfilling with Half-sack Slurry:

All conduit installed by trenching within existing Salt River Project overhead power corridors shall be backfilled with half-sack slurry, as per the project plans. The widths of the overhead power corridors are shown on the project plans.

Method of Measurement:

Electrical conduit will be measured by the linear foot for each diameter size, regardless of method of installation; from center to center of pull boxes, from edge of foundation to center of pull box, from end of conduit to center of pull box or foundation, from end to end of conduit when no pull boxes are used.

No measurement will be made for conduit that is below ground in vertical conduit stub-ups, field equipment cabinets, or node building.

No measurement for payment shall be made for cleaning out of existing conduit, or for the disconnecting, removing, reinstalling and reconnecting any existing cables or conductors in existing conduit into which new cable or conductors are to be installed, the cost being considered as included in the cost of the contract items.

No measurement or direct payment will be made for furnishing or installing detectable pull tape, the cost being considered as included in the cost of the contract items.

Direct buried HDPE conduit shall be paid at the unit bid price of direct buried PVC conduit.

Basis of Payment:

The accepted quantities of conduit, 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 warning tape, excavation, backfill, detectable pull tape, connectors, fittings, horizontal directional drilling, horizontal directional boring, removal of spoil, compaction of trenches and directional drilling/boring pits, restoration of the surface to existing condition, including concrete, pavement, decomposed granite and other landscaping items where appropriate, repair of irrigation facilities, locating of existing conduit when new is to be intercepted with existing, and all incidentals necessary to complete the work.

No direct payment will be made for rigid metal conduit bends or rigid non-metallic conduit bends at pull boxes, expansion fittings and coupling fittings, the cost being considered as included in the contract price for the conduit items. The cost of potholing for utility requirements shall be considered included in the cost of these items.

Reconditioning of conduit shall be measured and paid under the Force Account Item 9240011.

ITEM 7320450 PULL BOX (NO. 7)(FMS STD FM-2.06):
ITEM 7320455 PULL BOX (NO. 9):
ITEM 7320456 PULL BOX (SPLIT NO. 9):
ITEM 7320460 PULL BOX (REPLACE NO. 9 LID):

Description:

The work under these items shall consist of furnishing and installing pull boxes for ITS elements, including restoration of the surface to existing condition, including but not limited to the replacement of concrete slabs, decomposed granite, irrigation and other landscaping items where appropriate, in accordance with the project plans and these project Special Provisions.

The contractor shall replace or adjust, as requested by the Engineer and based upon the inventory, existing pull box extensions, pull boxes, lids or any other work needed to remedy conditions of existing pull boxes within the project limits as called for on the project plans and in these Special Provisions.

Materials:

All pull boxes and lids shall conform to the applicable ITS Standard Drawings, project plans and these project Special Provisions.

Pull box lids shall bear the words "ADOT FMS" unless otherwise specified on the project plans and in the Special Provisions.

Markings shall be clearly defined and shall be placed parallel to the long side of the cover. Letters shall be a minimum of 1 inch in height for No. 4, 5, 6 and 7 series pull boxes, and 4 inch height for No. 9 pull boxes. Letters shall be raised or recessed into the lid, but shall not be stenciled or painted.

All pull boxes shall have a locking mechanism approved by the Engineer.

(A) Polymer Concrete Pull Boxes:

No. 7 pull boxes shall be a precast, polymer concrete, fiberglass reinforced, pull box, conforming to the ITS Standard Drawings. A certificate of compliance, in accordance with Subsection 106.05 shall be supplied for structural capabilities and materials used in manufacture. Concrete pull boxes and lids shall not be used. Contractor shall submit test results to certify that the pull box sidewalls and lids remain intact when subjected to the loading conditions specified.

No. 7 pull boxes shall be 24 inches in depth, and consist of a single-piece box unit. Stacked units shall not be used unless otherwise specified on the project plans or in the Special Provisions. No. 7 pull box shall have pre-formed knockouts located in the short ends of the box.

Chipped, cracked or otherwise damaged pull boxes and lids will not be accepted.

(B) No. 9 Pull Boxes:

No. 9 and No. 9 "split" pull boxes shall be fabricated of concrete and provide conduit access ports on each of the four sides, as shown in the ITS Standard Drawings. Pull box lid wording shall be as indicated in the ITS Standard Drawings, unless the project plans and Special Provisions specify otherwise.

The No. 9 pull box lid shall have a square, hinged lid that opens a full 180 degrees. Opening of the lid shall be spring assisted from both the open and closed positions via a torsion bar lift system. The lid shall lock down with at least one stainless steel security type penta-head bolt that shall be captive to the lid. The lid shall have provisions for an externally mounted padlock for extra security. The padlock shall mount in a cavity in the pull box cover so no part of the padlock is exposed.

A certificate of compliance, in accordance with Subsection 106.05 shall be supplied for structural capabilities and materials used in manufacture of No. 9 pull boxes and No. 9 "split" pull boxes.

Each No. 9 pull box shall be furnished with galvanized and slotted C-channel struts embedded in the concrete walls of the pull box, with an 18-hole rack mounted to each slotted C-channel strut, and 0.5 inch spring nuts and bolts and a cable hook per rack, as shown in the ITS Standard Drawings, or as shown on the project plans or these Special Provisions.

Locations requiring replacement of No. 9 pull box lids, the existing top section of the existing No. 9 pull box shall be replaced with a new section containing a square spring-loaded lockable lid, conforming to the ITS Standard Drawings.

(C) Metal Junction Boxes:

Metal junction boxes and covers for installation in concrete structures shall be fabricated from a minimum of 16 gauge type 304 stainless steel. All seams shall be continuously welded and shall conform to the dimensions and details shown in the referenced Standard Drawing or on the project plans.

A neoprene gasket with a thickness of 0.125 inch shall fit between the box and the cover. The cover shall be made to fit securely and shall be held in place with a minimum of four stainless steel machine screws.

Construction Requirements:

Construction Requirements shall conform to Section 732, unless otherwise specified in the ITS Standard Drawings, in the ITS Standard Drawings, on the project plans, or these Special Provisions.

Pull boxes shall be field located, and approved by the Engineer, to avoid drainage swales, maintenance vehicle pathways or repeating wheel loads.

The contractor shall be responsible for restoring the surrounding surface conditions back to their original condition.

All existing FMS pull box flexible delineators within the project limits, associated with

any existing FMS Pull boxes, including those that otherwise have no work associated with or in the existing FMS pull box, shall be removed and disposed of by the contractor.

When a new pull box occupies the same location as an existing pull box, the existing bricks, stone sump and felt paper shall be replaced with new. In instances where an existing 12 inch depth pull box is replaced by a 24 inch depth pull box, the contractor shall adjust the existing conduits, as necessary, to allow the conduit to enter the bottom of the box in conformance with the ITS Standard Drawings, the project plans and these Special Provisions.

When installing a No. 9 pull box, the contractor shall only lift the pull box and covers using the lifting hardware installed for that purpose. The lid shall be oriented such that the lid hinge lies along the side of the pull box farthest from the roadway.

At the locations where the contractor is required to install a "Split No. 9" pull box, the contractor shall pour the concrete floor of the pull box after the pull box installation. The concrete shall be Class S with 3,000 psi minimum compressive strength with an integrated 8" diameter sump hole which will be used for drainage, and for a ground rod. Conduits shall be cut at the split No. 9 box inside wall face and fitted with bell ends.

Where the project plans call for the removal of an existing pull box at locations where the contractor is required to install a "Split No. 9" pull box, the existing pull box and any existing plastic pull box delineators shall be completely removed and disposed of, away from the project site.

The compaction around pull boxes shall not cause the sides to deflect or any part of the box or lid to crack or become dented. The contractor shall replace any cracked, broken, chipped or damaged pull boxes or lids at no additional cost to the Department.

The contractor shall record drawing the GPS latitude and longitude coordinates, ± 5 feet, of each new and existing pull box and provide the Engineer with an electronic GIS file that contains such information.

(A) Pull Box Reconditioning:

The field inventory completed by the contractor shall include locating and documenting damaged pull boxes within the project limits. Pull box reconditioning shall be completed prior to the start of work on any other work affecting the use of any pull box slated to be reconditioned. The contractor shall recondition the pull boxes as indicated on the project plans and in the Special Provisions and as directed by the Engineer, in response to the type and extent of damage identified.

Method of Measurement:

Pull boxes will be measured as a unit for each pull box, lid replacement or pull box removal.

Basis of Payment:

The accepted quantities for pull boxes, 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 any excavating and backfilling and surface restoration necessary to

complete the work.

Reconditioning of pull boxes shall be measured and paid under the Force Account Item 9240011.

The cost of removal and disposal of existing pull boxes, existing flexible FMS pull box delineators, brick, stone sump and the adjustment of existing conduits to allow proper entry into new pull boxes, shall be considered included in the unit price of the pull box item.

ITEM 7320765 SINGLE MODE FIBER OPTIC CABLE (12 FIBERS):
ITEM 7320787 SINGLE MODE FIBER OPTIC CABLE (144 FIBERS):

Description:

The work under these items shall consist of furnishing and installing fiber optic cables in accordance with the project plans and these project Special Provisions.

Materials:

The contractor shall furnish and install Single Mode Fiber Optic (SMFO) communication cables, in conduit, as required to provide a communications subsystem.

(A) Documentation:

The contractor shall provide certification that the cables furnished and installed are in conformance with the appropriate specifications. This certification shall be in two parts:

1. The contractor shall secure a certification from the cable manufacturer that the cable is in conformance with the Rural Electrification Administration (REA) Bulletin PE-90 (where applicable) and the project Special Provisions.

2. The contractor shall certify that the communication cable subsystem has been installed and spliced in accordance with the plans, cable and splice manufacturer's recommendations, standard industry practice and the project plans and Special Provisions.

(B) Technical Requirements:

All fiber optic cable shall be SMFO cable that is of loose tube construction, filled with a water- blocking material, and constructed by a certified ISO 9001 or 9002 manufacturer. Fiber optic cable shall be dielectric and comply with the requirements of REA PE-90, except as modified by the following requirements:

Number of fibers:	Per project plans and Special Provisions
Cladding diameter:	125 ±1.0 µm
Core-to-cladding offset:	≤ 0.8 µm
Cladding non-circularity:	≤ 1.0 percent
Maximum attenuation:	≤ 0.35 dB/km at 1310 nm, δ0.25 dB/km at

Microbend attenuation (1 turn, 1.25-inch dia.):	≤ 0.5 dB at 1550 nm
Microbend attenuation (100 turns, 3'	≤ 0.05 dB at 1310 nm
Mode-field diameter (matched	9.3 ±0.5 µm at 1310 nm; 10.5 ±1.0 µm at 1550
Maximum chromatic dispersion:	≤ 3.2 ps/(nm x km) from 1285 nm to 1330 nm and
Fiber polarization mode dispersion:	≤ 0.5 ps/(km)1/2
Fiber coating:	Dual layered, UV cured acrylate
Coating diameter:	245 µm ±10 µm
Minimum storage temperature range:	-40 to 158 degrees F
Minimum operating temperature range:	-40 to 158 degrees F

(1) Buffer Tubes:

Each buffer tube shall be filled with a dry water-blocking material that provides for an efficient and craft-friendly cable preparation.

Buffer tubes shall be stranded around a central member using the reverse oscillation or "S-Z", stranding process. Filler rods shall be used in the fiber optic cable to lend symmetry to the cable section.

(2) Central Strength Member:

The fiber optic cable shall have a central strength member designed to prevent buckling of the cable.

(3) Cable Core:

The fiber optic cable shall utilize a dry water-blocking material to block the migration of moisture in the cable interstices.

(4) Tensile Strength Members:

The fiber optic cable shall have tensile strength members designed to minimize cable elongation due to installation forces and temperature variation.

The fiber optic cable shall withstand a 600 lbf (pound-force) maximum installation tensile load and a long term installed maximum tensile load of 200 lbf.

(5) Cable Jacket:

The fiber optic cable jacket shall be constructed of a high or medium density polyethylene (HDPE or MDPE) jacket that has been applied directly over the tensile strength members and water-blocking material. The jacket shall have at least one ripcord designed for easy sheath removal.

The cable shall be wound on the reel in such a manner as to provide access to both ends of the cable to enable testing to be performed while the cable is on the reel.

(6) Environmental:

The cable shall be capable of withstanding total immersion in water with natural mineral and salt contents, and wasp/hornet spray without damage or decrease in function.

(7) Cable Tags:

Cable marking tags shall conform to the requirements of Subsection 732-2.01 (A) (2), unless otherwise specified on the project plans and in the Special Provisions. The Contractor shall submit sample durable wire and cable marking tags for approval by the Engineer. The tags shall have the capability of being moved along the cable during future alterations.

Construction Requirements:

Construction Requirements shall conform to Section 732, unless otherwise specified in the ITS Standard Drawings, in the ITS Standard Drawings, on the project plans, or these Special Provisions.

No fiber optic cable shall be installed until the pull boxes and cabinets through which fiber cables will pass or terminate have been approved for fiber optic cable installation.

Installation of fiber optic cable shall be continuous and without splices between allowable splice points, as identified on the project plans and Special Provisions. The contractor shall perform all final length measurements, and order cable accordingly.

(A) Cleaning Existing Conduit:

No more than one week prior to installation of fiber optic cable, all new and existing conduits in which fiber optic cable is to be installed shall be cleared/cleaned by pulling through a metal- disc mandrel with a diameter of 90 percent of the conduit inside diameter for PVC conduit, or a ball mandrel with a diameter of 80 percent of the conduit inside diameter for HDPE. The conduit may be brushed or swabbed, if deemed necessary, prior to pulling the mandrel through the conduit. Where cable is to be installed by the contractor over existing cables that remain in place, conduit clearing/cleaning is not required.

(B) Installation Procedures:

The contractor shall ensure that the cable is protected from dragging or scraping on sharp edges and excessive bending. The contractor shall not cause the cable to violate the minimum bending radius for which the cable was designed, as specified by the cable manufacturer. In the event the contractor violates the minimum bending radius, the entire length of cable from the previous splice point shall be removed from the project and a new cable shall be pulled, at no additional cost to the Department.

Fiber optic cables shall be pulled through conduit with a device designed to provide a firm hold on the exterior covering and the central strength member of the cable. Cable shall not drag on the ground or pavement, and be guided into conduits to avoid contact with sharp edges.

The contractor shall ensure that the tensile load on the cable does not exceed the

manufacturer's allowed maximum tensile load by using a break-away tension limiter set below the recommended tensile limit of the cable being pulled and/or a system that provides a means of alerting the installer when the pulling tension approaches the tensile load limit.

During pulling, the cable shall be lubricated at each pull box, as directed by the Engineer. The contractor shall use a prelubrication or continuous lubrication method. The lubricant used shall be compatible with the cable jacket, as recommended by the cable manufacturer. Liquid detergent shall not be used.

The contractor shall use a pre-lubrication or continuous lubrication method. Lubricant quantity for each pull shall be as follows:

$$Q = 0.0008 \times D \times L$$

Where:

Q	=	is the quantity of lubricant in gallons
D	=	is the diameter of the conduit in-inches
L	=	is the length of the pull in feet

The contractor shall supply documentation identifying the manufacturer's recommendation for maximum pulling tension and speeds, and these values shall not be exceeded. The contractor shall have this documentation on site during each fiber optic cable installation pull. If the contractor fails to continuously lubricate the cable, the work shall be stopped until a meeting is held between the contractor and the Engineer to discuss why the terms of this specification are not being met. No compensation for the work stoppage shall be given.

Use of equipment required to install cable, including equipment to limit pull-tension and speed will be incidental to these items. All installation equipment will remain the property of the contractor.

(C) Occupied Existing Conduit:

Where fiber optic cables are to be installed in conduit with existing loop lead-in cables or other cables or conductors that shall remain, the contractor shall not damage the existing loop lead- in cables, conductors or any other cables present within the conduit. Where fiber optic cables are to be installed in a conduit that contains existing loop lead-in cables, the contractor shall disconnect, remove, reinstall, and reconnect the existing loop lead-in cables as specified in Subsection 735-3.01 (D) and (E), to facilitate the installation of the new fiber optic cable. The contractor shall be responsible for any damage to the existing loop lead-in cables caused by this operation.

Unless approved by the Engineer, new fiber optic cables or other cables or conductors shall not be pulled over existing fiber optic cables in any existing conduit or existing innerduct. When an existing fiber optic cable is present in an existing conduit, the contractor shall disconnect, remove and re-pull it at the same time with the new fiber optic cable or other cables or conductors. The existing fiber optic cable shall then be reconnected in the same manner as it was in its original condition, including any fusion splicing or connectorization, unless otherwise specified in the project plans or Special Provisions.

Two weeks prior to disconnecting any existing conductors or cables, the contractor shall submit a schedule for approval by the Engineer, with the timeframes of when the existing cables are to be disconnected.

(D) Cable Slack & Coiling:

In all locations where fiber optic cable enters an existing or new No. 9 pull box, cable slack shall be loosely looped into a circular shape, using the rack and hook system integral to the wall of the No. 9 pull box.

Each new fiber optic cable shall be attached to the rack and hook system with industry standard nylon cable ties. Cables should be looped independently of one another. Cable ties shall encompass the cable loops of 1 cable per cable tie, applying ties to each cable individually. Cable ties shall be tightened to prevent cable slippage, but not as to deform or damage the cable sheath.

No. 9 pull boxes with splice closures shall have 50 feet of cable slack provided for all cables entering the pull box, between the splice closure and the point where the cable enters/exits the pull box, allowing the attached splice closure to be removed up to 50 feet from the pull box, unless a greater distance is noted on the project plans or in the Special Provisions.

No. 9 pull boxes without splice closures shall provide a minimum of 100 feet of slack in each cable passing through the pull box, unless otherwise noted on the project plans or in the Special Provisions.

(E) Splicing:

Splicing of fiber optic cable shall be conducted only at communications hub buildings, specified pull boxes, and connector housing units as shown on the project plans and in the Special Provisions. Additional splices, proposed by the contractor and as approved by the Engineer, shall be only at approved locations, and not measured or paid separately.

(F) Connectors:

Trunk line fiber optic cables, typically connecting between communications hubs and No. 9 pull boxes with splice closures, shall not be connectorized. Branch fiber optic cables, typically between a cabinet or device, and a splice closure on the trunk line cable, shall be connectorized, as indicated on the project plans and in these Special Provisions.

The contractor is required to install as many connectors as is necessary to meet the communications requirements shown on the project plans. Where connectors are required, the contractor shall first install a spider type fan-out kit to strengthen and protect all the fibers of the branch cable (regardless of how many connectors are required for the branch cable). The spider fan-out kit shall protect each fiber of the branch cable with a minimum length one meter long protective PVC jacket, minimum 3 millimeter in diameter. The jacket shall contain a Teflon inner tube into which the fiber is inserted, and a dielectric strength member.

Each fiber connector shall introduce less than 0.5 dB attenuation. Connectors found to

exceed 0.5 dB attenuation shall be replaced at no additional cost, until this requirement is met.

(G) Test Requirements:

Fiber optic cable shall meet the following test requirements.

(1) Pre-Installation Testing:

The contractor shall inspect all cable upon delivery, and prior to installation. Cable that is found to have visual damage shall be tested using an OTDR per the following section prior to installation.

(2) Post-Installation Testing:

After installation and splicing of fiber optic cable, the contractor shall perform the following tests:

Power Meter Test:

The contractor shall conduct Power Meter Tests for each fiber to measure installed fiber cable attenuation, demonstrate connectivity, and correct splicing. The contractor shall perform Power Meter Tests on each fiber strand terminated with connectors utilized in circuits, in accordance with Method A.3 of TIA/EIA-526-7 – "Measurement of Optical Power Loss of Installed Single-mode Fiber Cable Plant", and submit test results for each fiber to the Engineer.

Power meter tests shall be conducted after all cable has been installed, all splices have been made, all fiber optic pigtails have been installed, and all break-outs have been installed. Testing shall be conducted at the cable ends in one direction for all fiber strands using 1310 nm wave length. The testing shall include a test summary spreadsheet that includes at a minimum the parameters for each buffer tube, by cable.

OTDR Tests:

The contractor shall conduct bi-directional tests using an OTDR in accordance with TIA/EIA-455-8 for each fiber. The contractor shall demonstrate that the attenuation for each fiber, splice, and connector, individually and as a whole, comply with the requirements of the test procedures for Fiber Optics in TIA/EIA-455. The contractor shall test each fiber at 1310 nm and 1550 nm using a launch cable of a length recommended by the OTDR manufacturer. The contractor shall submit OTDR traces for approval, and clearly annotate the location of each splice and identify the measured loss.

The contractor shall test all fibers in all splice enclosures the contractor works in, whether existing or new, including dark fibers.

The contractor shall identify unacceptable losses, and make corrective actions at no additional cost to the Department. Failed splices shall be remade and re-tested for compliance. The contractor shall replace cable in its entirety that is not compliant with these Specifications, at no additional cost to the Department.

Following completion of all testing, and approval by the Department, the contractor shall compile and submit organized test notebooks reflecting the post-installation tests, in electronic form (PDF) on a CD to the Engineer. These notebooks shall include a fiber test summary sheet that includes at a minimum the parameters shown in Appendix A of these Special Provisions, the OTDR traces of each fiber strand, and the power meter test results.

The contractor shall submit an electronic copy of the actual OTDR traces and any software applications required for the Department to view the files.

(H) Cable Labeling:

The contractor shall submit permanent identification labels, and the method of attachment, for approval by the Engineer.

Labels, as approved by the Engineer, shall be installed on each cable near the point where it enters/exits the pull box. A cable passing through a pull box, whether spliced or not, shall have two labels, one near each exit/entry point to the pull box. The two labels for the cable will be similar, but will always differ in the "destination". A typical trunkline No. 9 pull box with one branch circuit fiber optic cable would have three labels, two on the trunkline fiber optic cable (one on each side of the splice closure), and one on the branch fiber optic cable. All labels shall include, as applicable by application:

The word "CAUTION"

Cable type and number of strands, such as:
"SMFO96" (single mode fiber-optic, (SMFO 96 strands)
"CCTV"
"DMS"

Destination

The following table is the default labeling scheme for destinations, unless otherwise noted on the project plans or in the Special Provisions.

Cable Tagging: Destinations --- "TO:_____"			
Type	**Use**	**Destination**	**Examples**
Fiber-optic	Trunk	Next: • Terminal point for segment • Node • Building	• "TO Val Vista" • "TO Node 12" • "TO TOC"
Fiber-optic	Branch	Trunkline & side of freeway	"TO EB Trunkline"
		Cabinet Number	"TO CAB 3118253"
		Transformer Number	"TO XFRM 3118279"
		Cabinet Number	"TO CAB 3118253"

Where appropriate, cable labels may be bundled around multiple cables.

A complete labeling record, in the form of an Record Drawing Cable Schedule, shall be provided to the Engineer with the final project documentation. The cabling record shall

include the distance markings on all fiber optic cables at the ingress and egress points of each No. 9 pull box, at each splice closure, entry to each cabinet and all termination points.

Method of Measurement:

Fiber Optic Cable will be measured by the linear foot for each type of cable furnished and installed, based on number of fibers in the cable as follows; from center to center of pull boxes, from edge of foundation to center of pull box, from edge to edge of foundation, from end of conduit to center of pull box, from end to end of conduit when no pull boxes are used.

No measurement or direct payment will be made for slack or coiled cable, the cost being considered as included in the contract price for fiber optic cable.

No separate measurement will be made for splicing and terminating cables, detectable pull tape, lubricant, labels, conduit cleaning and sealing, or testing, the cost being considered as included in the cost of the contract items.

Basis of Payment:

The accepted quantities of Fiber Optic Cable, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the item, complete in place.

ITEM 7320794 FIBER OPTIC SPLICE CLOSURE (FMS):

Description:

The work under this item shall consist of furnishing and installing fiber optic splice closures in accordance with the project plans and these project Special Provisions.

Materials:

Fiber optic splice closures shall be either shell design or cylindrical, butt-end style, corrosion resistant, watertight, and meet the requirements of CR-771-CORE. Underground splice closures shall seal, bond, anchor, and provide efficient routing, storage, organization, and protection for fiber optic cable and splices.

The splice closure shall provide an internal configuration and end cap with a minimum of 2 express ports for entry and exit of backbone cable and a minimum of 3 additional ports for distribution and branch cables.

Splice closures shall be designed to accommodate heat-shrink fusion splice trays in sufficient quantities to perform the required number of splices. At a minimum, the splice closure shall accommodate 144 splices, or as specified on the project plans and in these Special Provisions. Each splice closure shall be supplied with the maximum number of fusion splice trays.

Splice closures shall have a reliable dual seal design with both the cable jackets and core tubes sealed, without the use of water-blocking material. The splice closures shall

be capable of being opened and completely resealed without loss of performance.

The splice closure minimum dimensions shall be at least 29 inches long by 11 inches wide, or as specified on the project plans and in these Special Provisions.

Construction Requirements:

At the locations shown in the project plans or as specified in the Special Provisions, the contractor shall perform all required fusion splicing. The contractor shall install the splice closure in a manner proposed to and approved by the Engineer, such that the trunk cable entries are on the same side of the end cap so if additional branch fiber optic cables are installed at a later date, the 2 existing seals remain undisturbed.

The full cable splice in PB 6004961 and the branch cable splices in PB 6004945A are in existing splice closures that were installed as a part of FMS Phase 14A. The contractor shall include the cost of completing the splices in these two splice closures as incidental to the cost of providing fiber optic splice closures for the Phase 14B project.

Where the contractor is splicing to existing fiber, the contractor shall be careful to not disturb any existing splices. Existing splices that are damaged shall be repaired by the contractor immediately, at no cost to the Department.

All splices and connectors shall be prepared in accordance with the manufacturer's recommendations. Each splice between 2 new fibers shall introduce less than 0.1 dB attenuation. For splices between 1 new and 1 existing, or reconnection of 2 existing fibers, the maximum allowable attenuation shall be 0.3 dB.

Method of Measurement:

Fiber Optic Splice Closures (FMS) will be measured as a unit for each splice closure furnished and installed, complete in place, including the cost of splicing.

Basis of Payment:

The accepted quantities of Fiber Optic Splice Closures (FMS), measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work, furnished and installed, complete in place.

SECTION 733 - SIGNAL INDICATIONS AND MOUNTING ASSEMBLIES:

733-2.01(A) Signal Indications: of the Standard Specifications is modified to add:

All ramp meter signal indications and flashing beacons shall be Light Emitting Diode (LED) modules. This will include red, yellow and green indications.

733-2.01(C) Fiber Optic Turn Arrow Signal: of the Standard Specifications is modified to add:

(C) Light Emitting Diode (LED) Module:

(1) General:

The Department requires all new traffic signal heads installed on new ramp meter assemblies and flashing beacon assemblies to have LED modules for all indications.

LED traffic signal modules shall meet all the requirements identified in the Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement of the Institute of Transportation Engineers except as listed below. LED traffic signal modules shall be designed to fit traffic signal housings that meet the specifications established in Section 733. The module shall be weather tight and fit securely in the housing and shall have wire leads long enough for easy connection to the traffic signal head wire terminal block. The wire shall have crimped on terminal connectors. The LED signal module shall be a single, self-contained device. The power supply shall be integral to the sealed LED module.

(2) Module Identification:

The manufacturer shall label each LED module. The label shall contain all information listed in Section 3.6 of the ITE LED Specification. In addition to the requirements of Section 3.6, the Department shall require that the label contain the date of manufacture, the date of installation (this information will be filled in by the installing technician), and the following statement " Manufactured in Conformance with the 2005 Purchase Specification of the ITE for LED Vehicle Traffic Signal Modules".

(3) LED Environmental Requirements:

Two ambient operating temperature ranges are being identified. The Department may, on certain projects in high heat desert areas, require the Contractor to supply units that are rated to operate in the high temperature range. The Contractor and material vendor shall carefully review the project plans and special provisions for LED temperature range requirements. LED signal modules shall be rated for use in the ambient operating temperature range of –40 (-40) to +74 degrees C (164 degrees F) The manufacturer shall provide independent environmental testing verification that the product has operated successfully in the rated temperature range, or ranges that the manufacturer is proposing to supply.

(4) LED Module Photometric Requirements:

The Department requires the light output of the LED modules supplied by the Contractor to meet the requirements of Section 4 of the 2005 ITE LED Purchase Specification, the 44-point test identified in paragraph 6.4.2.1 and the single point test identified in paragraph 6.4.2.2.

(5) LED Module Electrical Requirements:

The LED module shall use 2 color-coded copper wires. The wire shall be No. 20 AWG with 30 mil jacketed insulation. The wires shall be a minimum of 36-inches long with

crimped on fork connectors. The wire shall be rated for 600 Volt AC. The insulation shall be rated for 105 degrees C (220 degrees F).

(6) LED Dimming:

All LED modules purchased, as part of a Department construction project shall not include dimming circuitry.

(7) Failed State Impedance:

The Department requires the manufacturer to include the option listed in Section 5.8 of the 2005 ITE LED Purchase Specification.

(8) LED Module Compatibility:

The Department has adopted the recommendation stated in Technical Note No. 2 of the Institute of Transportation Engineers 2005 LED Purchase Specification. All LED manufacturers shall insure that LED modules are compatible with Department load switches and conflict monitors.

733-2.03(B) Pole Flashers: of the Standard Specifications is modified to add:

Each pole flasher shall consist of 1 signal section. Each pole flasher assembly shall contain 8-inch signal sections with yellow lenses.

733-2.04 Mounting Assemblies: the second paragraph of the Standard Specifications is revised to read:

Terminal Compartments: A terminal compartment shall be assembled in the mounting brackets as shown in the Standard Drawings. The terminal compartment shall be manufactured of bronze.

733-3 Construction Requirements: of the Standard Specifications is modified to add:

The Contractor shall install and test each signal head for accuracy with a qualified traffic signal representative to verify operation before the system is turned over to ADOT for further testing and acceptance. The assembly of the signals and flashing beacons shall be designed to assure all components are adequately supported and protected to withstand mechanical shock, vibration from high winds and other sources, and vandalism.

All traffic signal indications must satisfy the requirements of this specification in order to be approved and used on ADOT ramp meter and flashing beacon systems. In addition, all systems must perform acceptably under actual field conditions for high temperature desert exposure to be accepted. The Contractor shall provide ADOT a written minimum four-year product warranty from the manufacturer.

ITEM 7330410 POLE FLASHER:

Description:

The work under this item shall consist of furnishing and installing a W3-8 sign assembly with beacon consisting of a W3-8 sign, Type A pole with break-away base, pole foundation, Type D flashing amber beacon, and mounting hardware, at required locations and in accordance with the project plans.

This unit shall include but not be limited to, the sign, pole, foundation, break-away base, Type D flashing amber beacon, excavation, backfill, mounting hardware, ground rods, electrical conduit (from beneath the foundation through the foundation) to the beacon and the wiring of the unit, and all other materials incidental to the completion of a functional assembly.

Materials:

The contractor shall comply with requirements of Section 608 for a sign using series D letters. The contractor shall submit the sign format to the Engineer for review prior to installing signs. Certification of reflectivity requirements of Subsections 1007-1 and 106.05 shall be furnished.

Each pole flasher assembly shall be warranted against all defects in materials and workmanship in accordance with Subsection 106.13.

(A) W3-8 Sign Panel:

The 36-inch by 36-inch warning sign shall meet requirements of details in the ITS Standard Drawings, Subsection 608-2.09, and the ADOT Traffic Group's latest revisions of the Policies, Guides, and Procedures (PGP) and Manual of Approved Signs (MOAS).

(B) Type A Pole with Break-Away Base:

The steel pole shall meet requirements of Standard Drawings T.S. 4-1, 5-1, and Subsection 731-2.02, and ITS Standard Drawing FM-6.01. Final elevations of poles should be approximately the same for a pair of flashers on an on-ramp. The contractor shall be responsible to determine site elevations to result in correct combinations of pole lengths.

(C) Pole Foundation:

The drilled shaft foundation shall meet requirements of Standard Drawing T.S. 4-1 and Subsection 609-2. The concrete shall be Class S with 3,000 psi minimum compressive strength. The foundation shall include conduit elbows.

(D) Type D Flashing Amber Beacon:

The amber (yellow), 12-inch signal head shall meet requirements of Standard Drawing T.S. 8-1 (louvers are not required for this project), shall use a Type III mount meeting requirements of Standard Drawing T.S. 9-2, and shall flash at a rate determined by the

flasher unit supplied in the ramp metering cabinet. Requirements of Subsection 733-2.03 shall be met. The signal head shall be furnished with a LED module, tunnel visor and backplate. The beacon shall be bagged until placed in operation.

Construction Requirements:

The contractor shall furnish and install a sign assembly, Type A pole with break-away base, pole foundation, Type D flashing amber beacon, and mounting hardware as shown in the ITS Standard Drawings, project plans and according to these Special Provisions.

The pole flasher assembly shall meet the requirements of the following Department standards: Standard Drawing T.S. 8-1, T.S. 9-2, S-9, T.S. 4-1, and T.S. 5-1.

The contractor shall connect the pole flasher assembly to the associated ramp meter controller cabinet using a 4-conductor IMSA cable having No. 14 AWG conductors.

Connections shall be as follows:

CONDUCTOR TABLE

		INSULATION		CONDUCTOR		
CIRCUIT	**FUNCTION**	**COLOR**	**TYPE**	**Minimum Thick. (MILS)**	**Minimum Gauge (AWG)**	**TYPE**
Ramp Meter Flashers	Beacon Common Spare Spare	Red White Green Black			#14	IMSA 19-1

Method of Measurement:

The Pole Flasher assembly with beacon will be measured as a unit for each W3-8 sign assembly with beacon furnished and installed. This unit shall include but not be limited to, the sign, pole, foundation, anchor bolts, break-away base, Type D flashing amber beacon, excavation, decomposed granite restoration, backfill, mounting hardware, ground rods, electrical conduit (from beneath the foundation through the foundation) to the beacon and the wiring of the unit, and all other materials incidental to the completion of a functional assembly.

