

City of Takoma Park Housing and Community Development



*7500 Maple Avenue,
Takoma Park, MD 20912
c/o Rosalind Grigsby*

City of Takoma Park IFB No. HCD-20170201

ETHAN ALLEN GATEWAY STREETSCAPE

SHA Contract No. MO0705125

FAP No. TAP-3(481)E

SHA Tracking No. 15APMO015XX

NOTICE TO BIDDERS

A Pre-Bid Meeting will be conducted on Thursday, March 2, 2017 at 10:00 am. The meeting will be held in the Conference Room of the City of Takoma Park's office located at 7500 Maple Avenue, Takoma Park, Maryland 20912. *While attendance at the Pre-Bid Meeting is not mandatory, this is the offeror's opportunity to raise questions and/or issues of concern regarding the project.*

Qualifications are due by 3:30 pm on Friday, March 31, 2017.

Bids are due by 3:30 pm on Tuesday, April 18, 2017.

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Roadside Tree Permit (MD-DNR)

Forest Conservation Exemption Approval (M-NCPPC)



CITY OF TAKOMA PARK
INVITATION FOR BIDS No. HCD-20170201
ETHAN ALLEN GATEWAY STREETScape PROJECT

SHA PERMIT NO. 15APMO01516
SHA CONTRACT NO. MO0705125 / FAP No. TAP-3(481)E

CITY OF TAKOMA PARK SUPPLEMENTAL SUBMITTAL REQUIREMENTS
City IFB No. HCD-20170201

All responses must be complete. The City reserves the right to disregard any incomplete bid responses. The City will exercise a multi-step bidding process. Bidders responding to this Invitation for Bids are to provide two sealed and labeled envelopes:

1. Labeled "Qualifications" must include the following City of Takoma Park forms and information to adequately qualify and certify bidders:
 - Form A (Contact Information)
 - Bidder Qualification and Certification Statement
 - Bidder Reference List
 - Certification of Non-Involvement in the Nuclear Weapons Industry
 - Living Wage Requirements Certification

2. Labeled "Price Proposal" must include all items related to price.

Each bidder's sealed envelope labeled "Qualifications" will be reviewed first, ten (10) days prior to the bid opening date. All bidders deemed "unqualified/uncertified" will be notified in writing within seven (7) days of the bid opening date. Bidders have the opportunity to submit a written protest as set forth in section GP-2.23 of the Maryland State Highway Administration's Standard Specification for Construction and Materials.

In the event that a Bidder is ruled unqualified, the bid opening may be postponed as deemed necessary.

Contract will be awarded to a responsive and responsible bidder with the lowest priced proposal.

Responses may only be mailed or delivered to:

Rosalind Grigsby, Community Development Manager
Housing & Community Development
City of Takoma Park
7500 Maple Avenue
Takoma Park, MD 20912



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FORM A (Contact Information)

Company Name: _____

Address: _____

Phone Number: _____

Fax Number: _____

Web Site (if applicable): _____

Contact Name: _____

Contact E-mail Address: _____

Tax ID #: _____



CITY OF TAKOMA PARK
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2. CERTIFICATION.

The undersigned proposes to furnish and deliver all labor, supplies, material, equipment, or services in accordance with specifications and stipulations contained in the Request for Proposals for the price(s) and upon the terms and conditions set forth in the proposal.

The undersigned certifies that this proposal is made without any previous understanding, agreement or connection with any person, firm, or corporation submitting a bid/proposal for the same labor, supplies, material, equipment, or services and is, in all respects fair and without collusion or fraud. The undersigned further certifies that he/she is authorized to sign for the bidder.

Bidder Name (print): _____

By: _____
(Signature) (Date)

Print Name: _____

Title: _____

Business Address: _____

Telephone Number: _____

Fax: _____

E-Mail: _____

Web Site: _____



CITY OF TAKOMA PARK
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BIDDER REFERENCE LIST

Please provide a representative list of three (3) references involving work as specified herein. Failure to submit the required information with the Proposal may be cause for rejection of the Proposal. The City may make such investigation, as it deems necessary to determine the ability of the Firm to furnish the services and the Firm shall furnish to the City all such information and data for this purpose as the City may request. The City reserves the right to reject any proposal if the evidence submitted by or investigation of such Firm fails to satisfy the City that such Firm is properly qualified to carry out the obligations of the contract and deliver the service herein.

REFERENCE #1

Organization Name: _____

Address: _____

Contact Person: _____ **Phone:** _____

Email: _____ **Contract Value:** _____

Project Description: _____

REFERENCE #2

Organization Name: _____

Address: _____

Contact Person: _____ **Phone:** _____

Email: _____ **Contract Value:** _____

Project Description: _____

REFERENCE #3

Organization Name: _____

Address: _____

Contact Person: _____ **Phone:** _____

Email: _____ **Contract Value:** _____

Project Description: _____



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**CITY OF TAKOMA PARK, MARYLAND
CERTIFICATION OF NON-INVOLVEMENT IN THE NUCLEAR WEAPONS INDUSTRY**

KNOW ALL PERSONS BY THESE PRESENTS:

Pursuant to the requirements of Chapter 14.04 of the Takoma Park Code, the Takoma Park Nuclear Free Zone Act, the undersigned person, firm, corporation or entity hereby certifies that he/she/it is not knowingly or intentionally a nuclear weapons producer.

Note: The following definitions apply to this certification per section 14.04.090:

A “nuclear weapons producer” is any person, firm, corporation, facility, parent or subsidiary thereof or agency of the federal government engaged in the production of nuclear weapons or its components.

“Production of nuclear weapons” includes the knowing or intentional research, design, development, testing, manufacture, evaluation, maintenance, storage, transportation or disposal of nuclear weapons or their components.

“Nuclear weapon” is any device the sole purpose of which is the destruction of human life and property by an explosion resulting from the energy released by a fission or fusion reaction involving atomic nuclei.

“Component of a nuclear weapon” is any device, radioactive substance or nonradioactive substance designed knowingly and intentionally to contribute to the operation, launch, guidance, delivery or detonation of a nuclear weapon.

IN WITNESS WHEREOF, the undersigned has signed and sealed this instrument this ____ day of _____, 2016.

First Name: _____

By: _____

Signature

Print Name & Title

State of _____, County of _____:

Subscribed and sworn to before me this ____ day of _____, 2016.

Notary Public



CITY OF TAKOMA PARK
INVITATION FOR BIDS No. HCD-20170201
ETHAN ALLEN GATEWAY STREETScape PROJECT

SHA PERMIT NO. 15APMO01516
SHA CONTRACT NO. MO0705125 / FAP No. TAP-3(481)E

My commission expires: _____

CITY OF TAKOMA PARK, MARYLAND
LIVING WAGE REQUIREMENTS CERTIFICATION
(Takoma Park Code, section 7.08.200.B)

Business Name: _____

Address: _____

City, State, Zip Code: _____

Phone Number: _____

Fax Number: _____

E-Mail: _____

Please specify the contact name and information of the individual designated by your business to monitor your compliance with the City’s living wage requirements, unless exempt under Section 7.08.190 (see item B below):

Contact Name: _____ Title: _____

Phone Number: _____ Fax: _____ E-Mail: _____

CHECK ALL APPROPRIATE LINES BELOW THAT APPLY IN THE EVENT THAT YOU ARE AWARDED THE CONTRACT AND BECOME A “CONTRACTOR.”

A. Living Wage Requirements Compliance

_____ This Contractor as a “covered employer” will comply with the requirements of the City of Takoma Park Living Wage Law (*Takoma Park Code, Section 7.08.180 et. seq. - Ordinance No. 2007-55*). Contractor and its subcontractors will pay all employees who are not exempt from the wage requirements and who perform measurable work for the City related to any contract for services with the City, the living wage requirements in effect at the time of the City contract. The bid price submitted under this procurement solicitation includes sufficient funds to meet the living wage requirements.

B. Exemption Status (if applicable)

This Contractor is exempt from the living wage requirements because it is:



**CITY OF TAKOMA PARK
INVITATION FOR BIDS No. HCD-20170201
ETHAN ALLEN GATEWAY STREETScape PROJECT**

SHA PERMIT NO. 15APMO01516
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_____ The total value of the contract for services (based on the bid or proposal being submitted under this procurement solicitation) is less than \$20,000.00.

_____ A public entity.

_____ A nonprofit organization that has qualified for an exemption from federal income taxes under Section 501(c)3 of the Internal Revenue Code.

_____ A contractor who is prohibited from complying with the City’s living wage requirements by the terms of an applicable federal or state program, contract, or grant requirement. **(Must specify the law and/or furnish a copy of the contract or grant.)**

C. Living Wage Requirements Reduction.

_____ This Contractor provides health insurance to the employees who will provide services to the City under the City contract and it desires to reduce its hourly rate paid under the living wage requirements by an amount equal to, or less than, the per employee hourly cost of the employer’s share of the health insurance premium. This Contractor certifies that the per employee hourly cost of the employer’s share of the premium for that health insurance is \$_____. **(Must submit supporting documentation showing the employee labor category of all employee(s) who will perform measurable work under the City contract, the hourly wage the Contractor pays for that employee labor category, the name of the health insurance provider and plan name, and the employer’s share of the monthly health insurance premium.)**

Contractor Certification and Signature

Contractor submits this certification in accordance with *Takoma Park Code* section 7.08.200.B. Contractor certifies, under penalties of perjury, that all of the statements and representations made in this Living Wage Requirements Certification are true and correct. Contractor and any of its subcontractors that perform services under the resultant contract with the City of Takoma Park, will comply with all applicable requirements of the City’s living wage law.

Authorized corporate, partner, member, or proprietor signature: _____

Print name: _____

Title of authorized person: _____

Date: _____

NOTICE TO CONTRACTORS

CARGO PREFERENCE ACT (CPA)

All Contractors and Sub-Contractors are to be in compliance with the requirements of 46 CFR Part 381 and incorporate by reference the recommended clauses in 46 CFR 381.7(a)-(b) - ("Contractor and Subcontractor Clauses. "Use of United States-flag vessels")

(a) Agreement Clauses. "Use of United States-flag vessels:

"(1) Pursuant to Pub. L. 664 (43 U.S.C. 1241(b)) at least 50 percent of any equipment, materials or commodities procured, contracted for or otherwise obtained with funds granted, guaranteed, loaned, or advanced by the U.S. Government under this agreement, and which may be transported by ocean vessel, shall be transported on privately owned United States-flag commercial vessels, if available.

"(2) Within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (a)(1) of this section shall be furnished to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590."

(b) Contractor and Subcontractor Clauses. "Use of United States-flag vessels: The contractor agrees-

"(1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

"(2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b) (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

"(3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract".

Guidance documents for this requirement, including the 12/11/2015 policy memo, the 12/8/2015 legal opinion and a page of Q&A's are available on the CPA construction Program Guidance page:

<https://www.fhwa.dot.gov/construction/cqit/cargo.cfm>

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

NOTICE TO CONTRACTORS

eMaryland Marketplace.

eMaryland Marketplace (eMM) is an electronic commerce system administered by the Maryland Department of General Services. All associated materials, the solicitation, the summary of pre-bid meetings, bidder's questions and the Procurement Officers responses, Addenda, and other solicitation related information will be provided via eMaryland Marketplace; <https://emaryland.buyspeed.com/bs/>.

Bidders must register, (registration is free) on eMM, log-in and acknowledge all bid amendments and submit the Addendum Verifications to be Awarded a Contract. Should you have any questions regarding registration, please call the eMM Help Desk at 410-767-1492.

Bidder's List.

The Bidders list for this solicitation is available on the eMaryland Marketplace website, (<https://emaryland.buyspeed.com/bs/>). To view this:

- On the eMaryland website; <https://emaryland.buyspeed.com/bs/>;
- Click Open Bids on the login Screen (DO NOT LOG IN to eMaryland);
- Open bid opportunities will be listed (you can filter the list by category, if desired);
- On the open bids screen, the right hand column is labeled Bid Holders List;
- When the solicitation is found, double click the List link to view the Plan Holders List.

If you need additional assistance, please contact the eMM Help Desk at 410-767-1492.

Bid Opening and Requirements.

Bid Opening will be administered per the current bidding process through;

The City of Takoma Park
Housing and Community Development
7500 Maple Avenue
Takoma Park, Maryland 20912

and per TC SECTION 2 BIDDING REQUIREMENTS AND CONDITIONS of the 2008 Standard Specifications for Construction and Materials. Also, see the City of Takoma Park's Supplemental Submittal Requirements (enclosed herein).

Bidders are required to provide verifications for all Addenda and include with your sealed bids. "Sealed Bid" should be labeled on your envelope.

NOTICE TO CONTRACTORS

Most SHA projects advertised for construction after July 1, 2012 were designed to follow the “2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control”. This project will be built using the 2011 version of these Standards and Specifications. These Standards and Specifications contain significant revisions to materials and methods compared to earlier versions. Perspective bidders are encouraged to consider the impacts of these changes when preparing their bids. These Standards and Specifications can be found on the internet at: <http://www.roads.maryland.gov/Index.aspx?PageId=689&d=6> .

NOTICE TO CONTRACTORS

Environmental Stewardship

The Maryland State Highway Administration is committed to the development and maintenance of the Administration's highway system in an environmentally responsible manner. Therefore, Contractors are encouraged to consider the use of Administration-approved recycled and reclaimed materials in construction projects where practicable, and in accordance with the Plans and Specifications.

The Contractor is also encouraged to reuse, salvage, or recycle all generated waste materials to the extent possible. Materials that are easily recognizable, maintain their physical properties, meet the required material properties for recycling, are easily separated and transported, and have value as commodities are candidates for recycling. These types of materials generally include metals (steel, iron, copper, aluminum, bronze, etc.), plastics (cones, barrels, barricades, crash cushion plastic barrels, conduit, containers, etc.), aluminum poles and signs, electronic and electrical components, signals and signal components, topsoil, formwork, temporary falsework, brick, masonry, stone, wood, paper, and timber and yard waste from clearing and grubbing operations.



CONTRACTOR REGISTRATION REQUIREMENTS

On all Federal-Aid funded contracts, the Administration is requiring that Contractors have an active Dun and Bradstreet Data Universal Numbering System (DUNS) and be registered in the Central Contract Registration (CCR) database prior to Award of Contract.

The Contractor DUNS number is a unique nine-digit number issued by Dun & Bradstreet, followed by the optional 4 digit DUNS Plus number (reported as “999999999.9999”). A DUNS number can be obtained on-line at <http://fedgov.dnb.com/webform>.

The Central Contractor Registration (CCR) is no longer the primary registrant database for the U.S. Federal Government.

The System for Award Management (SAM) is the Official U.S. Government system that consolidated the capabilities of CCR/FedReg, ORCA, and EPLS. There is NO fee to register for this site. Entities may register at no cost directly from this page. User guides and webinars are available under the Help tab. Contractor’s can now register on-line at <https://www.sam.gov>.



NOTICE TO ALL HOLDERS OF THIS CONTRACT DOCUMENT

**NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP)
REPORT 350 AND THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH)
IMPLEMENTATION SCHEDULE FOR DEVICES USED IN THE MAINTENANCE OF
TRAFFIC**

Except as otherwise specified in this Section, all items for the maintenance of traffic, including those listed under the following categories, shall be crashworthy in conformance with Level 3 or other Level as specified by the Engineer in conformance with the safety crash testing and performance criteria published in the National Cooperative Highway Research Program (NCHRP) Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features" or the Manual for Assessing Safety Hardware (MASH). When conformance with NCHRP Report 350 or MASH is required, the Contractor shall provide the Engineer with the manufacturers' certifications that the devices comply with the specified criteria.

Unless specifically waived by an attachment to these Contract Provisions, devices must be approved by the Office of Traffic and Safety.

Category 1 Devices

These devices are cones, tubular markers, flexible delineator posts, and drums, all without any accessories or attachments, which are used for channelization and delineation.

Category 2 Devices

These devices are Type I, II, and III barricades; portable sign supports with signs; intrusion alarms; and drums, vertical panels, and cones, all with accessories or attachments.

Category 3 Devices

- (a) Truck Mounted Attenuators (TMAs) and Trailer Truck Mounted Attenuators (TTMAs).
- (b) Temporary Barrier.
 - (1) Concrete Barrier.
 - (2) Traffic Barrier W Beam and Water Filled Barrier.
 - (3) Steel/Aluminum Barrier.
- (c) Temporary End Treatments.

Category 4 Devices

These devices are area lighting supports, arrow panels, and portable variable message signs that are usually portable or trailer-mounted.

CONTRACT PROVISIONS
 (NCHRP) REPORT 350 AND MASH IMPLEMENTATION SCHEDULE

SHA TRACKING NO. 15APMO015XX
 FAP NO. TAP-3(481)E
 2 of 2

WORK ZONE DEVICES	IMPLEMENTATION SCHEDULE TO CONFORM TO NCHRP REPORT 350 OR MASH CRITERIA
CATEGORY 1 Cones, tubular markers, flexible delineator posts, and drums (all without any accessories or attachments)	All devices shall conform to NCHRP Report 350 or MASH criteria.
CATEGORY 2 Type I, II, and III barricades; portable signs supports with signs; intrusion alarms; and drums, vertical panels, and cones (all with accessories or attachments)	All devices shall conform to NCHRP Report 350 or MASH criteria.
CATEGORY 3 (a) Truck Mounted Attenuators (TMAs); Trailer Truck Mounted Attenuators (TTMAs) (b) Temporary Barriers (1) Concrete Barrier (2) Traffic Barrier W Beam and Water Filled Barrier (3) Steel/Aluminum Barrier (c) Temporary End Treatments	All devices shall conform to NCHRP Report 350 or MASH criteria.
CATEGORY 4 Portable trailer mounted devices including area lighting supports, arrow panels, and changeable message signs	The Contractor may use devices that do not conform to NCHRP Report 350 or MASH criteria, until compliance dates are established. Use of these devices shall comply with the provisions of Part 6 of the MUTCD.