No additional measurement will be made for restoring landscaping or decomposed granite to existing conditions.

The 4-conductor IMSA cable will be measured and paid under separate bid item.

Basis of Payment:

The accepted quantity of the pole flasher assembly, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work, complete and in place.

ITEM 7330446 RAMP METER SIGNAL AND SUPPORT ASSEMBLY:

Description:

The contractor shall furnish and install ramp meter signals and support assemblies, including foundations, at the required locations and in accordance with the requirements of the project plans and these Special Provisions.

This assembly shall include, but not be limited to, the R10-28 sign panel (R10-29AZ if mast arm pole is used), Type A pole with break-away base (or mast arm pole and arm, if shown on plans), pole foundation, Type E 12-inch LED red/green signal head (with backplate), Type B 8-inch LED red/green signal head (with backplate), 1-inch LED tattle tale, and all necessary signal head mounting hardware as specified. It shall also include any excavation, backfill, ground rods, electrical conduit (from beneath the foundation, through the foundation, and to the signal head), the wiring of the unit, and all other materials to complete a functional ramp meter signal and support assembly.

Materials:

The contractor shall comply with requirements of Section 608 for signs using Series C and D letters and shall receive written approval for the sign layouts prior to installing signs. Certification of reflectivity requirements of Subsection 1007-1 and 106.05 shall be furnished.

Each ramp meter signal and support assembly shall be warranted against all defects in materials and workmanship in accordance with Subsection 106.13.

(A) Type A Pole with Break-Away Base:

The steel pole shall meet requirements of Standard Drawing T.S. 4-1, 5-1, and Subsection 731-2.02. The pole shall be 10 feet tall and mounted on a break-away base.

(B) Mast Arm Pole & Mast Arm:

When shown on the project plans, mast arm poles shall conform to the applicable requirements of the pole and arm combination indicated on the ramp meter plans. Situations where the elevation of the base of the pole shaft is on an elevation different than the pavement elevation shall be field surveyed to determine applicable pole shaft length resulting in the bottom of the lowest signal head being a minimum of 17 feet and maximum of 20 feet above the pavement surface.

(C) Pole Foundation:

The drilled shaft foundation shall meet requirements of Standard Drawing T.S. 4-1 for Type A poles, and the applicable T.S. Standard Drawing for any mast arm poles, and Subsection 609-2. The concrete shall be Class S with 3,000 psi compressive strength.

(D) Type E Red/Green Signal Head:

The red/green, 12-inch signal head shall meet requirements of Standard Drawing T.S. 8-1 (louvers are not required for this project) and shall use a Type III mount meeting requirements of Standard Drawing T.S. 9-2. Requirements of Section 733 shall be met. The signal heads shall have LED indicators, tunnel visors and backplates. The signal heads shall be bagged until placed in operation.

(E) Tattle Tale Light:

Each Type E indication shall include a tattle tale light with a minimum of nine LED's (650-660 nm, one candela minimum) with bayonet UV shield. A tattle-tale light shall be permanently affixed to the higher elevation ramp meter signal head assembly housing. Each LED shall emit red color only. Chromaticity shall remain constant from 32 degrees F to 140 degrees F.

The bayonet shall be 2-1/2-inch minimum depth. The pixel shall be 2-inch to 3-inch in diameter. The tattle tale light shall be affixed to the ramp meter signal head by means of a water tight female type, flexible, steel cord connector. The steel cord connector shall be attached to the exterior of the signal head, pass through the signal head and be secured on the interior.

The 100,000 hour life fully encapsulated LED cluster shall be activated at precisely the same time the red signal indication is activated. The Contractor shall directly wire this connection, but shall limit the power to ensure 20 mA maximum draw by the LED's. The LED's shall be visible at 300 feet within 20 degrees from perpendicular to the backplate. Wiring shall include such grommets and wire loops as necessary to prevent water intrusion in either the LED cluster or the signal head.

A certificate shall be required from the manufacturer on Chromaticity and how it relates to the power and LED life.

(F) Type B Red/Green Signal Head:

The red/green, 8-inch signal head shall meet requirements of Standard Drawing T.S. 8-1 and shall use a Type XI mount meeting requirements of Standard Drawing T.S. 9-9. Requirements of Section 733 shall be met. The signal head shall be furnished with LED indicators, tunnel visors and backplates. The signal heads shall be bagged until placed in operation.

Construction Requirements:

The contractor shall survey and stake the locations of the ramp meter pole foundations, 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.

The contractor shall wire all devices to provide a complete and functional assembly. The ramp meter signal and support assembly shall be constructed according to the project details and meeting the requirements of the following Department standards: T.S. 4-1, T.S. 5-1, T.S. 8-1, T.S. 9-2, T.S. 9-9, S-9, and the following Department specifications: 608-2.09, 731-2.02, 731-3, 609-2, 609-3, 733, 608, and 704.

The contractor shall coordinate with the ADOT VISION Field Office and the ADOT PCD ITS Maintenance Division after completing the construction of all new ramp meter systems. ADOT PCD ITS Maintenance will conduct operational testing of the ramp meters, approve and accept the newly constructed ramp meter system in conjunction with the ADOT VISION Field Office. The contractor shall be readily available during the testing period. The testing shall occur twice a day for 7 calendar days.

Sites using mast arm poles and mast arm signals shall comply with applicable mast arm pole details, with exceptions specified herein regarding pole shaft lengths.

The contractor shall connect the signal subassembly to the associated ramp meter controller cabinet using a 7-conductor IMSA cable having No. 14 AWG conductors, to provide a complete and functional ramp meter system. Connections shall be as follows:

CONDUCTOR TABLE

		INSULATION		CONDUCTOR		
CIRCUIT	**FUNCTION**	**COLOR**	**TYPE**	**Minimum Thick. (MILS)**	**Minimum Gauge (AWG)**	**TYPE**
Ramp Meter Signals	Red No. 1 Red No. 2 Green No. 1 Green No. 2 Common Spare Spare	Red Blue Green Orange White Black White/Blk			No. 14	IMSA 19-1

Method of Measurement:

The Ramp Meter Signal and Support Assembly will be measured as a unit for each ramp meter signal, foundation, support assembly furnished and installed. This unit shall include the R10-28 (R10-29AZ if mast arm installation) sign panel, Type A pole with break-away base (or mast arm pole and mast arm), pole foundation, anchor bolts, 12-inch Type E red/green signal head, 8-inch Type B red/green signal head, tunnel visors

and backplates, 1-inch tattle tale light, all necessary sign mounting hardware, and all necessary signal head mounting hardware. It shall also include any excavation, decomposed granite restoration, backfill, ground rods, electrical conduit (from beneath the foundation, through the foundation, and to the signal head), the wiring of the unit, and all other materials to complete a functional ramp meter signal and support assembly.

The 7-conductor IMSA cable will be measured and paid under separate bid item.

Furnishing and installing conduit, pull boxes, detector loops, ramp meter control cabinet and foundation, and two-channel detector cards will be measured and paid as separate items.

No additional measurement will be made for restoring landscaping or decomposed granite to existing conditions.

No additional measurement or payment will be made for grading in the vicinity of the ramp meter support assembly. The cost is considered as included in the price of the ramp meter support assembly.

Basis of Payment:

The accepted quantity of the Ramp Meter Signal and Support Assembly, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work, complete and in place.

ITEM 7340101 CONTROL CABINET (CCTV):
ITEM 7340103 CONTROL CABINET (RAMP METER/DETECTION):

Description:

The work under these items shall include, but is not limited to, furnishing all materials, tools, equipment, and labor necessary to furnish and install various control cabinets, and related equipment. A control cabinet assembly shall consist of electrical and electronic equipment and components for controlling the operation of the ITS devices served by the cabinet, as shown in the ITS Standard Drawings or project plans and Special Provisions.

Materials:

The control cabinet assembly shall include the cabinet, all internal equipment and devices, and all necessary documentation.

Cabinets shall be field mounted on a concrete foundation or pole mounting hardware, including any conduit, conduit elbows, foundation anchor bolts and foundation maintenance pads.

Equipment lists and equipment submittals shall conform to the requirements of Subsection738-4.

Sign Controller Unit (SCU) and associated software and control cabinet for DMS shall be Department furnished for contractor installation as indicated on the project plans and in the Special Provisions.

All cabinets shall be furnished with the following items.

(A) General:

The cabinets shall be a be type indicated on the project plans, and shall be ventilated NEMA 3 double or single-door enclosures, depending on specified type. Overall appearance and dimensions shall be as shown in the ITS Standard Drawings or other reference, as indicated on the project plans or Special Provisions.

All bolts, nuts, washers, screws, hinges, and hinge pins shall be stainless steel, unless otherwise specified on the project plans or in the Special Provisions.

All cabinet equipment and accessories shall be mounted on the cage mounting rails as shown in the ITS Standard Drawings, unless otherwise specified on the project plans and Special Provisions.

Each cabinet shall be installed with contractor-furnished pressure-sensitive, permanent identification decals, as shown in the ITS Standard Drawings. 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.

(B) Mechanical Requirements:

All cable connectors shall have cable hoods or shields and strain relief clamps.

All pin and socket connectors shall use identical contact insertion tools, contact extraction tools, and contact crimping tools. Pin diameter shall be 0.062 inches.

Each unit of equipment shall be enclosed in a sheet metal case with a protective finish. The case shall be designed to provide convenient access to the entire interior assembly and permit the removal of printed circuit boards or modules without the use of special tools that are not available to the public.

Module and printed circuit assemblies shall incorporate plug-in techniques and be easily replaceable. A guide or track shall be provided for each module and assembly. All assemblies shall be mechanically secured so as to retain the assemblies in their proper position under conditions of shock and vibration which may reasonably be expected when the unit is mounted in a roadside cabinet.

Assemblies shall be provided with 2 guides for each plug-in printed circuit board. The guides shall extend to within 0.75 inch from the face of either the socket or connector. All connectors and printed circuit cards shall be keyed to prevent accidental insertion of the wrong connector or card.

The manufacturer's model number, serial number, functional variation circuit issue or revision number, and date of shipment (month and year) shall appear in an easily visible location on each equipment unit and module supplied.

All units having the same model number shall be electrically and mechanically interchangeable.

(C) Cabinet Housing:

Cabinet housing shall be rain-proof with the top of the enclosure crowned, to prevent standing water. Cabinet housing shall have single front and rear doors, each equipped with a lock.

The enclosure, doors, 2 lifting eyes, gasket channels and all supports welded to the enclosure and doors shall be fabricated of 0.125 inch minimum thickness aluminum sheet. Bolted-on supports shall be either the same material and thickness as the enclosure, or shall be 0.105 inch thick (minimum) steel. The side panels and filter shell shall be fabricated of 0.080 inch minimum thickness aluminum sheet.

Each cabinet shall be provided with 2 lifting eyes. Each lifting eye opening shall have a minimum diameter of 0.75 inch. Each lifting eye shall be able to support a load of 1,000 pounds.

All exterior seams for the enclosure and doors shall be continuously welded and shall be smooth. All edges shall be filed to a radius of 0.03125 inch minimum. Exterior cabinet welds shall be accomplished by gas Tungsten arc Tungsten Inert Gas (TIG) process only. For the TIG process, the ER5356 (AlMg-5) 5 percent Magnesium, Aluminum alloy welding rod, conforming to AWS A5.10 requirements shall be used for welding on aluminum. Procedures, welders, and welding operators shall conform to the requirements and practices in AWS B3.0 and C5.6 for aluminum. Internal cabinet welds shall be done by either gas metal arc Metal Inert Gas MIG aka: Gas Metal Arc Welding (GMAW) or gas tungsten arc TIG process.

An anodic coating shall be applied to all aluminum surfaces after the surface has been cleaned and etched. The cleaning and etching procedure shall be to immerse in inhibited alkaline cleaner at 159.8 degrees Fahrenheit for 5 minutes (in a mix of 6 to 8 ounces per gallon to distilled water) then rinsed in cold water and etched in a sodium solution at 150.8 degrees Fahrenheit for 5 minutes (0.5 ounce sodium fluoride, plus 5 ounces of sodium hydroxide mix per gallon to distilled water). The surface shall then again be rinsed in cold water and then degreased in a 50 percent, by volume, nitric acid solution at 68 degrees Fahrenheit for 2 minutes. Finally, the surface shall be rinsed in cold water.

The anodic coating shall conform to MIL-A-8625F (Anodic Coatings for Aluminum and Aluminum Alloys) for Type II, Class I Coating except the outer housing surface coating shall have a 0.0007 inch minimum thickness and a 0.952 ounces per square inch minimum coating weight. The anodic coating shall be sealed in a 5 percent aqueous solution of nickel acetate (pH 5.0 to 6.5) for 15 minutes at 210.2 degrees Fahrenheit.

The enclosure door frames shall be double-flanged on all 4 sides, and shall have strikers to hold tension on and form a firm seal between the door gasket and the frame. The dimension between the door edge and the enclosure external surface when the door is closed and locked shall be 0.156 + 0.08 inch.

Gasket shall be provided on all door openings and shall be dust-tight. Gaskets shall be 0.25 inch minimum thickness, closed-cell neoprene or silicone, and shall be permanently bonded to the metal. If neoprene is used, the mating surface of the gasket shall be covered with a silicone lubricant to prevent sticking to the mating metal surface. A gasket top channel shall be provided to support the top gasket on the door to prevent gasket gravitational fatigue.

The cage bottom support mounting angles shall be provided on either side, level with the bottom edge of the door opening, for horizontal support and bolt attachment. Side cage supports shall be provided for the upper cage bolt attachments. Spacer brackets between the side cage supports and the cage shall be either 0.188 inch aluminum or 0.105 inch steel.

No bolts shall protrude through the cabinet top or walls.

The latching handles shall have provisions for padlocking in the closed position. Each handle shall be 0.75 inch minimum diameter stainless steel with a minimum 0.50 inch shank. The padlocking attachment shall be placed at 4 inches from the handle shank center to clear the lock and key. An additional 4 inch minimum gripping length shall be provided.

The latching mechanism shall be a 3-point draw-roller type. Rollers shall have a minimum diameter of 0.75 inch with nylon wheels and steel ball bearings. The push rods shall be turned edgewise at the outward supports and have a cross-section of 0.25 inch thick by 0.75 inch wide, minimum.

When the door is closed and latched, the door shall be locked. The lock and lock support shall be rigidly mounted on the door. In the locked position, the bolt throw shall extend a minimum of 0.25 inch into the latch-cam area. A seal shall be provided to prevent dust or water entry through the lock opening.

Locks shall be consistent and compatible with current ADOT ITS control cabinet 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. Locks shall have rectangular spring-loaded bolts. Bolts shall have a 0.281 inch throw and shall be 0.75 inches wide by 0.75 inches thick (tolerance is +/- 0.035 inches).

The rear door shall be provided with louvered vents. The louvered vent depth shall be a maximum of 0.25 inch. A removable, reusable air filter shall be housed behind the door vents. The filter shall cover the vent opening area. A filter shell that fits over the filter and provides mechanical support for the filter shall be furnished. The shell shall be louvered to direct the incoming air downward. The shell sides and top shall be bent a minimum of 0.25 inch to contain the filter. The filter resident in its shell shall be held firmly in place with a bottom bracket and a spring loaded upper clamp. No incoming air shall bypass the filter. The bottom filter bracket shall be formed into a waterproof sump

with drain holes to the outside of the housing. The filter shall be 16 inches wide x 12 inches high x 0.875 inch thick, and compatible with the cabinet the filter is serving.

The intake (including filter with shell) and exhaust areas shall pass a minimum of 100 cubic feet of air per minute.

The housing shall be equipped with two electric fans with ball or roller bearings and each with capacity of 100 cubic feet of free air flow per minute. Each fan shall be mounted within the housing and vented.

Each fan shall be thermostatically controlled and shall be manually adjustable to turn on between 32 and 140 degrees Fahrenheit, with a differential between automatic turn on and off of not more than 20 degrees Fahrenheit. It shall be possible to manually adjust the on/off temperature set point in 20 degree Fahrenheit increments. Each fan circuit shall be protected at 125 percent of the fan motor current rating.

Two-bolt per leave hinges shall be provided to bolt the enclosure to the door. The housing shall have 4 hinges. Each hinge shall be 3.5 inch minimum length and have a fixed pin. The pin ends shall be welded to the hinge and ground smooth. The pins and bolts shall be covered by the door edge and not accessible when the door is closed.

Front and rear doors shall be provided with catches to hold the doors open at both 90 degrees and 180 ± 10 degrees. The catch minimum diameter shall be either 0.375 inch for plated steel or aluminum rods or 0.25 inch for stainless steel. The catches shall hold the door open at 90 degrees in a 60 mph wind acting at an angle perpendicular to the plane of the door.

The cabinets shall contain a minimum of two LED light fixtures. The fixtures shall be mounted on the inside top of the cabinet near the front edge and rear edge of the roof so that the front or rear of the control equipment will be illuminated when the corresponding door is open.

A door-actuated, refrigerator-type, normally-closed, durable push-button type switch shall automatically turn the appropriate light fixture on and off when the front or rear door is opened and closed.

(D) Cage Support Assembly:

A standard EIA 19-inch rack cage shall be installed inside the housing for mounting of the controller unit and cabinet accessories.

The EIA rack portion of the cage shall consist of two pairs of continuous, adjustable equipment mounting angles. The angle nominal thickness shall be either 0.1345 inch plated steel or 0.105 stainless steel. The angles shall be tapped with holes having 10-32 threads with EIA universal spacing.

The angle shall comply with standard EIA RS-310-D and shall be supported at the top and bottom by either welded or bolted support angles to form a cage.

Clearance between angles for mounting assemblies shall be 17.75 inches.

Two steel supporting angles extending from the front to the back rails shall be supplied to support the controller unit. The angles shall be designed to support a minimum of 50 pounds each. The horizontal side of each angle shall be a minimum 3 inches wide. The angles shall be vertically adjustable.

As part of the controller support brackets, a 1.5 inch rack mounted drawer shall be provided within a 1.75 inch space. The rack mounted drawer shall have a hinged top cover. The drawer shall store documents and miscellaneous equipment up to 50 pounds in weight when extended out from the cage. When fully extended, the drawer shall lock in place and shall require manual release of spring pins on each of two sides to allow the drawer to be retracted into the cage.

The cage shall be bolted to the cabinet at 4 points on both top and bottom, via the housing cage supports and associated spacer brackets, and shall be centered within the cabinet.

(E) Side Panels:

Aluminum side panels shall be provided in the cabinet as shown in the ITS Standard Drawings. They shall be bolted to the support cage.

(F) Electrical Requirements:

All circuits shall be functionally operational with regard to the following parameters:

Power source frequency:	60 ± 3 Hz
Applied Line Voltage:	90 to 135 VAC, single-phase
Ambient temperature:	-35 to +165 degrees Fahrenheit
Humidity:	5 to 95 percent, non-condensing

All circuits, unless otherwise noted, shall commence operation at or below 90 VAC, as the applied voltage is increased at a rate of 2 ± 0.5 VAC per second.

All equipment shall be unaffected by transient voltages normally experienced in commercial power lines.

Power line surge protection shall be provided to enable the unit being tested to withstand (non-destructive) and operate normally following the discharge of a 25 microFarad capacitor charged to ± 2,000 Volts, applied directly across the incoming AC line at a rate of once every 10 seconds, for a maximum of 50 occurrences per test, with the unit under test operating at between 27 to 109 degrees Fahrenheit, and at 108 to 132 VAC.

The equipment shall withstand (non-destructive) and operate normally when one discharge pulse of plus or minus 300 Volts is synchronously added to its incoming AC power line and moved uniformly over the full wave across 360 degrees or stay at any point of Line Cycle once every second. Peak noise power shall be 5 kiloWatts with a pulse rise time of 500 nanoseconds. The unit under test will be operated at between 27 to 109 degrees Fahrenheit, and at 108 to 132 VAC.

All equipment shall be capable of normal operation following opening and closing of contacts in series with the applied voltage at a rate of 30 openings and closings per minute for a period of 2 minutes in duration.

(G) Cabinet Wiring:

All conductors used in cabinet wiring shall terminate with properly sized non-insulated (if used for DC logic only) or clear insulated spring-spade type terminals except when soldered to a through-panel solder lug on the rear side of the terminal block or as specified otherwise. All crimp-style connectors shall be applied with a power tool that prevents opening of the handles until the crimp is completed.

Conductors between the service terminal AC- and Equipment Ground, and their associated bus, the equipment ground bus conductor to Power Distribution Assembly, and cage rail, AC- Bus to Power Distribution Assembly shall be No. 8 AWG or larger.

All conductors, unless otherwise specified, shall be No. 22 AWG or larger, with a minimum of 19 copper strands. Conductors shall conform to Military Specification MIL-W-16878D, Type B, or better. The insulation shall have a minimum thickness of 10 mils and shall be nylon jacketed polyvinyl chloride, except that conductors No.14 AWG and larger may have Type THHN insulation (without nylon jacket), and shall be stranded with minimum of 7 copper strands.

All conductors, except those that can be readily traced, shall be labeled. Labels attached to each end of the conductor shall identify the destination of the other end of the conductor.

All conductors shall conform to the following color-code requirements:

The grounded conductors of AC circuits shall be identified by a solid white or solid gray color;

The equipment grounding conductors shall be identified by a solid green color or by a continuous green color with one or more yellow stripes;

The DC logic ground conductors shall be identified by a continuous white color with a red stripe;

The ungrounded AC+ conductors shall be identified by a solid black or continuous black with colored stripe;

The logic ungrounded conductors shall be identified by any color not specified above.

All wiring harnesses shall be routed to minimize crosstalk and electrical interference.

C1 connector wire harness shall be a minimum of 4 feet in length and shall have adequate length to allow the C1P connector to properly connect the controller unit to the

cabinet while the unit is mounted in the cabinet and while the unit is sitting on the cabinet drawer.

Wiring containing AC shall be routed and bundled separately or shielded separately from all logic voltage control circuits.

Cabling shall be routed to prevent conductors from being in contact with metal edges. Cabling shall be arranged so that any removable assembly may be removed without disturbing conductors not associated with that assembly.

Within the cabinet, the DC logic ground shall be electrically isolated from both the AC neutral and the equipment ground by at least 500 MegOhms when tested at 250 VDC.

The cabinet power supply DC ground shall be connected to the DC logic ground bus using a No. 14 AWG or larger stranded copper wire.

With the power line surge protector disconnected, the AC neutral and the equipment ground shall be electrically isolated by at least 500 MegOhms when tested at 250 VDC.

(H) Circuit Breakers:

Circuit breakers shall be UL 489 approved. The trip and frame size shall be plainly marked on the breaker by the manufacturer, and the Amperes rating shall be marked and visible from the front of the breaker. All breakers shall be quick-make, quick-break on either manual or automatic operation. Contacts shall be silver alloy enclosed in an arc quenching chamber. Overload tripping shall not be influenced by an ambient temperature range of from 0.4 to 122 degrees Fahrenheit. Minimum interrupting capacity shall be 5,000 Amperes RMS when the breaker is secondary to a UL approved fuse or primary circuit breaker, and both breakers in concert provide the rated capacity. For circuit breakers 80 Amperes and above, the minimum interrupting capacity shall be 10,000 Amperes RMS.

Circuit breakers shall be trip-free type with medium trip delay characteristics. Multi-pole circuit breakers shall be the common-trip type.

(I) Fuses:

All fuses shall be 3AG Slow Blow type, and reside in a fuse holder. Fuse size rating shall be labeled on the chassis or beside the holder. Fuses shall be easily accessible and removable without the use of tools.

(J) Power Line Surge Protector:

A power line surge protector shall be furnished and installed as part of the cabinet. The power line surge protector shall consist of a hardware base and replaceable protection module with LED failure indicators, conforming to the following requirements:

Operating Voltage	120 VAC
Clamping Voltage	340 VAC
Operating Current	15 Amps

Peak Surge Current	32.5 kA/Phase, 45.5 kA/Total
Operating Frequency	60 ± 3 Hz
EMI Attenuation	50 dB Typ
Modes of Protection	L-N, L-G, N-G
Status Indicators	Power On, MOVs Functional
Temperature range:	- 40 to + 185 degrees Fahrenheit
Maximum Dimensions:	3.125 inches wide x 7.125 inches long x 3.5 inches high

Typical radio interference noise suppression shall be 10 dB at 10 kHz, 50 dB at 100 kHz, and 90 dB at 1 MHz.

(K) Power Strip:

The cabinet shall be equipped with a non-surge protected power strip conforming to the following requirements:

Electrical Rating:	120 VAC/20 Amps
Power Cord:	3-Wire, 4 Feet Length (NEMA 5-15)
Receptacles:	4 Minimum (NEMA 5-15)
Maximum Dimensions:	2 inches wide x 13 inches long x 2 inches high

The power strip shall be mounted in the rear of the cabinet on the left side (looking from the rear), and plugged into REC2A on PDA4.

Detection & Ramp Meter Cabinet:

The Detection & Ramp Meter Cabinet shall be furnished and installed in accordance with the ITS Standard Drawings or as shown on the project plans and in the Special Provisions.

Each cabinet shall be provided with the following cabinet accessories as shown in the ITS Standard Drawings or as shown on the project plans and in the Special Provisions.

Model 200 Switch Packs;
Model 204 Flasher Units;
Model 206 Power Supply Module;
Power Distribution Assembly (PDA) No. 4;
Input Files "I" and "J", and
Model 222 Two-Channel Detector Cards.

Additional equipment shall be furnished and installed in the cabinet when required on the project plans and in the Special Provisions, but shall be paid for under separate items. See the project plans and Special Provisions for required quantities and specific cabinets requiring these devices.

Detection and Ramp Meter Cabinet shall be capable of operating without a conflict monitor.

Locking star washers shall be included on each terminal block mounting screw. Each terminal of each double-sided terminal block shall contain two terminal screws with a removable shorting bar between the terminal screws. The shorting bar shall be suitable for No. 22 AWG through No. 14 AWG wire, and 22-16 spade lugs. A removable shorting bar shall be installed between the terminal screws. The terminal number assigned to each terminal shall be clearly and permanently indicated on a marking strip placed on or adjacent to the terminal block.

The main circuit breaker box shall contain the following:

120 VAC, 30 Ampere, socket-mounted, double-pole, single-throw heavy duty relay and socket to serve as the signal power interrupt relay;

30 Ampere single-pole breaker; and

Power surge protection device.

The circuit breaker box shall have maximum dimensions of 10 inches high x 8 inches wide x 4 inches deep. The main circuit breaker shall accommodate service wire as large as No. 2 AWG. The electrical service conductors shall be contained in a flexible conduit as described in the NEC. This conduit shall enclose the service from the entrance conduit to the circuit breaker box. It shall be long enough to be dressed neatly and attached to the side panel.

The flexible conduit shall be equipped with a coupling and a reducer, if necessary, to enable its attachment to the service entrance conduit. Conduit shall extend approximately 6 inches into the service entrance conduit.

CCTV Cabinet:

The CCTV Cabinet shall be furnished and installed in accordance with the ITS Standard Drawings, or as shown on the project plans and in the Special Provisions.

Only one exhaust fan shall be provided.

The following equipment shall be furnished and installed in the cabinet as required, but shall be paid for under separate bid items:

- Ethernet Switch

The main circuit breaker box shall include the following:

30 Ampere main circuit breaker;
20 Ampere circuit breaker for the EQUIP receptacles;
20 Ampere circuit breaker for UTIL receptacles (GFCI);

The CCTV Cabinet shall contain one standard three-wire 20 Ampere duplex outlet, and one GFCI three-wire 20 Ampere duplex outlet.

Each receptacle shall be clearly and permanently marked on the face plate of the outlet. The following abbreviations shall be used:

Outlet 1/Receptacle 1:	EQUIP
Outlet 1/Receptacle 2:	EQUIP
GFCI Outlet 2/Receptacle 1:	GFCI
GFCI Outlet 2/Receptacle 2:	GFCI

Cabinet Accessories:

(A) Power Distribution Assembly No. 4:

The power distribution assembly No. 4 (PDA4) shall conform to the requirements of the ITS Standard Drawings and the project plans, and perform the following functions:

Receive the 120 VAC power source and distribute it to the various cabinet functions through separate circuit breakers.

Provide, via the Model 206 power supply module, a + 24 VDC power source for the operation of various cabinet accessories.

Provide, via a Model 204 flasher unit, a means of flashing external signal indications.

Provide a switch pack load bay with inputs from the controller and outputs to field circuits.

The PDA4 shall include four 15 Amp circuit breakers. The rating of each breaker shall be shown on the face of the breaker or handle. Breaker function (EQPT, CCTV, SIG GATES, REC) shall be labeled on the front panel as shown on the ITS Standard Drawings.

The PDA4 shall have three duplex receptacles. Each receptacle shall accept both standard two-prong non-grounded and standard three-prong grounded plugs.

Receptacle No. 1 (REC1) and receptacle No. 2 (REC2) shall have ground-fault circuit interruption, as defined in the NEC. Circuit interruption shall occur in the presence of 6 mA or more ground-fault current and shall not occur on less than 4 mA ground-fault current.

The 120 VAC supplies to the 2 outlets of receptacle No. 3 (REC3A and REC3B) shall be separate. The rear panel of the PDA shall be etched to label REC3A as "CONTROLLER" and REC3B as "AUX".

Terminal blocks shall have 10-32 thread terminal screws.

The PDA4 shall provide for the mounting and connection of 4 Model 200 switch packs.

The PDA4 shall have a maximum depth of 10.5-inches.

(B) Model 206 Power Supply Module:

The Model 206 Power Supply Module shall supply + 24 VDC to the input files and other devices in the cabinet. It shall be furnished as a part of the PDA4.

The power supply shall be of ferro-resonant design, having no active components, and conforming to the following requirements:

Line regulation shall be 2 percent from 90 to 135 VAC at 60 Hz, plus an additional 1.6 percent for each 1.0-percent of frequency deviation.

Load regulation shall be 5 percent from one Ampere to five Amperes, with a maximum temperature rise of 86 degrees Fahrenheit, above ambient.

Design voltage shall be + 24 ± 0.5 VDC at full load, 86 degrees Fahrenheit, 115 VAC incoming voltage.

Full load current shall be 5 Amperes, minimum.

Ripple noise shall be no greater than 2 Volts peak-to-peak and 500 mV RMS at full load.

Power source shall be 90 to 135 VAC.

Efficiency, at full load, shall be 80 percent, minimum.

Circuit capacitors shall be rated for 40 Volts, minimum.

The front panel shall include AC and DC fuses, power ON light, and test points for monitoring the output voltages.

The assembly, including terminals, shall be protected to prevent accidental contact with energized parts.

The module chassis shall be vented. Its top and sides shall be open. When resident in the power distribution assembly, the module shall be held firmly in place by a stud screw, an assembly connector support panel, and a wing-nut.

Two 0.5 Ohm, 10 Watt (minimum) wire-wound power resistors, each with a 0.2 microHenry maximum inductance, shall be provided; one on the AC+ power line and one on the AC- line.

Three MOV surge arrestors rated for 20 Joules minimum, shall be supplied between AC+ and equipment ground, AC- and equipment ground, and between AC+ and AC-. A 0.68- microFarad capacitor shall be placed across AC+ and AC- between the two power resistors and the MOVs.

(C) Input File:

The contractor shall furnish and install input files as for cabinets used for detection applications, as shown in the ITS Standard Drawings.

The input file racks shall provide card slots for the Model 222 detector cards and conform to the following requirements:

Each input file rack shall have a maximum depth of 8.5 inches and shall mate with and support up to 14 two-channel detector sensor or isolator cards.

The file shall provide a PCB 22/44S connector centered vertically for each two-channel card slot.

The input file shall be provided with marker strips to identify detectors in the file.

Terminal blocks shall be provided with a terminal screw size of 8-32 with locking star washers.

(D) Switch Packs & Flasher Units – General Requirements:

The unit chassis shall be made of metal suitable to meet rigid support and environmental requirements. Where electrical isolation is the only requirement, plastic insulation material can be used in lieu of metal.

The unit control circuitry and switches shall be readily accessible by the use of a screwdriver or wrench. Only one type of screw head end (Slotted or Phillips) shall be used.

The unit shall be so constructed that no live voltage is exposed. A handle shall be attached to the front panel for insertion or removal from the unit mating connector.

The unit shall be so constructed that its lower surface shall be no more than 2.06 inch below the centerline of the connector and no part shall extend more than 0.9 inch to the left or 1.1 inch to the right of the connector centerline.

Continuous edge guides shall be provided on the unit.

Each switch shall be capable of switching any current from 0.050 to 10.0 Amperes (AC) load with power factor of 0.85 or higher.

Each switch shall be designed for a minimum of 300 Million operations while switching a tungsten load of 1,000 Watts at 158 degrees Fahrenheit. Switch isolation between DC input and AC output circuit shall be at least 10,000 Mega Ohms at 2,000 VDC.

Each switch shall turn ON within ± 5 degrees of the zero voltage point of the AC sinusoidal line, and shall turn OFF within ± 5 degrees of the zero current point of the alternating current sinusoidal line. After power restoration, the zero voltage turn ON may be within ± 10 degrees of the zero voltage point only during the first half cycle of

line voltage during which an input signal is applied. Turn ON and OFF shall be within 8.33 ms following application or removal of the logic signal, respectively.

(E) Model 200 Switch Packs:

The Model 200 Switch Pack unit shall be a modular plug-in device containing three solid- state switches. Each switch shall open or close a connection between applied power and external load.

A Ground True Controller Unit Input (0 to 6 VDC) shall cause the switch to energize and a Ground False (16 VDC or more) shall cause it to de-energize. State transition shall occur between 6 and 16 VDC. The input shall not sink more than 20 milliAmps or be subjected to more than 30 VDC. The input shall have reverse polarity protection.