NOTICE TO ALL HOLDERS OF THIS CONTRACT DOCUMENT

MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL
DEVICES (MdMUTCD) REQUIREMENTS

The 2011 Maryland Manual on Uniform Traffic Control Devices (MdMUTCD) is the legal State standard for traffic control devices. All traffic control devices (temporary or permanent) utilized on Administration projects shall be in conformance with the requirements provided in the 2011 Edition of the Administration's MdMUTCD for Streets and Highways.



CONTRACT PROVISIONS
OCCUPYING WETLANDS

SHA TRACKING NO. 15APMO015XX
FAP NO. TAP-3(481)E
1 of 1

OCCUPYING WETLANDS

The Contractor is hereby alerted to the importance of preserving wetland areas. The Administration, in conjunction with the various environmental agencies, has developed these Contract Documents so as to minimize or eliminate disturbance and damage to existing wetland areas. In order to accomplish this, the following must be rigidly adhered to:

- (a) Prior to performing any work on the project, the areas of wetland will be identified and marked as directed by the Administration. All personnel of the Contractor or sub-contractors shall be alerted to these designated areas.
- (b) The Contractor or sub-contractors shall not impact any wetland or waterway, whether it be permanently or temporarily unless otherwise stipulated in the permit application and approved as an authorized action by the appropriate regulatory agency. No fill shall be placed in these areas without a permit.
- (c) If a Contractor or sub-contractor has to impact a wetland or waterway that is not covered by an existing wetland permit, they shall immediately notify the Engineer. The Engineer will notify the Environmental Programs Division to determine the extent of any permit modification. At that time the Environmental Programs Division will request a permit modification or submit a permit application.
- (d) If the Contractor impacts any wetland or waterway for which they do not have a wetland permit, they shall be responsible for restoring the wetland areas and possibly mitigating the wetland impacts to the full satisfaction of the environmental agencies, which could include monetary compensation.
- (e) The cost of restoration and mitigation of the impacted areas shall be at no additional cost to the Administration.

The importance of not abusing the wetland areas cannot be overemphasized. Abuse of wetland areas could jeopardize the operation of the total Contract and could be cause for a shut-down. If a shut-down occurs because of the Contractor's failure to secure the required permits (i.e. the Contractor's method of work includes impacts not approved by previously acquired permits), the Contractor's negligence or operations, all costs and damages to the Contractor and to the State will be at no additional cost to the Administration. Noncompliance with these requirements will not be considered for an extension of Contract time.

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (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 qualified 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 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 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.



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**AFFIRMATIVE ACTION REQUIREMENTS
UTILIZATION OF DISADVANTAGED BUSINESS ENTERPRISES
FOR FEDERAL-AID CONTRACTS**

CONTRACT GOALS

FOR THE PURPOSE OF THIS CONTRACT, A GOAL OF **28** PERCENT HAS BEEN ESTABLISHED FOR SOCIALLY AND ECONOMICALLY DISADVANTAGED BUSINESSES THAT ARE OWNED AND CONTROLLED BY – THOSE INDIVIDUALS WHO ARE BLACK AMERICANS, HISPANIC AMERICANS, ASIAN-PACIFIC AMERICANS, SUBCONTINENT ASIAN AMERICANS, NATIVE AMERICANS, OR WOMEN PURSUANT TO THE MARYLAND DEPARTMENT OF TRANSPORTATION (MDOT) MINORITY BUSINESS ENTERPRISE PROGRAM:

It is the policy of the Maryland Department of Transportation that disadvantaged business enterprises as defined in 49 CFR Part 26 and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) shall have an equal opportunity to participate in the performance of the contracts financed in whole or in part with Federal funds under these agreements. Consequently, the disadvantaged business enterprise requirements of 49 CFR Part 26 and SAFETEA-LU apply to this agreement.

The bidder agrees to ensure that disadvantaged business enterprises as defined in 49 CFR Part 26 and SAFETEA-LU have an equal opportunity to participate in the performance of contracts and subcontracts financed in whole or in part with Federal funds provided under this agreement. In this regard, all bidders shall take all necessary and reasonable steps in accordance with 49 CFR Part 26 and SAFETEA-LU to ensure that disadvantaged business enterprises have an equal opportunity to compete for and perform on Federally funded contracts.

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

A. GENERAL

For the purpose of these requirements, the following terms as defined below shall apply:

Administration Representative – A DBE/MBE Officer or employee of an Administration who enforces the laws and regulations pertaining to disadvantaged and minority business enterprise and contract compliance.

Affirmative Actions – Specific steps taken to eliminate discrimination and its effects, to ensure nondiscriminatory results and practices in the future, and to involve disadvantaged and minority business enterprises fully in contracts and programs.



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Business Enterprises – Any legal entity which is organized in any form other than as a joint venture (e.g., sole proprietorship, partnership, corporation, etc.) to engage in lawful commercial transactions.

Certified Business – A business which by order of the Chair/MBE Advisory Council or his/hers designee, has been certified as a bona fide DBE/MBE. MDOT certification does not equate to a pre-qualification status.

DBE – Disadvantaged Business Enterprise – Reference 49 CFR, Part 26, Subpart A) a small business concern: (1) which is at least 51 percent owned by one or more socially and economically disadvantaged individuals. Where stock ownership is involved, the disadvantaged owner(s) shall own at least 51 percent of each class of voting stock and at least 51 percent of the aggregate of all classes of stock that have been issued (also applies to publicly owned businesses); and (2) whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who have ownership. In this specification the terms MBE and DBE have the same meaning.

DBE/MBE Directory – A compilation of businesses certified by MDOT as disadvantaged, minority, or socially and economically disadvantaged businesses. The directory will be published annually with quarterly supplements. It will also be provided in automated format and on the Internet to be updated as changes are made.

DBE/MBE Participation Packet – The documents submitted by the bidder or proposer pursuant to the appropriate special bid provisions. The DBE/MBE Participation Packet consists of the Certified DBE Utilization and Fair Solicitation Affidavit and the DBE Participation Schedule, both of which must be submitted with your bid or initial price proposal. The DBE Participation Packet also includes the following documents, which shall be submitted after bids or proposals are opened: Outreach Efforts Compliance Statement (MDOT-OP-018-2), DBE Subcontractor Project Participation Affidavit (MDOT-OP-019-2), MDOT Joint Venture Disclosure Affidavit (D-EEO-006), and Minority Contractor Unavailability Certificate (OOC46).

DBE/MBE Program – A program developed by MDOT to implement the requirements of Title 14, Subtitle 3 of the State Finance and Procurement Article, Annotated Code of Maryland; Title 10, Subtitle 3 of the State Finance and Procurement Article of the Annotated Code of Maryland for Leases of State-Owned Property; and 49 CFR, Part 26, Subparts A and C for all Federal Department of Transportation Financial Assistance Programs.

Director, Office of Equal Opportunity – The individual designated for the Administration's overall MBE compliance.

Joint Venture – An association of a DBE/MBE firm and one or more other firms to carry out a single, for-profit business enterprise, for which the parties combine their property, capital, efforts, skills, and knowledge, and in which the DBE/MBE 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.



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Small Business Administration (SBA) 8(a) Certification – The SBA 8(a) Certification Program is a Federal Program which establishes firms as disadvantaged and eligible for participation in the Federal SBA Program.

Socially and Economically Disadvantaged Individual Pursuant to 49 CFR, Part 26 – Those individuals who are citizens of the United States (or lawfully admitted permanent residents). For convenience, these individuals and groups are referred to as “minorities” in this document and who are:

1. Found by the MDOT to be socially and economically disadvantaged 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.
 - a. “Black Americans,” which includes persons having origins in any of the Black racial groups of Africa;
 - b. “Hispanic Americans,” which includes persons of Mexican, Puerto Rican, Cuban, Dominican, Central or South American, or other Spanish or Portuguese culture or origin, regardless of race;
 - c. “Native Americans,” which includes persons who are American Indian, Eskimos, Aleuts, or Native Hawaiians;
 - d. “Asian-Pacific Americans,” which included 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, Kirbati, Juvalu, Nauru, Federated States of Micronesia, or Hong Kong;
 - e. “Subcontinent Asian American,” which includes persons whose origins are from India, Pakistan, Bangladesh, Bhutan, the Maldives Islands, Nepal or Sri Lanka;
 - f. Women;
3. Only those persons whose personal net worth does not exceed \$750,000 may be found to be economically disadvantaged.

B. DBE/MBE and Good Faith Effort Requirements

1. This contract includes a DBE participation goal for subcontracting and/or procurement of materials and/or services. Bidders (or offerors) must make a good faith effort to meet the DBE participation goal **before bids or proposals are due**, including outreach efforts. A bid or initial proposal must include both a completed and executed Certified DBE Utilization and Fair Solicitation Affidavit and DBE Participation Schedule. The failure of a bidder to complete and submit these documents shall result in a determination that the bid is not responsive. The failure of an offeror to complete and submit these



documents shall result in a determination that the proposal is not susceptible of being selected for award.

2. In making a good faith effort to achieve the DBE goal, prior to completing the Certified DBE Utilization and Fair Solicitation Affidavit and the DBE Participation Schedule and prior to submitting a bid or initial proposal the bidders (or offerors) including those bidders or offerors that are certified DBEs must:
 - a. Identify specific work categories within the scope of the procurement appropriate for subcontracting and/or procurement of materials and/or services;
 - b. Solicit DBEs in writing at least 10 days before bids or initial proposals are due**, describing the identified work categories and providing instructions on how to bid on the subcontracts and/or procurement of materials and/or services;
 - c. Attempt to make personal contact with the DBEs solicited and to document these attempts;
 - d. Assist DBEs to fulfill, or to seek waiver of, bonding requirements; and
 - e. Attend prebid or other meetings the procurement agency schedules to publicize contracting opportunities to DBEs.
3. All firms bidding on a Federal-Aid Contract shall submit the name and address of all subcontractors, service providers and suppliers that submitted quotes on the Contract. All subcontractors, service providers and suppliers shall complete and submit the form entitled Contractor Information, to the Administration.
4. The bidder shall seek commitments from disadvantaged business enterprises by subcontracting and/or procurement of materials and/or services, the combined value of which equals or exceeds the appropriate percent (goal) of the total value of the prime contract. A bidder may count toward its DBE goals expenditures for materials and supplies obtained from DBE regular dealers and/or manufacturers provided that the DBEs assume the actual and contractual responsibility for the provision of the materials and supplies. The bidder may count its entire expenditure to a DBE manufacturer (i.e., a supplier that produces goods from raw materials or substantially alters them before resale). The bidder may count sixty (60) percent of its expenditures to a DBE regular dealer that is not a manufacturer, provided that the DBE supplier performs a commercially useful function in the supply process. The apparent low bidder shall submit to the Administration, within ten (10) business days after notification that it is the apparent low bidder, an acceptable Affirmative Action Plan for the utilization of Disadvantaged Business Enterprises in this Contract. The Contract will not be awarded without the Bidder's AAP being approved by the Administration.

The Affirmative Action Plan shall include as a minimum:

- a. The name of an employee designated as the bidder's liaison officer for minority affairs.



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- b. A complete DBE Subcontractor Project Participation Affidavit (MDOT-OP-019-2), using contractors whose names appear in the DBE/MBE directory or who are otherwise certified by MDOT as being a disadvantaged business enterprise. Except as permitted by law and approved by the Administration, this affidavit shall include all DBE firms identified on the DBE Participation Schedule with a percentage of participation that meets or exceeds the percentage of participation indicated in the bid or initial proposal.
 - c. A completed Outreach Efforts Compliance Statement (MDOT-OP 018-2).
5. When a bidder intends to attain the appropriate goal for disadvantaged business enterprise participation by use of a joint venture, the bidder shall submit a Joint Venture Disclosure Affidavit (Form D-EEO-006-A) showing the extent of disadvantaged business participation. If a bidder intends to use a joint venture as a subcontractor to meet its goal, the affidavit shall be submitted through the bidder by the proposed subcontractor and be signed by all parties. A DBE, even in a joint venture arrangement shall be certified as a DBE by MDOT prior to being included in the Affirmative Action Plan.
6. Where the proposed DBE participation does not meet the DBE contract goals, sufficient evidence to demonstrate that the bidder has taken all necessary and reasonable steps to make a good faith effort to meet these goals shall be required.

7. Determination of Bid Responsiveness for Federal-Aid Contracts

If the bidder is unable to secure from DBEs by subcontracting and/or by procurement of materials and/or services, commitments which at least equal the appropriate percent (goal) of the values of the prime Contract at the time of bid, he shall request, in writing, a waiver of the unmet portion of the goal. This request must be initiated by checking the appropriate box on the Certified DBE Utilization and Fair Solicitation Affidavit submitted with the bid or initial proposal.

The waiver may be granted by the Administrator. To obtain approval of a waiver, the bidder shall submit the following information:

- a. A detailed statement of efforts made prior to bid to contact and negotiate with DBEs including: (i) the dates, names, addresses, and telephone numbers of DBEs who were contacted; (ii) a description of the information provided to DBEs requesting the plans, specifications, and anticipated time schedule for portions of the work to be performed and (iii) a detailed statement of the reasons why additional prospective agreements with DBEs were not reached;
- b. A detailed statement of the efforts made to select portions of the work proposed to be performed by DBEs in order to increase the likelihood of achieving the stated goals;
- c. For each DBE that the Contractor considers not qualified, but from which a bid has been received, a detailed statement of the reasons for the bidder's conclusion; and
- d. For each DBE contacted but unavailable, (i) a Minority Contractor Unavailability Certificate (Form OOC46) signed by the disadvantaged business enterprise, or (ii)



a statement from the bidder shall be submitted that states that the DBE refused to sign the Certificate.

8. Guidance concerning good faith efforts. The following is a list of the types of actions and factors that will be used to determine the bidder's or offeror's good faith efforts to obtain DBE participation. It is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases.

- (1) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of certified DBEs who have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the 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 bidder or offeror 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) (a) Negotiating in good faith with interested DBEs. It is the bidder's or offeror's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation.

(b) 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 contract 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. Bidders and offerors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.
- (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.
- (9) In determining whether a bidder or offeror has made good faith efforts, you may take into account the performance of other bidders or offerors in meeting the contract goal. For example, when the apparent successful bidder or offeror fails to meet the contract goal, but others meet it, the Administration may reasonably raise the question of whether, with additional reasonable efforts, the apparent successful bidder or offeror could have met the goal. If the apparent successful bidder or offeror fails to meet the goal, but meets or exceeds the average DBE participation obtained by other bidders or offerors, the Administration may view this, in conjunction with other factors, as evidence of the apparent successful bidder or offeror having made good faith efforts.

9. Bidder Use of DBE Special Services

The bidder shall consider, whenever possible, utilizing the services of minority-owned banks. Most minority banks are full-service corporations that can provide an array of financial services such as Treasury and Tax Loan fund accounts, time and demand deposit accounts, payroll services, and if needed, organization investment counseling.

10. Bidder Records

The bidder shall maintain records showing actions which have been taken to comply with procedures set forth herein.

11. Bidder Cooperation

The bidder shall cooperate with the Administration Representative in any reviews of the Contractor's procedures and practices with respect to DBEs which the Administration Representative may from time to time conduct.



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12. Bidder DBE Modifications

During the life of the Contract, all plans to modify the approved DBE participation program will require the approval of the Administrator or his authorized representative. This shall include any changes to the items of work to be sublet or materials and services to be obtained which differ for those in the original DBE participation program. Any such request for revisions shall be directed to the appropriate District Engineer for their disposition.

C. RECORDS AND REPORTS

- 1.** The Contractor shall keep such records as are necessary to determine compliance with its Minority Business Enterprise utilization obligations. The records kept by the Contractor shall be designed to indicate:
 - a.** The name of disadvantaged and non-disadvantaged subcontractors and suppliers, the type of work materials or services being performed on or incorporated in this project, and the monetary value of such work materials or services.
 - b.** Documentation of all correspondence, contacts, telephone calls, etc., to obtain the services of disadvantaged business enterprises on this project.
 - c.** The progress and efforts made in seeking out disadvantaged contractor organizations and individual disadvantaged contractors for work on this project.
- 2.** Information required to be submitted for Federally Assisted contracts in accordance with 49 CFR Part 26:
 - a.** All bidders (not only the apparent successful bidder) shall provide the following information:
 - (1)** The age of the bidding firm; and
 - (2)** The annual gross receipts of the bidding firm.
 - b.** All bidders (not only the apparent successful bidder) shall provide the following information for each firm quoting or considered as subcontractors:
 - (1)** The name of firm; and
 - (2)** The address of firm.
 - c.** The Administration will contact each of the firms quoting or considered as subcontractors to obtain:
 - (1)** The age of the firm; and
 - (2)** The annual gross receipts of the firm

If this information already has been gathered by the Administration on a firm and it is current, it will not be requested.



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3. The Contractor shall submit reports on a monthly basis of those contracts and other business transactions executed with disadvantaged business enterprises with respect to the records referred to in Subparagraph 1.a above, in such form, manner, and content as prescribed by the Administration. The reports shall be due monthly on the 15th calendar day of each month. If the Contractor cannot submit their report on time, they shall notify the Administration's Representative and request additional time to submit the report. Failure of the Contractor to report in a timely manner may result in a finding of noncompliance. Additional reports may be required by the Administration upon written request.
4. To ensure compliance with the certified DBE contract participation goals, the Contractor shall:
 - a. Submit monthly, a report listing unpaid invoices, over 30 days, from all certified DBE subcontractors and the reason payment has not been made;
 - b. Include in its agreement with certified DBE subcontractors a requirement that the DBE subcontractors are to submit monthly to the Administration, a report identifying the prime Contractor and listing the following:
 1. Payment received from the Contractor in the preceding 30 days; and
 2. Invoices for which the subcontractor has not been paid.
5. All such records shall be retained for a period of three years following acceptance of final payment and shall be available for inspection by the U.S. Department of Transportation, the Maryland Department of Transportation, and the Administration.