With all switches on, the unit shall not draw more than 60 milliAmps at +16 VDC or more from the +24 VDC cabinet supply.

Each switch shall have an OFF state dV/dt rating of 100 Volts/Microseconds, or better. Each switch shall be isolated so that line transients or switch failure shall not alter the controller unit.

The unit front panel shall have an indicator on the input to each switch. The indicator shall be labeled or color-coded "Red"-top switch, "Yellow"-middle switch, and "Green"-bottom switch. The middle switch indicator shall be vertically centered on the unit front panel with the other indicators positioned 1 inch above and below.

The resistance between the AC+ input terminal and the AC+ output terminal of each switch shall be a minimum of 15 KiloOhms when the switch is in the open state. When the switch is in off state, the output current through the load shall not exceed 10 milliAmps, peak.

(F) Model 204 Flasher Unit:

The Model 204 Flasher Unit shall be a modular plug-in device containing a flasher control circuit and two solid-state switches. The unit's function is to alternatively open and close connections between applied power and external load.

The unit shall generate its own internal DC power from the AC line.

The unit shall commence flashing operation when AC power is applied providing 50 to 60 flashes per minute, per switch, with a 50 percent duty cycle.

Each switch shall have an OFF state dV/dt rating of 200 Volts/microsecond, or better.

An indicator showing the switch's output state shall be provided. The 2 indicators shall be centered with 1-inch minimum spacing.

Each circuit shall be designed to operate in an open-circuit condition without load for 10 years minimum.

A surge arrestor shall be provided between AC (pin 11) and Flasher Output (pins 7 & 8).

The arrestor shall meet the following requirements:

Recurrent Peak Voltage	212 Volts
Maximum Energy Rating	50 Joules
Average Power Dissipation	0.85 Watts

Construction Requirements:

(A) Electrical Equipment:

All equipment, housings, metal conduits, and cabinets shall be grounded and bonded in accordance with Subsection 732-3.03 and the NEC.

The cabinet shall be grounded with a No. 8 AWG solid copper wire.

Wire and cable terminations shall only be made at recessed-screw barrier type terminal blocks, unless otherwise specifically noted in each instance. No in-line or butt splices shall be made at any point in the work other than at such terminal blocks.

All field wires and power service cables shall be wired to the cabinets as shown in the ITS Standard Drawings or on the project plans.

(B) Cabinet Installation Procedures:

The contractor shall transport cabinets to the project site and install cabinets as shown on the project plans. Installation shall include:

Grounding the cabinet to the ground system, using bare, solid No. 8 AWG soft-drawn copper wire;

Grounding the transformer, if on the same foundation as the cabinet; Connecting the cabinet to the power source;

Completing fiber optic splices and terminations within the cabinet, as required; and,

Furnishing and installing any necessary mounting hardware (pole-mount, if applicable to specific cabinet type and location).

The contractor shall connect the cabinet and its accessories to the various field devices to be controlled, to form a fully functional system.

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.

(C) DMS Cabinets:

The contractor shall coordinate the location and schedule for delivery of any new DMS sign controller units through the Engineer at project initiation. The sign controller unit will be shipped by the sign manufacturer directly to the contractor.

The sign controller unit shall be securely mounted in the DMS control cabinet by firmly attaching all rack-mounted controllers to the 19-inch cabinet rack with screws, by the contractor.

Cabinet Testing Requirements:

(A) Factory Certification:

The contractor shall supply certification of the quality control and final test conducted on each item with each shipment of cabinets and components. The certification shall indicate the name of the tester and shall be signed by the responsible party representing the manufacturer or supplier.

The certification procedure shall include the following:
Acceptance testing of all supplied components;
Physical and functional testing of all modules;
A minimum of 100-hour burn-in of all modules; and,
A minimum of 24 hour operation of all cabinets.

The certification procedure shall include manufacturer or supplier testing, in the controller cabinet, of every unit furnished, as applicable, including:

All Model 200 Switch Packs; All Model 204 Flasher Units;
All Model 206 Power Supply Assemblies;
All Model 222 Two-Channel Detector Cards; All Power Distribution Assemblies; and,
All Input & Output files.

(B) Stand-Alone Tests:

Using the form and procedure indicated in the ITS Standard Drawings, and as directed by the Engineer, the contractor shall demonstrate that: each Detection and Ramp Meter and CCTV cabinet assembly operates properly, when assembled and connected to all equipment it serves.

The contractor shall perform the following loop calibration test for all mainline detector stations:

1. On the Model 2070 controller, set/verify that the loop Trap Distance is 18 feet.
2. Using a vehicle with a calibrated speedometer approved by the Engineer, or a radar gun verifying the exact speed of the vehicle, drive the vehicle past the detector station at a constant maximum safe, and legal speed.
3. Record the speed registered on the Model 2070 controller.

4. Record the actual vehicle speed of the car off the radar gun, or the car speedometer, as directed by the Engineer.
5. Multiply the actual vehicle speed (mph) by 1.467 to obtain the speed in feet per second (ft/sec).
6. Perform the following calculation:

$$\frac{\text{Actual vehicle speed (ft/sec)}}{\text{Speed off Model 2070 (ft/sec)}} \times 18 \text{ (ft)} = \text{Actual Trap Distance (ft)}$$

7. Adjust the value in the Model 2070 controller data location for the Trap Distance to the actual trap distance calculated in Step 6, above.
8. Record the corrected Lane Trap Distance on data sheets for submittal to the Engineer, as well as create and record a table of this data for the record drawings documentation.

(C) Subsystem Test (SST):

The Department, with the support of the contractor, shall conduct the subsystem test on the detection and ramp meter cabinets with communications system to verify that all communications circuits (contractor installed equipment as well as any connections to existing) have been properly configured and operate without failure and without adversely affecting the existing system.

Failure of an equipment component to pass the SST shall require the equipment to be repaired or replaced at no cost to the Department and the test repeated until the equipment successfully passes the test. If necessary, the contractor shall supply all test equipment required for the troubleshooting of the system, based on the test results.

(D) System Acceptance Test (SAT):

Upon successful completion of all subsystem testing, the SAT shall be started. The SAT shall consist of a 30-day period of operation without failure of all contractor-supplied equipment. The Engineer shall be provided with access to all equipment during this period for purposes of verifying its operation.

The purpose of the SAT is to demonstrate that the total system, consisting of hardware, software, communications, materials and construction, is properly installed, is free from defects and identified problems, exhibits stable and reliable performance, and completely complies with all contract documents.

During the SAT, the contractor shall ensure that all equipment is maintained in operable condition. The contractor shall identify, isolate, diagnose and troubleshoot all system problems and inconsistencies. The contractor, in conjunction with the Engineer, shall formulate possible solutions and shall implement all corrections required in contractor supplied equipment.

The contractor shall provide test equipment and labor needed to test, isolate and correct all equipment deficiencies found during the SAT. Key contractor technical personnel familiar with the design and construction of each system component shall be available on site within 48 hours of notification of a problem.

During the SAT, the contractor shall maintain a test event log. This log shall contain at a minimum the following information: Date and time of failure, who reported the failure, description of the failure, troubleshooting performed, and date and time repair was completed. The contractor shall submit an updated log to the Engineer after each reported failure, and again after the repair has been completed. The contractor shall submit for approval a draft version of the test event log as part of the submittal data.

All system documentation errors, omissions and changes occurring prior to and during the SAT shall be corrected and resubmitted before system acceptance can be completed.

SAT Failure Definitions

1) Minor Failure

In the event of a minor failure during the SAT, the test clock shall stop until the system is repaired. At the completion of the repair, the testing shall recommence with 24 hours added to the remaining test time of the system. The following constitute minor failures:

- Failure of Department-furnished equipment.
- Failure of an entire communications circuit for more than 15 minutes over any 24-hour period.
- Failure to communicate to any ramp meter controller.

(2) Major Failure

In the event of a major failure during the SAT, the test clock shall stop until the system is repaired. At the completion of the repair, the testing shall recommence with the test clock reset to day zero. The following constitute major failures:

- Minor failures of Department-furnished equipment three times, if determined that failures were caused by faulty installation of the contractor.
- Minor failure of an entire communication circuit two times.
- Minor failure of communication to an individual ramp meter controller three times.
- Failure to correct a problem that adversely impacts the safety of the traveling public, within four hours of notification, by the Engineer or his representatives.

The contractor shall record drawing the GPS latitude and longitude coordinates, ± 5 feet, of each new and existing cabinet and provide the Engineer with an electronic GIS file that contains such information.

Method of Measurement:

Detection and Ramp Meter Cabinets will be measured as a unit, for each cabinet assembly furnished and installed. The work includes breakers, all cabinet accessories (not paid under separate items), labor and all other materials and equipment to complete an operational cabinet.

CCTV Cabinets will be measured as a unit, for each cabinet furnished and installed. The work includes breakers, pole-mounting hardware, all cabinet accessories, mounting hardware, connecting conduits & elbows, labor, and all other materials and equipment to complete an operational cabinet.

Model 204 Flasher Units, Model 206 Power Supply Unit, Model 208 watchdog unit, Power Distribution Assembly, Input and Output files, side panels and any and all other cabinet components and accessories not otherwise paid under any other bid item will not be measured for payment, the cost being considered as included in the cost of the contract items.

Basis of Payment:

The accepted quantity of Control Cabinets, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work described and specified herein and on the project plans, complete and in place.

ITEM 7340251 CONTROLLER (MODEL 2070):

Description:

The work under this item shall include, but is not limited to, furnishing all materials, tools, equipment, and labor necessary to furnish and install Model 2070 controllers, as shown in the ITS Standard Drawings or project plans and Special Provisions.

Materials:

The controller unit shall include a controller unit for the specific device being controlled, and all necessary documentation.

The entire surface area of each circuit board shall be sealed to protect against moisture.

Equipment lists and equipment submittals shall conform to the requirements of Subsection 738-4.

Model 2070 controller units shall be furnished by the contractor unless otherwise specified in the project plans and Special Provisions.

The Model 2070 controllers shall be version 2070E, conforming to the requirements of the California Department of Transportation Electrical Equipment Specifications (TEES), inclusive of all current errata and addendums.

The 2070E Controller shall include the unit chassis and the following modules:

2070-1E, Central Processing Unit
2070-2A, Field Input/Output Module with C1S Connector
2070-3B, Front Panel Assembly
2070-4, Power Supply
2070-FX, Network Communications Module

The OS-9 operating system software shall be furnished by the controller manufacturer. The operating system shall include the embedded OS-9 real-time kernel, sequential character file manager, stacked protocol file manager, pipe file manager, random block file manager, and C shared library modules. The boot image utilities, network driver and descriptor shall be loaded into RAM as part of OS-9 initialization.

The Model 2070 detection application firmware will be Department furnished and installed during Department testing of the controller assembly.

Construction Requirements:

The contractor shall arrange to have the Model 2070 controller units delivered to the Department, as coordinated with and as directed by the Engineer, for configuration and testing. The Department will load the application firmware and configure the controller for the respective application.

The contractor will allow a minimum of 14 calendar days for the Department to perform programming and testing of Model 2070 controller units. The contractor shall pick-up the controllers after the testing and programming are completed, transport the controllers to the work site, and install the controllers in the field cabinets. The contractor shall coordinate the completion of Department testing, availability of controllers, pick-up and transport to the project site through the Engineer a minimum of 14 calendar days in advance.

Controller units shall be securely mounted in the controller cabinets by firmly attaching all rack-mounted controllers to the 19-inch cabinet rack with screws, by the contractor.

Method of Measurement:

Contractor furnished Model 2070 Controller units will be measured as a unit for each controller unit furnished and installed, complete in place.

Basis of Payment:

The accepted quantity of contractor furnished Model 2070 controllers, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work described and specified herein and on the project plans, complete and in place.

ITEM 7340304 CONTROL CABINET FOUNDATION (CONTROL CABINET & TRANSFORMER):
ITEM 7340305 CONTROL CABINET FOUNDATION (DMS CABINET & TRANSFORMER):

Description:

The work under these items shall include, but is not limited to, furnishing all materials, tools, equipment, and labor necessary to furnish and install various control cabinet

foundations, and related equipment, as shown in the ITS Standard Drawings or project plans and Special Provisions.

Materials:

Cabinet foundations shall conform to the requirements of the ITS Standard Drawings. Equipment lists and equipment submittals shall conform to the requirements of Subsection 738-4.

The Detection and Ramp Meter Cabinet shall be mounted on a concrete foundation. The CCTV Cabinet shall be furnished with all necessary hardware and mounted to the side of the CCTV support pole, as shown in the ITS Standard Drawings.

The contractor shall meet requirements of Subsection 731-3.01. Concrete shall be Class S, 3,000 psi.

Unless otherwise specifically noted on the project plans or in the Special Provisions, the contractor shall furnish all necessary materials and equipment for the various cabinet and cabinet accessory installations. Such equipment shall include, but not be limited to, anchor bolts and other mounting hardware, caulking, wire, cable, connectors, conduit and associated fittings, concrete, ground rods and grounding conductors, studs, and other items necessary to the installations as described herein, and as shown in the ITS Standard Drawings, on the project plans, and in the Special Provisions.

Anchor bolts shall conform to the requirements of Section 606-2.05 and 1004-4. Anchor bolts shall be used, as shown in the ITS Standard Drawings, unless otherwise specified in the project plans or in the Special Provisions.

(A) Fiber Optic Network Interface Device (NID):

The contractor shall install an outdoor compact fiber optic NID in all foundations that require a Dooley sump, and in accordance with the Plans.

Each Fiber Optic NID shall conform to the following requirements:

1. Accommodate up to 12 fiber terminations.

2. Constructed out of weather-resistant, UL listed, and UV rated material.

3. Provide a hinged door cover on the front of the device that allows for access to all internal components.

4. Maximum dimensions of 14 (H) x 15 (W) x 4 (D) inches.

5. Provide internal splice tray, fan out kit, and SC single-mode duplex fiber adapter.

6. Provide wall mount fiber optic NID.

7. Provide means for sealing cable entry ports.

Construction Requirements:

The contractor shall furnish and install all wire, cable, connectors, and other incidental materials through the foundation, to the cabinet, necessary to connect all equipment to be incorporated in or connected to the work, to form a properly operating and fully functioning system.

The contractor shall survey and stake all locations and receive the Engineer's approval of cabinet location and orientation prior to excavation and placement of the foundation. The contractor shall give a minimum of 2 working days advanced notice to the Engineer prior to staking the locations.

If the cabinet is to be located on a greater than 2:1 slope, the placement of 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 line 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. This shall include concrete pads.

Forms for the concrete shall be rigid and securely braced in place. Templates shall be used to properly position and hold in place necessary conduit, anchor bolts, and the ground rod. Immediately prior to pouring the concrete, both forms and the earth shall be thoroughly moistened and the concrete 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 per the plans as well as restoring the landscape.

The contractor shall install the new cabinet and the associated cabinet accessories to the new foundation to form a fully functional system. Caulking is required along the base of the cabinet.

(A) Electrical Equipment:

All equipment, housings, metal conduit, and cabinets (all exposed metal, non-current carrying parts) shall be grounded and bonded in accordance with the NEC, Article 250. Grounding conductors, or bonding jumpers, shall be connected by exothermic welding, UL listed pressure connectors, UL listed clamps, or other approved UL listed means. Connection devices or fittings that depend solely on soldering shall not be used. Sheet metal screws shall not be used to connect grounding conductors to enclosures.

The contractor shall meet the requirements of 732-3.03 of the ADOT Standard Specifications to bond the cabinet to ground.

All cabinet foundations shall have a copper clad steel ground rod with a diameter of at least 5/8-inch, in the foundation. The ground rod shall be installed so that it extends into the surrounding undisturbed earth for a minimum of 9 feet. The ground rod shall be driven into place through the sleeve in the foundation. The ground rod shall extend approximately 3- inches above the foundation. The ground rod shall be connected to the

cabinet and the grounding system using ground clamps on the rod and an approved lug connector in the cabinet.

The cabinets' ground resistance shall be 25 Ohms or less.

If the contractor prefers to use an electrolytic grounding system, it must meet the following specifications. The electrolytic grounding system must be 100-percent self-activating/sealed and maintenance free. The ground system shall hygroscopically extract moisture from the air to activate the electrolytic process; no additions of chemicals or water are permitted. The electrolytic ground shall not use any hazardous material to improve grounding performance. The electrolytic system must be UL listed with a minimum life expectancy of 30 years.

The contractor shall record drawing the GPS latitude and longitude coordinates, ± 5 feet, of each new and existing cabinet and provide the Engineer with an electronic GIS file that contains such information.

Method of Measurement:

Control Cabinet Foundations will be measured as a unit, for each type of foundation furnished and installed, complete in place. No measurement will be made for the grading, concrete, reinforcing steel, conduit, anchor bolts, ground rod(s) and/or grounding systems, mounting hardware, NID, landscape restoration, caulking, connectors, fittings, and all other material required to complete a functional foundation.

Basis of Payment:

The accepted quantity of Control Cabinet Foundations, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work described and specified herein and on the project plans, complete and in place.

ITEM 7340401 TRANSFORMER FOUNDATION:

Description:

The contractor shall furnish and install a transformer cabinet foundation for each transformer cabinet assembly.

Materials:

Concrete for all foundations shall be Class S and shall have a required 28-day compressive strength of 3,000 pounds per square inch.

Transformer cabinets shall be fastened to a concrete foundation, as shown in the ITS Standard Drawings, using anchor bolts of size placement shown in the ITS Standard Drawings or project plans. Caulking shall be placed along the bottom of the enclosure to seal to foundation.

Construction Requirements:

The transformer cabinet assembly foundation shall be constructed as shown in the ITS Standard Drawings or project plans. The contractor shall meet requirements of Subsection
731-3.01.

The contractor shall meet the requirements of Subsection 732-3.03 to bond the cabinet to ground. A separate 5/8 inch by 10 foot long copper clad ground rod shall be furnished and installed as part of the transformer cabinet assembly item.

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.

Method of Measurement:

Transformer Foundations will be measured as a unit for each foundation furnished and installed, unless otherwise included in a combination foundation for a control cabinet, as indicated in the project bid items. No separate measurement will be made for the grading, concrete, conduit, anchor bolts, ground rod(s) and/or grounding systems, landscape restoration, caulking, connectors, fittings, and all other material required to complete a functional foundation.

Basis of Payment:

The accepted quantity of Transformer Foundations, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work described and specified herein and on the project plans, complete and in place.

ITEM 7350030 LOOP DETECTOR FOR TRAFFIC SURVEILLANCE (6'X6'):

Description:

The work under this item includes furnishing and installing new detection, pre-formed and/or saw cut detector loops, associated loop slot sealant, loop splice kits, and loop detector surge protectors to form loop systems at designated locations as shown on the project plans.

All work shall conform to Section 735, unless otherwise specified in the ITS Standard Drawings, or the project plans and Special Provisions.

Materials:

All materials shall be furnished by the contractor. The contractor shall submit a complete list of all required project material for approval of the Engineer prior to installation.

Certificates of Compliance:

If requested by the Engineer, the contractor shall furnish certified reports that state that the loop wire fully complies with the requirements of these specifications. A statement shall be attached to the certified report indicating that the batches furnished were manufactured under the same conditions as the batches tested. All testing shall be accomplished by an independent testing laboratory approved by the Engineer. The contractor shall pay for all of the services of the testing laboratory, at no cost to the Department.

Loop Wire:

Loop detector wire for sawcut loops shall be No. 14 AWG, stranded, conductors in orange tube, conforming to IMSA 51-7, as shown on the ITS Standard Drawings.

Loop detector wire for pre-formed loops shall be No. 16 AWG, stranded, TFFN in orange PVC or polypropylene tubing, as shown on the ITS Standard Drawings.

Loop Slot Sealant:

The contractor shall furnish and install loop slot sealant, depending on the pavement surface to be sealed, conforming to the following requirements, to seal the loop slots and surface holes for the loop stub-out conduits. The contractor shall provide the expiration date of the material used, in the equipment submittal and review process.

Saw cut sealants shall be a flexible encapsulant intended for sealing and protecting vehicle detector loop wires installed in saw cuts.

(A) Two-Part Epoxy Filler Sealant:

Two-part epoxy joint filler sealant shall be a 100-percent solids, flexible, two-component, solvent free, epoxy resin/hardener system for use as a saw cut sealant in asphaltic concrete pavements and Portland cement concrete pavements.

Materials shall comply with the requirements of Subsection 1015-1 of the Specifications.

The epoxy system shall be specifically designed for the intended application according to the product literature provided by the manufacturer.

The epoxy system shall be of sufficient strength and hardness to withstand stress and abrasion from vehicular traffic, while remaining flexible enough to provide stress relief under thermal movement and protect the loop wire from moisture penetration. It shall also be moisture insensitive to allow effective application to damp pavements. No standing water is permitted on the surfaces to which the epoxy system is to be applied.

The epoxy system shall be designed to enable vehicular traffic to pass over properly filled saw cuts immediately after installation without tracking or stringing of the material.

Properly installed and cured epoxy systems shall exhibit resistance to the effects of weather, motor oils, gasoline, anti-freeze solution, brake fluid, deicing chemicals, and salt in such a manner that the performance of the vehicle detector loop wire is not adversely affected.

The epoxy system shall be designed for roadway installation when the surface temperature is a minimum of 40 degrees F and rising. The cured epoxy system shall be temperature stable and exhibit no degradation in performance throughout the ambient pavement temperature ranges experienced within the State of Arizona.

The components of the epoxy system shall have a minimum shelf life of 12 months in original unopened, undamaged containers, when stored in a cool dry environment, as recommended by the manufacturer.

The epoxy system shall meet the following requirements:

Property	Test Method	Requirements
Mixing Ratio; Part A to Part B	-	1 to 1 by volume
Viscosity, centipoises	ASTM D 2393-86	4000 to 8000
Pot Life, minutes	ASTM C 881	12 to 20
Cure Time, minutes	ASTM C 679	60 maximum, Tack Free
Hardness (Shore D)	ASTM D 2240	35 to 65
Tensile Elongation, percent	ASTM D 638	50 minimum
Water Absorption, percent (24 hrs)	ASTM D 570	1 maximum
3 percent Salt Water Absorption, percent (24 hrs)	-	0.03 to 0.20
Oil Absorption, percent (24 hrs)	ASTM D 471	0.01 to 0.02
Gasoline Absorption, percent (24 hrs)	-	0.05 to 0.90

(B) One-Part Elastomeric Sealant:

One-part elastomeric sealant may be used to seal saw cuts in Portland cement concrete pavement and lean concrete base.

The sealant shall provide compressive yield strength to withstand normal vehicular traffic as well as sufficient flexibility to withstand normal movement in concrete pavements, while protecting the loop wire from moisture penetration.

The encapsulant shall be a 1-part elastomeric compound requiring no mixing, measuring or application of heat prior to or during its installation.

The encapsulant shall, within its stated shelf life in original undamaged packaging, cure only in the presence of moisture. The rate of cure will, therefore, depend upon temperature and relative humidity at the time of installation. Cool dry weather will slow curing whereas warm, humid weather will accelerate curing.

The encapsulant shall be designed to enable vehicular traffic to pass over the properly filled saw cut immediately after installation without tracking or stringing of the material. The encapsulant shall form a surface skin allowing exposure to vehicular traffic within 30 minutes at 75 degrees F and completely cure to a tough, rubber-like consistency in two to seven days after installation.

Properly installed and cured encapsulant shall exhibit resistance to effects of weather, vehicular abrasion, motor oils, gasoline, anti-freeze solution, brake fluid, deicing chemicals and salt normally encountered, in such a manner that the performance of the vehicle detector loop wire is not adversely affected.

The cured encapsulant shall be temperature stable and exhibit no degradation in performance throughout the ambient pavement temperature ranges experienced within the State of Arizona.

The encapsulant shall exhibit minimal shrinkage during or after its installation, and in no manner affect the performance characteristics of the material.

The encapsulant shall be designed to permit clean-up of material and application equipment, prior to curing of the encapsulant, with a suitable non-flammable solvent. Should any encapsulant material be allowed to cure in the application nozzle, it shall be able to be pulled out as a solid plug.

The encapsulant shall have a minimum 12-month shelf life in undamaged original containers when stored in a cool, dry environment.

The encapsulant shall be designed for roadway installation when the surface temperature is between 40 and 140 degrees F.

The encapsulant shall have the following physical properties in its uncured and cured states.

Uncured (Wet) Encapsulant		
Property	**Requirement**	**Test Procedures**
Weight	10.1 ± 0.3 pounds/gallon	A. Weight/Gallon
Total Solids by Weight	75 – 85 Percent	B. Determination of Non-Volatile Content
Viscosity	10,000 - 85,000 Centipoise	C. Dynamic Viscosity
Drying Time	Touch: 24 Hours, Maximum Complete: 30 Hours, Max.	D. Tack-Free Time

Cured Encapsulant		
Property	**Requirement**	**Test Procedure**
Hardness (Indentation)	65 – 85	E. Rex Hardness
Tensile Strength	500 Pounds per Square Inch, Minimum	F. Tensile & Elongation
Elongation	300 Percent, Minimum	

(C) Hot Applied Rubberized Sealant:

Hot applied rubberized sealant may be used to seal saw cuts in asphaltic concrete and in lean concrete base. It shall be suitable for use as a sealant for traffic loop saw cuts and be non-tracking under traffic. At application temperatures, the traffic loop sealant shall be a thin, free flowing fluid which penetrates saw cuts and self-levels permitting uniform application. The sealant shall be melted and applied to pavements using a pressure feed melter unit. Pour pot application is not acceptable. The sealant shall be a relatively stiff sealant but shall remain flexible at low pavement surface temperatures. The test results shall conform to the following specifications for the loop detector sealant.

Test	Specification
Penetration: 125 degrees F, 50g, 5s	50 maximum
Penetration: 77 degrees F, 100g, 5s	10 – 25
Softening Point:	210 degrees F minimum
Ductility: 77 degrees F	15 cm minimum
Mandrel Bend: 0 degrees F, 90° Arc, 10s, 3/4 inch diameter	Pass 2 of 3
Recommended Pour Temp:	380 degrees F
Safe Heating Temp:	420 degrees F
Brookfield Viscosity: 400 degrees F	7,500 centipoise max.
Unit Weight:	8.5 pounds per gallon
Coverage; 1/2 by 1/2 inch crack	11.0 pounds per 100 feet

Construction Requirements:

Loop construction of saw cut and pre-formed loops shall conform to the ITS Standard Drawings and project plans, including loop numbering nomenclature.

The contractor shall furnish and install all necessary loop wire, hold down materials, loop slot sealant, saw slots, pre-formed loops (when applicable), stub-out conduit from saw slots to pull boxes, testing, and incidental materials necessary to complete the installation.

(A) Saw Cut Loops:

Prior to installing the loop wire or lead-in cable, the contractor shall cut the slots, drill the conduit holes, and complete the installation of associated conduit and pull boxes. The contractor shall use clean water to prevent blowing dust while cutting the slots. The

contractor shall flush the slots, vacuum water out of slots and from roadway, and then blow the loop slots with oil free compressed air to dry them and free them from debris, taking necessary safety precautions. The slots shall be thoroughly cleaned to allow sealant to adhere to the sides of the slot.

Debris shall be disposed of in a manner approved by the Engineer. Any materials entering the storm drains from the area shall be removed at the contractor's expense.

The contractor shall install the loop wire in the slots without damage to the insulation. The contractor shall not splice the loop wire at any point, except to the lead-in cable in the pull box. Loop shall consist of one continuous piece of wire from the pull box, through the loop, and back to the pull box.

If the loop is installed in reinforced concrete, or is at least 2-inches below the roadway surface, four turns of the loop shall be required. The loop wire pair from the corner of the loop in the roadway to the pull box shall be twisted 3 times per foot. All required turns of loop wire shall be installed in the same slot.

Loop wires shall be a minimum of 1 ½ inch below the pavement surface in new pavements, and a minimum of 2 inches below the pavement surface in existing pavements, measured from pavement surface to top of top loop wire tube.

The contractor shall solder splice the loop wire to its associated lead-in cable in the pull box, and shall watertight seal the splice. Solder used for splicing shall be resin core solder with 60 percent tin and 40 percent lead.

The contractor shall seal the slots with loop slot sealant. The contractor shall ensure that the slots are clean and dry with no residue remaining at the time of sealing. The contractor shall seal the conduit entrance at the curb, or in the roadway, with loop slot sealant. During the sealing operation, the ambient air temperature shall be within the application range specified by the sealant manufacturer. The sealant shall be installed in a manner that will fill the slot to its full depth and will totally encapsulate the wire or cable, and as shown in the ITS Standard Drawings. The Contractor shall strike off and remove any excess sealant and remove it from the site.

(B) Pre-Formed Loops:

Pre-formed loops shall be installed in accordance with the ITS Standard Drawings, the project plans and Special Provisions.

All new preformed loops shall be labeled per the provisions stated above.

Loop Test Requirements:

As part of the Stand-Alone test, the contractor shall incrementally test the complete loop system in the presence of the Engineer. If the loop system fails any of the following tests, the contractor shall, at no expense to the Department, replace any defective splices, wire or cable and resplice and relabel, if necessary, the loop wire and lead-in cable. The loop system shall then be re-tested in the presence of the Engineer until subject loop passes the tests successfully.

The contractor shall perform the following tests on each loop in the pull box, in the presence of the Engineer, both before the sealant has been poured and after the sealant has hardened.

(1) Insulation Resistance to Ground Test:

The insulation resistance to ground for each detector loop shall be measured with a MegOhmmeter (Megger) connected between the loop wire and the nearest reliable electrical ground, such as a meter, metal pole or fire hydrant, or to a metal rod driven 3 feet into the ground between the roadway and the pull box. The insulation to ground shall not measure less than 100 MegOhms at 500 VDC.

(2) Series Resistance Test:

The series resistance of each 6' x 6' loop, measured by an Ohmmeter, shall be between 0.1 and 0.8 Ohms. The maximum resistance of the other loops shall not exceed 10 Ohms.

(3) Inductance Test:

The inductance of each loop will be measured with an inductance tester. The accepted inductance shall be in the range of 50 to 100 microHenries for a 3-turn 6' x 6' loop and 100 to 155 microHenries for a 4-turn 6' x 6' loop, and the test may add 22 microHenries per 100 feet of lead-in cable. The Contractor shall notify the Engineer of any unacceptable readings:

Method of Measurement:

Loop Detectors will be measured as a unit, by size, for each detector loop furnished, installed and passing required testing.

No additional measurement or payment will be made for testing of new loops, loop slot sealant, saw cutting, stub-out conduit from saw slot to pull box, stub-outs serving new preformed loops, splicing to existing lead-in cables, and all other components and work necessary to provide a complete functional loop detection system.

Basis of Payment:

The accepted quantities of Loop Detectors, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work described and specified herein and on the project plans, complete in place and successfully tested.

ITEM 7350051 DETECTOR CARD:

Description:

The work under this item shall include, but is not limited to, furnishing all materials, tools, equipment, and labor necessary to furnish and install detector cards for controlling the operation of the ITS devices served by the cabinet, as shown in the ITS Standard Drawings or project plans and Special Provisions.

Materials:

The Model 222 Two-Channel Detector Card shall provide two loop-type vehicle detector channels for detecting vehicles and actuating the Model 2070 controllers. Each detector card shall conform to the requirements of the plans and to the following requirements:

Each card shall draw no more than 100 mA from the + 24 ± 6 VDC cabinet power supply and shall be insensitive to 700 mV RMS ripple on the incoming + 24 VDC line.

The detector card front panel shall be provided with a handle to facilitate insertion and removal.

All control switches, gain controls, and channel indicators shall be mounted on the front panel.

Each card shall have an indicator to provide visual indication of detection for each channel.

Each card output shall be an opto-isolated, open collector, NPN transistor and shall sink up to 50 mA at 30 VDC. The output shall be compatible with the controller unit's inputs.

Detector cards of the same type shall be interchangeable.

Detector cards shall be in full compliance with the environmental requirements of the most current NEMA standard, and shall meet the function, electrical, and performance requirements described herein.

All component parts and test points shall be clearly identified by permanent marking of circuit references on the printed circuit board.

The entire surface area of each circuit board shall be sealed to protect against moisture.

Sensitivity, frequency, and mode selection for each channel shall be accomplished by dip switches. The use of rotary thumbwheel switches for sensitivity selection and either thumbwheel switches or toggle switches for mode and frequency selection is acceptable.

Each detector card shall include 2 complete detector channels. An open-circuited, short-circuited, or intermittently functioning loop system connected to 1 channel shall have no adverse effect on the operation of the other channel. Each channel shall contain an automatic means to eliminate crosstalk (mutual coupling) between large, very closely spaced adjacent loops connected to the same unit and a manual means to reduce crosstalk between units.

Each channel of the detector card shall automatically self-tune to any loop system inductance from 20 to 500 microHenries within one second after application or interruption of voltage. Each channel shall function properly with a loop detector surge protector installed on its associated loop system. The detector channel shall track changes in loop/system electrical characteristics as might reasonably be expected to occur in undamaged loops without producing false indications or changes in sensitivity. Each channel shall re-tune instantly and detect properly on a loop system following a momentary open condition. In the case of a broken (open) loop, each channel shall provide a continuous output and indication of the fault. The open loop indication shall not be resettable as long as the open circuit exists, except that it shall be capable of being defeated when the channel "OFF" or reset position is selected or by a change of mode or sensitivity settings.

Each detector channel shall be provided with an automatic loop test to verify the loop system's integrity. The test shall indicate a previous fault via the front panel indicator. With an intermittent open loop, the channel shall re-tune and resume detection upon reconnection of the loop system. The occurrence of the "open" loop condition shall be indicated by a unique display sequence on the affected channel's output indicator. The sequence shall consist of three display flashes lasting 50 ms in duration and spaced 100 ms apart. The sequence shall repeat once every second while the open loop condition is present on the affected channel.

Each detector card shall contain a remote reset circuit which, when activated by an external ground level signal (greater than 15 microseconds), shall cause all presence detections to be reset.