D. ADMINISTRATIVE PROCEDURES FOR ENFORCEMENT

1. Whenever the Administration believes the prime Contractor or any subcontractor may not be operating in compliance with the terms of these provisions, the Administration Representative will conduct an investigation. If the Administration Representative finds the prime Contractor or any subcontractor not in compliance with these provisions, he will make a report of non-compliance and notify such Contractor in writing of the steps that will, in the judgment of the Administration, bring the Contractor into compliance. If the Contractor fails or refuses to comply fully with such steps, the Administration Representative will make a final report of noncompliance to the Administrator, who may direct the imposition of one or more of the sanctions listed below:
 - a. Suspension of work on a project, pending correction;
 - b. Withholding payment or a percentage thereof, pending correction;
 - c. Referral of DBE/MBE to MDOT Office of MBE for review for decertification or minority business fraud investigation;
 - d. Referral to MDOT Office of MBE for review/referral to the Attorney General's Office for review for initiation of debarment;



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- e. Referral to the Attorney General’s Office for review for debarment or for criminal prosecution through the MDOT Office of General Counsel; or
- f. Any other action as appropriate.

The Administrator will determine which sanction(s) should be imposed in order to promote the purpose of the MDOT DBE/MBE Program.

- 2. If the documents used to determine the status of a DBE contain false, misleading, or misrepresenting information, the matter may be referred to the MDOT Office of MBE for appropriate action.
- 3. Loss of DBE Certification
 - a. When a prime Contractor has made a commitment to use a DBE who has lost its certification but the subcontract has not been executed prior to the notice of loss of certification, the prime Contractor is required to obtain an eligible, certified DBE for the contract or demonstrate to MDOT that it has made a good faith effort to do so.
 - b. When a prime Contractor has executed a contract with a DBE subcontractor before the notice of loss of certification, the prime Contractor may continue to use the firm on the contract and may continue to receive credit towards its DBE goal, i.e., contract goal, for the work of that subcontractor.
 - c. The work carried out by a DBE Prime Contractor would be counted by MDOT up to the loss of certification. The work performed after the loss of certification would not be considered DBE participation.
 - d. When a DBE subcontractor has lost its certification, MDOT may not continue to count the DBE participation which takes place after the loss of certification as DBE work when counting participation towards the overall goal of the modal administration or the Department.
 - e. If a DBEs loss of certification is the result of exceeding the size standards while performing on a contract, the DBE participation may be counted for both the contract goal and the overall goal.

E. SUBCONTRACTING.

Subcontracting by the Prime Contractor. Form B Request for Approval of Subcontractor shall be used by the Prime Contractor to request approval of a Subcontractor and also to ensure that a formal Subcontract has been or will be written and kept on file by the Prime Contractor. Completion and submittal of the form by the Prime Contractor acknowledges that the Administration’s Contracting Officer may require the submission of the written Subcontract for review by the Administration and/or FHWA.

Lower Tier Subcontracting by an Approved Subcontractor. Form B Subcontractor’s Request for Approval of Lower Tier Subcontractor shall be used by an Approved Subcontractor to request approval of a Lower Tier Subcontractor and also to ensure that a formal Subcontract has been or will be written and kept on file by the Subcontractor.



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Completion and submittal of the form by the Subcontractor acknowledges that the Administration's Contracting Officer may require the submission of the written Subcontract for review by the Administration and/or FHWA.

Form Acquisitions. Maryland State Highway Administration Form B may be acquired through the Administration's Contracts Award Team or District Office. All questions should be directed to the Office of Construction, Contracts Award Team.

It is the Administration's intention to randomly select during each calendar quarter a representative sample of written Subcontracts for review. This review will be conducted by the Office of Construction's Contracts Award Team.



MBE/DBE COMPLIANCE FIELD MEETING

A MBE/DBE compliance Field Meeting will be conducted to review the responsibilities of the Administration and the Contractor's personnel relative to MBE/DBE Compliance and documentation. The meeting will be held within two weeks after starting work on the project.

The Construction Project Engineer, who will notify the following of the date, time and location, will arrange the meeting. At least one week advanced notice will be required.

(a) Administrative Representatives.

- (1) Director, Office of Equal Opportunity or Designee
- (2) District Equal Opportunity Officer
- (3) Regional Constructional Engineer
- (4) Construction Project Engineer
- (5) Construction Inspection Division Inspector

(b) Contract Representatives.

- (1) Superintendent - Prime Contractor
- (2) Equal Opportunity Officer - Prime Contractor
- (3) Owner/Superintendent/Foreman MBE/ DBE - Subcontractor

The Construction Project Engineer and Equal Opportunity Representative will jointly conduct the meeting. The Contractor shall notify the appropriate subcontractors and ensure their attendance.



CONTRACT PROVISIONS
TRAFFIC CONTROL PLAN CERTIFICATION

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TRAFFIC CONTROL PLAN CERTIFICATION

PRIOR TO THE COMMENCEMENT OF WORK ON THIS PROJECT, THE SUCCESSFUL BIDDER WILL BE REQUIRED TO COMPLETE A TRAFFIC CONTROL PLAN CERTIFICATION, CONTAINING THE INFORMATION SHOWN BELOW. THE CERTIFICATION FORM WILL BE PROVIDED TO THE SUCCESSFUL BIDDER UPON AWARD OF THE CONTRACT.

The Administration's Traffic Control Plan (TCP) has been reviewed and the following course of action shall be followed:

Option 1 _____

The TCP is accepted and shall be used on this project.

Option 2 _____

The TCP is accepted; however, revisions and/or additions shall be submitted for approval in conformance with the Administration's Specifications 104.01.

Option 3 _____

The TCP is not accepted and revision shall be submitted for approval in accordance with the Administration's Specifications 104.01.

It is understood that the effective implementation of the approved TCP is the responsibility of the Contractor. Minor modifications may be made by the Traffic Manager if field conditions warrant and prior concurrence is obtained from the Engineer. Significant changes to the TCP will be submitted to the Engineer in writing, for approval, in conformance with the Administration's Specifications 104.01.

(DATE)

(SIGNATURE)

(PRINT SIGNATURE)

(TITLE)



CONTRACT PROVISIONS
PREVAILING WAGE INSTRUCTIONS

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PREVAILING WAGE
INSTRUCTIONS FOR THE CONTRACTOR

PAYROLLS.

Non-Federally Funded Contracts. The Division of Labor and Industry, Prevailing Wage Unit is requiring that all certified payroll records be submitted electronically. For instructions on how to register and submit go online to www.dllr.state.md.us/prevwage and follow the instructions for registering. The regulation addressing this change can be found at COMAR 21.11.11.02. For Non-Federally funded projects, which include prevailing wage rates, the prime Contractor and each subcontractor, shall submit the certified payroll electronically and provide one hard copy to the Project Engineer. All wages shall be paid in conformance with the State Finance and Procurement Article, Section 17-201-17-226 of the Annotated Code of Maryland and the Fair Labor Standards Amendments of 1974 (P.L. 93259). If the award amount of a Non-Federally funded job is less than \$500,000, the project will be exempt from prevailing wage requirements.

A review has been made of the wage conditions in the locality and, based on the information available, the wage rates and fringe payments listed are determined by the Commissioner of the Department of Labor and Industry to be prevailing for the Contract for the described classes of labor in conformance with the law. It shall be the responsibility of the Contractor to fully comply with the law and to contact the Office of the Commissioner of Labor and Industry for interpretation of the provisions of the law.

Federally Funded Contracts. For Federally funded projects, the prime Contractor and each subcontractor shall submit one copy of the certified payroll to the Project Engineer.

General Requirements for Federally and Non-Federally Funded Contracts. All payrolls are subject to the following requirements:

- (a) All payrolls shall be numbered, beginning at No. 1, and consecutively numbered through the end of the Contract.
- (b) Contract and FAP numbers shall be shown on all payrolls (as applicable).
- (c) All payroll submissions shall include:
 - (1) Federally Funded – employees’ full name, classification, and Individual Identifying Number (IIN) e.g. (last four digits of social security number). Refer to FHWA 1273 (IV),(3),(b)1 for further requirements related to weekly payrolls.
 - (2) Non-Federally Funded – employees’ full name, classification, address and social security number.



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PREVAILING WAGE INSTRUCTIONS

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- (d) All payrolls shall show the employee's basic hourly wage rate, overtime rate (if applicable), and the number of hours worked (tabulated both daily and weekly).
- (e) When fringe benefits are required, indicate separately the amount of employer contributions to fringe benefit funds and/or programs. The fringe benefits shall be individually identified, but may be tabulated on a separate sheet. When required fringe benefits are paid in cash, add the required fringe benefit amount to the basic hourly rate to obtain the total prevailing wage rate for the employee.
- (f) The employee's net pay and the itemized deductions shall be included in all payrolls.
- (g) A Contractor may make deductions that are required by law or required by a collective bargaining agreement (between the Contractor and a bona fide labor organization). Deductions are also permitted if they are identified in a written agreement between the employee and employer that was made at the beginning of employment, provided that the Contractor presents the agreement to the Administration before the employee begins working on the Contract. Each payroll shall also include the U.S. Department of Labor and Hour Public Contracts Division Statement of Compliance Form WH-347 (or its equivalent), signed by an appropriate official of the Contractor/subcontractor. The Contractor's name, address, and telephone number shall also be shown.
- (h) On Non-Federally funded projects, all apprentices shall be registered with the Maryland Apprenticeship and Training Council.
- (i) Contractors employing a classification of worker for which a wage rate was not included on the original wage decision, shall submit to either the Wage and Hour Team (Federally Funded) or Department of Labor and Licensing (DLLR), (Non-Federally Funded), a request for an additional classification and rate prior to the employee's employment at the project.
- (j) Payrolls for Non-Federally Funded projects shall be submitted within 14 calendar days after the end of each payroll period.
- (k) Payrolls for Federally Funded projects shall be submitted within 7 calendar days after the end of each payroll period.
- (l) Contractors and Subcontractors are required to maintain complete social security numbers and home addresses for employees. Government agencies are entitled to request or review all relevant payroll information, including social security numbers and addresses of employees. Contractors and Subcontractors are required to provide such information upon request.



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PREVAILING WAGE INSTRUCTIONS

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OVERTIME.

Non-Federally Funded Contracts. Overtime rates shall be paid by the prime Contractors and subcontractors under their Contracts and agreements with their employees, which in no event shall be less than time and a half the prevailing hourly rate of wages for all hours worked in excess of ten hours in any one calendar day or forty hours in any one calendar week and work performed on Sundays and legal holidays.

Fringe benefits shall be paid for all hours worked, including the overtime hours. However, the fringe benefit amounts may be excluded from the half time premium due as overtime compensation.

Federally Funded Contracts. Overtime rates shall be paid as specified in Form FHWA 1273. Fringe benefits shall be paid for all hours worked, including the overtime hours. However, the fringe benefit amounts may be excluded from the half time premium due as overtime compensation.

PENALTIES.

Non-Federally Funded Contracts. When the Contractor is delinquent in submitting payroll records, processing of partial payment estimates will be held in abeyance, pending receipt of the records. The Contractor shall be liable to the Administration for liquidated damages in the amount of \$10.00 for each calendar day the records are late.

The Contractor shall be liable to the Administration for liquidated damages in the amount of \$20.00 for each day that an employee is paid less than the prevailing wage.

Federally Funded Contracts. When the Contractor is delinquent in submitting payroll records, processing of partial payment estimates will be held in abeyance pending receipt of the records.

ADDITIONAL CLASSIFICATIONS.

Federally Funded Contracts. If the wage determination lacks a necessary classification the Prime Contractor is responsible to submit the request for the additional classification, with a proposed rate, to the State Highway Administration's Wage and Hour Team. The request is to include a copy of the projects wage determination.

Non-Federally Funded Contracts. If the wage determination lacks a necessary classification the Prime Contractor is responsible to submit the request for the additional classification, with a proposed rate, to the Department of Labor and Licensing (DLLR).



Maryland Department of Transportation
State Highway Administration

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INQUIRIES.

Request for information or questions shall be addressed to:

Maryland State Highway Administration
Office of Construction
Wage and Hour Team
7450 Traffic Drive, Building #4
Hanover, MD 21076
Email: wageandhourteam@sha.state.md.us

AND

Senior Planner, Housing and Community Development Department
City of Takoma Park
7500 Maple Avenue
Takoma Park, MD 20912

General Decision Number: MD170014 01/06/2017 MD14

Superseded General Decision Number: MD20160014

State: Maryland

Construction Type: Highway

County: Montgomery County in Maryland.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.20 for calendar year 2017 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 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 \$10.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2017. 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	01/06/2017

SUMD2015-009 09/15/2015

	Rates	Fringes
CARPENTER.....	\$ 26.81	8.19
CEMENT MASON/CONCRETE FINISHER...	\$ 19.56	5.08
ELECTRICIAN.....	\$ 38.79	15.25
IRONWORKER, REINFORCING.....	\$ 27.05	17.31
IRONWORKER, STRUCTURAL.....	\$ 26.97	15.87
LABORER: Asphalt, Includes Raker, Shoveler, Spreader and Distributor.....	\$ 18.93	16.35
LABORER: Concrete Surfacer.....	\$ 27.48	5.25
LABORER: Grade Checker.....	\$ 19.11	16.35
LABORER: Jack Hammer.....	\$ 14.30	0.00
LABORER: Luteman.....	\$ 14.00	0.00

LABORER: Mason Tender - Cement/Concrete.....	\$ 19.11	16.35
LABORER: Pipelayer.....	\$ 17.25	3.50
LABORER: Common or General, Includes Flagger.....	\$ 21.10	2.18
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 21.07	4.99
OPERATOR: Bobcat/Skid Steer/Skid Loader.....	\$ 16.00	0.00
OPERATOR: Broom/Sweeper.....	\$ 23.49	12.15
OPERATOR: Bulldozer.....	\$ 24.75	12.15
OPERATOR: Crane.....	\$ 30.30	15.30
OPERATOR: Gradall.....	\$ 27.45	12.15
OPERATOR: Loader.....	\$ 26.45	12.15
OPERATOR: Milling Machine.....	\$ 21.16	0.00
OPERATOR: Paver (Asphalt, Aggregate, and Concrete).....	\$ 19.92	0.00
OPERATOR: Piledriver.....	\$ 26.89	8.78
OPERATOR: Roller.....	\$ 16.17	2.58
OPERATOR: Screed.....	\$ 16.00	0.00
PAINTER: Bridge.....	\$ 33.23	9.40
TRUCK DRIVER: Dump Truck.....	\$ 15.00	0.00
TRUCK DRIVER: Flatbed Truck.....	\$ 19.68	4.83
TRUCK DRIVER: TackTruck.....	\$ 22.94	7.87
TRUCK DRIVER: Water Truck.....	\$ 23.56	6.96

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave
for Federal Contractors applies to all contracts subject to the
Davis-Bacon Act for which the contract is awarded (and any
solicitation was issued) on or after January 1, 2017. If this
contract is covered by the EO, the contractor must provide
employees with 1 hour of paid sick leave for every 30 hours
they work, up to 56 hours of paid sick leave each year.
Employees must be permitted to use paid sick leave for their

own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (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.

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END OF GENERAL DECISION

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**NOTICE OF ACTIONS REQUIRED FOR AFFIRMATIVE ACTION TO
ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)**

1. The Offeror's or Bidders 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 noted in Appendix A and B:

These goals are applicable to all the Contractors' construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and nonfederally involved construction.

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 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.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this notification. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.
4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is noted on appendix B.

**STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION
CONTRACT SPECIFICATIONS (Executive Order 11246)**

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;



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- 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 of race);
 - (iii) Asian and Pacific Islander (all persons having origins in any of the original people of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and,
 - (iv) American Indians or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
- 2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.
- 3. If the Contractor is participating (pursuant to 41 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 7.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 and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goal in each craft during the period specified.
- 5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.



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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 sites or in such facilities.
 - b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
 - c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with reason therefore, along with whatever additional actions the Contractor may have taken.
 - d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
 - e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7.b 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



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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 work force.
- 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 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 insure 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.



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- p.** Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
- 8.** Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7.a through 7.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 7.a through 7.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 work force 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 non-compliance.
- 9.** A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, 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 underutilized).
- 10.** The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
- 11.** The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.
- 12.** The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
- 13.** The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
- 14.** The Contractors shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at 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



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which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

- 15.** Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents

(a.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

- 16.** The Contractor will receive at the time of Award Federal Form CC-257 for his use in reporting monthly the Affirmative Actions for minority and female which he has employed.



APPENDIX A

The following goals and timetables for female utilization shall be included in all Federal and federally assisted construction contracts and subcontracts in excess of \$10,000. The goals are applicable to the Contractor's aggregate on-site construction work force whether or not part of that work force is performing on a Federal or federally assisted construction contract or subcontract.

AREA COVERED: Nationwide

GOALS AND TIMETABLES

Timetable	Goals (percent)
From April 1, 1978 until March 31, 1979.....	3.1
From April 1, 1979 until March 31, 1980.....	5.0
From April 1, 1980 until further notice.....	6.9



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APPENDIX B

Until further notice, the following goals for minority utilization in each construction craft and trade shall be included in all Federal or federally assisted construction contracts and subcontracts in excess of \$10,000 to be performed in the respective geographical areas. The goals are applicable to each nonexempt contractor's total on-site construction work force, regardless of whether or not part of that work force is performing work on a Federal, federally assisted or nonfederally related project, contract or subcontract.

Construction contractors which are participating in an approved Hometown Plan (see 41 CFR 60-4.5) are required to comply with the goals of the Hometown Plan with regard to construction work they perform in the area covered by the Hometown Plan. With regard to all their other covered construction work such contractors are required to comply with the applicable SMSA or EA goal contained in this appendix B-80.

State	Goal (percent)
Maryland:	
019 Baltimore, MD:	
SMSA Counties:	
0720 Baltimore, MD.....	23.0
MD Anne Arundel; MD Baltimore; MD Carroll; MD Harford; MD Howard; MD Baltimore City	
Non-SMSA Counties.....	23.6
MD Caroline; MD Dorchester; MD Kent; MD Queen Annes; MD Somerset; MD Talbot; MD Wicomico; MD Worcester	
Washington, DC:	
020 Washington, DC:	
SMSA Counties:	
8840 Washington, DC.....	28.0
MD Charles; MD Montgomery; MD Prince George's	
Non-SMSA Counties.....	25.2
MD Calvert; MD Frederick MD St. Marys; MD Washington	
Pennsylvania	
Non-SMSA Counties.....	4.8
MD Allegany; MD Garrett	



TRAINING PROVISIONS

As part of the Contract's Equal Employment Opportunity Affirmative Action Program, on-the-job training shall be provided as follows:

The on-the-job training shall be aimed at developing full journeypersons in the type of trade or job classification involved. On this Contract **ZERO (0)** (number to be filled in by the Administration) persons will be trained.

In the event that a Contractor subcontracts a portion of the Contract work, the Contractor shall determine how many, if any, of the trainees are to be trained by the subcontractor, however, the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this Provision. The Contractor shall also insure that this training Provision is physically included in each subcontract to insure that the workforce utilized by the subcontractor meet the goals for minority and female employment and training. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees in each classification shall be distributed among the work classifications on the basis of the Contractor's needs, minority and women employment goals specified for each trade in the Contract Provision, and the reasonable area of recruitment.

Prior to beginning construction, the Contractor shall submit to the Administration for approval a Manpower and Training Utilization (MTU) Schedule no later than at the preconstruction meeting.

The MTU schedule shall include:

1. The proposed training programs.
2. The number of trainees to be trained in each classification.
3. Anticipated starting and ending dates for training in each classification.

No Contract work may be undertaken until the Administration has accepted the schedule.

If the submitted training programs fail to meet the requirements as defined within these Provisions, the Administration will withhold one percent of the total category code one pay items from the payment due the Contractor. The Contractor shall submit a revised Manpower and Training Utilization Schedule when major changes in the Contract work schedule occur that substantially affect the previously submitted schedule.

The Contractor shall be credited for each trainee employee who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for the hourly cost of the trainee as specified in the schedule of prices.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Provision. The purpose for this objective is to insure a pool of qualified minorities and women to replace those journeypersons who, in the natural course of events will leave the workforce. The program will also provide opportunities to the minorities and women trainees in geographic areas where shortages in minority and women journeypersons are prevalent and recognized due to the Contractor's inability to meet the Equal Employment Opportunity goals specified in this Contract.



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The training requirements of this Training Provision are not intended nor shall they be used to discriminate against any applicant for training, whether a member of a protected class or not. It is the Contractor's responsibility to demonstrate good faith efforts to ensure an adequate workforce representation of minorities and women in all job classifications on this Contract. Therefore, the Contractor shall consider the employment Contract goals set for minorities and females when enrolling trainees. The Contractor's utilization of the on-the-job training goals will be weighed when an Equal Employment Opportunity workforce compliance determination is made.

The Contractor shall make every effort to enroll minority and women trainees (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minorities and women to the extent that these persons are available within a reasonable area of recruitment).

No employee shall be employed as a trainee in any classification which the individual has successfully completed a training program leading to journeyperson status or has been employed as a journeyperson. This includes a person gainfully employed as a journeyperson by virtue of informal on-the-job training. The Contractor should satisfy this requirement by including appropriate questions in the employee job application or by other suitable means. Regardless of the method used, the Contractor's records shall document the findings in each case. In the case of apprentices, evidence of indentureship and registration of the approved apprenticeship program shall be included in the Contractor's records.

The minimum length and type of training and rate for each classification shall be specified in the training program by the Contractor and approved by the Administration and the Federal Highway Administration.

The Administration will approve any program specified in the Administration's On-The-Job Training Manual. The Administration and the Federal Highway Administration will consider other programs if it is reasonably calculated that the programs conform to the Equal Employment Opportunity obligations of the Contract and will qualify the average trainee for journeyperson status in the specified classification by the end of the training period. Apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, and training programs approved by, but not necessarily sponsored by the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training will also be acceptable, provided that the program being offered is administered in a manner consistent with the Equal Employment obligation of Federal-aid highway construction Contracts and meets the minimum requirements of this Training Provision.

Some offsite 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.

Unless otherwise specified, the Contractor will be reimbursed 80 cents per hour of training given an employee on this Contract in conformance with an approved training program. As approved by the Engineer, reimbursement will be made for training persons in excess of the number specified herein. This reimbursement will be made even though the Contractor received additional training program funds from other sources, provided that the other sources do not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above will only be made to the Contractor where the Contractor does one or more of the following and the trainees are concurrently employed on a Federal-aid project:

1. Contributes to the cost of the training.



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2. Provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

No payment will be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman is caused by the Contractor and evidences a lack of "good faith" on the part of the Contractor in meeting the requirements of this Training Provision. It is normally expected that a trainee will begin training on the project as soon as feasible after the start of work utilizing the skill involved and remain on the project as long as training opportunities exist in the work classification or until the program is completed. It is not required that all trainees be on board for the entire length of the Contract. A Contractor will have fulfilled their responsibilities under this Training Provision when:

1. Systematic and direct recruitment likely to yield qualified minority and women applicants is conducted through:
 - a. Public and private referral sources.
 - b. Advising the existing workforce of training opportunities.
 - c. Unions (if applicable).
2. Acceptable training has been provided to trainees enrolled in the program.
3. The number of specified trainees have completed the minimum hours required in an approved training program.
4. Trainees completing approved programs are retained in the workforce as journeymen.

The Contractor shall pay the trainees at least 60 percent of the appropriate minimum journeyman's hourly rate plus the full fringe benefits specified in the Contract for the first half of the training period, 75 percent for the third quarter of the training period plus full fringe benefits, and 90 percent for the last quarter of the training period plus full fringe benefits. However, in no case shall the total hourly rate be less than the U.S. Department of Labor's unskilled laborer wage rate for the project. In addition, all trainees shall be identified as such on the certified payroll.

The Contractor shall furnish the trainee a copy of the approved training program in which the trainee is enrolled. The Contractor shall provide each trainee with a certificate showing the type and length of training satisfactorily completed. The Contractor shall submit a Certificate to the trainee in the following instances:

1. Certificate of Completion when a trainee completes the total number of hours required to complete a training program.
2. Certificate of Training when a trainee does not totally complete the required program hours.

The Contractor shall provide for the maintenance of records and furnish periodic reports inclusive of the Administration's Contractor's Semiannual Training Reports, documenting his performance under this Training Provision. The Semiannual Training Report is to be submitted by the 10th of the month following the reporting period (July 10 and January 10).



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If the Contractor fails to fully comply with these Training Provisions, the Administration's Representative will make a final report of non compliance to the Administrator, who may direct the imposition of one or both of the sanctions listed below:

1. Withholding a percentage of the progress payment.
2. Other action appropriate and/or within the discretion of the Administrator.



NOTICE TO ALL HOLDERS OF THIS CONTRACT DOCUMENT

HIGH VISIBILITY SAFETY APPAREL POLICY

BACKGROUND. Research indicates that high visibility garments have a significant impact on the safety of employees who work on highways and rights-of-way. In addition, high visibility garments may help to prevent injuries and accidents and to make highway workers more visible to the motoring public, which ultimately improves traffic safety.

STATEMENT OF POLICY.

- (a) The High Visibility Safety Apparel Policy provides a standardized apparel program.
- (b) The program seeks to improve the visibility of all persons who work on Administration highways and rights-of-way.
- (c) All apparel shall contain the appropriate class identification label.
- (d) Compliance with this policy is retroactive and becomes effective immediately. All affected employees shall receive high visibility apparel awareness training.

APPLICABILITY. This policy applies to all Administration employees and all other persons who work on Administration highways and rights-of-way. All workers shall wear, at a minimum, Class 2 ANSI/ISEA 107/2004 apparel.

- (a) For Administration employees, this apparel shall have a fluorescent yellow-green background material color and be the outermost garment worn.
- (b) Retro-reflective material color for Administration employee apparel shall be silver or white and be visible at a minimum distance of 1,000 feet. The retro-reflective safety apparel shall be designed to clearly recognize and differentiate the wearer from the surrounding work environment. The retro-reflective material may be contrasted by fluorescent orange background material not exceeding one and one half inches on either side of the retro-reflective material.
- (c) For non-Administration employees, this apparel shall be either fluorescent orange-red or fluorescent yellow-green background material color and be the outermost garment worn.
- (d) Retro-reflective material color for non-Administration employee apparel shall either be orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors, and be visible at a minimum distance of 1,000 feet. The retro-reflective safety apparel shall be designed to clearly recognize and differentiate the wearer from the surrounding work environment.



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REFERENCES.

- (a) ANSI/ISEA 107/2004 standard – American National Safety Institute/International Safety Equipment Association
- (b) MUTCD 2003 – Manual for Uniform Traffic Control Devices - Sections 6D.03B and 6E.02
- (c) Visibility Research – The VCTR 1989 report concludes that fluorescent colors, when compared with non-fluorescent colors, enhance the daytime conspicuity of worker clothing.

DEFINITIONS.

- (a) Apparel – The outermost high-visibility garment worn by employees who work on Administration highways and rights-of-way.
- (b) Highways – All roads owned by the Maryland Department of Transportation and maintained by the Administration.
- (c) High Visibility – The ability for workers to be distinguishable as human forms to be seen, day and night, at distances that allow equipment operators and motorists to see, recognize, and respond.

PROJECT DESCRIPTION

This project is for the construction of streetscape improvements along Ethan Allen Avenue and East-West Highway (MD 410) by the City of Takoma Park. The limits of the improvements along Ethan Allen Avenue / MD 410 are from approximately 350 feet west of New Hampshire Avenue (MD 650) to approximately 1,100 feet east of MD 650, for a total distance of 0.268 miles.

The work will consist of the following:

- (a) new pavement construction and patching, full depth widening, grinding and resurfacing the existing pavement;
- (b) relocation / reconstruction of curb and gutter, raised median, monolithic concrete median, and inlet structures;
- (c) cleaning of existing inlets and pipes;
- (d) relocation / reconstruction of sidewalk, pedestrian ramps, driveway aprons, and bus stops per ADA standards;
- (e) installation of new bicycle lanes and compatible signing / pavement markings;
- (f) modifications to and removal of existing channelization islands at MD 410/MD 650 intersection;
- (g) installation of two (2) new micro-bioretenion SWM practices;
- (h) WSSC water main relocation;
- (i) installation of new landscaping, hardscaping;
- (j) installation of new energy efficient (LED) decorative pedestrian and vehicular lighting;
- (k) modifications to the existing lane configurations along Ethan Allen Avenue / MD 410;
- (l) traffic and pedestrian signal modifications at the MD 410 / MD 650 intersection; and
- (m) Maintenance of Traffic (MOT).

Note: Replacement of existing High Pressure Sodium (HPS) cobra head lighting with Light-Emitting Diode (LED) cobra head lighting on utility poles will be furnished and installed by PEPCO.

EMPLOYMENT AGENCY

The Maryland Department of Human Resources is located at:

SPECIAL PROVISIONS
PROJECT DESCRIPTION

SHA TRACKING NO. 15APMO015XX
FAP NO. TAP-3(481)E
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Montgomery County

Montgomery County One Stop Center (Germantown)
Up County Regional Service Center
12900 Middlebrook Road
Germantown, MD 20874
(P) 240-777-2050
(F) 240-777-2070

NOTICE TO CONTRACTOR

PROJECT SCHEDULE. Section 109 shall only apply when a CPM Project Schedule item is included in the Schedule of Prices. Otherwise, all Project Schedules shall conform to Section 110.

NOTICE TO BIDDERS. The Proposal Form Packet in this Invitation for Bids requires the following information be submitted for the Bidder and each firm quoting or considered as subcontractors:

- (a) Name of firm.
- (b) Address of firm.
- (c) MBE, Non-MBE, DBE, or Non-DBE.
- (d) Age of firm.
- (e) Annual gross receipts per last calendar year.

Note that there are provisions for submitting copies for additional subcontractors, and that an “X” is required to indicate whether or not additional copies have been submitted.

AFFIRMATIVE ACTION PLAN (AAP) CONTRACT GOALS. In order to be in compliance with the revised MBE/DBE laws effective September 27, 2011 or later, the bidder is required to complete the AAP information on pages 19, 20, 24–27, and 37-41 of 45 of the Contract Provisions, Proposal Form Packet—Federal, or complete the AAP information on pages 15-25, and 34-38 of 43 of the Contract Provisions, Proposal Form Packet—State, or complete the AAP information on pages 16-26 and 35-39 of 44 of the Contract Provisions, Proposal Form Packet—State Small Business Reserve Procurement. Failure to complete the information may be grounds for the bid to be declared non-responsive.

BOOK OF STANDARDS. The Book of Standards for Highway and Incidental Structures is only available on the Administration’s Internet Site at www.roads.maryland.gov. The Book of Standards can be located by clicking on Business, Business Center, Business Standards and Specifications; and Book of Standards for Highway and Incidental Structures.

2008 STANDARD SPECIFICATION FOR CONSTRUCTION AND MATERIALS BOOK. The 2008 Standard Specifications for Construction and Materials Book is now only available on the Administration’s Internet Site at www.roads.maryland.gov. The 2008 Specification Book can be located by clicking on Business, Business Center, Business Standards and Specifications; and 2008 Standard Specification for Construction and Materials which is available for download in .pdf format.

CITY OF TAKOMA PARK ADDENDUM TO MARYLAND STATE HIGHWAY ADMINISTRATION’S 2008 STANDARD SPECIFICATION FOR CONSTRUCTION AND MATERIALS BOOK. All work on this project shall conform to 2008 Standard Specifications for Construction and Materials Book, revisions thereof, or additions thereto, and the Special Provisions included in this Invitation for Bids. Any supplements, deletions or additions included in the Contract Documents shall govern.

The Ethan Allen Gateway Streetscape is a project of the City of Takoma Park, undertaken on right-of-way owned and maintained by the Maryland State Highway Administration, and in partnership with the State Highway Administration.

Compiled herein are notes and comments that apply to Part I: General Provisions (pp. 1-78), and Part II: Terms and Conditions (pp. 81- 134) in the Maryland State Highway Administration's Standard Specification for Construction and Materials (Gray Book).

For the purposes of this Invitation for Bids, all references made in the Gray Book to the "State", as well as state and federal personnel, bodies, agencies, and contractors are expanded to include the City of Takoma Park, Maryland, its departments and staff. It is understood that any contract resulting from this Invitation for Bids will be subject to the corresponding General Provisions and Terms and Conditions applicable to an "Administration Contract."

Unless otherwise stated below, all sections of General Provisions and Terms and Conditions set forth within the Gray Book apply.

WSSC Water Main Relocation Work: Refer to the WSSC General Conditions for Construction, Project Specifications and Details included herein.

Salvaged Items: All salvaged items and material becomes the contractor's property by virtue of the contract provisions. This shall include all salvaged items and material associated with the WSSC water main relocation work.

GP-1.03 Organizational Definitions (pp.1-2)

The organizational definitions, as they apply throughout the General Provisions and Terms and Conditions should be considered expanded and inclusive of employees of the City of Takoma Park, Maryland. For the purposes of this Contract:

- "Administration" encompasses the City of Takoma Park and its organizational departments.
- "Administrator" includes the Takoma Park City Manager.
- "Procurement Officer" is an employee of the City of Takoma Park.

GP-2.07 Proposal Guaranty (pp.10-11)

The guaranty will be made payable to the City of Takoma Park, not to the State of Maryland.

GP-3.03 Performance Bond and Payment Bond Requirements (p. 20)

The performance and payment bond is to be delivered to the City of Takoma Park.

GP-3.05 Failure to Execute Contract

Forfeiture of proposal guaranty shall become property of the City of Takoma Park, not the State of Maryland.

GP-4.10 Warranty of Construction (pp.26-27)

By this statement, GP-4.10 Warranty of Construction does apply to this contract.

GP-5.15 Disputes (pp.35-37)

This contract is not subject to the provisions of Title 15, Subtitle 2, State Finance and Procurement Article (Dispute Resolution) of the Annotated Code of Maryland and COMAR 21.10 (Administrative and Civil Remedies). Therefore, subsection GP-5.15 Disputes is to be amended as follows:

- (a) – does not apply
- (d) – replace “Office of the Attorney General” with “City Attorney”
- (h) – The Maryland State Board of Contract Appeals does not govern this contract. A written appeal may be filed with the Takoma Park City Manager within 30 days of receipt of a decision by the procurement officer. The Contractor shall be afforded the opportunity to be heard and offer evidence in support of the claim.

TC-1.03 Definitions (pp. 82-87)

Definitions, as they apply throughout the Terms and Conditions should be considered expanded and inclusive of employees of the City of Takoma Park, Maryland. For the purposes of this Contract:

- “Administration” encompasses the City of Takoma Park and its organizational departments.