Each loop input channel shall be galvanically isolated, through the use of separate isolation-transformers, from each other and the internal circuitry of the detector.

Each channel shall include a mode switch to select "PRESENCE," "PULSE," and "OFF". OFF shall disable the output and indicator and shall disable the channel excitation circuit to assist in determining the offending channel when crosstalk is present.

Pulse mode shall provide a single 125 ± 25 ms output pulse in response to all types of licensed motor vehicles when traveling over a 6 foot x 6 foot rectangular loop at 10 mph and shall detect successive vehicles traveling over the same rectangular loop at speeds of 10 to 60 mph with a minimum 1 second headway. Pulse mode shall include a 2 second maximum re-phase time to allow detection of a licensed vehicle over unoccupied portions of the loop within 2 seconds after

initiation of the output with a vehicle stopped on the loop system. Selection of pulse mode shall RESET (Clear) the presence indication on the associated channel.

When presence mode is selected, the detector channel shall output a pulse that is directly related to the duration that a vehicle is detected by the loop system. The time delay between a vehicle entering the loop detection zone or area and the occurrence of an output Vehicle Present condition shall be 4 ms or less and the time delay between the vehicle leaving a loop detection zone or area and the output turning OFF, Vehicle Absent condition shall be 20 ms or less. That is, for any negative inductance change Vehicle Present condition that exceeds the sensitivity threshold, the channel shall output a ground true logic level within 4 ms. When the inductance change is removed (Vehicle Absent condition), the output shall become an open circuit within 20 ms. The recovery time between output turn-off and the unit being ready to respond to presence of another vehicle shall be 100 ms or less.

Each channel shall be provided with a Multi-position sensitivity selector switch. The switch shall allow the selection of a range of sensitivity settings including a setting to ensure detection of all types of licensed motor vehicles (including motorcycles) without detecting moving or stopped vehicles 36 inches or more from the loop for each of the following loop configurations:

Three-turn Loops:	Single 6 foot x 6 foot loop; (each with 50 feet, 500 feet, and 1,000 feet of lead-in cable)

In presence mode, the detector channel shall have a sensitivity setting that allows the detector channel to detect a motorcycle and hold the output for at least four minutes when the motorcycle is parked over one loop of a series/parallel connected loop system having four 6 foot x 6 foot loops with 1,000 feet of lead-in. The detector channel shall hold the output for at least 15 minutes when the test is repeated using a standard automobile on the same loop system configuration.

Presence indicator lights and character displays shall have a 45 degree cone of visibility from an axis perpendicular to the front panel. They shall be readily visible at a radius of up to 4 feet within the cone of visibility when they are subjected to 9,000 foot-candles of white light (equivalent to bright sunlight) at 45 degree to the front panel.

Internal surge protection, provided on loop detector input terminals, shall:

Enable the detector to withstand the discharge of a 10 microFarad capacitor charged to ± 1,000 Volts directly across the detector loop input pins with no loop load present.

Enable the detector to withstand the discharge of a 10 microFarad capacitor charged to ± 2,000 Volts directly across either the detector input pins or from loop input pins to equipment ground. The detector input pins

shall have a dummy resistive load attached equal to 5.0 Ohms for demonstration purposes.

Optically-isolated solid state output devices shall be rated to hold off 50 VDC at 20 mA ON current with a maximum 1.4 Volt drop across the output terminals. Isolation shall be at least 1,000 VAC RMS.

Each unit shall mate and be fully functional with the input file via a 44 terminal, double row, edge connector having terminal spacing of 0.156 inch.

Construction Requirements:

Detector cards shall be installed by the contractor in the appropriate slots in the control cabinet.

Any spare detector cards called for by the project documents, shall be left in the cabinet or turned over to the Department, as directed by the Engineer.

Testing:

For test purposes, a negative inductance change shall be maintained for a minimum of 100 ms and a maximum of 600 ms after it is applied. When the difference between the length of time that the inductance change is applied and the duration of the corresponding ground true output are averaged over 10 trials, the average difference (algebraic) shall not exceed 4 ms.

For test purposes, a negative inductance change shall be maintained for a duration between 100 and 600 ms.

To test for the Vehicle Presence condition: the delay time between when an inductance change is applied and the time it takes for the output to respond, averaged over 10 trials, shall not exceed 4 ms.

To test for the Vehicle Absence condition: the delay time between when an inductance change is removed and the time it takes for the output to respond, averaged over 10 trials, shall not exceed 4 ms.

To test the recovery time: the above 2 tests shall be repeated in sequence 10 times with a delay of not more than 100 ms between the beginning of each 2 stage sequence to determine if the output accurately responds to and records rapidly repeating stimuli.

Method of Measurement:

Model 222 Two-Channel Detector Cards will be measured as a unit, for each card furnished and installed.

Basis of Payment:

The accepted quantity of Model 222 Two-Channel Detector Cards, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work described and specified herein and on the project, complete and in place.

ITEM 7350165 LOOP DETECTOR LEAD-IN CABLE:

Description:

The work under this item includes furnishing and installing new detector lead-in cables, to form loop systems and shall connect the loop systems to loop detector channels in control cabinets at designated locations as shown on the project plans.

All work shall conform to Section 735, unless otherwise specified in the ITS Standard Drawings, or the project plans and Special Provisions.

Materials:

Except as specified in Subsection 735-2.01(F), all materials shall be furnished by the contractor. The contractor shall submit a complete list of all required project material for approval.

Loop lead-in cable shall be No. 14 AWG, IMSA 50-2 cable with aluminum shielding.

(A) Documentation:

The Contractor shall furnish a schematic diagram for each existing or new control cabinet to which loop systems are to be connected. The schematic diagram shall show the approximate location of each detector loop connected to the cabinet, the designation of the associated loop lead-in cable, the lead-in cable conductor pair serving the loop, the cabinet terminals to which the loop is proposed to be connected, and the function that the loop performs.

Schematic diagram shall be submitted to the Engineer for review and approval prior to terminating and connecting loop cables in any existing or new cabinets.

(B) Certificates of Compliance:

If requested by the Engineer, the contractor shall furnish certified reports that state that the lead-in cable fully complies with the requirements of these specifications for each cable being furnished. A statement shall be attached to the certified report indicating that the batches furnished were manufactured under the same conditions as the batches tested. All testing shall be accomplished by an independent testing laboratory approved by the Engineer. The contractor shall pay for all of the services of the testing laboratory, at no cost to the Department.

(C) Loop Detector Surge Protectors:

Loop detector surge protectors shall be provided in each existing and new cabinet with new loop terminations. Loop detector surge protectors shall have three spade lugs for connection to a terminal strip, with 7/16-inch spacing, and conform to the following minimum performance requirements:

Peak Surge Current:	
8 x 20 µsec Differential Mode:	400 A
8 x 20 µsec Common Mode:	1,000 A
Life Expectancy (Occurrences):	
8 x 20 µsec (200A):	500
10 x 700 µsec (100A):	100
Response Time:	Less than 5 ns
Input Capacitance:	35 pF
Clamping Voltage (After Breakover):	150 V
Operating Temperature:	Up to 185 degrees Fahrenheit

Construction Requirements:

The contractor shall furnish and install all necessary lead-in cable, loop detector surge protectors, splice kits, solder, wire nuts, spade lugs, tape, wire ties, water-proofing, testing, and incidental materials necessary to complete the installation.

The contractor shall solder splice the loop wire to its associated lead-in cable in the pull box, and shall watertight seal the splice. Solder used for splicing shall be resin core solder with 60 percent tin and 40 percent lead.

The contractor shall install the lead-in cable between the control cabinet and the pull box adjacent to the loops at the roadside, and shall leave 5 feet of coiled slack in the pull box. Each lead-in cable shall be unspliced between the loop splice pull box and cabinet. One lead-in cable shall be provided, per loop, unless otherwise specified on the project plans and in the Special Provisions. All installed lead-in cables that are not immediately terminated (within 1 day) to the cabinet field panels shall have the unterminated ends waterproofed by a method approved by the Engineer.

The contractor shall furnish and install a label on each lead-in cable in the control cabinet and in the pull box where the loop is spliced to the lead-in cable. The legend of the label shall conform to the loop numbering nomenclature shown in the ITS Standard Drawings. The legend shall be legible, weatherproof and shall indicate the location and lane of the associated loops. Methods of labeling shall be approved by the Engineer.

The spade lugs installed on the loop lead-in wire in cabinets shall be crimped and soldered.

The contractor shall connect the loop system to the associated loop detector channel in the control cabinet, per the wiring schematic approved by the Engineer, and shall tune the channel to operate properly and reliably with the loop system.

Inventory and Testing of Existing Loops:

The contractor shall physically locate, place identification labels, and establish the working order of each existing loop within the project limits specified to be tested and/or reused. The contractor shall submit loop testing forms and a list of loops where tests were not performed due to an existing damaged condition. The contractor shall not proceed with further work until the Engineer reviews and approves the loop test forms and list of damaged loop locations. The contractor shall test each detector loop to be used.

Testing of loops shall be conducted by cutting off existing splices to lead-in cables or cutting off existing waterproofed ends of loop wires, testing, and resplicing the ends of existing loop wires to existing lead-in cables or securing and waterproofing the ends of successfully tested loop wires for future termination to future installed lead-in cables. Loop wires shall not be tested by "skinning" or cutting the existing loop wire insulation and covering with electrical tape or applying waterproofing agents.

(1) Existing Loop Passes Test:

If the existing detector loop meets the test requirements, the contractor shall proceed to install the detector loop lead-in cable, splice the detector lead-in cable to the loop wire, terminate the detector lead-in cable in the proper equipment cabinet, and connect it with the associated detector channel.

(2) Existing Loop Fails Test or Non-Existent Loop:

If testing indicates that the existing detector loop is defective, the contractor shall replace the detector loop, as directed by the Engineer. If a replacement saw cut loop is designated to replace the failed existing loop, contractor shall install a new loop of the same size, conforming to the ITS Standard Drawings or project plans and Special Provisions.

If a single loop of a pair of detector loops (trap) is defective, the contractor shall replace both detector loops. The contractor shall offset the new loops in front of, or behind, the existing loop pair, and not cut immediately over the exact same placement footprint. The new detector loops shall not be placed within 6 feet of an existing operational loop.

The contractor shall verify that all designated lanes contain existing loop detectors, as shown on the project plans. The contractor shall saw cut new loops, of the proper configuration, in any lanes determined not have existing loops.

Test Requirements – New Loops:

As part of the Stand-Alone test, the contractor shall incrementally test the complete loop system in the presence of the Engineer. If the loop system fails any of the following tests, the contractor shall, at no expense to the Department, replace any defective

splices, wire or cable and resplice and relabel, if necessary, the loop wire and lead-in cable. The loop system shall then be re-tested in the presence of the Engineer until subject loop passes the tests successfully.

Tests described in Subsections 742-3.03 (A) and (B) apply to all new freeway mainline and ramp meter loops.

(A) After Loop Installation:

The contractor shall perform the following tests on each loop in the pull box, in the presence of the Engineer, both before the sealant has been poured and after the sealant has hardened.

(1) Insulation Resistance to Ground Test:

The insulation resistance to ground for each detector loop shall be measured with a MegOhmeter (Megger) connected between the loop wire and the nearest reliable electrical ground, such as a meter, metal pole or fire hydrant, or to a metal rod driven 3 feet into the ground between the roadway and the pull box. The insulation to ground shall not measure less than 100 MegOhms at 500 VDC.

(2) Series Resistance Test:

The series resistance of each 6' x 6' loop, measured by an Ohmmeter, shall be between 0.1 and 0.8 Ohms. The maximum resistance of the other loops shall not exceed 10 Ohms.

(3) Inductance Test:

The inductance of each loop will be measured with an inductance tester. The accepted inductance shall be in the range of 50 to 100 microHenries for a 3-turn 6' x 6' loop and 100 to 155 microHenries for a 4-turn 6' x 6' loop, and the test may add 22 microHenries per 100 feet of lead-in cable. The Contractor shall notify the Engineer of any unacceptable readings:

(B) After Lead-in Installation:

Tests shall be conducted in the equipment cabinet after all splices have been made but before final connection to the loop detector channel. The following tests shall be conducted for each detector loop:

(1) Test No. 1:

Utilizing a Megger, the Contractor shall verify that the insulation resistance from each lead-in conductor to ground is at least 10 MegOhms to ground.

(2) Test No. 2:

Utilizing a loop inductance meter, the Contractor shall verify that the inductance of the loop plus its lead-in cable is within the range of 50 to 490 microHenries.

(3) Tests No. 3 and No. 4:

The above Tests No. 1 and No. 2 shall be performed when the splice between the loop wire and the loop lead-in cable is dry. These same tests shall be performed a second time after the Contractor has submerged this splice in water for 1 minute, minimum.

(4) Test No. 5:

After all preceding tests have been passed, the loop system shall be connected to the loop detector channel and the unit observed under normal working conditions. Failure of the loop to provide a count of vehicles within 5-percent of the observed volume of traffic during a 15-minute period, or 100 vehicles passing over the loop, whichever comes first, shall constitute failure of the test.

Method of Measurement:

Loop Detector Lead-in Cable will be measured per linear foot of loop lead-in cable furnished and installed from center of pull box to center of pull box and center of pull box to center of equipment cabinet. Slack and/or coiling in the pull boxes will neither be measured or paid.

No additional measurement or payment will be made for inventory and testing of existing loops, testing of new loops, loop detector surge protectors, splicing to the lead-in cables, and all other components and work necessary to provide a complete functional loop detection system.

Basis of Payment:

The accepted quantities of Loop Detector Lead-in Cable, measured as provided, will be paid for at the contract unit price, which price shall be full compensation for the work, complete in place and successfully tested.

ITEM 7360243 LOAD CENTER CABINET (TYPE IV) (MODIFIED) (120/240 VOLT):

Description:

The work under this section shall consist of furnishing and installing load center assemblies and load center internal transformers, per the project plans.

Materials:

Load centers shall conform to the requirements of subsection 736-2.03, with modifications as shown on the ITS Standard Drawings, project plans, and Special Provisions.

The load center assembly shall consist of a NEMA 3 cabinet, foundation, applicable transformer, circuit breakers, internal wiring, and appropriate hardware. The Service

Entrance Section and Meter Socket shall meet all requirements of the utility company providing service.

All transformers shall be new and shall conform to paragraphs 2.1.3 and 2.1.5 in Section 2 of the current NEMA TS-1 Standards and to other applicable standards of NEMA (i.e., NEMA ST 120), UL (i.e., UL-506), EIA, and ANSI. The contractor shall comply with any and all national, state, and local laws, ordinances, and codes in effect at the time that the work is performed.

Cabinets:

(A) General:

The cabinets shall be of the type indicated on the project plans, and shall be ventilated NEMA 3 double or single-door enclosures, depending on specified type. Overall appearance and dimensions shall be as shown in the ITS Standard Drawings or as indicated on the project plans or Special Provisions.

There shall be no shelves in the interior of the cabinet.

All electrical components in the load center assembly shall be UL listed.

(B) Cabinet Construction:

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 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. The 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 (known as elastic stop 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.

(C) Cabinet Ventilation:

Cabinet ventilation shall be provided, with ventilation holes as shown in the ITS Standard Drawings 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.

(D) Transformer Mounting:

The transformer shall be mounted on a 12 gauge steel mounting plate or panel board attached to the back wall of the cabinet with six 3/8-inch diameter mounting studs welded to the back wall.

The transformer shall be located 4 inches from the top of this mounting plate or panel board.

(E) Cabinet Finish:

Cabinets shall not be painted.

(F) Cabinet Mounting:

The cabinets shall be designed for pad mounting, and attached using anchor bolts of size placement shown in the ITS Standard Drawings or project plans.

(G) Circuit Breakers:

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.

Transformer:

The transformer overall dimensions, physical outlines, and mounting hole dimensions shall be as shown on the project plans, or as approved by the Engineer. All transformers shall be single-phase, dry type units. The transformer primary and secondary voltages shall be as shown on the project plans

The Apparent Power rating shall be 15 or 25 kVA, as indicated on the project plans to support the application loads, or as directed by the Engineer. The mass of the transformer shall not exceed 250 pounds and shall be wall mounted. The transformer shall be labeled either "step-up" or "step-down" and the incoming (primary winding) and outgoing (secondary winding) voltages shall be clearly identified on the exterior.

The transformer shall conform to paragraphs 2.1.3 and 2.1.5 in Section 2 of the current NEMA Standards Publication TS-1, and to other applicable standards of NEMA (i.e., NEMA ST 120), UL (i.e., UL-506), EIA, and ANSI. The contractor shall comply with all national, state, and local laws, ordinances, and codes in effect at the time that the work is performed.

All cabinets and transformers furnished on the project shall be new and of prime quality, and shall not have been used previously on other projects, or in other locations. All items of the same type shall be identical and totally interchangeable.

(A) Cores:

Power transformer cores shall be fabricated with high grade materials. The core volume shall allow operation at 10 percent above rated primary voltage at no load, without exceeding a temperature rise of 207 degrees Fahrenheit. All core laminations shall be oxide or varnish coated, annealed, free of burrs, and properly assembled to reduce noise and ensure efficient operation of the transformer.

(B) Coils:

Coil conductors shall be continuous with terminations brazed or welded without auxiliary flux material. The entire core and coil assembly shall be impregnated with varnish and cured to seal out moisture. Coils shall be protected with an outer layer of glass tape or similar quality insulation. Coils shall incorporate an electrostatic shield located between primary and secondary windings.

(C) Sound Levels:

All power transformers shall be of low noise design. Sound levels shall not exceed 45 dB.

Up to 9 kVA:	40 dB
10 to 50 kVA:	45 dB

Construction Requirements:

Installation of new load centers shall require the contractor to contact and coordinate with the utility company at project initiation to clearly define service locations, requirements specific to that utility, verify acceptance and approval of the type and style of load center proposed, and determine service addresses, if not shown on the project plans.

The contractor shall coordinate with the utility, bear the cost of any permits, fees, and connection costs from the utility, and monthly electrical charges, until final acceptance, and will be reimbursed under a separate Force Account item.

The load center assembly shall be furnished and installed at design 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.

Load centers shall be installed with contractor-furnished pressure-sensitive, permanent identification decals, as shown in the ITS Standard Drawings. 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.

(A) Test Requirements:

The contractor shall verify that the transformer output voltage is within 3 percent of input voltage, stepped up/down under loaded and unloaded conditions.

Method of Measurement:

Load Center Cabinets will be measured as a unit for each type of cabinet unit furnished, and installed.

Basis of Payment:

The accepted quantity of Load Center Cabinets, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work described and specified herein and on the project plans, complete in place and successfully tested. No separate payment will be made for breakers, transformers, internal components and panels, ground rod(s), and other items necessary to complete the installation.

ITEM 7360250 MODIFY LOAD CENTER CABINET:

Description:

The work under this item shall include, but is not limited to, furnishing all materials, tools, equipment, and labor necessary to modify existing load center cabinets as shown on the project plans.

Materials:

The contractor shall comply with any and all national, state, and local laws, ordinances, and codes in effect at the time that the work is performed.

All electrical components in the load center assembly shall be UL listed.

Switches, breakers and other components shall have openings to operate from the front panel.

Construction Requirements:

Existing load center cabinets to be reused, shall remain in service for items and devices served in the existing condition.

Method of Measurement:

Modify Load Center Cabinet will be measured as a lump sum for all load center cabinets modified.

Basis of Payment:

The accepted quantity of Modify Load Center Cabinet, measured as provided above, will be paid for at the contract lump sum price, which price shall be full compensation for the work described and specified herein and on the plans, complete in place, including all hardware necessary to provide a complete, functional, modified load center cabinet.

ITEM 7360290 LOAD CENTER CABINET FOUNDATION:

Description:

The contractor shall furnish and install a load center cabinet foundation for each load center assembly.

Materials:

Concrete for all foundations shall be Class S and shall have a required 28-day compressive strength of 3,000 pounds per square inch.

Construction Requirements:

The load center assembly foundation shall be constructed as shown in the ITS Standard Drawings and project plans. The contractor shall meet requirements of Subsection 731-3.01. Concrete shall be Class S, 3,000 psi.

The contractor shall meet the requirements of Subsection 732-3.03 to bond the cabinet to ground.

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 survey and stake the locations of the load center cabinet foundations in the presence and for approval of the Engineer. The contractor shall give a minimum of 2 working days advanced notice to the Engineer prior to staking the locations.

Method of Measurement:

The Load Center Cabinet Foundation will be measured as a unit for each type of cabinet unit furnished, and installed.

No additional measurement or payment will be made for grading in the vicinity of the Load Center Cabinet Foundation. The cost is considered as included in the price of the Load Center Cabinet Foundation.

Basis of Payment:

The accepted quantity of Load Center Cabinet Foundations, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work described and specified herein and on the plans, complete in place. No separate payment will be made for conduit, grading, concrete, decomposed granite restoration, anchor bolts, ground rod(s), caulking or sealant and other items necessary to complete the installation.

ITEM 7370430 TRANSFORMER (CABINET ASSEMBLY) (3 KVA):
ITEM 7370431 TRANSFORMER (CABINET ASSEMBLY) (7.5 KVA):

Description:

The work under these items shall consist of furnishing and installing transformer cabinet assemblies, as shown in the ITS Standard Drawings and on the project plans to convert voltages to control cabinets and devices.

Depending on application, the transformers within the transformer cabinet may be serving to step-up or step-down voltages, as indicated on the project plans and in the Special Provisions.

Materials:

The contractor shall meet the requirements the ITS Standard Drawings, project plans and Special Provisions. The transformer cabinet assembly shall consist of a NEMA 3 cabinet, foundation, applicable transformer, external cut-off breaker with lever, internal wiring, and applicable hardware.

All transformers shall be new and shall conform to paragraphs 2.1.3 and 2.1.5 in Section 2 of the current NEMA TS-1 Standards and to other applicable standards of NEMA (i.e., NEMA ST 120), UL (i.e., UL-506), EIA, and ANSI. The contractor shall comply with any and all national, state, and local laws, ordinances, and codes in effect at the time that the work is performed.

All transformers shall be single phase, dry type, totally enclosed, encapsulated distribution transformers, and operate on primary and secondary voltages as shown on the project plans and as specified in the Special Provisions.

All cabinets and transformers furnished on the project shall be new and of prime quality, and shall not have been used previously on other projects or in other locations. All items of the same type shall be identical and totally interchangeable.

Cabinet:

(A) General:

The enclosure shall be a single door ventilated cabinet. Overall appearance and dimensions shall be as shown in the ITS Standard Drawings unless specified otherwise in the project plans.

(B) Cabinet Construction:

The cabinet and door shall be constructed from 5052-H32 sheet aluminum alloy with a thickness of 0.125 inches. External welds shall be made by using the Heliarc welding method, whereas internal welds shall be made by the wire welding method. 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 door shall have a "Danger High Voltage" sign attached.

The door opening shall be double flanged on all four sides. A door restraint shall be provided to prevent door movement in windy conditions. The restraint shall hold the door open at 90 ± 10 degrees and at 180 ± 10 degrees. The cabinet door shall be a minimum of 80 percent of the front surface area and shall be hinged on the right side when facing the cabinet. The door shall be furnished with a gasket that satisfies the physical properties as found in UL 508 Table 21.1 and shall form a weather tight seal between the cabinet and door. The hinges shall be continuous and bolted to the outside of the cabinet and door using twenty 0.25-inch stainless steel carriage bolts and nylon insert lock nuts (known as elastic stop 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 0.875 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.

(C) Cabinet Ventilation:

Cabinet ventilation shall be provided by louvered vents in the front door with a removable pleated paper air filter. The filter shall cover the vents and shall be held firmly in place with bottom and top brackets and a spring-loaded upper clamp. Exhaust air shall be vented out between the top of the cabinet and the door. The exhaust area shall be screened with a material having a maximum hole diameter of 0.125 inches.

(D) Transformer Mounting:

The transformer shall be mounted on a 12 gauge steel plate or panel board attached with six 3/8-inch mounting studs welded to the back wall of the cabinet. The transformer shall be located 4 inches from the top of this pan and centered from side to side. The transformer shall be mounted using appropriately sized carriage or lag bolts and attached at the top and bottom.

(E) Cabinet Mounting:

Transformer cabinets shall be fastened to a concrete foundation, as shown in the ITS Standard Drawings, using anchor bolts of size placement shown in the ITS Standard Drawings or project plans.

(F) Cabinet Finish and Dimensions:

The outside surface of the cabinet shall have a smooth, uniform, natural, aluminum finish. The dimensions and physical construction shall be as shown in the ITS Standard Drawings, unless otherwise specified in the project plans and Special Provisions.

Transformer:

All transformer overall dimensions, physical outline, and mounting hole dimensions shall be as shown in the ITS Standard Drawings unless otherwise specified in the project plans and Special Provisions. All transformers shall be single-phase, dry type units. The transformer primary and secondary voltages shall be as specified on the project plans and in the Special Provisions. The Apparent Power rating shall be 3, 7.5, 10 or 25 kVA, as indicated on the project plans.

(A) Cores:

Power Transformer cores shall be fabricated with high grade materials. The core volume shall allow operation at 10 percent above rated primary voltage at no load, without exceeding a temperature rise of 207 degrees Fahrenheit. All core laminations shall be oxide or varnish coated, annealed, free of burrs, and properly assembled to reduce noise and ensure efficient operation of the transformer.

(B) Coils:

Coil conductors shall be continuous with terminations brazed or welded without auxiliary flux material. The entire core and coil assembly shall be impregnated with varnish and cured to seal out moisture. Coils shall be protected with an outer layer of glass tape or

similar quality insulation. Coils shall incorporate an electrostatic shield located between primary and secondary windings.

(C) Sound Levels:

All transformers shall be of low noise design. Sound levels shall not exceed the following:

Up to 9 kVA:	40 dB
10 to 50 kVA:	45 dB

(D) Standards:

Transformers shall be constructed and rated in accordance with applicable UL, CSA, NEMA, ANSI, IEEE and OSHA standards and shall meet NEC requirements.

Construction Requirements:

The transformer cabinet assembly shall be furnished and installed at design locations as shown on the project plans, and as directed by the Engineer.

(A) Test Requirements:

The contractor shall verify that the transformer output voltage is within 3 percent of input voltage, stepped up/down under loaded and unloaded conditions.

Method of Measurement:

The Transformer Cabinet Assembly will be measured as a unit for each cabinet assembly furnished, by transformer size, installed.

Basis of Payment:

The accepted quantity of Transformer Cabinet Assemblies, measured as provided above, will be paid for at the contract unit price which price shall be full compensation for the work described and specified herein and on the plans, complete in place. No separate payment will be made for circuit breakers, transformers, and other items necessary to complete the installation.

ITEM 7370452 MISCELLANEOUS ELECTRICAL (FACILITIES INVENTORY):

Description:

The work under this item shall include, but is not limited to, furnishing all tools, equipment, and labor necessary to conduct a comprehensive field inventory of the presence and status of existing items related to the final configuration of the ITS system, including proofing of the routing and accessibility of conduits and pull boxes.

Construction Requirements:

At project initiation, the contractor shall coordinate with the Engineer to conduct a comprehensive field inventory that verifies and establishes existing conditions of all existing infrastructure such as occupied or empty conduit, existing pull boxes, existing in-use or not-in-use detection devices, existing DMS, existing CCTV, existing load centers serving other ITS devices that may or may not be involved in the specific project at hand, and existing cabinets and controllers.

The field inventory shall determine, confirm and document the locations and condition of existing infrastructure and ITS elements, identify conditions that may have changed during or since the design of the project, identify conditions not typically able to be completely investigated during a design function due to contractor/licensing limitations imposed on design engineers, and allow the contractor an opportunity to identify items and issues unanticipated in the project plans and Special Provisions that would consequently lead to modifications or additions, as well as protect both the Department and the contractor from dispute over the initial condition of items otherwise the responsibility of the contractor to replace or repair "at no cost to the Department", for elements damaged by the contractor during construction activities.

The contractor shall be accompanied by the Engineer, or his designee, to include both parties to be present for all inventory and discovery efforts. The development of a proposed inventory plan shall be approved by the Engineer for assessment of conditions a minimum of 5 working days in advance.

The field inventory does NOT relieve the contractor of his obligations to review the project site prior to submitting bid for visible discrepancies, as described in Subsection 102.07.

Field inventory shall, at a minimum, include documentation of the existing locations, continuity, usability and conditions of existing conduits, pull boxes, detection devices, cabinets, load centers, conductors and cables, splice closures and related elements, and identify any that have existing damage, are missing or are otherwise contrary to the project plans and Special Provisions.

All conduits shall be blown out with compressed air, at a minimum, to determine continuity and if completely blocked.

All pull boxes shall be opened, photographed, and evaluated for usefulness in the context of the project plans and project intent for use. Broken or cracked lids, damaged and shifted boxes and contents shall be documented.

The contractor shall document evidence by digital photographs or digital video, and compile a written report of the results of the inventory for submittal and review by the Engineer, correlating or pointing out differences between mutually observed field conditions and the project documents and items.

The Engineer shall determine the need, process and methodology of any necessary mitigations or changes resulting from the field inventory effort, in the context of the project intent.

This item shall include the cost of associated traffic control utilized for the field inventory.

Method of Measurement:

Miscellaneous Work (Facilities Inventory) will be measured as a lump sum, inclusive of any traffic control, equipment, labor, coordination and documentation necessary to provide an acceptable comprehensive inventory of conditions.

Basis of Payment:

Miscellaneous Electrical (Facilities Inventory), measured as provided above, will be paid for at the contract lump sum price, which price shall be full compensation for the work, complete in place.

ITEM 7370455 MISCELLANEOUS ELECTRICAL (FMS RECORD DRAWINGS):

Description:

The work under this item shall include, but is not limited to, furnishing all materials, tools, equipment, and labor necessary to developing and maintaining a comprehensive set of record drawing documentation, as it relates to the installation of any new or modifications to existing ITS facilities.

In-Progress Project Documentation:

In-progress record drawing documentation of the work shall be kept current (no longer than 14 days behind actual work period), through substantial completion. This in-progress documentation shall be provided by the contractor to the Engineer prior to initiation of any required System Acceptance Tests (SAT).

In-progress record drawing documentation includes, as a minimum:

Construction Plans;
Operator's Manuals;
Maintenance Procedures/Manuals;
Equipment Assembly Drawings;
Cabinet and Rack Wiring Diagrams;
Electrical Schematics, Wiring and Logic Diagrams;
System Connection Diagrams;
Fiber Optic Splices/Assignments;
Splice Closure Diagrams;
Software Documentation;
Communications and Operating Protocols;
Manufacturer-Issued Manuals;
Detailed Shop Drawings;
Certifications;
Warrantees;
Instruction Sheets; and,

Parts Lists.

Documentation shall include manufacturer's equipment documentation for all contractor furnished items. Acceptable factory manuals must contain technical, diagnostic, and maintenance (preventive and troubleshooting) information. Advertising brochures and catalog cuts are not acceptable.

Final Documentation:

(A) Configuration Information:

Prior to the start of the project System Acceptance Test, the contractor shall provide all final configuration information for contractor installed equipment. The contractor shall submit two bound paper copies and one electronic copy of their configuration information, in the form of a computer spreadsheet, compatible with the Department computer system/existing software. This electronic information shall be provided on a CD-ROM. The information shall include all configuration parameters for each device location, make and model number, serial number, date of installation, vendor, vendor contact information, and warrantee expiration date.

(B) Required Documentation:

All project documentation shall be subject to the approval of the Engineer prior to acceptance.

The contractor shall be required to collect the record drawing coordinates using a GPS device with accuracy within 6.0 inches, using L1 L2 carrier and L1 code. The contractor shall provide the electronic files of the GPS survey to the ADOT Transportation Technology Group in both a raw (non-post-processed) file format and post-processed .shp file format compatible for import into GIS software, unless otherwise specified in the Special Provisions.

The contractor shall collect a minimum of 60 seconds of point logging information per field device to improve accuracy. Data is required for the following ITS features:

- New pull boxes
- Pull boxes containing new cables installed as part of this project
- All new poles installed as part of this project
- All load center and cabinets installed as part of this project.
- All DMS and ramp metering equipment installed as part of this project

Project final record drawing documentation shall consist of the following documents as a minimum (each of the following documents shall be submitted to the Engineer prior to the completion of the project):

(1) Construction Record Drawings:

The Contractor shall modify the construction plan sheets to reflect any variations in equipment locations or requirements shown on the plan sheets.

If no modifications are made, the Contractor is still required to indicate the GPS coordinates for each field element inventoried during the contractor's inspection of the existing ITS infrastructure.

The following attributes for each device shall be documented by the contractor as part of the record drawing documentation process:

ITS Controller Cabinets (Ramp Meter, Detection, CCTV, DMS):

- Station & Offset
- Coordinates at left corner of front door
- Cabinet Identification Number
- MU decal numbers
- Control Application (DMS, Mainline Detection, Ramp Meter, CCTV, etc.)
- Route
- Direction

Load Center Cabinets:

- Station & Offset
- Coordinates at left corner of front door
- Cabinet Identification Number
- MU decal numbers
- Name of Serving Utility
- Route
- Direction

Dynamic Message Signs:

- Station & Offset
- Coordinates of DMS foundation on right shoulder in direction of traffic flow
- DMS Manufacturer
- Final height over roadway, at lowest point of clearance
- Route
- Direction

Ramp Meter Signal Heads and Advance Warning Flashers:

- Station & Offset
- Coordinates of pole foundation
- Pole Type
- Route
- Direction

Ramp Meter Queue Loops:

- Station of leading edge of loop
- Loop Size
- Route
- Direction
- Edge of roadway to center of loop.

Mainline Detection:

- Station of leading edge of loop
- Loop Size
- Route
- Direction
- Edge of roadway to center of loop.