TC-2.02 Preparation of Bid (pp.88-89)

Sample forms should additionally be submitted to:

Community Development Manager, Housing & Community Development
City of Takoma Park
7500 Maple Avenue
Takoma Park, MD 20912

TC-4.01 Working Drawings (pp.95-98)

Working drawings should additionally be submitted to:

Community Development Manager, Housing & Community Development
City of Takoma Park
7500 Maple Avenue
Takoma Park, MD 20912

TC-5.01 Insurance (pp. 100-101)

The City of Takoma Park shall be listed as an additional named insured on the policy. Notice of the policies shall be additionally provided to the City of Takoma Park:

Community Development Manager, Housing & Community Development
City of Takoma Park
7500 Maple Avenue
Takoma Park, MD 20912

TC-7.05 Progress Payments and TC-7.06 Final Acceptance and Final Payment (pp.127-133)

Sections TC-7.05 & TC-7.06 does not apply and is replaced with the following:

PROGRESS PAYMENTS AND RETAINAGE

The Contractor shall submit a detailed application for payment on a monthly basis. Such application for payment, notarized, if required, must be accompanied by supporting data and documents substantiating the Contractor's right to payment and reflecting a five percent (5%) retainage.

Applications for payment shall not include payment for equipment or materials delivered to the site but not installed or for materials or equipment properly stored off-site unless specifically approved by the Procurement Officer. If such approval is granted, the Contractor must submit with the application for payment, bills of sale or other such documentation satisfactory to the City to establish the City's title to such materials or equipment or otherwise to protect the City's interest, including applicable insurance and transportation to the site for materials and equipment stored off site. Such approvals are typically reserved for "big ticket" items that individually would exceed five percent (5%) of the bid total. The Contractor shall promptly pay each subcontractor and supplier for work completed upon receipt of payment from the City the amount to which said subcontractor is entitled, reflecting any percentage retained from payments to the Contractor on account of each subcontractors work. The Contractor shall, by an appropriate agreement with each subcontractor, require each subcontractor to make prompt payments to his subcontractors in a similar manner.

The City shall be under no obligation to pay or to see to the payment of any moneys to any subcontractor except as may otherwise be required by law.

No Certificate of Payment or partial or entire use of the facility by the City shall constitute an acceptance of any work which is not in accordance with the Contract Documents.

Payments Withheld – The City may decline to certify payment or because of subsequently discovered evidence or observations, nullify the whole or any part of any Certification of Payment previously issued, as may be necessary to protect the City from loss because of: (1) defective work not remedied, (2) third party claim filed or evidence indicating probable filing of such claim, (3) failure of the Contractor to make payments properly to subcontractors or suppliers, (4) reasonable evidence that the work cannot be completed for the unpaid balance of

the contract sum, (5) reasonable evidence that the work will not be completed within the Contract time, (6) persistent failure to carry out the work.

FINAL PAYMENT REQUEST

Upon reaching substantial completion, as defined by receipt of occupancy permit or when all related punch list items have been completed, whichever date is later, the Contractor may submit a written Application for Final Payment. All supporting documentation and data shall be submitted with the Request for Final Payment as is applicable to the monthly Requests for Payment referenced heretofore. Out of the amount representing the total of the final payment request the City shall deduct five (5%) percent, which shall be in addition to any and all other amounts which, under the Contract, it is entitled or required to retain and shall hold said sum for a period of one hundred and twenty (120) days after the date of acceptance of the work by the City.

Within thirty (30) days after the approval of the final payment request, the City will pay to the Contractor the amount remaining after deducting from the total amount of the final estimate all such sums as have hereto before been paid to the Contractor under the provision of the Contract and also such amounts as the City has or may be authorized under the Contract to reserve or retain.

Neither the final payment nor the remaining retainage shall become due until the Contractor submits to the Procurement Officer:

1. An affidavit that all payrolls, bills for materials and equipment and other indebtedness connected with the work for which the City or his property might in any way be responsible, have been paid.
2. Consent of surety to final payment, and
3. If requested, data establishing payment or satisfaction of obligations, such as receipt, release and waivers of liens arising out of the Contract;
4. All punch list items are completed to the satisfaction of the Procurement Officer. If any subcontractor refuses to furnish a release or waiver of liens required by the City, the Contractor may furnish a bond satisfactory to the City to indemnify him against any such lien. If any such lien remains unsatisfied after all payments are made, the Contractor shall refund to the City all moneys that the latter may be compelled to pay in discharging such lien, including all costs and reasonable attorney fees. Acceptance by the Contractor of final payment shall operate as a release to the Mayor and Council and every officer and agent thereof, from all claims and liabilities to the Contractor for anything done or furnished or relating to the work under the contract.

RELEASE OF RETAINAGE

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Upon the expiration of the aforesaid period of one hundred and twenty (120) days succeeding the date of acceptance, the City will pay to the Contractor all sums reserved or retained, less such amount as it may be empowered under the provisions of the Contract to retain.

INSURANCE REQUIREMENTS. The Contractor shall include the State of Maryland and the City of Takoma Park as an additional named insured on all insurance policies required by this Contract, or otherwise required by law, including, but not limited to, commercial general liability (CGL), Workers' Compensation, and automobile liability.

All insurance policies, as described above, shall be kept in full force and effect until all work has been satisfactorily completed and accepted. All insurance policies, as described above, shall be endorsed to require thirty (30) days notice of cancellation or nonrenewal to:

Maryland State Highway Administration
Director, Office of Construction
7450 Traffic Drive
Hanover, MD 21076

AND

Community Development Manager, Housing & Community Development
City of Takoma Park
7500 Maple Avenue
Takoma Park, MD 20912

Evidence of insurance required by this Contract, or otherwise required by law, shall be provided to the Administration at the address listed above prior to the award of the Contract by means of a Certificate of Insurance with copies of all cancellation endorsements attached. Any policy exclusions shall be shown on the face of the Certificate of Insurance.

Certificates of Insurance shall comply with all requirements of the Maryland Annotated Code, Insurance Article, Section 19-116. Certificates of Insurance shall be on a form approved by the Maryland Insurance Commissioner (Commissioner). Standard Certificate of Insurance forms currently adopted for use by the Association for Cooperative Operations Research (ACORD) or the Insurance Services Office (ISO) are deemed approved by the Commissioner and are acceptable. Outdated ACORD or ISO forms (those with a revision date prior to the date of the form currently adopted for current use by ACORD or ISO) are not acceptable. The Contractor shall ensure that all required Certificates of Insurance satisfy all requirements of Section 19-116 of the Insurance Article, including the prohibition against the issuance of any certificate of insurance that contains false or misleading information or that purports to amend, alter, or extend the coverage provided by the policies referenced in the certificate.

REQUEST FOR INFORMATION. Any information regarding the requirements or the interpretation of any provision of the Contract Documents shall be requested, in writing, per the

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requirement of GP-2.09. Responses to questions or inquiries having any material effect on the bids shall be made by written addenda sent to all prospective bidders. The Administration will not respond to telephone requests for information concerning this invitation for bids that would materially affect the bid.

Written requests for information or questions shall be addressed to:

Community Development Manager, Housing & Community Development
City of Takoma Park
c/o Ms. Rosalind Grigsby
7500 Maple Avenue
Takoma Park, MD 20912

Each request for information or questions shall include the Project Name, SHA Tracking number, FAP contract number and the name and address of the originator.

PAVEMENT PATCHING

Quantities for patching are included in these specifications. The Project Engineer shall contact the Pavement and Geotechnical Division to identify patching locations. Please contact the following for assistance:

Office of Materials Technology
Pavement and Geotechnical Division
7450 Traffic Drive
Hanover, MD 21076
1-866-926-8501
443-572-5058

MISS UTILITY FEE SCHEDULE

Calls to Miss Utility to mark utilities within SHA ROW will be invoiced by SHA per the following fee schedule:

- \$27.00 on tickets coded as **“Clear / No Conflict.”**
- \$35.00 on tickets coded as **“Marked.”**
- \$15.00 on tickets coded as **“Updated.”**
- \$0.00 on tickets coded as **“Cancelled.”**

COORDINATION WITH TRANSIT AUTHORITY

Contact the transit authorities listed below prior to beginning construction to coordinate the temporary relocation or closure of bus stops.

Mr. Jamie Ira Cepler
WMATA – Bus Operations Specialist

03-23-16¶

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Office of Planning, Scheduling and Customer Facilities
600 5th Street, NW, 7B-11
Washington, D.C. 20001
202-962-6085
JCepler@wmata.com

RIGHT-OF-WAY STATUS

The City of Takoma Park will secure all right of entry agreements and easements prior to Notice to Proceed.

No right of way acquisitions are anticipated for this project. There are no relocation assistance services necessary for the above-captioned contract.

Notice is hereby given in the contract proposal, in accordance with Title 23, Code of federal Regulations, Part 635, that the lack of possession, right of entry agreements or easements for any of the properties on this project may interfere with construction operations.

The City of Takoma Park will not honor any claim for inconvenience or delay caused by lack of clear right-of-way. Notice will be given that an extension of time will be granted, if necessary, for delays caused by the interference beyond the time of notice to proceed.

RAILROAD STATEMENT. Federal Aid Contracts Only. Federal Aid Contract No. **TBD**

For this project, Maryland SHA is providing the following statement of coordination (check one):

- No Railroad coordination required (no RR facilities are affected) (check this box when there is no railroad facility within or near the terminus of the project limits)
- All Railroad work has been completed prior to the project (check this box if traffic control devices within or near the terminus of the Federal-Aid project limits comply with the current edition of the Manual on Uniform Traffic Control Devices)
- The necessary arrangements have been made for all railroad work to be undertaken and completed as required for proper coordination with physical construction schedules. (Appropriate notification shall be provided in the PS&E for railroad coordination concurrent with the project construction)
- For AREAWIDE Contracts, Maryland SHA will provide a Statement of Coordination when the Modification to the 25C is submitted, prior to NTP. (Check this box for all AREAWIDE Projects)

REQUIRED ENVIRONMENTAL PERMITS, APPROVALS AND AUTHORIZATIONS.

The City of Takoma Park will obtain all required permits, approvals, or authorizations which are within the project scope and limits set forth in the contract documents and listed in the below table. The Contractor shall comply with the requirements of all permits, approvals, or authorizations required for this project. All permits received by advertisement are included in the IFB. Permits received after advertisement and prior to bid opening will be added to the IFB via an addendum.

All of the indicated permits, approvals, and authorizations should be kept on-site unless indicated otherwise. Proposed changes to the project may require additional permits, approvals, and authorizations and/or modifications.

Note: The City of Takoma Park will transfer authorization of the NPDES permit to the Contractor, who will then be responsible under the requirements of this permit.

Permit/ Approval/Authorization Description	Required for this project?	Approval/ Permit/ Authorization Included in IFB? ¹	Permit, Approval, Or Auth. Number	Expiration Date
WETLANDS, WATERWAYS, CRITICAL AREA				
MDE Non-tidal Wetland & Waterway Permit	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No	N/A	
MDE Authorization to Proceed	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No	N/A	
MDE Letter of Authorization	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No	N/A	
MDE General Waterway Construction Permit	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No	N/A	
MDE Water Quality Certification	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No	N/A	
MDE Tidal License	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No	N/A	
MDE Tidal Permit	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No	N/A	
MDE Tidal No-License	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No	N/A	
Maryland State Programmatic General Permit	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No	N/A	
COE Individual Permit	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No	N/A	
U.S. Coast Guard Permit	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No	N/A	
Critical Area Commission Approval	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No	N/A	
MDE Water Appropriations Permit for Ground Water	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No	N/A	

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Permit/ Approval/Authorization Description	Required for this project?	Approval/ Permit/ Authorization Included in IFB? ¹	Permit, Approval, Or Auth. Number	Expiration Date
EROSION/SEDIMENT CONTROL & STORMWATER MANAGEMENT				
Stormwater Management and Erosion & Sediment Control Approval	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Draft <input type="checkbox"/> No	City SWM permit enclosed Sediment Control Permit No. 277875	7/27/2018
NPDES Permit for Stormwater Associated with Construction Activity ²	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Draft <input type="checkbox"/> No	MDRCP020Y	12/31/2019
AASCD Approval	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No	N/A	
TREES				
MD Roadside Tree Permit	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Draft <input type="checkbox"/> No	2015-1152	9/06/2017
Maryland Reforestation Law Approval	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> Draft <input checked="" type="checkbox"/> No		
Maryland Forest Conservation Act Approval	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Draft <input type="checkbox"/> No	42014191E	
OTHER				
Access Permit (SHA)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Draft <input type="checkbox"/> No	15APMO0151 6	8/1/2017

¹ ‘Draft’ indicates the formal permit has not been obtained but draft permit conditions are included.

² See website listed below for complete NPDES Permit requirements:

<http://www.mde.state.md.us/programs/Permits/WaterManagementPermits/WaterDischargePermitApplications/Documents/2014MDRC-GeneralPermit.pdf>

Abbreviations:

AASCD - Anne Arundel Soil Conservation District
 COE – U.S. Army Corps of Engineers
 MDE – Maryland Department of the Environment
 NPDES – National Pollutant Discharge Elimination System

NOTICE TO CONTRACTOR

EARLY SUBMISSIONS. The last sentence of the first paragraph of TC-5.02, “No work shall be started before receipt of the Notice to Proceed” shall not apply to the following:

After notification to the Contractor from the *City of Takoma Park* that the Contractor is the apparent low bidder, the Contractor will be permitted to provide a written request to the Engineer to submit documentation for materials sources and working drawings for any items of work that have a long lead time and could jeopardize the project schedule. Upon written approval from the Engineer the Contractor may submit the applicable documentation to the Engineer.

Should the Contract not be awarded to the apparent low bidder who meets the requirements of the Contract, GP-8.10 will apply for all costs accrued for the preparation and approval of the working drawings and any resultant material purchase approved by the District Engineer and steel fabricated in conformance with the approved working drawings between the date the Contractor received notice of apparent low bidder and the date of notice that the apparent low bidder will not be awarded this Contract.

Should this Contract not be awarded to the apparent low bidder due to failure of the Contractor to comply with all award and execution requirements, all costs accrued for the preparation of the specific items and any resultant material purchased and steel fabrication shall be borne by the Contractor.

Failure of the Contractor to submit the early submissions will not be basis for delaying issuance of the Notice to Proceed or be considered a reason for a time extension.



TERMS AND CONDITIONS

**TC SECTION 4
CONTROL OF WORK**

TC-4.01 WORKING DRAWINGS

96 **DELETE:** The first paragraph “” All working drawings... in order named:” in its entirety.

INSERT: The following.

All working drawings shall be on sheets measuring 22 by 34 in. or 24 by 36 in. and shall have a standard title block at the lower right corner approximately 4 by 8 in. (2 in. for the revision column on the left side and the remaining 6 in. for the title) indicating the following information in the order named:

TERMS AND CONDITIONS

**TC SECTION 4
CONTROL OF WORK**

TC-4.02 FAILURE TO ADEQUATELY MAINTAIN PROJECT

98 **ADD:** To the second paragraph.

Additionally, an appropriate deduction will be made from the Contractor's next progress estimate for each day or portion thereof that Maintenance of Traffic deficiencies exist, and will continue until the deficiencies are satisfactorily corrected and accepted by the Engineer. Any portion of a day will be assessed a full day deduction.

The above noted deduction will be assessed on the next progress estimate if:

The Contractor does not take action to correct the deficiencies and properly assume the responsibilities of maintaining the project (as determined by the Engineer) within four hours of receiving a notice to comply with the required maintenance provisions.

The deduction will be set at \$800.00 per day, whichever is more for each day or portion thereof that the deficiencies exist, and will continue until the deficiencies and proper assumption of the required maintenance provisions are satisfactorily corrected and accepted by the Engineer. The amount of monies deducted will be a permanent deduction and are not recoverable. Upon satisfactory correction of the deficiencies, payment of the Maintenance of Traffic lump sum item will resume.



TERMS AND CONDITIONS

**TC SECTION 5
LEGAL RELATIONS AND PROGRESS**

TC-5.01 INSURANCE

100 **DELETE:** In its entirety.

INSERT: The following.

TC-5.01 INSURANCE

In addition to the provisions of GP-7.14 (Liability Insurance), the following shall apply on Administration Contracts.

The Contractor shall maintain in full force and effect third party legal liability insurance necessary to cover claims arising from the Contractor's operations under this agreement that cause damage to the person or property of third parties. The insurance shall be under a standard commercial general liability (CGL) form endorsed as necessary to comply with the above requirements and the other requirements of this Section. The State of Maryland shall be listed as an additional insured on the policy. The limit of liability shall be no less than \$1 000 000 per occurrence/\$2 000 000 general aggregate. The insurance shall be kept in full force and effect until all work has been satisfactorily completed and accepted.

When specified in the Contract Documents or otherwise required by law, the Contractor shall carry the type and amounts of insurance in addition to any other forms of insurance or bonds required under the terms of the Contract and these Specifications.

All insurance policies required by this Section, elsewhere in the Contract Documents, or otherwise required by law, shall be kept in full force and effect until all work has been satisfactorily completed and accepted. The Contractor shall be responsible for the payment of all deductibles or self-insured retentions.

All insurance policies required by this Section, elsewhere in the Contract Documents, or otherwise required by law, (other than Workers' Compensation Policies) shall include endorsements:

- (a) Stating that the State of Maryland is an additional insured with respect to liability arising from the Contractor's operations under this agreement that cause damage to the person or property of third parties.
- (b) Stating that such coverage as is provided by the policies for the benefit of the additional insureds is primary and any other coverage maintained by such additional insureds



SPECIAL PROVISIONS INSERT
TC-5.01 INSURANCE

(including self-insurance pursuant to the Maryland Tort Claims Act) shall be non-contributing with the coverage provided under the policies.

- (c) Containing waivers of subrogation with respect to all named insureds and additional insureds.
- (d) Stating that the insurer has the duty to adjust claims and provide a defense with regard to such claims made against the additional insured.

All insurance policies required by this Section, elsewhere in the Contract Documents, or otherwise required by law, (including Workers' Compensation Policies) shall be endorsed to state that the insurer shall provide at least 7 days notice of cancellation or nonrenewal to:

Maryland State Highway Administration
Director, Office of Construction
7450 Traffic Drive
Hanover MD 21076

Evidence of insurance shall be provided to the Administration at the address listed above prior to the award of the Contract by means of a Certificate of Insurance with copies of all endorsements attached.