CCTV Poles:

- Station & Offset
- Coordinates of pole foundation
- Route
- Direction

Pull boxes:

- Station & Offset
- Plan Sheet Number
- Pull box ID from Plan sheet (if applicable to project)
- Pull box Size (No. 7, No. 9, etc.)
- Conduit Qty/Sizes
- Route
- Direction:
- All new and existing ITS-related pull boxes where electrical conductors, fiber optic cables or new pull tape are existing or have been installed (or in the case of mainline No. 7 pull boxes, existing pull boxes where new fiber cable was installed in conduits that otherwise bypass the box), and foundations shall indicate station number and offset from edge of roadway. The distance from pull box to pull box (along FMS and Lighting conduit runs containing cable), and/or pull box to foundation shall be dimensioned.

Conduit:

- New and existing conduit inventoried and/or used in the project shall be dimensioned from edge of roadway, starting and ending point station number, and indicate length.
- Conduits should be dimensioned from pull box showing length and direction.

Fiber Cable:

- All fiber cable distance markings at the ingress and egress of all No. 9 pull boxes and equipment cabinets shall be recorded in a table that references the pull boxes.
- Sequential distance markings of all cables entering and exiting each splice closure.

Any changes to any diagram or detail in the Project Plans (i.e. Communication Block Diagram, fiber splice details, etc.) shall be documented in the record drawings.

Conductor, Cable and Conductor, Pull Box and Pole schedules shall reflect any changes made, such as cable or pull box size changes, pole size/type, phase number,

number of conductors, size of conductors, circuit number, size/type of signal head or mounting, sign changes, etc..

The final document submitted by the Contractor shall be a complete set of plan sheets. 2 sets of drawings on electronic CD-ROM media, in PDF format with an additional 2 printed copies on 11 inch x 17 inch format shall be furnished.

(2) Operator's Manuals:

A manual containing a general description and detailed operating and installation instructions shall be provided for each different type or model of ITS equipment. This manual shall contain instructions for possible modification to the equipment within the capability of the equipment. One copy for each unit with 2 copies, shall be provided for each model of equipment.

(3) Maintenance Procedures Manuals:

A manual containing detailed preventive and corrective maintenance procedures shall be provided for each different type or model of ITS equipment. Step-by-step field and bench trouble-shooting procedures shall be included, as shall normative waveforms and test voltages as applicable. A detailed parts list shall be included. For each part, its circuit or pictorial identification shall be shown, as shall all necessary rating information and a manufacturer and associated model or part number. The list shall include cross-references to part numbers of other manufacturers who make the same replacement part. 1 copy for each unit's manual, with 2 copies, shall be provided for each model of equipment.

(4) Equipment Assembly Drawings:

A pictorial drawing showing the physical location and identification of each ITS component shall be provided for each different electronic unit and each different subassembly of each unit. These drawings may be included in the maintenance procedure manuals or they may be electronic files in PDF format with 2 printed copies. The electronic files and 2 printed copies shall be provided for each distinct unit and subassembly model. Location information shall be shown on the construction record drawings.

(5) Cabinet and Rack Wiring Diagrams:

In addition to the diagram stored in the field cabinet, a wiring diagram shall be provided for each different cabinet, equipment rack, and junction box containing wire terminals identified by location and must depict actual, installed conditions. If the diagrams are in manual form, 6 manuals shall be provided for each distinct cabinet and equipment rack. Drawings shall be furnished on electronic media in PDF format with 2 printed copies. Separate drawings and copies shall be provided for each distinct type of cabinet, rack, and junction box. If the same diagram serves more than one location, it shall be labeled with all appropriate locations and a copy provided for each location. If a set of drawings is provided, each serving more than one location, a separate drawing on electronic media in PDF format with two printed copies shall be included that shows a cross-index by location and drawing.

(6) System Connection Diagrams:

Connection diagrams for the entire ITS system, including block diagrams, terminal numbers, IP addresses, and conductor color codes for the work performed by the Contractor, shall be cross-referenced to correlate with existing wiring diagrams and shall be addenda thereto. The diagram shall include field conduits, boxes, detectors, etc. A drawing on electronic media in PDF format with an additional 2 printed copies of each drawing shall be furnished.

(7) Fiber Optic Splices and Splice Closures:

The Contractor shall prepare documentation identifying the location and fiber color codes for each field splice performed by the Contractor. In addition to storing a drawing in each field cabinet, a fiber assignment drawing shall be provided for each splice closure throughout the project. A drawing on electronic media in PDF format with an additional two printed copies of each drawing shall be furnished.

(C) Formats of Documentation:

Except for standard bound manuals, all standard letter size documentation shall be bound in logical groupings in loose-leaf binders of the 3-ring type. Each such bound grouping of documentation shall be permanently and appropriately labeled. No documentation shall be smaller than standard letter size.

All documentation, including that documentation which exceeds standard letter size, shall be furnished on electronic media in ADOT standard format with an additional two printed copies. A separate drawing of the cabinet wiring diagram for each control cabinet, labeled with the location name and number, shall be required even though some of the cabinets may be wired identically. All drawings shall be standard half size (unless otherwise approved by the Engineer in each instance). Drawings larger than standard letter size but smaller than standard half size shall be placed in the lower right-hand corner of a standard half size sheet.

1 print of each schematic diagram, cabinet wiring diagram, and fiber optic splice diagrams applicable to each control cabinet and equipment rack and the equipment in them shall be provided in a weatherproof holder mounted within each cabinet or rack for easy access. One weatherproof print of each wiring diagram applicable to each junction box shall be provided in each junction box. The cost of these prints, the weatherproof holder, and their installation shall be incidental to the cost of the units in which they are installed.

The Contractor shall furnish all software manuals, flowcharts, printed tables, charts, and program listings in standard letter size three ring binders. All software source code shall be furnished in duplicate on CD or DVD ROM compatible with the Department's computer system.

For purposes of record drawing documentation, fiber optic cable connection and splicing documentation shall be treated in the same manner as that for electrical wires and cables.

Materials:

There are no materials anticipated with this item of work.

Construction Requirements:

(A) Construction Record Drawings:

The Contractor shall modify the plan sheets to reflect any variations in equipment locations and requirements shown on the plan sheets.

The record drawings shall include GPS coordinates, station numbers, and offsets to each field device, referenced to back of curb, edge of pavement or other fixed landmark (barrier, guard rail, bridge wall, etc.), as approved by the Engineer.

The final document submitted by the Contractor shall be a complete set of all plan sheets, including sheets added by Addendum or Change Order. Two sets of drawings on electronic media in ADOT standard format with two 11 inch x 17 inch printed copies shall be furnished.

Final acceptance of all electrical work in accordance with Subsection 105.20(B) of the Standard Specifications will not be made until the complete sets of electrical record drawings have been submitted and approved by the Engineer.

Method of Measurement:

Record Drawings will be measured as a Lump Sum, which includes all labor required to prepare the FMS record drawings as stipulated within, as well as the related documents.

Basis of Payment:

Miscellaneous Electrical (FMS Record Drawings), measured as provided above, will be paid for at the contract lump sum price, which price shall be full compensation for the work, complete in place.

ITEM 7370666 SWITCH PACK (LOAD SWITCH) (MODEL 200):

Description:

The work under this item shall include, but is not limited to, furnishing all materials, tools, equipment, and labor necessary to furnish and install switch packs for controlling the operation of the ITS devices served by the cabinet, as shown in the ITS Standard Drawings or project plans and Special Provisions.

Materials:

The entire surface area of each circuit board shall be sealed to protect against moisture. Equipment lists and equipment submittals shall conform to the requirements of

Subsection 738-4.

The Model 200 Switch Pack unit shall be a modular plug-in device containing three solid-state switches. Each switch shall open or close a connection between applied power and external load.

A Ground True Controller Unit Input (0 to 6 VDC) shall cause the switch to energize and a Ground False (16 VDC or more) shall cause it to de-energize. State transition shall occur between 6 and 16 VDC. The input shall not sink more than 20 miliAmps or be subjected to more than 30 VDC. The input shall have reverse polarity protection.

With all switches on, the unit shall not draw more than 60 miliAmps at +16 VDC or more from the +24 VDC cabinet supply.

Each switch shall have an OFF state dV/dt rating of 100 Volts/microseconds, or better. Each switch shall be isolated so that line transients or switch failure shall not alter the controller unit.

The unit front panel shall have an indicator on the input to each switch. The indicator shall be labeled or color-coded "Red"-top switch, "Yellow"-middle switch, and "Green"-bottom switch. The middle switch indicator shall be vertically centered on the unit front panel with the other indicators positioned 1 inch above and below.

The resistance between the AC+ input terminal and the AC+ output terminal of each switch shall be a minimum of 15 KiloOhms when the switch is in the open state. When the switch is in off state, the output current through the load shall not exceed 10 MilliAmps, peak.

Construction Requirements:

Switch packs shall be installed by the contractor in the appropriate slots in the control cabinet.

Any spare switch pack called for by the project documents, shall be left in the cabinet or turned over to the Department, as directed by the Engineer.

Method of Measurement:

Model 200 Switch Packs will be measured as a unit, for each furnished and installed.

Basis of Payment:

The accepted quantity of Model 200 Switch Packs, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work described and specified herein and on the project plans, complete and in place.

ITEM 7370705 CCTV FIELD EQUIPMENT:

Description:

The work under this item includes furnishing, installing, and testing CCTV cameras and associated equipment including, but not limited to, cameras, camera housings, pan/tilt/zoom assemblies, mounting hardware, power/communications/video cabling and miscellaneous materials required to provide a complete and operational CCTV system.

The work includes control center hook-up, testing and other ancillary equipment required to assemble a complete, fully-functional system integrated with equipment furnished by others on previous projects.

Materials:

All materials provided shall be new. Refurbished materials shall not be acceptable. All parts and materials provided shall be currently supported by the manufacturer, and not scheduled for end-of-life within five years after Notice to Proceed for a project.

The CCTV cameras shall be digital, IP-addressable, and one of the following or approved equivalent:

1. COHU Electronics Model 3960HD, with 30X optical zoom;
2. Axis Communications, Model Q6032-C, with 36X optical zoom;
3. Vicon Surveyor HD PTZ Network Dome, with 18X optical zoom; or
4. Pelco, Model SD4N36-PG-E1, with 36X optical zoom.

Proposed alternates shall be field tested by the Department prior to granting approval, and order by contractor. The contractor shall contact the ADOT Transportation Technology Group (TTG), Joan Lovell (602) 712-7754 to arrange delivery and obtain Department testing requirements and procedures. Contractor shall allow a minimum of 30 days for CCTV testing, if an alternate is proposed.

The contractor shall furnish mounting arms and required mounting hardware to install the CCTV assembly on the poles as shown on the plans, and be compatible with the CCTV lowering device provided by the contractor.

The contractor shall supply all grommets, connectors, cabling, nipples, and incidental hardware required to install the power and network cabling from the CCTV cabinet to the CCTV Assembly.

The contractor shall coordinate with the TTG to obtain IP addressing, and program IP and other communications parameters into the CCTV camera.

The contractor will not be required to program the system with camera ID information, directional messages, preset positions with text messages, and privacy zones. This shall be accomplished by the Department, and coordinated by the Engineer. The contractor shall coordinate with the Engineer to schedule the programming of the CCTV cameras.

Construction Requirements:

The contractor shall mount the CCTV assembly which includes the camera mount, camera housing, camera, zoom lens, tilt/pan drive, and receiver/driver on the CCTV camera pole and lowering device per the requirements of the CCTV camera supplier.

No wire, cables, or conductors shall be exposed from the base of the tilt/pan drive to the ground or between the pole-mounted CCTV cabinet and the ground. All conductors shall be routed inside the support structure.

The surge suppression rack shall be installed in the CCTV equipment cabinet and all surge suppressors connected per the supplier/manufacturer's instructions. All surge protector leads shall be as straight and short as possible. The mounting bolts for the chassis and terminal strips shall not protrude from the outside of the enclosure. All cabling, connectors, and hardware required to interconnect the various CCTV field and fiber optic communications equipment shall be furnished and installed by the contractor. The remote data port shall also be placed in the CCTV cabinet.

The contractor shall not be required to program the system with camera ID information, directional messages, preset positions with text messages, and privacy zones. This shall be accomplished by ADOT TOC personnel. The contractor shall coordinate with ADOT TOC personnel to schedule the programming of the CCTV cameras.

(A) Test Requirements

(1) General:

All CCTV components shall be subject to testing and monitoring to determine conformance with all applicable specifications and to ensure proper operation of the equipment and system.

For purposes of completing the tests, "bright sunlight" conditions shall be defined as occurring between 10:00 a.m. local time and 2:00 p.m. local time on a cloudless day. "Night" conditions shall be defined as occurring between one hour after local sundown and one hour before local sunrise. The moon shall be no more than one-quarter full.

The contractor shall develop testing procedures and submit them to the Engineer for approval a minimum of 30 days prior to conducting any testing.

(2) Stand-Alone Tests:

The test shall exercise all stand-alone (non-network) functional operations of the CCTV. The tests shall verify the following:

- Control of focus, zoom, digital zoom, white balance, iris, tilt/pan, and power on/off
- Response to automatic preset positioning commands
- Display of Camera ID information and directional indicators
- Video "blacked out" when in a privacy zone
- Presence and quality of video signal during bright sunlight and night conditions

- Retention of non-volatile RAM data (i.e., sector text, preset positions)

(3) Subsystem Test (SST):

The CCTV SST test shall verify the following:

- All items in the stand-alone test
- Color and Black/White modes of operation
- Transmission of high quality video images to the ADOT TOC
- Transmission of control signals to field locations
- Positioning of each camera from the control panels
- Response to automatic preset positioning commands
- Priority and partitioning of commands
- Generation of text, date, and time on monitors

The Engineer shall be the sole judge of video quality acceptability. If in the Engineer's opinion the video is substandard, the contractor shall be required to perform video resolution and signal to noise ratio testing on however many cameras the Engineer requires, in which case the contractor shall submit a test procedure for approval, prior to the testing.

The test needs to run successfully for 72 hours. The time is included in the contract time.

(4) System Acceptance Test (SAT):

As part of the SAT, at least once per week, and on the final day of the SAT, the Department shall demonstrate that all CCTV system functions tested in the stand-alone test are operational.

The test needs to run successfully for 30 calendar days. The time is included in the contract time.

Method of Measurement:

The CCTV Field Equipment installation will be measured as a unit for each CCTV field equipment furnished and installed, complete in place.

Basis of Payment:

The accepted quantity of CCTV Field Equipment installation, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work described and specified herein and on the project plans, complete and in place and successfully tested.

ITEM 7379111 VARIABLE MESSAGE SIGN ASSEMBLY INSTALLATION:

Description:

The work under this item consists of installing fully equipped Department furnished Dynamic Message Signs (DMS) on new sign structures, and furnishing and installing DMS support frameworks and catwalks. The work under this item also includes installing Department furnished DMS control cabinets, with Department furnished sign controller units (SCU), on new foundations. It should be noted that the current ADOT procurement contract refers to the signs as Dynamic Message Signs, but for purposes of this specification, the terms "Dynamic Message Sign" and "Variable Message Sign" (VMS) are interchangeable.

The contractor shall be responsible for the receipt, safe storage, and delivery to project site of the Department furnished DMS, DMS control cabinets and Department furnished SCU and internal components, prior to the scheduled installation.

Materials:

The contractor shall prepare and submit structural shop drawings for each DMS installation. The contractor shall illustrate the method of connection and indicate the types of materials used, length of support members, flex conduit routing, catwalk design and dimensions, catwalk connections, handrail, grating, electrical and communications operation.

Field survey of location and elevation of final locations, thorough understanding of the applicable ADOT Bridge Group Standard Details and coordination with the DMS supplier is required to determine the specific structural dimensions, mounting and cable routing requirements and limitations. The contractor shall utilize field survey to obtain and confirm the vertical and horizontal dimensions of the new DMS structures for inclusion into the material submittal drawings. The structural drawings shall show, in detail, the existing surveyed lane configurations, shoulder widths, the location of the new DMS sign centered over the roadway, or as otherwise specified on the project plans, and the catwalk limits with regards to the shoulder widths to the edge or across the front of the various types of DMS.
The contractor shall install the Department furnished DMS SCU cabinets on new foundations, furnished by the contractor, conforming to the ITS Standard Drawings and project plans.

Concrete for SCU cabinet foundations shall be Class S, and shall have a required 28-day compressive strength of 3,000 pounds per square inch.

All wiring and grounding shall conform to the requirements of the regulations and codes specified in Section 732-3.03.

All interconnecting control and power cables between the SCU cabinet and final location of the DMS on the support structure shall be furnished by the DMS supplier, and coordinated through the Engineer.

The contractor shall determine and provide the required cable lengths from the DMS to SCU cabinet. Cable lengths shall be communicated by the contractor to the DMS sign supplier, as directed by the Engineer, for cable fabrication. This information must be communicated at least 12 weeks prior to delivery date of the sign units to the contractor.

Construction Requirements:

(A) Delivery and Storage:

The contractor shall be responsible for accepting the delivery of, storage and safe keeping of the DMS, cabinet, SCU and all associated components furnished by the DMS supplier, upon arrival to the designated delivery point coordinated with and approved by the Engineer.

The contractor shall coordinate the schedule for installation with the Engineer, DMS supplier, District in which the sign will reside, and appropriate traffic control entities, and install the DMS equipment on the sign structure at locations shown on the project plans.

The contractor shall notify and coordinate with the DMS supplier of the scheduled installation date a minimum of 45 days prior to installation, and shall keep the DMS supplier apprised of any approved revisions to schedule that effects the date of DMS installation.

The DMS supplier will have a representative arrive at the project site to terminate the cabling between the DMS and SCU cabinet in the DMS housing and in the SCU cabinet. The contractor shall incur all of the supplier's costs caused by the contractor's non-adherence with the schedule (storage, personnel time, air fare, hotels, meals, etc). The contractor shall not install the DMS without the presence of the on-site DMS supplier's technician unless prior approval is received from both the supplier and the Engineer authorizing the installation, or specific portions of the installation, without the technician being present.

It is the responsibility of the contractor to thoroughly inspect all of the delivered items and equipment before the delivery truck departs, and note, in writing, any damage on the bill of lading. In the event that damage is found, or it is discovered components are missing, the Engineer must be notified immediately, and will contact the DMS supplier to arrange mitigations. The contractor shall coordinate with the Engineer, in advance of the delivery date, and allow the Engineer or his designated representative to be present at the location and time of delivery.

Storage must provide security from damage, theft, fire, weather and other causes of loss or damage. Any material arriving in a cardboard box or container shall be stored indoors.

The sign, and associated components, shall be loaded, transported, and unloaded from the storage site to the project site by the contractor.

(B) Installation:

The contractor shall install the Department furnished SCU control cabinet on the foundation, as indicated in the project plans and Special Provisions.

The contractor shall furnish and install UV-rated flexible conduits from the DMS structure to the DMS case.

The contractor shall furnish and install one No. 8 AWG Green Bond conductor between the DMS sign housing and SCU cabinet. The one No. 8 AWG Green Bond conductor shall conform to Subsection 732-2.01, and will be terminated on both ends by the contractor.

The contractor shall submit and obtain approval from the Engineer, for the specific date, time and traffic control strategy to be implemented for the installation of the DMS, if the DMS is to be mounted over the highway.

The contractor shall coordinate all traffic control, police or DPS participation and any required media and local agency (city, transit, emergency services) announcements and notifications to the ADOT Traffic Operations Center operators, in advance of the date of installation and activation. Specific dates and methods of traffic control shall be proposed by the contractor but shall be approved or modified at the discretion of the Engineer on a case by case basis.

The contractor shall install the Department furnished DMS cabling between the DMS sign housing and SCU cabinet, utilizing any traffic control required by the Engineer. Cabling shall be installed in accordance with DMS supplier's site representative's direction. Termination of communication cabling in the sign housing and in the SCU cabinet shall be the responsibility of the sign supplier. All power and bond conductor terminations within the sign housing and control cabinet shall be by the contractor.

The contractor shall provide all necessary traffic control required for the DMS installation and a bucket truck for the DMS supplier's on-site technician to make connections at the DMS sign housing, and during the stand-alone test, subsystem testing, and through completion of the system acceptance test, on an as-needed basis. The traffic control items will be measured and paid for under their respective traffic control items.

If an urban DMS is not in operation for more than 14 calendar days after the date of installation, a Department-furnished temporary 36-inch by 36-inch static sign shall be mounted on each DMS structural support vertical member with contractor furnished steel strap or banding sign mounting hardware. The temporary signs shall face traffic with the message "SIGN UNDER TEST" until final acceptance, at which time the contractor shall remove the sign and mounting hardware. Sign shall be returned to the Engineer, after removal. Sign mounting hardware shall become the property of the contractor. Mounting of the temporary static sign by drilling into the support structure is not allowed.

(C) DMS Communications:

The contractor shall install communications equipment, as indicated in the project plans and Special Provisions.

The contractor shall integrate the DMS controller unit and the DMS with the communications system, as indicated on the project plans and Special Provisions, and participate in DMS testing.

(D) Testing Requirements:

(1) Stand-Alone Test:

The Stand-Alone test is performed by the supplier's on-site technician.

The contractor shall work with the DMS supplier's on-site technician to debug and mitigate or repair any problems in the overall DMS system operation, including providing necessary lift or bucket trucks and traffic control, as required.

(2) Subsystem Test (SST):

The Department, with the support of the contractor, shall conduct the subsystem test on the DMS and communications system to verify that all communications circuits (contractor installed equipment as well as any connections to existing) have been properly configured and operate without failure and without adversely affecting the existing system.

The test needs to run successfully for 72 hours. The time is included in the contract time.

Failure of an equipment component to pass the SST shall require the equipment to be repaired or replaced, as directed by the Engineer, at no cost to the Department and the test repeated until the equipment successfully passes the test. The contractor shall supply all test equipment required for the troubleshooting of the system, based on the test results.

(3) System Acceptance Test (SAT):

Upon successful completion of all subsystem testing, the SAT shall be started. The SAT shall consist of a 30-day period of operation without failure of all contractor-supplied equipment. The Engineer, and his designees, shall be provided with full access to all equipment, load centers and control cabinets during this period for purposes of verifying operations.

The purpose of the SAT is to demonstrate that the total system, consisting of hardware, software, communications, materials and construction, is properly installed, is free from defects and identified problems, exhibits stable and reliable performance, and completely complies with all contract documents.

During the SAT, the contractor shall be responsible that all equipment is maintained in operable condition. The contractor shall identify, isolate, diagnose and troubleshoot all system problems and inconsistencies. The contractor, in conjunction with the Engineer, shall formulate possible solutions and shall implement all corrections required in contractor supplied equipment.

The contractor shall provide test equipment and labor needed to test, isolate and correct all equipment deficiencies found during the SAT. Key contractor technical personnel familiar with the design and construction of each system component shall be available on site within 24 hours of notification of a problem.

During the SAT, the contractor shall maintain a test event log. This log shall contain at a minimum the following information: Date and time of failure, who reported the failure, confirmation of notification to/from the Engineer, description of the failure, troubleshooting performed, and date and time repair was completed. The contractor shall submit an updated log to the Engineer after each reported failure, and again after the repair has been completed. The contractor shall submit for approval a draft version of the test event log as part of the initial equipment submittal, to allow Department review of form and content.

The test needs to run successfully for 30 calendar days. The time is included in the contract time.

All system documentation errors, omissions and changes occurring prior to and during the SAT shall be corrected and resubmitted before system acceptance can be completed.

SAT Failure Definitions:

(1) Minor Failure

In the event of a minor failure during the SAT, the 30-day test period shall be suspended until the system is repaired. At the completion of the repair, the testing shall recommence with 24 hours added to the remaining test time of the system. The following constitute minor failures:

- Failure of Department-furnished equipment.
- Failure of an entire communications circuit for more than 15 minutes over any 24-hour period.
- Failure to communicate to any DMS.

(2) Major Failure

In the event of a major failure during the SAT, the test period shall be suspended until the system is repaired. At the completion of the repair, the testing shall recommence with the test period reset to "Day zero". The following constitute major failures:

- Minor failures of Department-furnished equipment three times, if determined that failures were caused by faulty installation of the contractor.
- Minor failure of an entire communication circuit two times.
- Minor failure of communication to an individual SCU three times.
- Failure to correct a problem that adversely impacts the safety of the traveling public, within four hours of notification, by the Engineer or his representatives.

Method of Measurement:

Variable Message Sign Assembly Installation will be measured as a unit, for each DMS with associated components, support frameworks, and catwalks installed and passing all required testing.

No additional measurement or payment will be made for transporting and installing the SCU cabinet, providing the No. 8 AWG bond wire, installing the cabling between the DMS sign housing and SCU cabinet, extra costs incurred by the DMS on-site technician due to the contractor's failure to adhere to schedule, flexible conduits between sign costs of troubleshooting and repair of contractor-responsible items, and all other components and work necessary to provide a complete functional DMS system.

No additional measurement or payment shall be made for static sign mounting, hardware and removal.

The DMS support structure, support structure foundations, control cabinet foundation, DMS communications equipment and traffic control items will be measured and paid for as separate items of work.

Basis of Payment:

The accepted quantity of Variable Message Sign Assembly Installation, measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work described and specified herein and on the project plans, complete and in place.

No direct payment will be made for transport, assembly or installation of Department furnished items, the cost being considered as included in the contract price bid for the item in place.

(901MOBE, 09/18/12)

SECTION 901 MOBILIZATION:

901-5 Basis of Payment: of the Standard Specifications is revised to read:

Payment for mobilization, measured as provided above, will be made at the contract lump sum price, which shall be full compensation for supplying and furnishing all

materials, facilities and services and performing all the work involved as specified herein.

Partial payments under this item will be made in accordance with the following provisions. Reference herein to the adjusted contract shall mean the original contract amount exclusive of mobilization:

The first payment of the lump sum price for mobilization will be paid after the Preconstruction Conference provided that all submissions required under Subsection 108.03 are submitted by the contractor at the Preconstruction Conference to the satisfaction of the Engineer. The amount paid for the first partial payment will be in accordance with Table 901-1.

The second payment of the lump sum price for mobilization will be made when the Engineer has determined that a significant amount of equipment has been mobilized to the project site which will be used to perform portions of the contract work. The amount paid for the second partial payment will be in accordance with Table 901-1.

The third payment of the lump sum price for mobilization will be made on the first estimate following completion of five percent of the adjusted contract. Such percentage determination will not include partial payments for material on hand. The amount paid for the third payment will be in accordance with Table 901-1.

The fourth payment of the lump sum price for mobilization will be made on the first estimate following completion of 10 percent of the adjusted contract. Such percentage determination will not include partial payments for material on hand. The amount paid for the fourth payment will be in accordance with Table 901-1.

The total sum of all payment shall not exceed the original contract lump sum price for mobilization, regardless of the fact that the contractor may have, for any reason, shut down its work on the project or moved its equipment away from the project and back again.

TABLE 901-1
AMOUNT ALLOWED FOR MOBILIZATION DURING THE LIFE OF THE CONTRACT

Contract Amount: $	% Of Contract	Basis Of Payment
0 - 5,000,000	12% *	25% of the lump sum price for mobilization or 3% of the original contract amount, whichever is less.
5,000,000 +	10% *	25% of the lump sum price for mobilization or 2.5% of the original contract amount, whichever is less.

* If the price bid for mobilization exceeds this percentage, any excess will be paid to the contractor upon completion of the contract.

The adjustment provisions in Section 104 and the retention of funds provisions in Section 109 shall not apply to the item of mobilization.

When other contract items are adjusted as provided in Section 104, and if the costs applicable to such items of work include mobilization costs, such mobilization costs will be considered as recovered by the contractor in the lump sum price paid for mobilization, and will be excluded from consideration in determining compensation under Section 104.

When mobilization is not included as a contract item, full compensation for any necessary mobilization required will be considered as included in the prices paid for the various contract items involved and no additional compensation will be made.

ITEM 9040201 MEDIAN CABLE BARRIER (HIGH TENSION):
ITEM 9040221 MEDIAN CABLE BARRIER ANCHOR (HIGH TENSION):

Description:

The contractor shall remove sections of the existing median cable barrier, support posts and cable barrier anchors in the areas where new DMS foundations, structures, and sand barrel arrays are to be installed as indicated on the Plans.

Additionally, the work under this item consists of installing Median Cable Barrier (High Tension) and Median Cable Barrier Anchor (High Tension) and includes all necessary excavation, backfill and shoulder build-up.

The cable barrier and end anchorage foundations shall be installed at the locations shown on the project plans and in accordance with these specifications.

Materials:

The contractor shall provide all materials and equipment required for the removal of the cable barrier, vertical support posts and cable barrier anchors.

The contractor shall provide a median cable barrier system with approved terminals and transitions per the following requirements:

- System shall meet NCHRP 350 TL3 on a 6H: 1V or flatter slope.
- Maximum deflection shall be 8 feet under NCHRP 350 TL-3 conditions.
- Wire rope shall be pre-stretched to the manufacturer recommendations.

Provide a socketed (cast-in-place concrete foundations) line post.

Provide the manufacturer FHWA Letter of Acceptance. Manufacturer shall have submitted the complete system to ADOT PRIDE program for review and approval.

System parts shall be available within 48 hours of request.

The manufacturer representative shall conduct a manufacturer-supplied training, prior to the installation of the system.

(A) Wire Rope:

Wire rope shall be per the manufacturer specifications and shall be galvanized. Wire rope shall be pre-stretched to the manufacturer specifications. If the wire rope is an out sourced product of the manufacturer of the cable barrier system, supply a separate certification from the manufacturer of the wire rope stating it meets the requirement of the manufacturer of the cable barrier system.

(B) Fittings:

Fittings shall be per the manufacturer specifications and shall be galvanized to ASTM A153 after threading.

(C) Turnbuckle or Rigging Screws:

Size and shape shall be as required by the manufacturer.

Turnbuckle or Rigging Screws shall be solid or closed body type with two inspection holes to determine threaded rope terminal penetration. They shall allow for a minimum of six inches of penetration from each end, develop a minimum tensile load without yielding to 36,800 pounds and they shall be galvanized to ASTM A153 after threading.

(D) Mechanical Anchor Fittings:

Mechanical Anchor Fittings shall be per the manufacturer specifications.

(E) Line Posts:

Line Posts shall meet all manufacturer specifications. Posts shall bend over rather than shear upon impact and they shall be galvanized to ASTM A-123, after fabrication. Posts shall have a means of holding the wire ropes at the design height. Post caps shall be per the manufacturer specifications.

(F) Line Post Sleeve:

Line Post Sleeves shall meet all manufacturer specifications. Line Post Sleeves shall be galvanized to ASTM A-123, after fabrication. Sleeve covers shall be per the manufacturer specifications.

(G) Line Post Foundations, Cast in Place with Sleeve:

Cast in place post foundations shall completely fill each excavated hole with concrete. Reinforcing steel shall be as required by the manufacturer. Concrete shall be per the manufacturer specification.

(H) Line Post Delineation:

Delineation shall be placed on both near and far sides of posts at a minimum spacing of 40 feet and shall be ASTM Type V retro-reflective sheeting or greater. Sheeting color shall be yellow. Minimum size shall be 7 sq. in. per exposed side and shall be placed within one inch from the top of post.

(I) Cable Barrier Terminals:

Cable Barrier Terminals shall be of the size and shape required by the manufacturer and shall meet the manufacturer specifications.

(J) Meter for Setting Cable Tension, Manufacturer Approved:

Meter shall be given to the Engineer or his representative upon completion and acceptance of the work.

(K) Shop Drawings:

Four sets of shop drawings shall be supplied for the installation of the following:

- Cable Barrier Terminal (NCHRP-350 approved).
- Typical installation of line posts and cable.
- Cable barrier post attachment to bridge deck (if applicable).

(L) Training Materials:

Training materials shall include installation manuals, maintenance manuals, and other materials deemed necessary to conduct training for proper installation and maintenance of the cable barrier system.

(M) Certificate of Analysis:

A Certificate of Analysis conforming to the requirements of Subsection 106.05 shall be submitted for wire rope, posts, and anchor frames. The manufacturer's material test reports for wire rope, posts, and anchor frames shall be submitted with the Certificate of Analysis.

Construction Requirements:

The existing median cable barrier system consists of 3 parallel strands attached to vertical posts in concrete foundations. The existing cable shall be terminated by cutting and removing the existing cable. Existing vertical support posts where the cable is to be removed shall be completely removed including any foundations. The cable barrier anchors shall have the cable termination bracket cut off flush to the top of the anchor and the concrete slab completely removed. The use of native materials for backfilling of any hole or depression is acceptable and is subject to the compaction requirements of Section 203-10.03 (B). Cables, posts, foundations and other materials associated with the removal shall become the property of the contractor.

(A) Training and Literature:

The contractor shall provide all training materials in hard copy and electronically in PDF format and he shall notify and provide installation and maintenance training and certification.

(B) Training Conducted By the Supplying Manufacturer:

Provide one training session prior to construction to the following:

- Contractor (Prime)
- Installation Contractor (Sub)
- Resident Engineer and/or designee

Provide 4 sets of shop drawings as stated above. Distribution shall be:

- ADOT Resident Engineer
- Prime Contractor
- Installation Contractor (sub)
- ADOT Maintenance Engineer

Provide one training session prior to ADOT accepting project to the following:

- ADOT District personnel

(C) Site Considerations:

Complete final grading requirements as per plan prior to installing cable barrier post foundations and terminals.

Prior to the start of work, the manufacturer's representative shall review the terminal placement locations as shown on the plans to ensure that placement location is in accordance with the manufacturer's recommendations for placement.

(D) Cast in Place Post Foundation:

Post foundations shall be per the manufacturer specifications. Excavate hole to diameter and depths as per cable manufacturer specification. Fill with concrete completely. Install required reinforcing steel. Install post sleeve ½ to 1 inch above finished grade. Fill the excavated hole with concrete, dome concrete down from top of post sleeve to flush with finished grade.

Allow concrete to achieve manufacturer strength requirement before installing any other elements of the barrier system.