Any policy exclusions shall be shown on the face of the Certificate of Insurance or provided with the Certificate of Insurance.

Certificates of Insurance shall comply with all requirements of the Maryland Annotated Code, Insurance Article, § 19-116. Certificates of Insurance shall be on a form approved by the Maryland Insurance Commissioner (Commissioner). Standard Certificate of Insurance forms currently adopted for use by the Association for Cooperative Operations Research (ACORD) or the Insurance Services Office (ISO) are deemed approved by the Commissioner and are acceptable. Outdated ACORD or ISO forms (those with a revision date prior to the date of the form currently adopted for current use by ACORD or ISO) are not acceptable. The Contractor shall ensure that all required Certificates of Insurance satisfy all requirements of §19-116 of the Insurance Article, including the prohibition against the issuance of any certificate of insurance that contains false or misleading information or that purports to amend, alter, or extend the coverage provided by the policies referenced in the certificate.

The Certificate of Insurance shall be accompanied by a document (a copy of State License or letter from insurer) that indicates that the agent signing the certificate is an authorized agent of the insurer.

No acceptance and/or approval of any Certificate of Insurance or insurance by the Administration shall be construed as relieving or excusing the Contractor, or the Contractor's Surety from any liability or obligation imposed upon either or both of them by the provisions of



SPECIAL PROVISIONS INSERT
TC-5.01 INSURANCE

this Contract or elsewhere in the Contract Documents.

The cost of the insurance will not be measured but will be incidental to the Contract lump sum price for Mobilization. If an item for Mobilization is not provided, the cost of the insurance will be incidental to the other items specified in the Contract Documents.

Contractor and Railroad Public Liability and Property Damage Insurance shall be provided as specified in TC-6.05.



TERMS AND CONDITIONS

**TC SECTION 6
RESTRICTIONS AND PERMITS**

112 **DELETE:** TC 6.10 – RECYCLED OR REHANDLED MATERIAL in its entirety.

INSERT: The following.

TC 6.10 – RECYCLED OR REHANDLED MATERIAL.

Refer to 900.03 in the Contract Documents.



TERMS AND CONDITIONS

**TC SECTION 7
PAYMENT**

TC-7.05 PROGRESS PAYMENTS

(a) Current Estimate.

127 **DELETE:** (2) **Variable retainage.** “The contract will.....reduction may be reconsidered.”

INSERT: The following.

(3) Variable Retainage. The Contract will be subject to a variable retainage. Any variation in retainage (increase or decrease) will be at the discretion of the Administration and the District Engineer. Those meeting the minimum qualifications may have retainage reduced upon request of the Contractor with consent of surety. This request shall be processed through the District Engineer. If, in the opinion of the District Engineer at any time during the performance of the work, the evaluation of the contract or Contractor changes, retainage reduction may be reconsidered.

Minimum Qualifications are as follows: After 50 percent project completion and upon request, Contractors with 'A' evaluations for the last two years may be reduced from 5 percent to 1 percent. Project completion percentage will be based upon actual work completed (excluding monies paid for stored materials). An interim evaluation of the current project would need to be completed and would need to be an 'A'.

At 50 percent project completion and upon request, Contractors with 'B' evaluations or any combination of 'A' and 'B' evaluations for the last two years may be reduced from 5 percent to 2.5 percent, and remain at that level until released upon final payment. Project completion percentage will be based upon actual work completed (excluding monies paid for stored materials). An interim evaluation of the current project would need to be completed and would need to be an 'A' or 'B'.

Contractors with 'C' evaluations or any combination of 'C' and 'D' evaluation for the past two years will begin and remain at 5 percent for the life of the project.

Contractors with a 'D' evaluation for the last two years will begin at 5 percent. Project performance will be evaluated monthly with the retainage being raised to 10 percent for continued 'D' performance.

New Bidders. Contractors who have not been previously rated by the Administration may be eligible for a reduction in retainage. To be eligible, their past performance on



SPECIAL PROVISIONS INSERT
TC-7.05 PROGRESS PAYMENTS

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highway and bridge work shall be documented by the government agency with whom they had a contract and their performance shall be documented on Administration forms. Contractors who do not fit into the above criteria would require a 5 percent retainage throughout the life of the Contract.

PRICE ADJUSTMENTS

Diesel Fuel. There will not be any Price Adjustments (PA) for Diesel fuel in this contract. There will be no additional compensation to the Contractor or credit given to the City of Takoma Park for the fluctuation in the cost of diesel fuel.

Pavement Density and Asphalt Mixture. There will not be any Price Adjustments (PA) for Pavement Density or Asphalt Mixture in this contract. There will be no payment reductions or incentive payments for Asphalt items.

Asphalt Binder. A Price Adjustment (PA) will be made to provide additional compensation to the Contractor or to provide a credit to the City of Takoma Park for the fluctuation in the cost of asphalt binder. The Contractor will use the prevailing base index price to develop his cost for the applicable Asphalt item. Refer to the *Special Provisions Insert for Asphalt Pavement – Section 504* for information regarding computing a PA to update the unit price for Asphalt Binder.

Price adjustments (PA) will not be permitted, except as noted above.



**CATEGORY 100
PRELIMINARY**

SECTION 101 — CLEARING AND GRUBBING

101.01 DESCRIPTION.

101.01.01 Definitions.

137 **DELETE:** (e) Grading Unit in its entirety.

INSERT: The following.

(e) **Grading Unit.** A contiguous area not to exceed 20 acres.

101.03 CONSTRUCTION.

138 **DELETE:** 101.03.01 Erosion and Sediment Control in its entirety.

INSERT: The following.

101.03.01 Erosion and Sediment Control. The maximum area that may be cleared and grubbed is limited to a single grading unit unless otherwise specified and approved. Work may proceed to a subsequent grading unit once at least 50 percent of the current grading unit is stabilized as determined and approved by the SHA Regional Environmental Coordinator. The total disturbed area shall not exceed 30 acres at any given time.

**CATEGORY 100
GRADING**

SECTION 101 — CLEARING AND GRUBBING

101.01 DESCRIPTION.

101.01.01 Definitions

137 **DELETE:** (a) Clearing in its entirety.

INSERT: The following:

(a) Clearing. The removal and disposal of trees, fallen timber and rotten wood, brush, shrubs, vegetation, rubbish, fences, bollards, bike racks and structures not specified in the Contract Documents for removal and disposal. Unless otherwise specified, clearing outside the LOD includes the removal of rubbish only.

101.04 MEASUREMENT AND PAYMENT.

139 **DELETE:** Measurement and Payment in its entirety.

INSERT: The following:

101.04 MEASUREMENT AND PAYMENT. Clearing and Grubbing will not be measured but will be paid for at the Contract lump sum price. The payment will be full compensation for the removal and disposal of fences, removal and resetting of mailboxes, removal and disposal of bollards and bike racks, selective tree trimming and scar repair, repair or replacement of damaged trees, restoration measures for damaged or destroyed protected resources, repair or other damaged properties, removal and disposal of existing buildings when not covered as a specific pay item in the Contract Documents, and for all material, labor equipment, tools, and incidentals necessary to complete the work.



CATEGORY 100
PRELIMINARY

SECTION 103 — ENGINEERS OFFICE

103.03 CONSTRUCTION.

103.03.05 Requirements for all Offices.

144 **ADD:** the following after (v).

(w) One paper shredder capable of shredding at least 10 sheets (20 lb bond) at a time. Throat width of at least 12 in. Speed of at least 20 feet per minute. Auto reverse or auto stop for paper jams. Power of at least 115 v.

146 **DELETE:** **103.03.09 Recyclable Materials (Paper, Bottles, Cans, Etc.)** in its entirety.

INSERT: The following.

103.03.09 Recycling. Recycling of recyclable paper (bond, newsprint, cardboard, mixed paper, packaging material and packaging), bottles (glass and plastic), and aluminum cans will be required at the Engineer's Office and the Contractor's facilities for the project.

Furnish approved containers, and remove the material from the site on an approved schedule or as directed. All material shall be taken to an authorized recycling facility. Maintain a log for the duration of the project documenting the type of materials recycled. The log shall include the types of material, date, time, location of facility, and signature line. Furnish a copy of the log at the completion of the project and upon request.

The Contractor shall be considered the owner of any profit and be responsible for all incurred costs.

**CATEGORY 100
PRELIMINARY**

SECTION 103 – ENGINEERS OFFICE

144 **DELETE:** 103.03.06 Microcomputer System for all Offices in its entirety.

INSERT: The following.

103.03.06 Computer System. Furnish 1 desktop computers and 1 laptop computers, Printers and or multifunction printers and other equipment as specified herein.

General Requirements.

- (a) IBM compatible with an Intel Core i5 processor.
- (b) Minimum hard drive storage of 500 GB (gigabyte).
- (c) One CD-RW drive (re-writable CD-ROM). 16X Minimum speed.
- (d) Operating System. Minimum Microsoft® Windows 7 Professional Edition. The computer system will not be acceptable unless all Microsoft Windows Critical Updates are installed.
- (e) Printer. When an Engineers Office is specified, furnish a color all-in-one laser printer/scanner/copier/fax with at least 64 MB of RAM and meeting the following minimum requirements:
 - (1) Input paper capacity of 150 sheets.
 - (2) Automatic document feed of 35 page capacity.
 - (3) Printer resolution up to 600 X 2400 dpi, and a print speed (color) of at least 15 ppm.
 - (4) Scanner resolution must be capable of 1200 x 2400 dpi optical. Built in Copier resolution must be capable of up to 600 X 600 dpi. Copier speed of at least 15 ppm.
 - (5) Fax speed of at least 2 sec / page.
 - (6) For security reasons a printer with an internal hard drive installed is not allowed.
- (f) Software. Supply all manuals, license numbers, software key numbers, and/or software on original disks for retention in the Engineers Office or Administration facility for the duration of the Contract.
 - (1) Microsoft® Office 2007 Professional (32-Bit version only), for Windows™ or later. The computer system will not be acceptable unless all available Microsoft Office Professional critical updates and service packs are installed.

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- (2) Install and configure antivirus/antispyware software to perform an automatic virus signature update when the microcomputer system connects to the internet. No Freeware allowed (Antivirus/AntiSpyware software approved for Administration web email: *Norton, *McAfee, Sophos, or ETrust.)
- (g) Internet Access. Provide unlimited internet service approved by the Engineer. Where available, provide internet high-speed service from cable. DSL service will be acceptable only if cable service is not available. Provide an external router device with cable or DSL internet service. Provide firewall software to protect the computer from security intrusions.

*Both Norton Internet Security and McAfee Internet Security include Antivirus and a Personal Firewall.

(h) Accessories.

- (1) When an Engineers office is specified, provide a standard computer workstation with minimum desk space of 60 X 30 in. and a padded swivel type chair with armrests.
- (2) 8-1/2 X 11 in. xerographic paper as needed.
- (3) Toner and ink as needed.
- (4) Maintenance agreement to provide for possible down time.
- (5) Physical security system to deter theft of the computer and components.
- (6) Three 4-GB (minimum size acceptable) USB flash drive storage devices.
- (7) Blank recordable CD-RW media as needed.

Desktop Specific Requirements.

- (a) IBM compatible with an Intel Core i5 processor.
- (b) Minimum processor speed of 3.0 GHz.
- (c) Minimum of 4 GB RAM.
- (d) Enhanced 101 key keyboard with wrist rest.
- (e) Super video graphics accelerator (SVGA).
- (f) Mouse and mouse pad.

- (g) Flat-panel LCD monitor (19 in. minimum) meeting Energy Star requirements.
- (h) Uninterruptible power supply (UPS).

Laptop Specific Requirements.

- (a) Must meet military standard of durability MIL-STD 810G.
- (b) Minimum processor speed of 3.2 GHz.
- (c) Minimum 4 GB SDRAM.
- (d) Minimum 15 in. 1024x768 (XGA), daylight-readable, 500nits (cd/m²) LCD display.
- (e) Power Supply. Two lithium ion battery packs with overcharge protection, an AC adaptor, and a vehicle DC power adaptor that operates the laptop and simultaneously charges the laptop's internal battery.
- (f) Carrying Case.
- (g) Printer. When an Engineers Office is not specified, furnish a portable B&W printer with DC power adapter and having a minimum resolution of 1200 dpi, at least 8 MB of RAM, and a print speed of at least 15 ppm. (Note: A color printer may be substituted if a digital camera is specified. Refer to SP-Section 113).
- (h) Internet Service. If an Engineers office is not specified, furnish the laptop with an internal wireless broadband card and broadband internet service.

Have the computer system completely set up and ready for use on or before the day the Engineers office is to be occupied. When an Engineers office is not specified, have the computer system furnished complete and ready for use at least five days prior to beginning any work on the project.

The computer system is for the sole use of the Engineer. The engineer will have complete access to the system. After all specified software is satisfactorily installed by the contractor an SHA technician/ representative will ensure that no user accounts exist on the computer system except those used by the Engineer.

If for any reason the system fails to operate, is stolen, or is otherwise unavailable for use, it shall be replaced or repaired within 48 hours.

Any remote access to the computer system by the contractor may be performed only with the permission and supervision of the Engineer.

When the computer system is no longer required, the Construction Management software system including original user/operator guide manuals, program disks, and all data files (including those stored on USB flash drives, CD-R's, etc.) will be removed by the Engineer and

delivered to the District Engineer and become the property of the Administration. The remaining computer systems shall remain the property of the Contractor.

103.04 MEASUREMENT AND PAYMENT.

147 **ADD:** The following as a fourth paragraph.

Computer. The computer system will not be measured but the cost will be incidental to the Contract price for the Engineers Office item. If an item for Engineers Office is not specified, the cost of the computer system will be incidental to the payment for Mobilization. In absence of either item, payment will be incidental to the other items specified in the Contract Documents.

CATEGORY 100
PRELIMINARY

SECTION 104 — MAINTENANCE OF TRAFFIC

104.01 TRAFFIC CONTROL PLAN (TCP)

104.01.01 DESCRIPTION.

- 149 **Work Restrictions.** The Engineer reserves the right to modify or expand the methods of traffic control or working hours as specified in the Contract Documents. Any request from the Contractor to modify the work restrictions shall require written approval from the Engineer at least 72 hours prior to implementing the change. The Contractor shall submit a copy of the original work restrictions with the written request.

Work is not permitted on Saturdays or Sundays.

Work is not permitted on the holidays, or work day preceding and following holidays indicated below with an "X":

- New Year's Day, January 1
- Martin Luther King's Birthday, the third Monday in January
- President's Day, the third Monday in February
- Good Friday
- Easter Weekend
- Memorial Day, the last Monday in May
- Independence Day, July 4
- Labor Day, the first Monday in September
- Columbus Day, the second Monday in October
- Veteran's Day, November 11
- Thanksgiving Day, the fourth Thursday in November
- Christmas Day, December 25

TEMPORARY LANE OR SHOULDER CLOSURE SCHEDULE			
ROADWAY	# LANE(S) / SHOULDER CAN BE CLOSED	DAY OF THE WEEK	CLOSURE PERIOD (TIME OF DAY)
<u>DISTRICT 3:</u>			
<u>MD 410</u>			
West of MD 650	1/0	Mon.-Fri.	9:00 AM – 3:00PM
East of MD 650	1/0	Mon.-Fri.	9:00 AM – 3:00 PM
	1/0	Sun. - Thurs	8:00 PM – 6:00 AM (Next Day)
<u>MD 650</u>			
Northbound	1/0	Mon.-Fri.	9:00 AM – 3:00PM
	1/0	Mon.-Fri.	8:00 PM – 10:00PM
	2/0	Sun. - Thurs	10:00 PM – 6:00 AM (Next Day)
Southbound	1/0	Mon.-Fri.	10:00 AM – 4:00PM
	1/0	Mon.-Fri.	8:00 PM – 10:00PM
	2/0	Sun. - Thurs	10:00 PM – 6:00 AM (Next Day)

149 **ADD:** The following after the last paragraph, “Any monetary savings...and the Administration.”

When closing or opening a lane on freeways, expressways, and roadways with posted speed ≥ 55 mph, a work vehicle shall be closely followed by a protection vehicle (PV) during installation and removal of temporary traffic control devices. The PV shall consist of a work vehicle with approved flashing lights, either a truck-mounted attenuator (TMA) with support structure designed for attaching the system to the work vehicle or a trailer truck-mounted attenuator (TTMA) designed for attaching the system to the work vehicle by a pintle hook and an arrow panel (arrow mode for multilane roadways and caution mode on two-lane, two-way roadways).

The work vehicle size and method of attachment shall be as specified in the TMA/TTMA manufacturer’s specification as tested under NCHRP and/or MASH Test Level 3.

When a temporary lane or shoulder closure is in effect, work shall begin within one hour after the lane is closed. Any delay greater than one hour with no work in progress shall require the Contractor to remove the lane/shoulder closure at no additional cost to the Administration. The Contractor's Traffic Manager shall attend Pre-Construction and Pre-Paving Meetings and shall discuss traffic control and the Traffic Control Plan including procedures to be implemented for lane closures.

SPECIAL PROVISIONS

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104.01 — TRAFFIC CONTROL PLAN

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All closures shall be in conformance with the approved TCP and under the direction of the Contractor's Traffic Manager and the Engineer.

Workers and equipment, including temporary traffic control devices needed for setting up a lane closure or restriction, are prohibited in the lane/shoulder to be closed or restricted before the time permitted in the Contract work restrictions, unless otherwise noted below or as approved by the Engineer.

Temporary traffic control devices to be used for lane/shoulder closure may be placed on the shoulder of the roadway by workers no earlier than 30 minutes prior to actual time lane/shoulder closure or restriction is permitted. When temporary traffic control devices are being installed, all work vehicles involved in the installation shall display flashing lights that provide a 360-degree visibility of the vehicles. These lights shall remain on until the full installation of TTC devices is complete. Temporary traffic signs may be displayed to traffic at this time.

Workers shall not enter a lane open to traffic. Workers may be present on shoulders to prepare for lane closure setup no earlier than 30 minutes prior to actual time lane/shoulder closure or restriction is permitted. During preparation for the lane closure, all work vehicles present at the site and involved in the installation of the lane closure or restriction shall display flashing lights that provide 360-degree visibility of the vehicles. These lights shall remain on until the full implementation of the road closure or restriction is complete.

All temporary lane or shoulder closures shall be restored at the end of the closure period and no travel lane shall be reduced to less than 11 ft on expressways, freeways and 10 ft on other roadways. Prior to opening the closed lane or shoulder, the Contractor shall clear the lane or shoulder of all material, equipment, and debris.

Failure to restore full traffic capacity within the time specified will result in a deduction being assessed on the next progress estimate in conformance with the following.

This is in addition to the requirements specified in TC-4.02.

The lane closure penalties for freeways are categorized by the District in which they are located.

The lane closure penalties for other roads are categorized by intersection Level of Service. The penalty for other roads with Level of Service D, E or F is greater than that for Level of Service A, B or C.

For Level of Service D, E or F, the following fee structure will be followed:

ASSESSED DEDUCTIONS FOR OTHER ROADS	
ELAPSED TIME, (MINUTES)	DEDUCTION
<i>For 1 Lane Closures</i>	
1 – 10	\$ 300.00
Over 10	\$150.00 per minute (In addition to the original 10 minute deduction)
<i>For 2 or more Lane Closures</i>	
1 – 10	\$ 600.00
Over 10	\$300.00 per minute (In addition to the original 10 minute deduction)



**CATEGORY 100
PRELIMINARY**

SECTION 104 — MAINTENANCE OF TRAFFIC

104.07 ARROW PANEL (AP).

104.07.01 DESCRIPTION.

159 **DELETE:** The second and third paragraphs “Furnish APs that are.....units unless otherwise specified” and “APs shall have bothdimmer device is operational.

104.07.03 CONSTRUCTION.

160 **ADD:** The following after the first paragraph.

Furnish APs that are self-contained, vehicle-mounted or portable, and approved. Use self-contained trailer units unless otherwise specified.

Provide APs that have both manual and automatic dimmer devices capable of reducing the light intensity by 50 percent. Periodically clean the photocells in order to prevent malfunctioning of the brightness control. Dimmer devices are mandatory during night operation. The devices shall include a fail-safe system that ensures maximum brightness during daytime operations and a reduction in brightness of up to 50 percent during periods of darkness, regardless of which dimmer device is operational.

The AP’s shall provide full illumination within at least a 24-degree cone perpendicular to the panel face.

Power Supply. The AP shall operate from a solar powered electrical system and consist of battery power and solar array panels, and be capable of providing power supply to the AP for 21 consecutive days without auxiliary charge.

ADD: The following after the Arrow Panel Lamp Options table.

Arrow Board Type	Minimum Size	Minimum Legibility Distance	Minimum Number of Elements
A	48x24 in.	½ mile	12
B	60x30 in.	¾ mile	13
C	96x48 in.	1 mile	15
D	None*	½ mile	12

* Length of arrow equals 48 in. width of arrowhead equals 24 in.



DELETE: (b) “Aim the AP at approaching.....that the display is level”.

INSERT: (b) “Aim the AP at approaching traffic in conformance with the minimum legibility distances specified above. Ensure that the display is level”.

SPECIAL PROVISIONS

104.11 — TEMPORARY PAVEMENT MARKINGS

**CATEGORY 100
PRELIMINARY**

SECTION 104 — MAINTENANCE OF TRAFFIC

166 **DELETE**: Section 104.11 TEMPORARY PAVEMENT MARKINGS. in its entirety.

INSERT: The following.

104.11 TEMPORARY PAVEMENT MARKINGS.

104.11.01 DESCRIPTION. Furnish, install, and remove temporary pavement markings as specified in the Contract Documents or as directed by the Engineer. These markings shall include lines, letters, numbers, arrows, and symbols.

104.11.02 MATERIALS.

Removable Preformed Pavement Marking Material	Refer to the Contract Documents
Nontoxic Lead Free Waterborne Pavement Markings	Refer to the Contract Documents
Black Out Tape	QPL

104.11.03 CONSTRUCTION.

104.11.03.01 Quality Assurance/Quality Control. Quality control testing shall be completed by the Contractor’s Administration certified technicians. The Engineer will complete the quality assurance checks in conformance with MSMT 729 by performing the Nighttime Visibility Evaluations.

104.11.03.02 Warranty Period. The Contractor shall maintain and be responsible for any defects in the pavement markings for a period of 180 days from the date of application. The Contractor shall replace the pavement markings as necessary within this period as directed by the Engineer at no additional cost to the Administration. Refer to GP-5.11.

104.11.03.02 Application and Removal. The pavement markings shall be applied in conformance with the manufacturer’s recommendations and the Contract Documents. Markings shall be applied in the same direction as the flow of traffic. The markings shall be located as specified in the Contract Documents or as directed by the Engineer.

Pavement markings may be applied to either new or existing paved surfaces. When applied to newly paved surfaces, the markings shall be placed before traffic is allowed on the pavement. Nontoxic lead free waterborne pavement markings shall be used for all temporary pavement markings except for the final surface. However, the Contractor may use removable preformed pavement markings at no additional cost to the Administration.

When at the “end of season”, the temperatures are too low to allow the placement of removable tape on the final surface, a written exception request may be submitted to the Engineer to allow the use of nontoxic lead free waterborne paint in lieu of removable tape until the following striping season.

When it is appropriate to shift lanes, all nonapplicable pavement markings within the travel way and adjacent to the travel way as directed by the Engineer shall be completely removed.

SPECIAL PROVISIONS

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104.11 — TEMPORARY PAVEMENT MARKINGS

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Surface Condition. Prior to application of pavement markings, the pavement surface shall be clean, dry, and free of all contaminants, including curing compound, dirt, and loose particles. Residual pavement markings shall be removed. Loose or poorly constructed markings shall also be removed.

Pavement Marking Removal. All removable preformed pavement markings shall be completely removed prior to application of the permanent markings. On stage construction or final surfaces of portland cement concrete pavements, any objectionable adhesive residue shall be removed by water blasting or other methods as may be approved by the Engineer. Open flame is prohibited to remove adhesive residue, or any pavement markings. The Contractor shall remove all nonapplicable pavement markings so that there is no damage to the existing or final surface.

Retroreflectance. The initial retroreflectance readings for temporary pavement markings shall be a minimum of 250 and 150 millicandellas/lux/square meter for white and yellow, respectively. The Engineer will monitor the pavement markings in conformance with MSMT 729 during the Contractor's 180 day period of responsibility.

104.11.04 MEASUREMENT AND PAYMENT. Payment for Removable Preformed Pavement Markings, Removal of Removable Preformed Pavement Markings, Nontoxic Lead Free Waterborne Pavement Marking Paint, and the Removal of Existing Pavement Markings will be measured and paid for using one or more of the items listed below and as specified in the Contract Documents.

The payment will be full compensation for furnishing, placing, complete removal of lines, letters, numbers, arrows, symbols, and the removal of all residue. In addition, payment will cover maintenance and replacement during the 180 day period, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Removal and replacement of temporary pavement markings required beyond the 180 day period will be measured and paid for at the Contract unit price for the pertinent temporary pavement marking item.

Temporary markings replaced during the 180 day period as a result of plowing (as determined by the Engineer) will be paid for at the Contract unit price for the pertinent temporary marking item.

- (a) Nontoxic Lead Free Waterborne Pavement Marking Paint-in width specified-per linear foot.
- (b) Removable Preformed Pavement Line Markings-in width specified-per linear foot.
- (c) Removable Preformed Letters, Symbols, Arrows, and Numbers per each.
- (d) Removal of Removable Preformed Pavement Markings-any width-per linear foot.
- (e) Removal of Removable Preformed Letters, Symbols, Arrows and Numbers per each.
- (f) Removal of Existing Pavement Line Markings-any width per linear foot.
- (g) Removal of Existing Letters, Symbols, Arrows, and Numbers per each.
- (h) Black Out Tape Lines-in width specified-per linear foot.
- (i) Removal of Black Out Tape Lines-any width-per linear foot.



CATEGORY 100
PRELIMINARY

SECTION 104 — MAINTENANCE OF TRAFFIC

104.12 DRUMS FOR MAINTENANCE OF TRAFFIC.

104.12.02 MATERIALS.

169 **ADD:** The following to the end of the first paragraph.

Drums may include recycled plastic content. The drum base may contain up to 100 percent recycled content.

104.12.03 CONSTRUCTION.

ADD: The following to the end of the third paragraph.

Damaged drums shall be recycled to the extent possible. The disposition of the damaged drums shall be provided prior to payment for any replacement drums.

104.12.04 MEASUREMENT AND PAYMENT.

ADD: The following to the end of the second paragraph.

A disposition as specified in 104.12.03 is required prior to payment.



**CATEGORY 100
PRELIMINARY**

SECTION 104 — MAINTENANCE OF TRAFFIC

104.14 CONES FOR MAINTENANCE OF TRAFFIC.

104.14.02 MATERIALS.

171 **DELETE:** First paragraph on this page “Cones shall be...an upright position”.

INSERT: The following.

All cones shall meet MdmUTCD and be new or like new condition. All cones shall be orange in color. Cones shall be at least 28 in. high, 10 in. diameter at the inside of the base, and reflectorized with two white retroreflective stripes. The top stripe shall be 6 in. wide and located 3 to 4 inches from the top of the cone. The second stripe shall be 4 in. wide and located 2 inches below the top band.

Tall-Weighted Cones. When specified, tall-weighted cones shall be at least 42 in. high and 7 in. diameter at the inside of the base. Tall-weighted cones shall be manufactured of low density polyethylene (LDPE) and have four high performance wide angle white and orange retroreflective stripes. The stripes shall be horizontal, circumferential and 6 in. wide. Alternate stripe colors with the top stripe being orange. Any nonretroreflective spaces between the orange and white stripes shall not exceed 1/2 in.

104.14.03 CONSTRUCTION.

ADD: The following after the first paragraph “The Contractor’s name...away from traffic”.

Equip all cones with approved weights or anchor collars, (15 lb maximum) as needed to maintain an upright position. Anchor collars shall fit to the base of the cone. For tall-weighted cones use anchor collars weighing 10 to 30 lb.



CATEGORY 100 — PRELIMINARY

104.19 PORTABLE VARIABLE MESSAGE SIGNS (PVMS)

104.19.03 CONSTRUCTION.

104.19.03.01 Equipment.

PVMS UNIT.

Sign Controller.

179 **DELETE:** (j) in its entirety.

INSERT: The following.

- (j) Contained in a secure weatherproof cabinet located on the controller housing and insulated to protect against excessive vibration, temperature or tampering.
- (1) Equipped with a lockable door latch and an interior cabinet dome light.
- (2) Provided with a keyboard storage location inside the cabinet.
- (3) Security locks shall include those installed by the manufacturer and an additional hardened hasp/lock combination with a user changeable combination. This hasp/lock setup shall be installed in a manner to maximize its effectiveness in stopping unauthorized access to the sign controls. For control box surfaces not compatible with the hasp/lock setup, other supplemental high security locking devices may be approved by the Engineer.

Security.

- (a) Lock all trailer control cabinets when not attended by Administration employee or contractors, whether being stored, in transport, or deployed and activated.
- (b) Do not store or maintain any passwords on the PVMS.
- (c) Remove any password attached or inscribed on the PVMS trailer or equipment.
- (d) Change the password when it is no long secure or every six months.
- (e) Some older model PVMS may not have a changeable password, so extra measures shall be taken to hide the password.



SPECIAL PROVISIONS INSERT

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104.19 — PORTABLE VARIABLE MESSAGE SIGNS (PVMS)

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- (f) Do not leave Owner/Instruction manuals in the trailer control cabinets. Manuals should be copied and made available to the personnel responsible for deploying the PVMS Signs.
- (g) When equipped with a detachable keyboard remove it from the trailer and secure in the transport vehicle, field office or at the respective shop.
- (h) Failure to comply with these security standards or any subsequent PVMS tampering incidents will be cause for penalty under TC-4.02.
- (i) Construction and District Inspectors will ensure contractor compliance.

CATEGORY 100
PRELIMINARY

SECTION 104 — MAINTENANCE OF TRAFFIC

104.21 CELLULAR TELEPHONES.

104.21.01 DESCRIPTION. Furnish and maintain new or like new cellular telephones for use by the appropriate Administration personnel. Each telephone shall be furnished with a hands-free device and be delivered to the Engineer at time of Notice to Proceed, fully activated and operational. They shall remain operational until returned to the Contractor at final acceptance of the entire project in conformance with GP-5.13.

104.21.02 MATERIALS.

Cellular Telephones

As approved by the Engineer

104.21.03 CONSTRUCTION. Not applicable.

104.21.04 MEASUREMENT AND PAYMENT. The number of cellular telephones required for this Contract is 1. The cellular telephones will not be measured but will be incidental to the Contract price for the Engineers Office item. If an item for Engineers Office is not specified, payment for the cellular telephones will be incidental to the payment for Mobilization. In the absence of either item, payment will be incidental to the other items specified in the Contract Documents. The payment will be full compensation for furnishing the telephones and hands-free devices, activation fees, battery replacement, monthly service fees, extended coverage charges, air time (peak and nonpeak time per minute), roaming rates, long distance fees in conformance with the schedules provided, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. If any of the telephones become defective, are stolen, or for any other reasons do not function as intended, they shall be replaced in-kind at no additional cost to the Administration or the City of Takoma Park. Nonfunctioning or stolen telephones shall be replaced within eight hours after the Contractor is notified by the Engineer.

Ownership of the telephones will remain with the Contractor. The Administration and the City of Takoma Park assumes no responsibility or liability for the condition of the telephones when they are returned.



SPECIAL PROVISIONS INSERT

SHA TRACKING NO. 15APMO015XX

**104.31 — ACCESSIBLE PEDESTRIAN MAINTENANCE
OF TRAFFIC**

1 of 2

**CATEGORY 100
PRELIMINARY**

SECTION 104 — MAINTENANCE OF TRAFFIC

104.31 ACCESSIBLE PEDESTRIAN MAINTENANCE OF TRAFFIC.

104.31.01 DESCRIPTION. Provide and maintain an accessible pedestrian route, to the “maximum extent feasible”, throughout the project’s limits. When an existing pedestrian access route within the public right of way is blocked by construction, alteration, or maintenance activity, an alternate accessible pedestrian route shall be provided.

The phrase to the “maximum extent feasible” applies in areas where the nature of an existing facility or site conditions makes it virtually impossible to comply fully with applicable accessibility standards through a planned alteration. In these circumstances, the alternate accessible pedestrian route shall provide the maximum physical accessibility that is feasible, or a design waiver must be approved by SHA’s Office of Highway Development.

104.31.02 MATERIALS. Not applicable

104.31.03 CONSTRUCTION. The following considerations shall be taken into account when addressing accessible pedestrian maintenance of traffic:

- (a) All pedestrians, including persons with disabilities, shall be provided with a reasonably safe, convenient and accessible path that replicates as much as practicable the existing pedestrian facilities.
- (b) The width of the existing pedestrian facility should be maintained if practical. When it is not possible to maintain a minimum width of 60 in. throughout the entire length of the pedestrian route, a minimum width of 36 in. shall be provided with 60 x 60 in. passing zones at least every 200 ft, to allow individuals in wheelchairs to pass.
- (c) Traffic control devices and other construction materials and features shall not intrude into the usable width of the sidewalk, temporary pathway or other pedestrian facility.
- (d) Signs and other devices mounted lower than 7 ft above the temporary pedestrian pathway shall not project more than 4 in. into accessible pedestrian route.
- (e) A smooth, continuous hard surface shall be provided throughout the entire length and width of the pedestrian route throughout construction. There shall be no curbs or vertical elevation changes greater than 1/4 in. in grade or terrain that could cause tripping or be a barrier to wheelchair use. Vertical elevation differences between 1/4 in. and 1/2 in. shall be beveled at a maximum 2:1 slope.



SPECIAL PROVISIONS INSERT

SHA TRACKING NO. 15APMO015XX

104.31 — ACCESSIBLE PEDESTRIAN MAINTENANCE
OF TRAFFIC

2 of 2

- (f) When channelization is used to delineate a pedestrian pathway, a continuous detectable edging should be provided throughout the length of the facility such that pedestrians using a white cane can follow it. Edging should protrude at least 6 in. above the surface of the sidewalk or pathway with the bottom of the edging a maximum of 2.5 in. above the surface
- (g) Temporary ramps shall be provided when an alternate pedestrian route crosses a curb and no permanent ramps are in place. The width of the ramp shall be a minimum of 36 in. and the slope of the ramp shall not exceed 12:1. Temporary detectable warning mats must be installed at street crossings and signalized entrances.
- (h) When possible, an accessible pedestrian route shall be provided on the same side of the street as the disrupted route. When it is not feasible to provide a same-side accessible pedestrian route an accessible pedestrian detour route shall be provided.
- (i) Information regarding closed pedestrian routes, alternate crossings, and sign and signal information shall be communicated to pedestrians with visual disabilities by providing devices such as audible information devices, accessible pedestrian signals or barriers and channelizing devices that are detectable to the pedestrians traveling with the aid of a white cane or who have low vision.
- (j) It is desirable that pedestrians cross to the opposite side of the roadway at intersections rather than mid-block. Appropriate signing shall be placed at the intersections.
- (k) Access to transit stops shall be provided and maintained at all times.

104.31.04 MEASUREMENT AND PAYMENT. Unless otherwise specified, Accessible Pedestrian Maintenance of Traffic will not be measured but the cost will be incidental to the Lump Sum item for Maintenance of Traffic. The payment will be full compensation for all materials, labor, equipment, tools, and incidentals necessary to complete the work.