(E) Terminals:

Terminals shall be per the manufacturer specifications and instructions.

When installed at a location of an existing terminal, the two cable barrier segments shall overlap as shown in the project plans. If the two systems are compatible, an approved field swage shall be used.

(F) Post and Cable Installation:

Install posts per the manufacturer requirements. Install cable per the manufacturer requirements. Tension per the manufacturer specifications and instructions.

(G) Tension Log:

Maintain tension log showing time, date, location, ambient temperature, and final tension reading, signed by the person performing the tension reading. Give log to the Engineer after work is completed. Include manufacturer recommended tension chart.

Parts and Contacts:

Manufacturer of system shall supply the following to the Maintenance District of the Department prior to project acceptance:

- Installation details and parts list of system. (4 sets).
- List of suppliers of repair parts, with contact information.
- List of Arizona based, manufacturer trained installers.

Manufacturer of system shall supply parts directly to the Maintenance District within 48 hours of written notification of need.

Method of Measurement:

Median Cable Barrier (High Tension) will be measured by the linear foot along the top of the cable barrier, to the nearest foot for each segment length.

Median Cable Barrier Anchor (High Tension) will be measured by the unit each, including the end anchorage foundation and the first four socketed posts.

No measurement or direct payment will be made for the cost of the removal of existing cable barrier sections, the cost being considered incidental to the price for the Median Cable Barrier (High Tension) item.

No measurement or direct payment will be made for the cost of the training sessions, the cost being considered incidental to the price for the Median Cable Barrier (High Tension) item.

No measurement or direct payment will be made for additional posts, footings and sleeves provided by the manufacturer to meet deflection criteria, curve spacing criteria or other special application criteria required by their system.

Basis of Payment:

The accepted quantities of Median Cable Barrier (High Tension), measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work described and specified herein and on the project plans, complete and in place, including removal of existing cable barrier sections, installing all posts with sockets and caps, wire rope, fittings, end terminals, reflectors, excluders, excavation, concrete, backfill, compaction, shoulder build-up and other items to provide a system complete in place, including providing a Manufacturer's representative, as required.

The accepted quantities of Median Cable Barrier Anchor (High Tension), measured as provided above, will be paid for at the contract unit price, which price shall be full compensation for the work described and specified herein and on the project plans, complete and in place, including all fittings, hardware, sockets, posts, reflectors, excluders, excavation, forming, backfill, compaction, concrete, anchor frame and reinforced cage.

(905GRDRL, 12/14/09)

SECTION 905 - GUARDRAIL:

905-3.05 Reconstruct Guardrail: of the Standard Specifications is revised to read:

(A) General:

Existing guardrail, guardrail transitions, tangent and flared guardrail terminals, end anchors, and other guardrail systems shall be removed and reconstructed at the locations shown on the project plans, and in accordance with the provisions specified herein for new construction.

Guardrail shall be reconstructed in accordance with either Subsection 905-3.05(B) or 905-3.05(C).

For reconstructed guardrail transitions, tangent and flared guardrail terminals, end anchors, and other guardrail systems, all components shall be completely removed and then reconstructed using existing posts, blocks, and hardware, unless otherwise specified herein.

Reconstructed tangent and flared guardrail terminals and end anchors shall be installed with new foundation tubes.

Unless otherwise specified herein, where existing posts include a concrete foundation, the concrete foundation shall be fully removed and the hole backfilled with moist soil in compacted lifts, as approved by the Engineer. No separate payment will be made for removal of concrete foundations, or the subsequent backfill and compaction, the cost being considered as included in the contract item.

All guardrail components to be re-used shall be removed in such a manner as to prevent damage to and minimize the loss of the components.

Items designated to be reused which are lost, damaged or destroyed as a result of the contractor's operations shall be repaired or replaced by the contractor at no additional cost to the Department.

If any materials designated for reconstruction are deemed by the Engineer to be unsuitable for reuse or if the quantities of existing materials are insufficient to complete the work, the contractor shall furnish new materials in sufficient quantities to complete the work and the cost of furnishing such materials will be paid for in accordance with the provisions of Subsection 109.04.

Existing posts, blocks, rail elements, or hardware which are not required for guardrail reconstruction or which the Engineer deems unsuitable for reconstruction, shall be removed and disposed of as directed by the Engineer.

(B) Reconstruct Guardrail With Existing Materials:

When reconstruct guardrail with existing materials is specified, all guardrail components shall be completely removed and then reconstructed using existing rail elements, posts, blocks, and hardware.

Where new bolt holes in reused rail elements are permitted and approved by the Engineer, the holes shall be made by drilling or punching. Flame-cut bolt holes will not be permitted. All metal cut in the field shall be cleaned and painted in accordance with Subsection 905-3.01.

(C) Reconstruct Guardrail With New Posts, Blocks, and Hardware:

When reconstruct guardrail with new posts, blocks and hardware is specified, all guardrail components shall be completely removed and then reconstructed using existing rail elements, and new posts, blocks, and hardware.

905-3.09 Nested Guardrail: the second paragraph of the Standard Specifications is revised to read:

Nested guardrail shall be defined as additional steel W-beam sections attached as an appurtenance to the normal guardrail, as shown on the plans.

905-4 Method of Measurement: the seventh paragraph of the Standard Specifications is revised to read:

Nested guardrail, Type 1, 2, or 3, attached as an appurtenance to new or reconstructed guardrail, shall be measured by the linear foot of additional steel W-beam attached to the normal guardrail to provide a complete installation, as shown on the plans. Such measurement shall be in accordance with the pay limits shown on the plans, and shall be separate from and in addition to the quantity of normal guardrail.

905-5 **Basis of Payment:** the seventh, eighth, ninth, and tenth paragraphs of the Standard Specifications are revised to read:

The accepted quantities of nested guardrail, Type 1, 2, or 3, comprised of additional steel W-beam attached to the normal guardrail, measured as provided above, will be paid for at the contract unit price per linear foot, complete in place. Such payment for nested guardrail shall be separate from the price paid for the normal guardrail specified above.

The accepted quantities of bolted guardrail anchors, measured as provided above, will be paid for at the contract unit price each, and shall be full compensation for the work, complete in place, including steel brackets, hardware, excavation, backfill, removing and replacing surfacing, cutting and fitting steel beam posts or timber posts, drilling anchor bolt holes in steel posts, timber posts and box culverts, and disposal of surplus materials.

The accepted quantities of construct guardrail, guardrail transitions, and end anchors from salvage, measured as provided above, will be paid for at the contract unit price, complete in place, including all new guardrail delineation, removal of existing delineation as necessary, excavation, backfill and disposal of surplus or unusable materials.

The accepted quantities of reconstruct guardrail with existing materials, measured as provided above, will be paid for at the contract unit price, complete in place, including all new guardrail delineation, removal of existing delineation as necessary, excavation, backfill and compaction, and disposal of surplus or unusable materials.

The accepted quantities of reconstruct guardrail with new posts, blocks, and hardware, measured as provided above, will be paid for at the contract unit price, complete in place, including all new posts, blocks, and hardware, new guardrail delineation, removal of existing delineation as necessary, excavation, backfill and compaction, and disposal of surplus or unusable materials.

The accepted quantities of reconstruct guardrail transitions, tangent and flared guardrail terminals, and end anchors, measured as provided above, will be paid for at the contract unit price, complete in place, including new guardrail delineation, removal of existing delineation as necessary, excavation, backfill and compaction, and disposal of surplus or unusable materials. Payment for reconstructing end anchors, and tangent and flared guardrail terminals, will include all costs for providing and installing new foundation tubes.

The contractor will be paid in accordance with the provisions of Subsection 109.04 for furnishing new posts, blocks, rail elements or hardware to replace components deemed by the Engineer unsuitable for reuse, or to supplement insufficient existing quantities for reconstructing the various types of guardrail, or for constructing the various types of guardrail from salvage.

ITEM 9240010 FORCE ACCOUNT WORK (DECOMPOSED GRANITE):

Description:

The contractor shall replace, as requested by the Engineer, decomposed granite along disturbed areas within the project limits.

Materials:

The contractor shall meet the requirements of Section 803-3.02, for decomposed granite materials. The contractor shall be aware that there are multiple different colors of decomposed granite within the project limits. The contractor shall coordinate with ADOT District Landscape Maintenance office on color selection.

Construction Requirements:

The contractor shall meet the requirements of Section 803-3.02.

Method of Measurement:

The Force Account Work of Decomposed Granite will be measured as a complete unit of work.

No measurement or payment will be made for Decomposed Granite areas disturbed by the contractor's construction activities as these areas are considered included in the contract items.

Basis of Payment:

The accepted quantity of Decomposed Granite, measured as provided above, will be paid for in accordance with the requirements of Section 109.04 (D) – Force Account of the Standard Specifications.

ITEM 9240011 FORCE ACCOUNT WORK (PULL BOX AND CONDUIT RECONDITIONING):

Description:

The contractor shall replace or adjust, as requested by the Engineer and based upon the field inventory, extensions, pull boxes, lids or any other work needed to remedy conditions of existing pull boxes, Loop detectors, or miscellaneous FMS elements within the project limits.

The contractor shall replace or adjust, as requested by the Engineer and based upon the field inventory, all conduit sweeps in pull boxes, conduit orientation and alignment, unusable conduit, or bell ends or fittings within the project limits.

Materials:

The contractor shall meet the requirements of Section 732-2, for conduit and pull boxes, except as modified by these Special Provisions.

Construction Requirements:

(A) Pull Box Reconditioning

Pull box reconditioning shall be completed prior to the start of work on fiber optic cable or conductor installation.

(B) Conduit Reconditioning

The inventory completed by the contractor shall include locating and documenting damaged areas within existing conduit by utilizing either a fish-tape or fiberglass rod. The contractor shall provide record drawing information to the Department for conduits that are found to be different than indicated on the Plans. The contractor shall pull a metal-disk or metal-ball mandrel, with a diameter that is 90 percent of the conduits' inner diameter (80 percent for HDPE conduit), through all existing empty and contractor installed conduits.

Prior to identifying conduit as damaged, the contractor shall verify that the conduit has not become compacted with soil. Where fiber optic cable and copper conductors do not exist, the contractor may use pressurized air, or other means, to clean the conduit.

Conduit reconditioning shall be completed prior to the start of work on fiber optic cable or conductor installation.

Method of Measurement:

The Force Account Work of Pull Box and Conduit Reconditioning will be measured as a complete unit of work.

Basis of Payment:

The accepted quantity of Pull Box and Conduit Reconditioning, measured as provided above, will be paid for in accordance with the requirements of Section 109.04 (D) – Force Account of the Standard Specifications.

ITEM 9240012 FORCE ACCOUNT WORK (IRRIGATION REPAIR):

Description:

The contractor shall repair, as requested by the Engineer, irrigation lines throughout the project area that were disturbed due to these construction activities.

The irrigation system shall be repaired, flushed and tested at operating pressure for leaks in the system within 24 hours. The irrigation system shall be repaired with comparable materials and using installation methods to the approval of the Engineer.

Materials:

The contractor shall meet the requirements of Section 807-3.03, for the irrigation system. The contractor shall coordinate with ADOT District Landscape Maintenance office on the irrigation repairs.

Construction Requirements:

The contractor shall meet the requirements of Section 807-3.03 of the Standard Specifications.

Method of Measurement:

The Force Account Work of Irrigation repair will be measured as a complete unit of work.

Basis of Payment:

The accepted quantity of Irrigation Repair, measured as provided above, will be paid for in accordance with the requirements of Section 109.04 (D) – Force Account of the Standard Specifications.

ITEM 9240014 FORCE ACCOUNT WORK (PROVIDE ELECTRICAL SERVICE)

Description:

The contractor shall facilitate the establishment of the necessary final electrical service for the FMS equipment. This force account creates a funding source for any necessary permits, service initiation fees, hookup fees, required deposits, transformers, j-boxes, etc. required by Salt River Project (SRP) related to the final establishment of electrical service.

The total fees to establish the final electrical service at each location are site specific. The costs will be estimated and provided by SRP, and reimbursed to the contractor under this Force Account item.

The following table presents the new and modified existing power service locations:

Load Center No.	Location	Comments
LC6004961	1997 W. Santan Freeway	Existing SRP Service
LC6104861	1259 S. Alma School Road	New SRP Service
LC6104762	1237 S. Arizona Avenue	New SRP Service
LC6004763	1275 S. Arizona Avenue	New SRP Service
LC6104658	1600 S. McQueen Road	New SRP Service

LC6004658	1758 S. McQueen Road	New SRP Service
LC6004559	1610 S. Cooper Road	New SRP Service
LC6104452	1595 S. Gilbert Road	New SRP Service
LC6004458	1610 S. Gilbert Road	New SRP Service
LC6104359	3652 S. Lindsay Road	New SRP Service
LC6004359	3765 S. Lindsay Road	New SRP Service
LC6002452	3481 S. Val Vista Drive	New SRP Service
LC6104147	2921 S. Santan Village Parkway	New SRP Service
LC6004148	2979 S. Santan Village Parkway	New SRP Service
LC6004078	2388 E. Williams Field Road	New SRP Service
LC6103977	2388 E. Ray Road	New SRP Service

Materials:

All materials required by SRP to establish the final electrical service shall conform to the SRP Electric Service Specifications, including Section 11: Contractor Supplied Material, the SRP plans, the applicable ITS Standard Drawings, project plans and these project Special Provisions.

New SRP contractor-supplied junction boxes where required to be installed by the contractor shall conform to page 11-4 of Section 11 of the SRP Electric Service Specifications.

Construction Requirements:

Construction Requirements shall conform to the SRP Electric Service Specifications, Section 732, unless otherwise specified in the SRP Electric Service Specifications, Section 732, unless otherwise specified in the ITS Standard Drawings, the ITS Standard Drawings, the project plans, and these Special Provisions.

Method of Measurement:

The Force Account Work of Provide Electrical Service will be measured as a complete unit of work.

Basis of Payment:

The accepted quantity of Provide Electrical Service, measured as provided above, will be paid for in accordance with the requirements of Section 109.04 (D) – Force Account of the Standard Specifications.

ITEM 9240119 MISCELLANEOUS WORK (SMALL FORM-FACTOR PLUGGABLE TRANSCEIVER):

Description:

The work under this item shall consist of all labor, materials, and equipment and install field hardened Small Form-Factor Pluggable (SFP) transceivers at designated locations

in Node 16 as shown on the plans, as detailed in accordance with these special provisions, and as directed by the Engineer.

For the new SFPs that will be installed in Node 16, the contractor will coordinate with ADOT to install the SFPs and reconfigure the existing switches to accommodate the new fiber communications channels being established for this project (Phase 14B).

The contractor shall ensure compatibility of the new SFPs with the existing switches in Node 16.

Materials:

Provide all SFP transceivers of the same manufacturer. All equipment shall be new and in strict accordance with the details shown on the plans and in the specifications. All SFP transceivers furnished, assembled, fabricated, or installed under this item shall meet the following provisions:

General:

- The characteristics are performed in accordance with Telcordia Specification GR-468-CORE
- Single +3.3V Power Supply
- RoHS Compliant and Lead-free
- AC/AC Differential Electrical Interface
- Eye Safety Designed to meet Laser Class 1 compliant with EN60825-1
- Compliant with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP)
- EMC requirement meets FCC in the United States and CENELEC EN55022 (CISPR 22) in Europe

Technical:

- The characteristics are performed in accordance with Telcordia Specification GR-468-CORE
- Operating Temperature: - 40 to 85 degrees C / - 40 to 185 degrees F)
- Distance: 40 km
- Cable Type: 9/125 µm/SM
- Connector Type: Duplex LC
- Wavelength 1310 nm
- Link Budget: 20 dBm
- Sensitivity: -23 dBm

Method of Measurement:

The Small Form-Factor Pluggable Transceivers shall be measured as a unit for each SFP Transceiver furnished and installed, including all connectors, labor and incidental items to make a complete and accepted installation in Node 16 as specified on the Plans and these Special Provisions.

Basis of Payment:

The accepted quantities of Small Form-Factor Pluggable Transceivers, 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.

ITEM 9240120 MISCELLANEOUS WORK (FIBER PATCH PANEL):

Description:

The contractor shall furnish and install Fiber Patch Panel connector housing capable of housing 12 SC style connectors in the pump station locations as shown in the plans. The contractor shall install the fiber patch panel at a location within the pump station equipment room as designated by the Engineer, generally, on the wall next to the existing radio panel. The contractor shall also terminate all 12 fibers with female SC style connectors.

Materials:

The fiber patch panel shall be compatible with the SC connectors provided with the patch cords and with the SC connectors terminate the cabling at the panel installed by the contractor.

The fiber patch panel shall be compatible with plenum-rated loose tube fiber and provide protection of the buffer tube and individual fibers. The panel shall be capable of securing the cable to the housing to prevent any damage due to movement.

The panel shall terminate the fiber on panels consisting of 12 SC type connectors. The connectors shall have SC connectors compatible with single mode fiber. The connectors shall have metal inserts in a composite housing.

Construction Requirements:

The Fiber Patch Panel shall be secured to the wall at a location designated by the Engineer. The cabling shall be routed to the panel as to prevent any damage inside or outside of the panel. The contractor shall install SC type connectors on the each fiber in the cable and attach to the panel in the cable order. The SC connectors for the cable may be fusion pre-polished pigtails or hot melt field-polished connectors. No dry crimp connectors will be acceptable. These SC connectors shall be incidental to the fiber patch panel.

Method of Measurement:

The Fiber Patch Panel shall be measured as a unit for each Fiber Patch Panel furnished and installed, including connectors, labor and incidental items to make a complete and accepted installation as specified on the Plans and these Special Provisions.

Basis of Payment:

The accepted quantities of Fiber Patch Panel, 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 SC connectors.

ITEM 9240122 MISCELLANEOUS WORK (GigE SWITCH):

Description:

The contractor shall furnish and install field hardened Gigabit Ethernet Switches (GigE Switch) at designated locations as shown on the plans, as detailed in accordance with these special provisions, and as directed by the Engineer.

Materials:

Provide all Gigabit Ethernet Switches of the same manufacturer. All equipment shall be new and in strict accordance with the details shown on the plans and in the specifications. All Gigabit Ethernet Switches shall be fully compatible with the existing ADOT Network Management System (NMS) server. The contractor shall demonstrate, to the Engineer, the compatibility of the Gigabit Ethernet Switch before the material submittal can be approved by the Engineer.

Provide a high-performance and field hardened Gigabit Ethernet Switch supporting standard Open System Interconnection (OSI) Layer 2 functionality. Provide a Gigabit Ethernet Switch that supports direct connectivity to existing networks configured in ring and mesh fault tolerant topologies enabling applications to operate reliably and with low latency.

Include all equipment licenses, where required, for any software or hardware in the system.

Comply with the following standards for all Gigabit Ethernet Switches furnished, assembled, fabricated, or installed under this item:

- IEEE 802.1d – Spanning Tree Protocol
- IEEE 802.1d – MAC Bridges
- IEEE 802.1p – Class of Service
- IEEE 802.1q – VLAN Tagging
- IEEE 802.1w – Rapid Spanning Tree Protocol
- IEEE 802.1x – Port Based Network Access Control
- IEEE 802.3 – 10BaseT
- IEEE 802.3af – Power over Ethernet Type 1
- IEEE 802.3at – Power over Ethernet Type 2
- IEEE 802.3u – 100BaseTX, 100BaseFX
- IEEE 802.3x – Flow Control
- IEEE 802.3z – 1000BaseLX
- IEEE 802.3ab – 1000BaseTX

- IEEE 802.3ab – Link Aggregation
- RFC768 – UDP
- RFC783 – TFTP
- RFC791 – IP
- RFC792 – ICMP
- RFC793 – TCP
- RFC826 – ARP
- FRC854 – Telnet
- RFC894 – IP over Ethernet
- RFC1112 – IGMP v1
- RFC1519 – CIDR
- RFC1541 – DHCP (client)
- RFC2030 – SNTP
- RFC2068 – HTTP
- RFC2236 – IGMP v2
- RFC2284 – EAP
- RFC2475 – Differentiated Services
- RFC2865 – Radius
- RFC3414 – SNMPv3-USM
- RFC3415 – SNMPv3-VACM

Provide all Gigabit Ethernet Switches with a physical design that conforms to the following requirements:

- Shall be configurable in point-to-point, daisy-chain, ring, and mesh topologies for connectivity into new and existing fiber optic and copper based Ethernet networks.
- Designed with an operating system that allows individual ports to be configured for port mirroring, speed, duplex, auto-negotiation, and flow control. The operating system shall also provide for broadcast storm frame filtering with user defined thresholds.
- Designed with an operating system that allows for the collection of statistics on a per port basis and provides for full support of Remote Monitoring (RMON) statistics, history, alarms, and event groups.
- Shall be capable of providing port security to prevent unknown devices from gaining access to the network. Unauthorized attempts to access the network shall result in the port being shut down for a definable period of time along with Simple Network Management Protocol (SNMP) trap and alarm generation.
- Shall have an operating environmental range of -40 to +74 degrees C with no fans.

Provide the following functionality and features:

(A) Port Performance:

- Provide Gigabit Ethernet Single mode Fiber ports that operate at 1000 Mbps.
- Provide Gigabit Ethernet RJ-45 copper ports with auto-negotiate operation at 10 Mbps and 100 Mbps.

- Provide external optical attenuators as necessary to support interconnectivity with close range devices upstream or downstream.

(B) Packet-Processing:

- Processing type: store and forward
- Frame buffer memory: 2 Mbit
- Switching Latency: 8 us
- Priority Queues: 4
- Virtual Local Area Networks (VLAN): 64
- Internet Group Management Protocol (IGMP) multicast groups: 256
- Switching bandwidth: 1.8 Gbps

(C) Gigabit Ethernet Network Connections:

- Two duplex SC connector ports for single mode fiber at a distance of 25km.
- Four RJ-45 connector ports for copper.

(D) Network Management Software:

The Network Management Software shall be server based software with the following capabilities:

- Graphic Visualization: Display network layout in hyperbolic tree structure with management functions, overview and tracking.
- Dynamic Discovery: Ability to discover and track all wireless, roaming or fixed devices in real time.
- Real Time Monitoring: Constant monitoring of all connected devices for potential status.

(E) Power Requirements:

- 120 VAC ± 10 percent, 60 ± 3 Hz

(F) Mechanical:

- Enclosure: Shall be constructed from a minimum 20 gage high strength galvanized steel case with metal mounting plates, suitable for stand-alone, shelf, rack, or din mounting. Enclosure shall be permanently and clearly identified with name, model number, serial number, and any other pertinent information required to facilitate equipment maintenance.

General Requirements:

(A) Documentation:

The contractor shall provide certification that the field hardened Gigabit Ethernet Switches furnished and installed are in conformance with the manufacturer standard and these specifications.

(B) Warranty:

The Gigabit Ethernet Switch shall be warranted by the contractor against all defects in material and workmanship in accordance with Subsection 106.13 as amended by these Special Provisions with the following additional requirement:

The warranty for the Gigabit Ethernet Switch shall include the following; that in the event of a malfunction during the warranty period, the defective unit, card, module, subassembly, or auxiliary device shall be replaced with a working unit within three working days for use while the warranted unit is being repaired.

Construction Requirements:

Minimum requirements for the Contractor or designated subcontractor involved in the installation and testing of the Gigabit Ethernet Switch equipment are:

- Three years experience in the installation, testing and maintenance of Ethernet equipment.

- Two installations where an Ethernet switches were deployed and the network has remained in continuously satisfactory operation for at least 2 years. The Contractor shall submit as proof, photographs or other support documents, and the names and contact information of the operating personnel who can be contacted regarding the networks operation.

Necessary documentation of subcontractor qualifications must be approved by Engineer prior to purchasing the field hardened Gigabit Ethernet Switch.

Installations of equipment shall be for ease of maintenance, with all component parts being readily accessible for inspection and maintenance.

Ensure that all external screws, nuts and locking washers are stainless steel. The use of self-tapping screws shall not be used without written approval by the Engineer.

Contractor shall meet all applicable codes and standards requirements for all external wiring to the Gigabit Ethernet Switches. All wires and cables shall be neatly installed and secured per common practices and standards. Contractor shall provide service loop at all connection points.

Contractor shall provide and install 1 duplex single mode SC to SC Fiber patch cable for each Fast Ethernet fiber port installed in the Gigabit Ethernet Switch.

Contractor shall provide and install 1 Category 5e patch cord for each Fast Ethernet copper port install in the Gigabit Ethernet Switch.

Contractor shall coordinate with the Engineer all switch configuration information, (i.e. IP addresses, VLANs etc.) 45 days prior to installing Ethernet Switches.

(A) Testing Requirements:

The Gigabit Ethernet Switch shall meet the following tests:

- Pre-Installation Testing:

The Contractor shall inspect the Gigabit Ethernet Switch upon delivery for any visual damage, inventory contents, and ensure proper functionality.

- Subsystem Testing:

The Contractor shall ensure the Gigabit Ethernet Switches, are correctly installed, configured, and are properly functioning as networked subsystem.

- System Acceptance Testing (SAT):

As part of the SAT the Contractor shall demonstrate that all Gigabit Ethernet Switches functioning and are operational for the duration of the SAT.

(B) Training Requirements:

In the event the contractor submits a Gigabit Ethernet Switch which is not currently in use by ADOT, the contractor shall arrange for and provide a training course for the Gigabit Ethernet Switch equipment components. The course shall be of adequate duration to cover the subject matter and shall have an instructor competent in the technical aspects of the Gigabit Ethernet Switch equipment. The training course shall provide training to up to 12 Engineering and Maintenance personnel.

The contractor shall submit a syllabus, training materials and a schedule for the Gigabit Ethernet Switch equipment training course to the Engineer for review and approval 45 days prior to the proposed start of training. The Engineer will notify the contractor of acceptability within 30 days of submittal. The contractor shall schedule the training no sooner than 14 days from receipt of the approved syllabus unless otherwise noted in the approval. Training materials shall include the course outline, material describing the course, and operations and maintenance manuals with any additional information needed to adequately describe the subject being taught. Training materials shall not be copyrighted.

Method of Measurement:

Each Gigabit Ethernet Switch furnished and installed shall include all material, hardware, configuration, testing, and labor necessary to make a complete and accepted installation as specified on the Plans and these Special Provisions. All mounting brackets, mounting hardware (i.e., screws, nuts, bolts), power cords, power transformer, fiber patch cables and adapters, copper patch cords, and documentation shall be included under this item.

Basis of Payment:

The accepted quantities of Gigabit Ethernet Switches, 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.

(923CBOJT, 04/14/15)

ITEM 9230002 - CONTRACTOR BASED ON-THE-JOB TRAINING:

1.0 Description:

1.01 Purpose:

The contractor shall provide on-the-job training (OJT) aimed at moving minorities, women, economically disadvantaged, and veteran trainees into journey-level positions in various types of construction trades or job classifications through a contractor-based OJT program. The contractor-based approach assigns contractors annual training goals for a specific number of trainees and hours. The contractor is provided the flexibility to meet the annual trainee and training hour goals on any transportation projects in the United States throughout the year, rather than on a project-by-project basis. Contractors may include ADOT and non-ADOT projects as long as more than 40 percent of the training hours are completed on ADOT projects.

Training of minorities and women toward journey-level status is a primary objective of this Training Special Provision. Accordingly, the contractor shall make every effort to enroll minority, women, economically disadvantaged, and veteran 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 this Training Special Provision. 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.

1.02 Program Summary:

The Department has established a Contractor Based On-The-Job Training Pilot Program for a one year period from July 1, 2015 to June 30, 2016. All successful bidders will automatically be placed in the Pilot Program beginning on July 1, 2015. Standard OJT requirements associated with individual projects will no longer be applied at the project level for new projects. OJT requirements will be applicable on an annual basis for each contractor performing work on ADOT projects. During the OJT Pilot Program each contractor meeting the threshold described in Subsection 1.04 of this Training Special Provision will be required to provide training for **one trainee** for a minimum of **1000 hours.** The 1000 hours may be completed by one or more trainees; if a trainee reaches program completion before completion of the 1000 hours then an additional enrolled_trainee may be used to complete the remaining training hours. For example, if a trainee reaches program completion after 700 hours, the contractor is

required to provide an additional 300 hours of training to an enrolled trainee in order to meet its annual OJT goal.

Contractors may also assign OJT Trainees to be trained by subcontractors on any project with ADOT approval. However, the contractor will only receive credit towards its annual goal for hours earned by its own OJT Trainees. The contractor's OJT Trainees must be employed by the contractor and be enrolled in an approved training program as described in Subsection 2.01 of this Training Special Provision.

Hours earned by a subcontractor's OJT Trainees on a project will be credited to that subcontractor's annual training goal and the contractor shall reimburse the subcontractor in accordance with Subsection 2.02 of this Training Special Provision.

No employee shall be employed as a trainee in any classification in which they have successfully completed a training course leading to journey-level status or in which they have been employed at journey-level status. The contractor shall satisfy this requirement by including appropriate questions in the employment application or by other suitable means. Regardless of the method used, the contractor's records shall document the findings in each case.

The trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journey-level status individuals in the various classifications. The ratio of apprentices and OJT Trainees to journey persons shall not be greater than permitted by the terms of the approved training program being utilized. When a specific ratio is not provided, the ratio of apprentices and OJT Trainees to journey persons expected to be on the contractor's work force during normal operations shall fall between 1:10 and 1:4, pursuant to 23 CFR 230.111(c)(10).

1.03 Definitions:

"OJT Trainee" herein refers to (a) a minority, female, veteran or economically disadvantaged individual enrolled in either a State of Arizona registered apprenticeship program or ADOT's OJT program and (b) any other individual ADOT approves for enrollment in such an apprenticeship or OJT program and for credit toward the OJT Goals.

"Program Completion" herein refers to the point in time when a trainee in the ADOT OJT Program has completed the required number of levels and hours of training within a calendar year for a designated craft classification or a registered Apprenticeship program, or has achieved journey-level status.

"Journey-Level Status" applies to a person who has completed a registered apprenticeship program or is an experienced worker, not a trainee, and is fully qualified and able to perform all of the duties of a specific trade without supervision.

"Economically Disadvantaged Persons" applies to a person who:

- 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.

- 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.
- Is a foster child on behalf of whom State or local government payments are made.
- Does not have a high school diploma or GED.
- Is from a family whose total annual household income is below the federal poverty limits. See Appendix A of the *OJT Guidelines and Procedures* document found at http://azdot.gov/business/business-engagement-and-compliance/on-the-job-training-program/ojt-contract-compliance.

1.04 Annual Training Goal:

During the OJT Pilot Program, each contractor that was awarded ADOT federally funded construction contracts, as a prime contractor, for $2,000,000 or more between October 1, 2013 and September 30, 2014 will be assigned an annual OJT goal to train a minimum of one trainee for a minimum of 1000 hours. The trainee shall receive training in the same construction trade or job classification from July 1, 2015 to June 30, 2016 with the aim of eventually achieving journey-level status. If the contractor is not awarded an ADOT federally funded contract during the pilot program period, they will not be required to meet the assigned annual OJT goal.
If a contracting firm is not assigned an annual OJT goal, it is not required to provide on-the-job training on ADOT projects regardless of whether OJT hours are included in the project bid schedule. If the contractor chooses to provide training to a registered OJT trainee on an ADOT federal-aid project although they do not meet the above criteria, the contractor will be reimbursed as described in Subsection 2.02 of this Training Special Provision.

The contractor shall make every possible effort to provide additional trainees with training and shall see that all trainees are afforded every opportunity to participate in as much training as is practically possible to provide. Contractors will not be required to meet OJT goals on individual contracts, but must meet the assigned annual training goal for the assigned number of OJT Trainees and hours by the end of the year.
Since not every OJT Trainee that enrolls in the program will complete the program, the contractor is encouraged to enroll sufficient numbers of OJT Trainees (well beyond the number of its annual training goal) to help ensure that it will meet its annual OJT goal if some OJT Trainees drop out of the program during the year. The contractor must carefully screen, hire, and support trainees that are likely to meet or exceed the 1000 hours of OJT during the calendar year, eventually earn journey-level status, and be retained as part of its workforce.

2.0 Requirements:

2.01 Approved Training Programs:

For this Contractor-Based OJT Program, the ADOT Business Engagement & Compliance Office (BECO) will only recognize two types of contractor based training programs. The programs are:

- The Department's OJT Program as approved by FHWA and described at http://azdot.gov/business/business-engagement-and-compliance/on-the-job-training-program/ojt-contract-compliance or
- Registered Apprenticeship and OJT programs registered with the Bureau of Apprenticeship, U.S. Department of Labor and/or the State of Arizona.

Contractors must use one or both of these programs. The contractor shall indicate which OJT program it is using for each trainee on his/her Trainee Enrollment form. It is the intention of these provisions that training be provided in the construction 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 a significant part of the overall training.

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. Contractors shall ensure that each trainee does not exceed the maximum number of training hours required for the completion of the selected training program unless prior approval is received from the Engineer.

2.02 Reimbursement:

The contractor will be reimbursed $3.00 per hour of training provided to a trainee on an ADOT federal-aid project up to the maximum number of hours approved for reimbursement on the project and shown in the project bid schedule. Reimbursement will not be made for a trainee's hours that exceed the maximum number of training hours required for the completion of his/her training program. In addition, the contractor will not be reimbursed for hours in excess of the maximum training hours shown on the project bid schedule unless written approval is received in advance from the Engineer.

The maximum number of hours approved for reimbursement on each ADOT federal-aid contract will be calculated by the Department, based on the engineer's estimate for the project and the contract time.

The trainee will be paid the appropriate trainee Davis-Bacon wage rates for training classifications/crafts on federally-funded projects. The contractor shall compensate OJT Trainees according to pay levels and percentages outlined in the ADOT Training Program Manual found at http://azdot.gov/business/business-engagement-and-compliance/on-the-job-training-program/ojt-contract-compliance.

Contractors shall reimburse subcontractors for the subcontractor's trainees on ADOT federally funded projects at least 75-percent of the amount paid to the contractor by the Department per training hour.

2.03 Submittals:

The contractor shall complete and submit the following to BECO:

- *OJT Program Trainee Enrollment Form* for approval for each proposed minority, female, veteran, economically disadvantaged, and other OJT Trainee throughout the year as each individual is hired. The form shall be submitted to BECO within the first week of hire if working on an ADOT project. If the contractor is working on an ADOT project, the form shall also be submitted to the Engineer.

  In addition, if the contractor is working on an ADOT construction project, the contractor shall submit the *OJT Program Trainee Enrollment Forms* of all current trainees to the Engineer at the Preconstruction Conference.

- Contractors shall enter trainee hours worked on ADOT construction projects on a weekly basis into the web-based Labor Compliance System, LCPtracker. Trainee hours not entered into LCPtracker by the 15th of each month for the preceding month will be considered delinquent. Trainee hours on non-ADOT contracts shall be entered into LCPtracker on a monthly basis.

- *OJT Monthly Progress Report Form* shall be submitted for each month by the 15th of the following month.

- *OJT Monthly Trainee Progress Report Form* shall be submitted for each trainee for each month by the 15th of the following month.

- *OJT Trainee Termination/Completion Form* when an OJT Trainee completes 1000 or more hours in the same construction trade or job classification within a calendar year, achieves journey-level status, terminates employment with the contractor, or withdraws from the OJT program.

- *OJT Annual Summary Report Form* by July 15, 2016 for the Pilot Program as described in Subsection 4.02 of this Training Special Provision.

The contractor's June monthly reports and uploads into LCPtracker submitted after July 31st will not be accepted or considered towards goal attainment for the previous calendar year.

All forms and Guidelines and Procedures for the Contractor-Based OJT program are available online at http://azdot.gov/business/business-engagement-and-compliance/on-the-job-training-program/ojt-contract-compliance.

The contractor shall retain the training records for all OJT Trainees for a period of five years following the completion of the trainee's work on contracts documenting his performance under this Training Special Provision. Such records shall be available at reasonable times and places for inspection or review by ADOT and the Federal Highway Administration.

The contractor is required to meet the assigned annual OJT goal if they are awarded federally funded ADOT construction contract(s) during the year. In anticipation of obtaining an ADOT contract, contractors are encouraged to begin registering trainees with the Department using the OJT Program Trainee Enrollment Form at the beginning of the year. In order to count training hours toward the goal, the trainee must be

registered with the Department and their hours must be entered monthly into the LCPtracker system as described in this specification.

2.04 OJT Liaison:

The contractor shall designate an OJT Liaison that shall be responsible for monitoring and administering its OJT Program and monitoring the trainees' progress. 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. The contractor shall furnish each trainee a copy of the Training Program, monthly reports that reflect their training hours accumulated to date and other documentation related to the training program. The contractor shall further make every reasonable effort to provide training that develops the skills outlined in the training program. The contractor shall furnish each trainee, upon successful completion of their training program, a certificate showing the type and length of training satisfactorily completed.

2.05 Training Hours:

Credit towards the contractor's annual training goal shall be earned as follows:

- Credit will be allowed towards the contractor's annual goal for the year in which the trainee entered training.

- Credit will be allowed for each trainee employed on a project, pending official enrollment, for all documented hours completed.

- Credit will be allowed for a terminated trainee if the contractor demonstrated a good faith effort to meet the goal and the trainee completed more than 90% of the training hours required for the year.

Credit will not be allowed when the contractor fails to provide the required training or does not make a satisfactory good faith effort to meet the requirements of the program.

2.06 Program Completion:

A trainee will be considered to have completed the program once the trainee completes the required number of levels and hours of training for the same craft or classification within a year, completes a registered apprenticeship program, or achieves journey-level status as determined by the contractor. Once a trainee completes a specific training level for a classification, the contractor will not be permitted to resubmit that trainee for enrollment or reimbursed at that same level, unless approved in advance by the Engineer.

Upon completion of the program, the contractor shall notify BECO so that a Certificate of Completion can be issued to the trainee showing the type and length of training satisfactorily completed.

3.0 Good Faith Efforts:

Whenever a contractor requests ADOT approval of someone other than a minority,

economically disadvantaged individual, woman, or veteran for credit towards its annual training goal, the contractor shall submit documented evidence of its Good Faith Efforts to fill that trainee position with a minority, female, veteran, or economically disadvantaged individual. Documentation of Good Faith Efforts shall be made by completing and submitting the Good Faith Effort form and supporting documentation to BECO.

Good Faith Efforts are those efforts designed to achieve equal opportunity through positive, proactive, and continuous result-oriented measures (23 CFR 230.409(g)(4)). Good Faith Efforts should be made as trainee hiring opportunities arise. More information on Good Faith Efforts is available in the *OJT Guidelines and Procedures* document available on BECO's website.

4.0 ADOT Program Monitoring:

4.01 Site Visits:

BECO may conduct periodic site visits to a contractor's worksite to review OJT Program compliance, as part of a FHWA required Contractor Compliance Program Review process. 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 available to meet with BECO staff as well as be available to respond to periodic emails and phone calls from BECO to check on the progress of OJT Trainees. BECO will make every effort to ensure minimal disruption to a contractor's work.

4.02 Determination of Compliance:

An OJT Annual Summary Report Form for the previous 12 months (July 1, 2015 to June 30, 2016) shall be submitted to BECO by July 15, 2016 for the Pilot Program. The report shall provide an accurate account of all trainee hours; identifying each trainee by name, ethnicity, and gender and identifying each project and/or contract, listing the contracting agency, whether they are ADOT projects/contracts, whether they are federally funded projects/contracts, and the trainee hours attributed thereto. The report shall include written explanation and documentation of Good Faith Efforts, if the contractor fails to meet its goal.

BECO will review the contractor's OJT Monthly and Annual Reports and Good Faith Effort documentation. BECO will determine whether the contractor has met the assigned annual training goal or made a good faith effort to do so. BECO will communicate its decisions in writing to the contractor.

If a contractor has neither attained its goal nor submitted adequate Good Faith Efforts documentation, ADOT will issue a Show Cause Notice outlining its findings of non-compliance. Within 30 days of receiving the Show Cause Notice, the contractor may submit a written response to the Show Cause Notice providing argument and evidence in opposition to the Department's findings of non-compliance.

If a 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

ADOT to change its findings of non-compliance, ADOT will issue its Final Notice to the Contractor regarding the non-compliance.

(925SRVY, 02/20/08)

SECTION 925 - CONSTRUCTION SURVEYING AND LAYOUT:

925-5 **Basis of Payment:** the first two sentences of the second paragraph of the Standard Specifications are 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 ITEM 9250101 - ONE-PERSON SURVEY PARTY at the predetermined rate of $65 per hour, ITEM 9250102 - TWO-PERSON SURVEY PARTY at the predetermined rate of $100 per hour, ITEM 9250103 - THREE-PERSON SURVEY PARTY at the predetermined rate of $135 per hour, ITEM 9250106 – SURVEY MANAGER at the predetermined rate of $100 per hour, and ITEM 9250105 - OFFICE SURVEY TECHNICIAN at the predetermined rate of $70 per hour.

(1003EPOX, 9/08/11)

SECTION 1003 REINFORCING STEEL:

1003-1 **General Requirements:** the first paragraph of the Standard Specifications is revised to read:

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 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 required from the coating manufacturer and Certificates of Analysis shall be required from the coating applicator.

1003-2 **Reinforcing Bars:** the first paragraph of the Standard Specifications is revised to read:

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 A 615. Unless otherwise specified, steel bars meeting the requirements of ASTM A 706 may be substituted for ASTM A 615 steel bars. When ASTM A 706 bars are used, tack welding of the reinforcement will not be permitted unless approved in writing by the Engineer.

1003-3 **Wire:** of the Standard Specifications is revised to read:

Steel wire used as spirals or ties for reinforcement in concrete shall conform to the requirements of ASTM A 82.

1003-5.02 Epoxy for Coating: the fifth paragraph of the Standard Specifications is revised to read:

The contractor shall furnish a Certificate of Compliance from the coating manufacturer, conforming to the requirements of Subsection 106.05. The Certificate of Compliance 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.

1003-5.03 Application of Coating: the ninth and tenth paragraphs of the Standard Specifications are revised to read:

The contractor shall furnish a Certificate of Analysis from the coating applicator, conforming to the requirements of Subsection 106.05, with each shipment of coated steel. In addition to the requirements of Subsection 106.05, 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.

(1006PCC, 10/03/14)

SECTION 1006 PORTLAND CEMENT CONCRETE:

1006-1 General Requirements: of the Standard Specifications is revised to read:

Portland cement concrete shall consist of a mixture of hydraulic cement, fine aggregate, coarse aggregate, and water. It may also contain air-entraining admixtures, chemical admixtures, and supplementary cementitious materials.

The contractor shall determine the mix proportions and shall furnish concrete which conforms to the requirements of the specifications. All concrete shall be sufficiently workable, at the slump proposed by the contractor within the specified range, to allow proper placement of the concrete without harmful segregation, bleeding, or incomplete consolidation. It shall be the responsibility of the contractor to proportion, mix, place, finish, and cure the concrete properly in accordance with the requirements of the specifications.

1006-2.01 Hydraulic Cement: the second through the fifth paragraphs of the Standard Specifications are revised to read:

Portland cement shall conform to the requirements of ASTM C 150 for Type II, III, or V, and shall be low alkali cement containing not more than 0.60 percent total alkali (Na_2O equivalent).

Portland-pozzolan cement shall conform to the requirements of ASTM C 595 for blended hydraulic cement with moderate sulfate resistance, Type IP (MS).

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 or Portland-pozzolan cement) and supplementary cementitious material (Fly Ash, Natural Pozzolan, or Silica Fume).

Hydraulic cement shall be approved prior to its use in accordance with ADOT Materials Policy and Procedure Directive No. 13, "Certification and Acceptance of Hydraulic Cement, Fly Ash, Natural Pozzolan, Silica Fume, and Lime".

1006-2.02 Water: the first sentence of the first paragraph of the Standard Specifications is revised to read:

The water used shall be free of injurious amounts of oil, acid, alkali, clay, vegetable matter, silt, or other harmful matter.

1006-2.03(A) General Requirements: the first paragraph of the Standard Specifications is revised to read:

When concrete is to be placed at elevations above 4,500 feet, the fine aggregate and the coarse aggregate shall be subjected to five cycles of the sodium sulfate soundness test, and the weighted percentage loss determined separately for each, in accordance with the requirements of AASHTO T 104. The weighted percentage loss determined for each shall not exceed 10 percent. Tests for soundness may be waived when aggregates from the same source have been approved and the approved test results apply to the current production from that source.

1006-2.03(A) General Requirements: the second paragraph of the Standard Specifications is hereby deleted:

1006-2.03(A) General Requirements: the fifth paragraph of the Standard Specifications is revised to read:

When aggregates are stored on the ground, the sites for the stockpiles shall be level and clear of all vegetation. The bottom one-foot layer of aggregate shall not be disturbed or used.

1006-2.03(A) General Requirements: "Lightweight particles" in the table of the ninth paragraph of the Standard Specifications is revised to read:

Lightweight particles (Specific gravity less than 2.0)	AASHTO T 113 (See Note)

1006-2.03(B) Fine Aggregate: "Lightweight particles" in the table of the second paragraph of the Standard Specifications is revised to read:

Lightweight particles (Specific gravity less than 2.0)	AASHTO T 113 (Except that the percent of lightweight particles shall be reported to the nearest 0.01%.)	1.25% (0.25% Max. Coal and Lignite*)

1006-2.03(B) Fine Aggregate: the last paragraph of the Standard Specifications is revised to read:

Fine aggregate shall be made into mortar and subjected to testing under AASHTO T 71, except that the mortar shall develop a compressive strength at seven and 28 days of not less than 90 percent of that developed by a mortar prepared in the same manner with the same Type II cement and graded sand conforming to the requirements of ASTM C 778.

1006-2.03(C) Coarse Aggregate: "Lightweight particles" in the table of the second paragraph of the Standard Specifications is revised to read:

Lightweight particles (Specific gravity less than 2.0)	AASHTO T 113 (Except that the percent of lightweight particles shall be reported to the nearest 0.01%.)	1.25% (0.25% Max. Coal and Lignite*)

1006-2.04(A) General Requirements: the first paragraph of the Standard Specifications is hereby deleted.

1006-2.04(B) Air-Entraining Admixtures: the first paragraph of the Standard Specifications is revised to read:

Air-entraining admixtures shall conform to the requirements of ASTM C 260.

Air-entraining admixtures shall be approved prior to their use in accordance with ADOT Materials Policy and Procedure Directive No. 2, "Certification and Acceptance of Chemical and Air-Entraining Admixtures for Portland Cement Concrete".

1006-2.04(C) Chemical Admixtures: the first paragraph of the Standard Specifications is revised to read:

Chemical admixtures shall conform to the requirements of ASTM C 494.

Chemical admixtures shall be approved prior to their use in accordance with ADOT Materials Policy and Procedure Directive No. 2, "Certification and Acceptance of Chemical and Air-Entraining Admixtures for Portland Cement Concrete".

1006-2.04(D) Supplementary Cementitious Material (Fly Ash, Natural Pozzolan, and Silica Fume): the first paragraph of the Standard Specifications is revised to read:

Supplementary cementitious materials may be used in addition to hydraulic cement. Supplementary cementitious materials shall be approved prior to their use in accordance with ADOT Materials Policy and Procedure Directive No. 13, "Certification and Acceptance of Hydraulic Cement, Fly Ash, Natural Pozzolan, Silica Fume, and Lime".

1006-2.04(D) Supplementary Cementitious Material (Fly Ash, Natural Pozzolan, and Silica Fume): the last two paragraphs of the Standard Specifications are revised to read:

When a supplementary cementitious material with a calcium oxide content greater than 15 percent is proposed, the hydraulic cement/supplementary cementitious material blend shall be tested for sulfate expansion in accordance with ASTM C 1012. The maximum expansion shall be 0.10 percent at six months.

When either moderate or high sulfate resistant concrete is specified in the Special Provisions, the proposed hydraulic cement/supplementary cementitious material blend shall be tested for sulfate expansion in accordance with ASTM C 1012. When moderate sulfate resistance is specified, the maximum expansion shall be 0.10 percent at six months. When high sulfate resistance is specified, the maximum expansion shall be 0.05 percent at six months or 0.10 percent at one year.

1006-2.05 Concrete Curing Materials: the second paragraph of the Standard Specifications is revised to read:

Acceptance of concrete curing materials shall be as specified in ADOT Materials Policy and Procedure Directive No. 3, "Curing Compounds".

1006-3.01 **Design Criteria:** Table 1006-A of the Standard Specifications is revised to read:

TABLE 1006-A

Class of Concrete	Minimum 28-Day Compressive Strength Required: psi (See Note 1)	Cementitious Material Content: Lbs per Cu Yd Minimum - Maximum (See Notes 2, 3, and 4)	Maximum Water/Cementitious Material Ratio (w/cm): Lb./Lb.	Slump Range: Inches
B	2,500	470 – 658	None	(See Note 6)
S	2,500	520 – 752	0.55	
	3,000 (See Note 5)			
	3,500			
	4,000			
	4,500	564 – 752	0.50	
	Greater than 4,500	564 - 800	0.45	
P	4,000	564 – 658	None	0 – 4.5
H	High performance concrete as specified in project special provisions.			

Note 1: Testing for compressive strength of cylinders for all classes of concrete shall be in accordance with the requirements of Arizona Test Method 314.

Note 2: A supplementary cementitious material (fly ash, natural pozzolan, or silica fume) conforming to the requirements of Subsection 1006-2.04(D) may be used, as specified in paragraphs (a) through (f) below.

(a) When Portland cement is used, a maximum of 25 percent, by weight of the cementitious material, may be an approved fly ash or natural pozzolan, except as specified in paragraphs (d), (e), and (f) below.

(b) When Portland-pozzolan cement [Type IP (MS)] is used, fly ash or natural pozzolan is not allowed, except as specified in paragraphs (d), (e), and (f) below.

(c) When silica fume is used, a maximum of 10 percent, by weight of either Portland cement or Portland-pozzolan cement, may be used.

(d) When a compressive strength greater than 4,500 psi is required, supplementary cementitious material may be added in excess of the maximum cementitious material content. Fly ash or natural pozzolan may exceed 25 percent, by weight of the cementitious material, if approved by the Engineer.

(e) When increased sulfate resistance is specified, the required amount of fly ash or natural pozzolan shall be incorporated into the concrete and may exceed 25 percent, by weight of the cementitious material.

(f) For Class S concrete used in bridge decks, a minimum of 20 percent, by weight of the cementitious material, must be an approved Class F fly ash or natural pozzolan, unless otherwise approved by the Engineer.

Note 3: For any concrete mix, other than for precast and/or prestressed bridge members, with a Portland cement content greater than 545 pounds per cubic yard, **one** of the options specified in paragraphs (a) through (e) below for the mitigation of a potential alkali silica reaction (ASR) shall be used:

(a) A minimum of 20 percent Class F fly ash or natural pozzolan, by weight of the cementitious material, shall be used. The Class F fly ash or natural pozzolan shall have a calcium oxide content of 15 percent or less.

(b) Instead of using Portland cement, Type IP (MS) Portland-pozzolan cement with a Class F fly ash or natural pozzolan content of at least 20 percent, by weight of the cementitious material, shall be used. The Class F fly ash or natural pozzolan shall have a calcium oxide content of 15 percent or less.

(c) Limit the total alkali (Na_2O equivalent) to a maximum of 3.00 pounds per cubic yard of concrete, when calculated as follows:

$$\begin{bmatrix}\text{Pounds of total}\\ \text{alkali per cubic}\\ \text{yard of concrete}\end{bmatrix} = \frac{\begin{pmatrix}\text{Pounds of Portland}\\ \text{cement per cubic}\\ \text{yard of concrete}\end{pmatrix} \times \begin{pmatrix}Na_2O \text{ equivalent (\%)}\\ \text{in Portand cement}\end{pmatrix}}{100}$$

(d) Introduce a lithium nitrate admixture, which has been approved by the Engineer, at a minimum dosage of 0.55 gallons of 30 percent lithium nitrate solution per pound of total alkali (Na_2O equivalent) per cubic yard of concrete. The required amount of lithium nitrate is calculated as follows:

$$\begin{bmatrix}\text{Required gallons}\\ \text{of 30 percent}\\ \text{lithium nitrate}\\ \text{solution}\end{bmatrix} = \frac{\begin{pmatrix}\text{Pounds of}\\ \text{Portland cement}\\ \text{per cubic yard}\\ \text{of concrete}\end{pmatrix} \times \begin{pmatrix}Na_2O \text{ equivalent (\%)}\\ \text{in Portand cement}\end{pmatrix}}{100} \times (0.55)$$

(e) The coarse aggregate and the fine aggregate shall be tested separately in accordance with ASTM C 1260 to determine the potential for alkali silica reaction (ASR). When aggregates show the potential for ASR, as indicated by expansions of 0.10% or greater at 16 days after casting, sufficient mitigation for the expansion shall be determined in accordance with ASTM C 1567. The use of fly ash or natural pozzolan may exceed 25 percent, by weight of the cementitious material.

Note 4: Unless otherwise specified, the cementitious material content shall be as shown.

Note 5: Unless otherwise shown on the plans.

Note 6: The proposed slump shall be chosen by the contractor. Concrete at the proposed slump shall be sufficiently workable to allow proper placement without harmful segregation, bleeding, or incomplete consolidation.

1006-3.01 Design Criteria: the second, third, and fourth paragraphs of the Standard Specifications are revised to read:

Air-entraining admixtures will be required for all classes of concrete placed at an elevation of 3,000 feet or above. The air content of the concrete mixture shall not be less than four percent nor more than seven percent by volume. However, no air-entrainment will be required for minor precast structures, precast pipe, and precast, prestressed structural members supporting a concrete deck slab or impervious overlay. Also, no air-entrainment will be required for any precast items constructed using the dry pack or no-slump method.

For elevations below 3,000 feet, air-entraining admixtures may be used at the option of the contractor. If air-entraining admixtures are used, the air content of the concrete mixture shall not exceed seven percent by volume.

Concrete that fails to conform to the air content requirements listed above for the respective elevation as determined by the Engineer, shall be rejected prior to placement.

1006-3.01 Design Criteria: the first and second sentences of the sixth paragraph of the Standard Specifications are revised to read:

The coarse aggregate size designation for Class S or Class B concrete shall be chosen by the contractor and approved by the Engineer and shall conform to the size designation and grading requirements of AASHTO M 43. In choosing the size designation, the maximum size of coarse aggregate shall not be larger than one fifth of the narrowest dimension between the sides of adjacent forms, or two thirds of the minimum clear spacing between reinforcing bars, or two thirds of the minimum clear spacing between reinforcing bars and the sides of adjacent forms, or one third of the depth of the slab, whichever is least.

1006-3.01 Design Criteria: the first sentence of the seventh paragraph of the Standard Specifications is revised to read:

Coarse aggregate for Class P concrete used to construct Portland cement concrete pavement without load transfer dowels shall be separated into two or more stockpiles.

1006-3.02 Design Procedures: the first paragraph of the Standard Specifications is revised to read:

At least two weeks prior to the appropriate concreting operation, the contractor shall furnish a mix design for each class of concrete and each strength of Class S concrete for review and approval. More than one mix design for each class of concrete and each strength of Class S concrete may be submitted for approval provided specific items and locations of intended uses accompany the mix design. The contractor shall substantiate each mix design by furnishing test data and providing all details of the mixtures proposed for use. Mix designs, for other than precast or prestressed concrete, shall be prepared by or under the direction of, and signed by, a registered professional engineer, a NICET Level III or higher certified technician in the concrete subfield, a NRMCA Level 3 Certified Concrete Technologist, or an ACI certified Concrete Laboratory Testing Technician Level 2 or Grade II. Mix designs for precast or prestressed concrete shall be prepared by or under the direct supervision of, and signed by, either one of the individuals listed above or a PCI Quality Control Technician/Inspector Level II or higher. Individuals preparing and submitting mix designs shall have experience in the development of mix designs and mix design testing for the respective type of concrete.

1006-3.02 Design Procedures: the second and third paragraphs of the Standard Specifications are revised to read:

The complete solid volume mix designs submitted for approval shall include all weights and volumes of all ingredients. The brand, type, and source of hydraulic cement and admixtures, the coarse aggregate size number designation, source of aggregates, the specific gravities of all ingredients, the proposed slump, the water/cementitious material ratio, a product code to identify the mix design, and the intended use of each mix design shall be an integral part of each mix design.

The use of new and previously used mix designs, and the requirements for trial batches, will be as required by ADOT Materials Policy and Procedure Directive No. 15, "Submittal and Approval of Portland Cement Concrete Mix Designs".

1006-4.01 General Requirements: of the Standard Specifications is revised to read:

The contractor may obtain concrete for each class of concrete and for each strength of Class S concrete from a source approved by the Engineer in lieu of establishing a batch plant at the project site.

For each class of concrete and each strength of Class S concrete, except for Class P concrete produced in a batch plant at the site and used exclusively for Class P work, the

contractor shall furnish a delivery ticket for each batch of concrete. The minimum information to be shown on each delivery ticket shall be the date, time batched, truck identification number, name or identification of batch plant, name of contractor, name and location of project, the quantity of concrete, the batch weights/volumes or mix design product code, the amount of permissible additional water to meet the design water/cementitious material ratio, and the number of revolutions that the concrete has been mixed at mixing speed in a truck mixer. An authorized representative of the contractor shall be responsible for each delivery ticket and shall sign each delivery ticket accepting the contractor's responsibility for the concrete. The representative shall immediately furnish the delivery ticket to the Engineer.

When requested by the Engineer, the contractor shall supply a separate record for each batch of concrete which shows the batch weight/volume of each individual ingredient.

1006-4.02(A) Hydraulic Cement: the last sentence of the first paragraph of the Standard Specifications is hereby deleted:

1006-4.03(A) General Requirements: the last sentence of the first paragraph of the Standard Specifications is revised to read:

Concrete may be mixed in a mobile mixer at the site for Class S or Class B concrete, provided written permission of the Engineer is granted.

1006-4.03(B) Mixing in a Stationary Mixer: the last sentence of the third paragraph of the Standard Specifications is revised to read:

The mixing time shall be not less than 60 seconds for one cubic yard and shall be increased 15 seconds for each additional cubic yard or fraction thereof for Class S or Class B concrete.

1006-4.03(C) Mixing in Truck Mixers: the first sentence of the last paragraph of the Standard Specifications is revised to read:

If additional mixing water is required to maintain the mix design water/cementitious material ratio, the concrete shall be mixed by a minimum of 30 revolutions of the drum at mixing speed after the water has been added, prior to discharge of any concrete for placement.

1006-4.03(D) Mixing in Mobile Mixers: of the Standard Specifications is revised to read:

Concrete mixing in mobile mixers for Class S or Class B concrete shall be performed in accordance with the requirements of AASHTO M 241.

1006-4.04 Consistency: the second paragraph of the Standard Specifications is revised to read:

The contractor shall furnish Class S and Class B concrete having the slump shown on the approved mix design, with a permissible variation of ± one inch when the slump shown on the approved mix design is four inches or less, and a permissible variation

of ± 1½ inches when the slump shown on the approved mix design is greater than four inches. However, when an approved high range water reducing chemical admixture (ASTM C 494, Type F or Type G) conforming to the requirements of Subsection 1006-2.04 is used, the permissible variation will be ± two inches, regardless of the slump shown on the approved mix design.

1006-5 **Weather Limitations:** the title of the Standard Specifications is revised to read:

1006-5 **Concrete Temperature and Weather Limitations:**

1006-5.01 **General Requirements:** of the Standard Specifications is revised to read:

The temperature of the concrete mixture immediately before placement shall not be less than 50 degrees F nor greater than 90 degrees F. Concrete that fails to conform to this temperature requirement shall be rejected prior to placement.

Under rainy conditions, placing of concrete shall be stopped before the quantity of surface water is sufficient to cause a flow or wash of the concrete surface or have a detrimental effect on the finished concrete and acceptance parameters.

Placing of concrete shall immediately cease if the hauling vehicles or any equipment or pedestrian traffic tracks mud on the prepared base or changes the allowable subgrade dimensional tolerances for Class P concrete and slabs placed on subgrade for Class S or Class B concrete.

1006-5.02 **Hot Weather Concreting:** of the Standard Specifications is revised to read:

Forms, subgrade, and reinforcing steel shall be sprinkled with cool water just prior to the placement of concrete.

Mix water may be cooled by refrigeration, liquid nitrogen, or well-crushed ice of a size that will melt completely during the mixing operation. If crushed ice is used, it shall be substituted for part of the mix water on a pound for pound basis.

1006-5.03 **Cold Weather Concreting:** of the Standard Specifications is revised to read:

Concrete shall not be placed on or against ice-coated forms, reinforcing steel, structural steel, conduits, or construction joints; nor on or against snow, ice, or frozen earth materials. Immediately prior to placing concrete, the temperature of forms, reinforcing steel, earthen material, or any other material that will come in contact with the freshly placed concrete shall be a minimum temperature of 40 degrees F. If artificial heat is used to adjust the temperature of the items that will come in contact with the freshly mixed concrete, the temperature of these items shall not exceed 10 degrees F greater than that of the concrete being placed.

Concrete operations shall be discontinued when a descending ambient temperature in the shade and away from artificial heat falls below 40 degrees F. Concrete operations shall not be resumed until an ascending ambient temperature in the shade and away from artificial heat exceeds 35 degrees F unless otherwise approved by the Engineer.

Mixing and placing concrete shall continue no later in any day than that time which will allow sufficient time to place and protect the concrete already poured before the ambient temperature drops to 35 degrees F.

Concrete shall be protected in a manner to maintain all concrete surface temperatures at not less than 50 degrees F for a period of 72 hours after placement and at not less than 40 degrees F for an additional 96 hours.

The contractor may use equipment to heat the aggregates or water, or both, prior to mixing. If aggregates are heated, the minimum temperature of the heated aggregate shall be 60 degrees F and the aggregates shall have no chunks of ice or frozen aggregate present. Equipment used to heat the aggregates shall be such that consistent temperatures are obtained throughout the aggregate within each batch and from one batch to another. Water shall not be heated in excess of 150 degrees F unless the water is mixed with the aggregate prior to the addition of cement to the batch. During the heating or mixing process, cement shall not be added to water and aggregate combinations which exceed 100 degrees F.

When weather forecasts indicate a probability that ambient temperatures will fall below 35 degrees F during the placement or curing periods, the contractor shall submit a cold weather concreting plan to the Engineer for approval prior to concrete placement. The cold weather concreting plan shall detail methods and equipment which will be used to ensure that the required concrete temperatures are maintained. The contractor shall provide adequate cold weather protection in the form of insulation and/or heated enclosures to protect the concrete after placement. For bridge decks and suspended structures, the cold weather concreting plan shall include protection measures for both the top and bottom surfaces of the concrete. This protection shall maintain concrete surface temperatures as specified above at all locations in the structure. When artificial heating is required, the heating units shall not locally heat or dry the surface of the concrete.

When a cold weather concreting plan is required, the Engineer may require concrete temperatures to be measured and continuously recorded by the use of temperature sensing devices during the entire curing period. The contractor shall provide the temperature sensing devices and recording instruments. The contractor shall install temperature sensing devices near the surface of the concrete at locations and depths designated by the Engineer. When concrete is placed on a bridge deck or suspended structure, both the bottom surface and the top surface shall be monitored with temperature sensing devices. Temperature sensing devices and recording instruments shall be approved by the Engineer. The contractor shall continuously monitor the concrete temperature and provide the recorded data to the Engineer at any time upon request.

If the surface concrete temperature at any location in the structure falls below 35 degrees F during the curing period, the Engineer may direct the contractor to core

the areas in question at the locations indicated by the Engineer. The contractor shall submit the cores to a petrographer for examination in accordance with ASTM C 856. Concrete damaged by frost, as determined by the petrographer, shall be removed and replaced at no additional cost to the Department. All costs associated with coring, transmittal of cores, and petrographic examination shall be borne by the contractor regardless of the outcome of the petrographic examination.

The placing of concrete will not be permitted until the Engineer is satisfied that all the necessary protection equipment and materials are on hand at the site and in satisfactory working condition.

Concrete requiring cold weather protection shall have such protection removed at the end of the required curing period in such a manner that will permit a gradual drop in the concrete temperatures.

1006-7.01 **General:** the second paragraph of the Standard Specifications is revised to read:

Rejection of concrete will also occur due to insufficient compressive strength. Concrete compressive strength requirements consist of the specified strength which the concrete shall attain before various loads or stresses are applied and a minimum strength at 28 days.

1006-7.01 **General:** the last sentence of the third paragraph of the Standard Specifications is revised to read:

Sampling and testing for compressive strength will be performed on all classes of concrete furnished, including each strength specified on the project plans for Class S concrete.

1006-7.02 **Sampling and Testing of Concrete:** the first sentence of item (1) of the second paragraph of the Standard Specifications is revised to read:

(1) Concrete for Class S or Class B shall be sampled only once during discharge in the middle portion of the batch.

1006-7.02 **Sampling and Testing of Concrete:** of the Standard Specifications is modified to add:

If approved by the Engineer, and unless otherwise specified, Arizona Test Method 318 may be used to estimate concrete strength by the maturity method. The maturity method shall not substitute for compressive strength acceptance testing (28-day test cylinder breaks). The contractor shall submit a written request to the Engineer prior to using the maturity method. If its use is approved by the Engineer, the contractor shall be responsible to develop the strength-maturity relationship and shall also be responsible to provide the maturity meter(s) and digital data loggers necessary, as well as performing all required testing, all at no additional cost to the Department.

1006-7.03(A) 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, a sample of concrete for the required tests, as specified in Subsection 1006-7.02, will be taken on a daily basis for each 100 cubic yards, or fraction thereof, of continuously placed concrete from each batch plant. For Class S concrete with a compressive strength requirement equal to or greater than 4000 psi, a sample of concrete for the required tests, as specified in Subsection 1006-7.02, will be taken on a daily basis for each 50 cubic yards, or fraction thereof, of continuously placed concrete from each batch plant. For Class B concrete, a sample of concrete for the required tests, as specified in Subsection 1006-7.02, will be taken for each 100 cubic yards placed from each batch plant. For Class S or Class B concrete placed at elevations of 3,000 feet or above, air content testing shall be performed for each 50 cubic yards placed, regardless of the compressive strength requirement. An additional sample or samples for any of the required tests may be taken at an interval of less than the sampling frequency specified above, at the discretion of the Engineer, on any batch or load of concrete. A sample for the required tests on daily placements of 10 cubic yards or less may be taken at the discretion of the Engineer.

1006-7.03(B) Class E Concrete: of the Standard Specifications is revised to read:

1006-7.03(B) BLANK

1006-7.06(A) Class P Concrete: the fourth sentence of the second paragraph of the Standard Specifications is revised to read:

Cores must be obtained under the observation of an ADOT representative and delivered to the Engineer in time to allow complete testing within 48 days of placement. Testing shall be performed by the Department.

1006-7.06(B) Class S and Class B Concrete: the second paragraph of the Standard Specifications is revised to read:

Concrete failing to meet at least 85 percent of the 28-day compressive strength for specified strengths of 3,000 pounds per square inch and below, 90 percent for a specified strength of 3,500 pounds per square inch, or 95 percent for specified strengths of 4,000 pounds per square inch and above, or any concrete failing to meet the other requirements of Subsection 1006-7.01, will be rejected and removed at no additional cost to the Department and replaced with concrete which meets the specified requirements, unless the contractor can submit evidence that will indicate to the Engineer that the strength and quality of the concrete is such that the concrete should be considered acceptable and be allowed to remain in place.

1006-7.06(B) Class S and Class B Concrete: the third sentence of the last paragraph of the Standard Specifications is revised to read:

All cores shall be obtained and tested in accordance with the requirements of Arizona Test Method 317. Testing shall be performed by the Department.

(1007REFS, 11/05/13)

SECTION 1007 - RETROREFLECTIVE SHEETING:

1007-1 **General Requirements:** the last two sentences of the first paragraph of the Standard Specifications are revised to read:

Sheeting shall conform to criteria listed in the most current version of ASTM D 4956 for the applicable type and class, unless otherwise specified.

1007-2 **Material Types:** of the Standard Specifications is revised to read:

Sheeting for permanent warning signs, regulatory signs, and overhead-mounted guide signs, including all sign legends and borders, shall be ASTM Type XI.

Sheeting for all warning signs with yellow backgrounds shall be Type XI fluorescent retroreflective yellow.

Sheeting for information signs, ground-mounted guide signs, and marker signs, including all sign legends and borders, shall be ASTM Type IX or XI.

Sheeting for permanent object markers and delineators on a rigid substrate with yellow backgrounds, including guardrail end treatments, guardrail markers, rigid delineators, and impact attenuators, shall be Type XI fluorescent retroreflective yellow.

Sheeting for permanent object markers and delineators on a rigid substrate in colors other than yellow, including guardrail end treatments, guardrail markers, rigid delineators, and impact attenuators, shall be ASTM Type IX or XI.

Sheeting for object markers and delineators on a flexible or plastic substrate, including flexible delineators and sand barrels, shall be ASTM Type VIII, IX or XI.

For temporary regulatory and guide signs on a rigid substrate with fluorescent retroreflective orange sheeting, ASTM sheeting Types VIII, IX, or XI shall be used.

For temporary regulatory and guide signs on a rigid substrate in colors other than fluorescent retroreflective orange, ASTM sheeting Types IV, VIII, IX, or XI shall be used.

For retroreflective orange temporary signs on a flexible or roll-up substrate, ASTM Type VI sheeting shall be used.

All temporary signs (rigid, flexible, or roll-up) with orange backgrounds shall use fluorescent retroreflective orange sheeting, except that non-reflective sign materials may be used for temporary signs where the signs will be clearly visible under available natural light.

For barricades and other temporary channelizing devices, ASTM sheeting Types IV, VIII, IX, or XI shall be used.

Sheeting for Adopt-A-Highway signs shall be ASTM Type I, IV, or XI.

Logo signs shall be ASTM Type I, IX, or XI.

When more than one sheeting type is allowed, the contractor may use any of the types listed, provided that materials used for a particular application shall be of the same ASTM type, manufacturer, and product for all signs of the same type in the project.

Opaque films used with sheeting shall be acrylic type films.

Direct-applied and demountable black characters shall be non-reflective.

1007-3 Visual Appearance, Luminance and Color Requirements: of the Standard Specifications is revised to read:

Except as specified herein, the color of the sheeting, ink or film shall conform to the ADOT Manual of Approved Signs, the Manual on Uniform Traffic Control Devices (MUTCD), and the plans.

All sheeting, inks and film used shall be uniformly colored so there is no visual variation in their appearance on the same sign or from sign to sign of the same colors.

Standard colors specified for sheeting, processing inks, and films shall, as applicable, match visually and be within the color tolerance limits required by Highway Tolerance Charts issued by the Federal Highway Administration. Additionally, for the retroreflective sheeting, unless otherwise noted, the Luminance Factor (Daytime Luminance) and Color Specification Limits (Daytime) shall conform to the applicable requirements of ASTM D 4956.

In addition to the luminance and color requirements, fluorescent orange sheeting and fluorescent yellow sheeting shall have the capacity to effectively fluoresce outdoors under low light conditions. For all applications requiring fluorescent orange sheeting or fluorescent yellow sheeting, the contractor shall provide a letter to the Engineer from the manufacturer certifying that the sheeting to be used is fluorescent.

1007-6 Adhesive: the first paragraph of the Standard Specifications is revised to read:

Reflective sheeting and film adhesives shall be Class I as specified in ASTM D 4956 and as modified herein.

1007-6 Adhesive: the third paragraph of the Standard Specifications is hereby deleted:

1007-8 Durability Requirements: the second and third paragraphs of the Standard Specifications are revised to read:

Sheeting shall be weather-tested as specified above in Subsection 1007-7. Sheeting weather-testing periods and durability ratings shall be as specified in Table 1007-8. In all cases, the related inks and films shall be tested along with the respective sheeting, and shall be subject to the same durability requirements as the sheeting.

TABLE 1007-8			
ASTM Sheeting Type	**Color**	**Weather-testing period, months**	**Durability rating, years**
XI	Fluorescent yellow	42	7
XI	Fluorescent orange	18	3
XI	All other colors	60	10
IX	Fluorescent orange	18	3
IX	All other colors	60	10
VIIIN	Fluorescent orange	18	3
VIII	All other colors	30	5
VI	Fluorescent orange	18	3
IV	All colors	30	5
I	All colors	30	5

(1012GRDRL, 10/30/08)

SECTION 1012 GUARDRAIL MATERIALS:

1012-2 **Fasteners, Elements, Posts and Blocks:** the title and first paragraph of the Standard Specifications are revised to read:

1012-2 **Fasteners, Rail Elements, Posts and Blocks:**

Guardrail fasteners, rail elements, posts, blocks, and other components shall conform to the requirements of ARTBA. Rail elements shall be galvanized after fabrication, with fabrication to include forming, cutting, shearing, punching, drilling, bending, welding, and riveting.

APPENDIX A

Fiber Test Summary Sheet Example

Fiber Test Summary Sheet (Example)

Fiber				Length (OTDR)	No. of Splices	Splice Loss Budget (1)	No. of Connectors	Conn. Loss Budget (2)	1310 Loss Budget (3)	1310 Actual Loss	1550 Loss Budget (4)	1550 Actual Loss	No. of Anomalies > 0.1 dB	P/F
No.	To	From	Branch Fiber No.											

Notes:

(1) Splice Loss Budget = No. of Splices x 0.1 dB/Splice

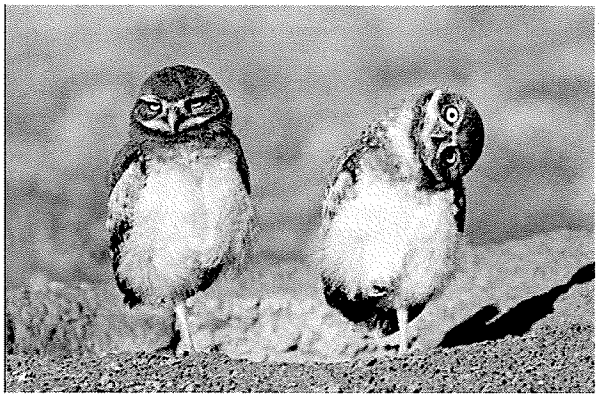
(2) Connector Loss Budget = No. of Connectors x 0.5 dB/connector

(3) 1310 Loss Budget = Length (OTDR) x 0.35 dB/km + Splice Loss Budget + Connector Loss Budget

(4) 1550 Loss Budget = Length (OTDR) x 0.25 dB/km + Splice Loss Budget + Connector Loss Budget

Appendix B

Western Burrowing Owl Awareness Flier



Western Burrowing Owl Awareness

ADOT Environmental Planning Group
1611 W. Jackson St- Mail Drop EM02
Phoenix, AZ 85007

The purpose of this flyer is to provide ADOT employees and contractors, working on roadside projects, with basic knowledge to reduce the risk of incidental take of Western Burrowing Owls.

Legal Status:

Western Burrowing Owls (*Athene cunicularia*) are protected under the Federal Migratory Bird Treaty Act of 1918. All migratory birds and their parts are fully protected. They are also protected under Arizona State Law in Title 17-101, Title 17-235, and Title 17-236.

What to look for:

- Description– small, ground-dwelling owl.
- Length– 19.5-25.0 cm (7.68-9.85 inches)
- Wingspan– 58.42 cm (23.0 inches)
- Mass– about 150 grams
- Males are typically slightly larger than females.
- Round head, lacks ear tufts.
- Distinct oval facial ruff, framed by a broad, puffy white eyebrow.
- Eyes contain a bright yellow iris.

Where are owls found?

- Dry, open, short grass, treeless plains.
- Dependent on fossorial mammals. (ground squirrels, prairie dogs, badgers, etc.) to construct burrows.
- Human dominated landscapes: golf courses, airports, agricultural fields.

Identifying an active burrow:

- Owls use burrows constructed by ground squirrels, badgers, coyotes and tortoises. They can also use pipes, culverts, and ditches.
- Presence of excrement (whitewash) near entrance to burrow.
- Burrowing owls frequently decorate entrance of burrows with cow or horse manure, feathers, vegetation and trash items.

How to avoid them:

- Scan ahead prior to arriving at a sign location.
- If burrowing owls are observed within the project area, stop and move at least 100 feet beyond the owl or occupied burrow before resuming work.

If you think your work may potentially impact a Burrowing Owl or active burrow, please stop.
Move at least 100 feet from the animal or burrow before resuming work.

If you have any questions or think you have a borrowing owl or active burrow on your work site please contact:
Joshua Fife, Biologist, ADOT Environmental Planning Group, jfife@azdot.gov
Office: (602)712-6819, Mobile: (602) 622-9622, EPG General: (602)712-7767

Source: Arizona Game and Fish Department Animal Abstract: Western Burrowing Owl. Heritage Data Management System

(revised November 25, 2013)

LIST OF SUBCONTRACTORS, SUPPLIERS, SERVICE PROVIDERS AND MANUFACTURERS BIDDING ON ADOT CONTRACTS

This form must be submitted to the Civil Rights Office by 4:00 p.m. on the fifth working day after the opening of bids. You may make copies of this form. List all companies that bid with your firm on this contract.

FAILURE TO SUBMIT THE REQUIRED INFORMATION BY THE STATED TIME AND IN THE MANNER HEREIN SPECIFIED SHALL BE CAUSE FOR THE BIDDER TO BE DEEMED NONRESPONSIVE.

Project No. _____ TRACS No. _____ Bidder _____

Firm Name	Contact Information (address or phone no)

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (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).

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.

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). 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 bid proposal or request for proposal 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).

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.

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. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 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 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, 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 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, 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 230, 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 (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 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 35 and 29 CFR 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.

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, 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 who 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.

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, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure 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. 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, 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, 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 there under. 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, 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 and 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. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor 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 contracting agency deems appropriate.

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 $10,000 or more.

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, 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). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

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

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

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

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

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour 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.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

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

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

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, 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.

3. Payrolls and basic records

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

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

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

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

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

(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 of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

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

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

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

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

d. 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. 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 journeymen 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.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

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

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

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

10. Certification of eligibility.

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

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

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 watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

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" 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:

(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.

2. 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. 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.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

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 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.

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 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).

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 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 1, 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

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

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.

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.

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.

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.

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 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee 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 grantee or subgrantee 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.

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.

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. 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 Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

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. 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) 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;

(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; 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.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. **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)

a. By signing and submitting this proposal, the prospective lower tier 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.

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 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 grantee or subgrantee 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 grantee or subgrantee 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.

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.

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 Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

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.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall 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 20).

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.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

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).

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.

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: AZ150008 11/06/2015 AZ8

Superseded General Decision Number: AZ20140008

State: Arizona

Construction Type: Highway

Counties: Coconino, Maricopa, Mohave, Pima, Pinal, Yavapai and Yuma Counties in Arizona.

HIGHWAY CONSTRUCTION PROJECTS

Note: Executive Order (EO) 13658 establishes an hourly minimum wage of $10.10 for 2015 that applies to all contracts subject to the Davis-Bacon Act for which the solicitation is issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.10 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/02/2015
1	06/12/2015
2	08/07/2015
3	11/06/2015

* CARP0408-005 10/01/2015

	Rates	Fringes
CARPENTER (Including Cement Form Work)	$ 24.63	11.54

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* ENGI0428-001 06/01/2015

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1	$ 22.59	9.34
Group 2	$ 25.86	9.34
Group 3	$ 26.94	9.34
Group 4	$ 27.97	9.34

POWER EQUIPMENT OPERATORS CLASSIFICATIONS:

GROUP 1: A-frame boom truck, air compressor, Beltcrete, boring bridge and texture, brakeman, concrete mixer (skip type), conductor, conveyor, cross timing and pipe float, curing machine, dinky (under 20 tons), elevator hoist (Husky and similar), firemen, forklift, generator (all), handler, highline cableway signalman, hydrographic mulcher, joint inserter, jumbo finishing machine, Kolman belt loader, machine conveyor, multiple power concrete saw, pavement breaker, power grizzly, pressure grout machine, pump, self-propelled chip spreading machine, slurry seal machine (Moto paver driver), small self-propelled compactor (with blade-backfill, ditch operation), straw blower, tractor (wheel type), tripper, tugger (single drum), welding machine, winch truck

GROUP 2:
ALL COUNTIES INCLUDING MARICOPA: Aggregate Plant, Asphalt plant Mixer, Bee Gee, Boring Machine, Concrete Pump, Concrete Mechanical Tamping-Spreading Finishing Machine, Concrete Batch Plant, Concrete Mixer (paving & mobile), Elevating Grader (except as otherwise classified), Field Equipment Serviceman, Locomotive Engineer (including Dinky 20 tons & over), Moto-Paver, Oiler-Driver, Operating Engineer Rigger, Power Jumbo Form Setter, Road Oil Mixing Machine, Self-Propelled Compactor (with blade-grade operation), Slip Form (power driven lifting device for concrete forms), Soil Cement Road Mixing Machine, Pipe-Wrapping & Cleaning Machine (stationary or traveling), Surface Heater & Planer, Trenching Machine, Tugger (2 or more drums).

MARICOPA COUNTY ONLY: Backhoe < 1 cu yd, Motor Grader (rough), Scraper (pneumatic tired), Roller (all types asphalt), Screed, Skip Loader (all types 3<6 cu yd), Tractor (dozer, pusher-all).

GROUP 3:
ALL COUNTIES INCLUDING MARICOPA: Auto Grade Machine, Barge, Boring Machine (including Mole, Badger & similar type directional/horizontal), Crane (crawler & pneumatic 15>100 tons), Crawler type Tractor with boom attachment & slope bar, Derrick, Gradall, Heavy Duty Mechanic-Welder, Helicopter Hoist or Pilot, Highline Cableway, Mechanical Hoist, Mucking Machine, Overhead Crane, Pile Driver Engineer (portable, stationary or skid), Power Driven Ditch Lining or Ditch Trimming Machine, Remote Control Earth Moving Machine, Slip Form Paving Machine (including Gunnert, Zimmerman & similar types), Tower Crane or Similar type.

MARICOPA COUNTY ONLY: Backhoe<10 cu yd, Clamshell < 10 cu yd, Concrete Pump (truck mounted with boom only), Dragline <10 cu yd, Grade Checker, Motor Grader (finish-any type power blade), Shovel < 10 cu yd.

GROUP 4: Backhoe 10 cu yd and over, Clamshell 10 cu yd and over, Crane (pneumatic or crawler 100 tons & over), Dragline 10 cu yd and over, Shovel 10 cu yd and over.

All Operators, Oilers, and Motor Crane Drivers on equipment with Booms, except concrete pumping truck booms, including Jibs, shall receive $0.01 per hour per foot over 80 ft in

addition to regular rate of pay

Premium pay for performing hazardous waste removal $0.50 per hour over base rate.

IRON0075-004 08/01/2015

COCONINO, MARICOPA, MOHAVE, YAVAPAI & YUMA COUNTIES

	Rates	Fringes
Ironworker, Rebar	$ 26.00	21.77

Zone 1: 0 to 50 miles from City Hall in Phoenix or Tucson
Zone 2: 050 to 100 miles - Add $4.00
Zone 3: 100 to 150 miles - Add $5.00
Zone 4: 150 miles & over - Add $6.50

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* LABO0383-002 06/01/2015

	Rates	Fringes
Laborers:		
Group 1	$ 16.49	4.95
Group 2	$ 17.39	4.95
Group 3	$ 18.09	4.95
Group 4	$ 19.03	4.95
Group 5	$ 19.89	4.95

LABORERS CLASSIFICATIONS:

GROUP 1: All Counties: Chipper, Rip Rap Stoneman. Pinal County Only: General/Cleanup Laborer.
Maricopa County Only: Flagger.

GROUP 2: Asphalt Laborer (Shoveling-excluding Asphalt Raker or Ironer), Bander, Cement Mason Tender, Concrete Mucker, Cutting Torch Operator, Fine Grader, Guinea Chaser, Power Type Concrete Buggy

GROUP 3: Chain Saw, Concrete Small Tools, Concrete Vibrating Machine, Cribber & Shorer (except tunnel), Hydraulic Jacks and similar tools, Operator and Tender of Pneumatic and Electric Tools (not herein separately classified), Pipe Caulker and Back-Up Man-Pipeline, Pipe Wrapper, Pneumatic Gopher, Pre-Cast Manhole Erector, Rigger and Signal Man-Pipeline

GROUP 4: Air and Water Washout Nozzleman; Bio-Filter, Pressman, Installer, Operator; Scaffold Laborer; Chuck Tender; Concrete Cutting Torch; Gunite; Hand-Guided Trencher; Jackhammer and/or Pavement Breaker; Scaler (using boson's chair or safety belt); Tamper (mechanical all types).

GROUP 5: AC Dumpman, Asbestos Abatement, Asphalt Raker II, Drill Doctor/Air Tool Repairman, Hazardous Waste Removal, Lead Abatement, Lead Pipeman, Process Piping Installer, Scaler (Driller), Pest Technician/Weed Control, Scissor Lift, Hydro Mobile Scaffold Builder.

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* PAIN0086-001 04/01/2014

	Rates	Fringes
PAINTER		
PAINTER (Yavapai County only), SAND BLASTER/WATER BLASTER (all Counties)	$ 19.50	4.85

ZONE PAY: More than 100 miles from Old Phoenix Courthouse $3.50 additional per hour.

SUAZ2009-001 04/20/2009

	Rates	Fringes
CEMENT MASON	$ 19.28	3.99
ELECTRICIAN	$ 22.84	6.48
IRONWORKER (Rebar)		
Pima County	$ 23.17	14.83
Pinal County	$ 20.27	8.35
LABORER		
Asphalt Raker	$ 15.49	3.49
Compaction Tool Operator	$ 14.59	2.91
Concrete Worker	$ 13.55	3.20
Concrete/Asphalt Saw	$ 13.95	2.58
Driller-Core, diamond, wagon, air track	$ 16.94	3.12
Dumpman Spotter	$ 14.99	3.16
Fence Builder	$ 13.28	2.99

Flagger Coconino, Mohave, Pima, Pinal, Yavapai & Yuma.....	$ 12.35	1.59
Formsetter.....	$ 16.09	3.97
General/Cleanup Laborer Coconino, Maricopa, Mohave, Pima, Yavapai & Yuma.....	$ 14.54	3.49
Grade Setter (Pipeline).....	$ 17.83	5.45
Guard Rail Installer.....	$ 13.28	2.99
Landscape Laborer.....	$ 11.39	
Landscape Sprinkler Installer.....	$ 15.27	
Pipelayer.....	$ 14.81	2.96
Powderman, Hydrasonic.....	$ 16.39	2.58
'ERATOR: Power Equipment		
Asphalt Laydown Machine.....	$ 21.19	6.05
Backhoe < 1 cu yd Coconino, Mohave, Pima, Pinal, Yavapai & Yuma.....	$ 17.37	3.85
Backhoe < 10 cu yd Coconino, Mohave, Pima, Pinal, Yavapai & Yuma.....	$ 18.72	3.59
Clamshell < 10 cu yd Coconino, Mohave, Pima, Pinal, Yavapai & Yuma.....	$ 18.72	3.59
Concrete Pump (Truck Mounted with boom only) Coconino, Mohave, Pima, Pinal, Yavapai & Yuma.....	$ 19.92	7.10
Crane (under 15 tons).....	$ 21.35	7.36
Dragline (up to 10 cu yd) Coconino, Mohave, Pima, Pinal, Yavapai & Yuma.....	$ 18.72	3.59
Drilling Machine (including Water Wells).....	$ 20.58	5.65
Grade Checker Coconino, Mohave, Pima, Pinal, Yavapai & Yuma.....	$ 16.04	3.68
Hydrographic Seeder.....	$ 15.88	7.67
Mass Excavator.....	$ 20.97	4.28
Milling Machine/Rotomill....	$ 21.42	7.45
Motor Grader (Finish-any type power blade) Coconino, Mohave, Pima,		

Water Truck 3900 gallons and over.....	$ 15.92	3.33
Water Truck under 2500 gallons.....	$ 15.94	4.16

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007

in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
CONTRACTS AND SPECIFICATIONS SECTION

BID SCHEDULE

CONTRACT # 2014146

TRACS No.	Project No.	Item	County	District	Gross Length	Net Length	Prepared By:
202 MA 040 H867301C	CM-202-A(219)T	43316	MARICOPA	PHOENIX	0		Mowery-Racz Thomas

Highway Termini	Location	Work Description
• SANTAN FREEWAY (SR 202L)	• SR 202L, Dobson Rd. to Ray Rd	• FMS Phase 14b

BID SCHEDULE

202 MA 040 H867301C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
2020021	REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	493		
2020071	REMOVE GUARD RAIL	L.FT.	70		
2020155	REMOVE (SIGN PANEL, POSTS, AND FOUNDATIONS)	EACH	5		
6060036	BRIDGE SIGN STRUCTURE (SD9.52, TYPE 3F, DMS)	EACH	7		
6060037	BRIDGE SIGN STRUCTURE (SD9.52, TYPE 4F, DMS)	EACH	1		
6060080	FOUNDATION FOR BRIDGE SIGN STRUCTURE ((SD9.20, TYPE 3F, DMS)	EACH	7		
6060081	FOUNDATION FOR BRIDGE SIGN STRUCTURE (SD9.20, TYPE 3F, DMS WITH RAISED COLUMN)	EACH	4		
6060083	FOUNDATION FOR BRIDGE SIGN STRUCTURE (SD9.20, TYPE 4F, DMS)	EACH	1		
6070038	SLIP BASE (STD DWG S-1)	EACH	8		
6070055	SIGN POST (PERFORATED) (2 1/2 S)	L.FT.	108		
6070060	FOUNDATION FOR SIGN POST (CONCRETE)	EACH	8		
6080005	WARNING, MARKER, OR REGULATORY SIGN PANEL	SQ.FT.	80		
7015010	TEMPORARY CONCRETE BARRIER (INSTALLATION AND REMOVAL)	L.FT.	2,000		

BID SCHEDULE

202 MA 040 H867301C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
7015020	TEMPORARY IMPACT ATTENUATORS (INSTALLATION AND REMOVAL)	EACH	8		
7016020	TEMPORARY CONCRETE BARRIER (IN USE)	L.FT./DAY	16,000		
7016021	TEMPORARY IMPACT ATTENUATORS (IN -USE)	EACH-DAY	64		
7016030	BARRICADE (TYPE II, VERT.PANEL, TUBULAR MARKER)	EACH-DAY	5,462		
7016031	BARRICADE (TYPE III, HIGH LEVEL FLAG TREES)	EACH-DAY	218		
7016032	PORTABLE SIGN STANDS (RIGID)	EACH-DAY	100		
7016033	PORTABLE SIGN STANDS (SPRING TYPE)	EACH-DAY	2,082		
7016035	WARNING LIGHTS (TYPE A)	EACH-DAY	4,506		
7016037	WARNING LIGHTS (TYPE C)	EACH-DAY	5,732		
7016039	EMBEDDED SIGN POST	EACH-DAY	6,600		
7016050	TRUCK MOUNTED ATTENUATOR	EACH-DAY	482		
7016051	TEMPORARY SIGN (LESS THAN 10 S.F.)	EACH-DAY	916		
7016052	TEMPORARY SIGN (10 S.F. OR MORE)	EACH-DAY	9,188		
7016061	FLASHING ARROW PANEL	EACH-DAY	124		
7016067	CHANGEABLE MESSAGE BOARD (CONTRACTOR FURNISHED)	EACH-DAY	1,102		

BID SCHEDULE

202 MA 040 H867301C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
7016080	FLAGGING SERVICES (DPS)	HOUR	144	$65.26	$9,397.44
7020011	IMPACT ATTENUATION DEVICE(SAND BARREL CRASH CUSHION,TYPE A)	EACH	8		
7040070	PAVEMENT MARKING (WHITE THERMOPLASTIC) (ALKYD)(0.090")	L.FT.	2,712		
7040072	PAVEMENT MARKING (TRANSVERSE) (THERMOPLASTIC) (ALKYD) (0.090")	L.FT.	495		
7060013	PAVEMENT MARKER, RAISED, TYPE C	EACH	49		
7310190	POLE (55 FT CCTV POLE WITH LOWERING DEVICE)	EACH	8		
7310191	POLE (80 FT CCTV POLE WITH LOWERING DEVICE)	EACH	2		
7310371	POLE FOUNDATION (FOR 55 FT CCTV POLE)	EACH	8		
7310372	POLE FOUNDATION (FOR 80 FT CCTV POLE)	EACH	2		
7320050	ELECTRICAL CONDUIT (2") (PVC)	L.FT.	1,345		
7320060	ELECTRICAL CONDUIT (2 1/2") (PVC)	L.FT.	1,245		
7320070	ELECTRICAL CONDUIT (3") (PVC)	L.FT.	990		
7320072	ELECTRICAL CONDUIT (3 - 3") (PVC)	L.FT.	780		
7320073	ELECTRICAL CONDUIT (2 - 3") (PVC)	L.FT.	4,650		

BID SCHEDULE

202 MA 040 H867301C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
7320130	ELECTRICAL CONDUIT (2") (RIGID METAL)	L.FT.	230		
7320274	ELECTRICAL CONDUIT (2-3") (PVC)(HALF SACK SLURRY)	L.FT.	675		
7320291	ELECTRICAL CONDUIT (2-3")(HDPE DIRECTIONAL DRILL)	L.FT.	1,560		
7320292	ELECTRICAL CONDUIT (3-3")(HDPE DIRECTIONAL DRILL)	L.FT.	60		
7320293	ELECTRICAL CONDUIT (3")(HDPE DIRECTIONAL DRILL)	L.FT.	890		
7320294	ELECTRICAL CONDUIT (2")(HDPE DIRECTIONAL DRILL)	L.FT.	250		
7320295	ELECTRICAL CONDUIT (2-2")(HDPE DIRECTIONAL DRILL)	L.FT.	960		
7320296	ELECTRICAL CONDUIT (2-2")(PVC)	L.FT.	7,780		
7320450	PULL BOX (NO. 7) (FMS STD FM-2.06)	EACH	89		
7320455	PULL BOX (NO. 9)	EACH	6		
7320456	PULL BOX (SPLIT NO. 9)	EACH	34		
7320460	PULL BOX (RETROFIT NO. 9 LID)	EACH	68		
7320500	CONDUCTOR (NO. 12)	L.FT.	17,960		
7320510	CONDUCTOR (NO. 10)	L.FT.	18,200		

BID SCHEDULE

202 MA 040 H867301C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
7320520	CONDUCTOR (NO. 8)	L.FT.	7,620		
7320530	CONDUCTOR (NO. 6)	L.FT.	5,680		
7320540	CONDUCTOR (NO. 4)	L.FT.	4,540		
7320560	CONDUCTOR (NO. 2)	L.FT.	28,800		
7320585	CONDUCTOR (INSULATED BOND) (NO. 8 GREEN BOND)	L.FT.	46,955		
7320656	CONDUCTORS (4C, 14 AWG)	L.FT.	2,040		
7320657	CONDUCTORS (7C, 14 AWG)	L.FT.	2,680		
7320765	SINGLE MODE FIBER OPTIC CABLE (12 FIBERS)	L.FT.	7,120		
7320787	SINGLE MODE FIBER OPTIC CABLE (144 FIBERS)	L.FT.	108,790		
7320794	FIBER OPTIC SPLICE CLOSURE (FMS)	EACH	42		
7330410	POLE FLASHER	EACH	10		
7330446	RAMP METER SIGNAL AND SUPPORT ASSEMBLY	EACH	10		
7340101	CONTROL CABINET (TYPE CCTV)	EACH	10		
7340103	CONTROL CABINET (TYPE RAMP METER/DETECTION)	EACH	19		
7340251	CONTROLLER (MODEL 2070)	EACH	19		

BID SCHEDULE

202 MA 040 H867301C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
7340304	CONTROL CABINET FOUNDATION (CONTROL CABINET & TRANSFORMER)	EACH	19		
7340305	CONTROL CABINET FOUNDATION (DMS CABINET AND TRANSFORMER)	EACH	8		
7340401	TRANSFORMER FOUNDATION	EACH	10		
7350030	LOOP DETECTOR FOR TRAFFIC SURVEILLANCE (6'X6')	EACH	192		
7350051	DETECTOR CARD	EACH	87		
7350165	LOOP DETECTOR LEAD-IN CABLE	L.FT.	54,740		
7360243	LOAD CENTER CABINET (TYPE IV) (MODIFIED)(120/240 VOLT)	EACH	15		
7360250	MODIFY LOAD CENTER CABINET	L.SUM	1		
7360290	LOAD CENTER CABINET FOUNDATION	EACH	15		
7370430	TRANSFORMER (CABINET ASSEMBLY)(3KVA)	EACH	29		
7370431	TRANSFORMER (CABINET ASSEMBLY)(7.5 KVA)	EACH	8		
7370452	MISCELLANEOUS ELECTRICAL (FACILITIES INVENTORY)	L.SUM	1		
7370455	MISCELLANEOUS ELECTRICAL (FMS RECORD DRAWINGS)	L.SUM	1		

BID SCHEDULE

202 MA 040 H867301C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
7370666	SWITCH PACK (LOAD SWITCH) (MODEL 200)	EACH	10		
7370705	CCTV FIELD EQUIPMENT	EACH	10		
7379111	VARIABLE MESSAGE SIGN ASSEMBLY INSTALLATION	EACH	8		
9010001	MOBILIZATION	L.SUM	1		
9040201	MEDIAN CABLE BARRIER (HIGH TENSION)	L.FT.	400		
9040221	MEDIAN CABLE BARRIER ANCHOR (HIGH TENSION)	EACH	8		
9050025	GUARD RAIL TERMINAL (TANGENT END TREATMENT PLUS or SKT-350)	EACH	2		
9050430	THRIE-BEAM GUARD RAIL TRANSITION SYSTEM	EACH	2		
9080041	CONCRETE CURB (C-05.10)(TYPE B)	L.FT.	166		
9100008	CONCRETE BARRIER (C-10.52)(4.5' GUTTER)	L.FT.	410		
9240010	FORCE ACCOUNT WORK (DECOMPOSED GRANITE)	L.SUM	1	$5,000.00	$5,000.00
9240011	FORCE ACCOUNT WORK (PULL BOX AND CONDUIT RECONDITIONING)	L.SUM	1	$25,000.00	$25,000.00
9240012	FORCE ACCOUNT WORK (IRRIGATION REPAIR)	L.SUM	1	$2,000.00	$2,000.00
9240014	FORCE ACCOUNT WORK (PROVIDE ELECTRICAL SERVICE)	L.SUM	1	$68,100.00	$68,100.00

BID SCHEDULE

202 MA 040 H867301C

Item No.	Item Description	Unit	Quantity	Unit Price	Extended Amount
9240119	MISCELLANEOUS WORK (SMALL-FORM FACTOR PLUGGABLE (SFP) TRANSCEIVER)	EACH	5		
9240120	MISCELLANEOUS WORK (FIBER PATCH PANEL)	EACH	5		
9240122	MISCELLANEOUS WORK (GigE SWITCH)	EACH	37		
9250001	CONSTRUCTION SURVEYING AND LAYOUT	L.SUM	1		

BID TOTAL :

PROPOSAL

TO THE ARIZONA DEPARTMENT OF TRANSPORTATION:

Gentlemen:

The following Proposal is made for constructing project

202 MA 040 H867301C CM-202-A(219)T
SANTAN FREEWAY (SR 202L)
(SR 202L, Dobson Road to Ray Road)

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.

A Proposal Guaranty in the amount and character named in the Advertisement for Bids is enclosed, which 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.

202 MA 040 H867301C CM-202-A(219)T
SANTAN FREEWAY (SR 202L)
(SR 202L, Dobson Road to Ray Road)

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 he 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 he 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.

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

202 MA 040 H867301C CM-202-A(219)T
SANTAN FREEWAY (SR 202L)
(SR 202L, Dobson Road to Ray Road)

REVISED 05/02

AFFIDAVIT

DISADVANTAGED BUSINESS ENTERPRISE ASSURANCES

The undersigned, fully cognizant of the requirements and of the goal established, hereby certifies that in the preparation of this bid for federal aid project

202 MA 040 H867301C CM-202-A(219)T
SANTAN FREEWAY (SR 202L)
(SR 202L, Dobson Road to Ray Road)

(CHECK ONE)

_____ The established goal for DBE participation will be met and agreements have been made with certified DBEs, or

_____ The bidder has been unable to meet the goal prior to the submission of the bid and has made good faith efforts to do so.

THIS AFFIDAVIT MAY NOT BE REVISED OR CORRECTED AFTER SUBMISSION OF THE BID.

In accordance with the Special Provisions, the bidder shall specify its DBE participation on the "DBE Intended Participation Affidavit", or provide documentation of its good faith efforts, by 4:00 p.m. on the fifth working day following the bid opening. The apparent low bidder shall obtain the required affidavit from the Civil Rights Office, 1135 N. 22nd Avenue (second floor), Phoenix, AZ, 85009, following the opening of bids.

_____
Print Name of Firm

_____
Print Name of Authorized Officer of Firm

_____
Signature of Authorized Officer of Firm

_____
Title

Subscribed and sworn to before me this

_____day of _____, 20_____

My commission expires:

_____
Notary Public

R03/11