CATEGORY 100
PRELIMINARY

SECTION 107 — CONSTRUCTION STAKEOUT

107.03 CONSTRUCTION.

199 **ADD:** The following.

107.03.10 Traffic Control Devices. For installation of Traffic Control Devices, arrange a meeting with the Engineer and representatives from the Traffic Operations Division to stakeout all items indicated on the sketches, plans, and in the Special Provisions. This meeting shall occur prior to any work after the notice to proceed. No work shall proceed before the stakeout is approved by the Engineer.

107.04 MEASUREMENT AND PAYMENT.

ADD: The following.

Intersection Utility Stakeout. Intersection utility stakeout for traffic control devices will not be measured but the cost will be incidental to other pertinent items specified in the Contract Documents.



SPECIAL PROVISIONS INSERT

SHA TRACKING NO. 15APMO015XX

111 — SAMPLING DEVICES, TESTING AND SAFETY EQUIPMENT

1 of 5

**CATEGORY 100
PRELIMINARY**

209 **DELETE**: SECTION 111 — SAMPLING DEVICES AND TESTING EQUIPMENT in its entirety.

INSERT: The following.

SECTION 111 — SAMPLING DEVICES, TESTING AND SAFETY EQUIPMENT

DESCRIPTION. Furnish and maintain Sampling Devices and Testing and Safety Equipment with accessories that are required to sample and test materials used on the project. The sampling and testing and safety equipment will be used by Administration employees as directed by the Engineer. All equipment shall be as approved by the Office of Materials Technology. Furnish the sampling devices and testing equipment to the Engineer at least five days prior to commencement of work on the project. All equipment shall remain in the Engineers' possession until completion of all sampling and testing on the project. Unless otherwise specified, all testing equipment, accessories, and unused sampling devices and safety equipment will be returned to the Contractor at the completion of the project.

MATERIALS. Furnish all applicable sampling devices and containers required by the Administrations' Materials Manual, including all inserts, Sample Testing and Frequency Guide, and this Specification. Quantities will be designated by the Engineer at the preconstruction meeting.

CONSTRUCTION.

Testing Equipment Requirements. Maintain the equipment in good working condition and submit a written certification to the Administration stating when the testing equipment was last calibrated or inspected by an Administration approved testing agency. Ensure that the equipment is calibrated at the frequency required for that type of equipment as specified in the test method and AASHTO R18.

If any testing equipment or accessories are stolen, become defective, or for any other reason do not function as intended, replace with an equal or better unit at no additional cost to the Administration within eight hours after notification.

Sampling Devices and Testing Equipment with Accessories. The following is a general list for sampling devices and testing equipment to be furnished by the Contractor for the specified testing. Contact the Office of Materials Technology, Materials Management Division with any questions concerning the requirements for Sampling Devices, Testing Equipment, and Accessories. The devices, testing equipment, and accessories will be randomly inspected during Independent Assurance Audits.

(a) Sampling Devices from the Administration's Materials Manual.

(1) Soil bags (able to hold at least 35 lb).

(2) Screw top cans - 1 qt.



SPECIAL PROVISIONS INSERT

- (3) Friction top cans - 1 qt and 1 gal.
- (4) Plastic jar - 1 gal.
- (5) Flow panels for joint sealer.
- (b) Testing Equipment and Accessories from the Administration's Materials Manual - Determination of Moisture Content of Aggregates (MSMT 251).
 - (1) Electric hot plate or a gas burner, including bottle and fuel.
 - (2) Scale or balance conforming to M 231, Class G2.
 - (3) Metal container, such as large frying pan or equivalent.
 - (4) Pointing trowel or large spoon.
- (c) Field Determination of the Amount of Stabilization Agent in Bases and Subbases (MSMT 254).
 - (1) Scale or balancing conforming to M 231, Class G 100 having a capacity of at least 100 lb/sample containers.
 - (2) Bench brush.
 - (3) Large spoon or scoop.
 - (4) Sampling mat consisting of a sheet of plywood or canvas with a surface of at least 1 yd².
 - (5) Tape measure.
- (d) Field Determination of Moisture Density Relations of Soils (MSMT 351). Refer to MSMT 350.
- (e) Hot Applied Joint Materials Sealer and Crack Filler (MSMT 404). Flow panels (brass panel may be used in lieu of a tin panel).
- (f) In-Place Density of Embankment, Subbase, Base, Surface and Shoulder Material (T 99, T 180, T 191, and MSMT 350).
 - (1) Cylindrical compaction molds, 1/30 and 1/13.33 ft³.
 - (2) Compaction rammers, 5.5 and 10 lb.
 - (3) 12 in. straightedge.
 - (4) Scale or balance conforming to M 231, Class G 100, having a capacity of at least 100 lb.
 - (5) Two 10 in. pie pans.



SPECIAL PROVISIONS INSERT

111 — SAMPLING DEVICES, TESTING AND SAFETY EQUIPMENT

- (6) 12 in. frying pan.
- (7) 12 in. rocker set complete with pan.
- (8) One each of the following sieves conforming to M 92:

SIZE (in.)	SHAPE	SIZE OPENINGS
12	Square	2 in.
12	Square	3/4 in.
12	Square	No. 4
12	Square	No. 10
*8	Round	No. 10

* For density sand.

- (9) Field density plate with recess to accommodate sand cone apparatus.
 - (10) Steel pan, 12 x 30 in.
 - (11) Electric plate or gas burner, including bottle and fuel.
 - (12) Soil density pick.
 - (13) Precalibrated sand cone density apparatus.
 - (14) Spatula, 3 in.
 - (15) Two water pails.
 - (16) Bag of density sand.
 - (17) Stencil brush, bench brush, sprinkling can, large spoon, and sample shovel.
- (g) Sampling Hot Mix Asphalt prior to Compaction (MSMT 457) - Performed by the paving contractor).
- (1) A 25 ft measuring tape.
 - (2) Random selection cards numbered from 0 to width of the paving lane in 1 ft increments
 - (3) Sample boxes
 - (4) Spatula.
 - (5) Spray paint or other suitable marking material.
 - (6) GPS equipment.



SPECIAL PROVISIONS INSERT

111 — SAMPLING DEVICES, TESTING AND SAFETY EQUIPMENT

- (7) Masonry nails or equivalent.
- (8) Thermometers (50 to 550°F).
- (9) Square end shovel, fire shovel, or grain shovel.
- (10) Scoop.
- (11) 24 ft of 18 gauge mechanical wire or equivalent to tie through each hole of the plate template.

(h) Concrete Tests.

TEST	METHOD
Sampling	T 141
Making and Curing Concrete Test Specimens	T 23
Slump	T 119
Air Content - Pressure Method	T 152
Air Content - Volumetric Method	T 196
Temperature	T 309

- (1) Air meter, pressure type for conventional concrete and volumetric air meter (Roll-a-Meter) for lightweight Concrete.
- (2) Air Bulb.
- (3) Air pump.
- (4) Rubber mallet.
- (5) Slump cone with rod.
- (6) Steel straight edge.
- (7) Large and small scoop.
- (8) Trowel.
- (9) 3/8 in. diameter tamping rod.
- (10) Unit weight bucket for light weight concrete.
- (11) Sprinkle can or bucket for water.
- (12) Postal scale (only for lightweight concrete).
- (13) Thermometer (0 to 220 F).
- (14) 4 x 8 in. cylinder molds (for compressive strength specimens).



SPECIAL PROVISIONS INSERT

111 — SAMPLING DEVICES, TESTING AND SAFETY EQUIPMENT

(15) 3 x 6 in. cylinder molds for latex concrete.

(16) 6 x 12 in. cylinder molds for density (unit wt) of lightweight concrete and when otherwise specified.

(17) Isopropyl alcohol for light weight concrete.

(18) Protective gloves.

(i) Other Measuring Devices.

(1) Hand held pile driving monitoring device (as approved by the Engineer).

111.03.02 Safety Equipment. Approved Safety Equipment.

(a) Fall Protection Devices for SHA Inspection Personnel.

(b) Life vests where applicable.

111.04 MEASUREMENT AND PAYMENT. Sampling devices, testing equipment, and safety equipment will not be measured but the cost will be incidental to items of work for which they are required.

CATEGORY 100
PRELIMINARY

SECTION 113 — DIGITAL CAMERA

113.01 DESCRIPTION. Furnish and maintain new or like new digital cameras for use by Administration personnel. For projects that do not include an Engineer's Office, furnish one color printer. The digital cameras and printer shall be delivered to the Engineer at the time of the Notice to Proceed. They shall remain operational and not be returned to the Contractor until final acceptance of the entire project, in conformance with GP-5.13.

113.02 MATERIALS.

(a) **Digital Camera.** Each digital camera shall meet the following minimum requirements and be furnished with the specified accessories:

- (1) Photo Managing Software.
- (2) 16.0 megapixel image resolution and 5X optical zoom.
- (3) AC adapter, 2 sets of rechargeable batteries, and battery charger.
- (4) 16 GB SD Card or memory stick with all items required for downloading.
- (5) Lens Cover, Shoulder Strap, and Carrying Case.

(b) **Color Printer.** The printer shall have at least 8 MB RAM, 2400 x 1200 dpi resolution, a color print speed of 13 ppm, and a duty cycle of 5,000 pages/month.

113.03 CONSTRUCTION. Not applicable.

113.04 MEASUREMENT AND PAYMENT. The number of digital cameras required for this project is 1. The digital cameras and printer will not be measured but the cost will be incidental to the Contract price for the Engineers Office item. If an item for Engineers Office is not specified, payment will be incidental to the payment for Mobilization. In the absence of either item, payment will be incidental to the other items specified in the Contract Documents. If a digital camera or printer becomes defective, is stolen, or for any other reason does not function as intended, it shall be replaced with an approved camera or printer at no additional cost to the Administration. A nonfunctioning or stolen camera or printer shall be replaced by the SHA Project prime contractor within 5 days after the Engineer notifies the Contractor.

SPECIAL PROVISIONS
113 — DIGITAL CAMERA

SHA TRACKING NO. 15APMO015XX
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Ownership of the camera(s) and printer(s) will be with the City of Takoma Park assigned project personnel during the progression of the project. Pictures and removable media will be the property of the State Highway Administration and City of Takoma Park. The State Highway Administration assumes neither responsibility nor liability for the condition of the camera when returned after project is satisfactorily completed.

**CATEGORY 100
PRELIMINARY**

SECTION 114 — TRUCK STAGING AREAS AND IDLING REQUIREMENTS

114.01 DESCRIPTION. Locate truck staging areas and avoid unnecessary idling of construction equipment in order to reduce engine emissions and to provide air quality benefits to those who live or work in or adjacent to the construction site.

114.02 MATERIALS. Not applicable.

114.03 CONSTRUCTION. Establish truck staging areas for all vehicles waiting to load or unload materials at the job site. Subject to review and approval by the Administration, locate staging areas where emissions will have the least impact on sensitive areas and the public.

Sensitive areas include, but are not limited to, hospitals, schools, residences, motels, hotels, daycare facilities, and elderly housing and convalescent facilities. All sources of emissions shall be located as far away as possible from fresh air intakes, air conditioners, and windows.

Idling of all mobile construction equipment, including delivery trucks, shall be limited to five minutes except under any of the following circumstances:

- (a) When forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control.
- (b) When necessary to operate defrosting, heating, or cooling equipment to ensure the safety or health of the driver or passenger.
- (c) When necessary to operate auxiliary equipment that is located in or on the mobile source to accomplish the intended use of the mobile source.
- (d) To attain the recommended operating temperature.
- (e) When the outdoor temperature is below 32 F.
- (f) When undergoing maintenance that requires operation for more than five consecutive minutes.

The above requirements do not prohibit the operation of an auxiliary power unit or generator set as an alternative to idle the main engine of a motor vehicle operating on diesel fuel.

114.04 MEASUREMENT AND PAYMENT. All methods and procedures required to comply with these requirements will not be measured for payment but will be incidental to the pertinent Contract items.

**CATEGORY 200
GRADING**

SECTION 201 — ROADWAY EXCAVATION

DESCRIPTION. Refer to Section 201.01 of the 2008 MSHA Standard Specifications for Construction and Materials.

201.01.01 Classification

217 **DELETE:** Section 201.01.01 in its entirety.

INSERT: The following.

Excavation for this Contract will be classified as:

Class I Excavation – includes all roadway excavation, excavation for micro-bioretenion (SWM-ESD) facilities (including hand excavation), erosion and sediment control excavation, and excavation for traffic/electrical items, regardless of width.

Class I-A Excavation – this item is established for all excavation of unsuitable material below the lowest excavation limits established and within the limits of the proposed roadway sections as specified in the Contract Documents or as directed by the engineer.

Class 3 Excavation (For Incidental Construction) – includes all storm system excavation below the planned elevation as directed. Class 3 Excavation (For Incidental Construction) shall be in accordance with Section 301. Backfill shall be in accordance with Section 302.

201.01.02 Excavation

INSERT: The following.

Excavation (Class I, I-A and Class 3) will include the removal of all materials regardless of its nature. This will include manholes, abandoned utilities, drainage structures, storm piping and incidental structures.

ADD: The following:

201.01.03 Wet Soil Conditions.

Materials with moisture in excess of the optimum moisture content may be encountered. These materials will require drying if they are to be used in embankment construction. No additional compensation will be allowed for dealing with these conditions.

MATERIALS. Not Applicable.

201.03 CONSTRUCTION.

ADD: The following:

Attention is called to the existing Verizon Business fiber optic cable that parallels the area of excavation for SHA BMP #150970 (Sta. 303+00, LT). Provide no mechanical excavation within 2 feet of the cable. Perform hand excavation only along the length of the BMP.

201.03.09 Unsuitable Material.

220 **DELETE:** The last sentence in its entirety:

INSERT: The following.

Class 1-A Excavation shall be backfilled using Geosynthetic Stabilized Subgrade using Graded Aggregate Base or other suitable material as directed by the Engineer.

MEASUREMENT AND PAYMENT. Excavation will be measured and paid for at the Contract unit price per cubic yard for the pertinent Class of Excavation.

CATEGORY 200
GRADING

SECTION 203 — BORROW EXCAVATION

203.01.02 Notice to Contractor —Borrow Pits.

225 **ADD:** After the first paragraph.

This project is located in Montgomery County. The following conditions applicable to the county or city shall be complied with and documented.

DISTRICT 1

Dorchester (DO) County

Site plan approved by Soil Conservation District.
Grading permit from County Highway Department (except City of Cambridge).
Planning and Zoning approval for use.
Critical Areas approval (if applicable).
Inspection by County.

Somerset (SO) County

Site plan approved by Soil Conservation District.
Grading Permit from the County.
Land Use permit.
Critical Areas approval by Planning and Zoning (if applicable).
Inspection by SHA.

Wicomico (WI) County

Site plan approved by Soil Conservation District.
Certificate of compliance with Planning and Zoning if located in Critical Area.
Inspection by SHA.

Worcester (WO) County

Site plan approved by Soil Conservation District.
Critical areas approved by Planning and Zoning (if applicable).
Inspection by SHA.

DISTRICT 2

Caroline (CO), Cecil (CE), Queen Anne's (QA) and
Talbot (TA) Counties

Site plan approved by Soil Conservation District.
Planning and Zoning approval.
Critical Areas approval (if applicable).
Inspection by SHA.

Kent (KE) County

Site plan approved by Soil Conservation District.
Grading permit.
Planning and Zoning approval.
Critical Areas approval (if applicable).
Inspection by SHA.

DISTRICT 3

Montgomery (MO) County

Sediment control permit and plan approval by County
Department of Environmental Protection, Division of
Water Resources Management, Storm Water Management Section/Sediment
Control.

Approval by Maryland National Capital Park and Planning Commission (if
applicable).

Inspection by City of Takoma Park.

Prince Georges (PG) County

Site Plan approved by Soil Conservation District.

County Grading Permit.

Tree conservation plan approval by Maryland National Capital Park and
Planning Commission (if applicable).

Critical Areas approval (if applicable).

Payment of all pertinent county fees and/or securing of county required bonding.

Inspection by SHA with oversight by County.

DISTRICT 4

Baltimore (BA) County

Site Plan approved by the Department of Environmental Protection and the Soil
Conservation District.

County Grading Permit.

Critical Areas approval by the Department of Environmental Protection and
Resource Management (if applicable).

Inspection by County.

Harford (HA) County

Site Plan approved by Soil Conservation District.

County Grading Permit.

Critical Areas approval (if applicable).

Inspection by County.

DISTRICT 5

Anne Arundel (AA) County

Site Plan approved by Soil Conservation District.

Planning and zoning approval - special exception required.

Grading plan issued by the County Department of Inspections and Permits.

Critical Areas approval (if applicable).

Inspection by County and SHA.

Calvert (CA) County

Site Plan approved by Soil Conservation District.

Grading plan issued by the County after a mining permit or exemption is issued.

Critical Areas approval (if applicable).

Inspection by SHA.

Charles (CH) County
Site Plan approved by Soil Conservation District.
Special exception granted by the County.
Critical Areas approval (if applicable).
Inspection by SHA.

St. Marys (SM) County
Site Plan approved by Soil Conservation District.
County Grading Permit.
Critical Areas approval (if applicable).
Inspection by SHA.

DISTRICT 6

Allegany (AL) County
Site plan approved by Soil Conservation District.
Informational copy of plans to County Planning and Zoning Commission.
Inspection by SHA.

Garrett (GA) and Washington (WA) Counties
Site plan approval by Soil Conservation District.
Inspection by SHA.

DISTRICT 7

Carroll (CL) County
Site plan approved by County Planning Commission.
Sediment control plan approval by Soil Conservation District.
County Grading Permit.
Inspection by County.

Frederick (FR) County
Site plan approved by Soil Conservation District.
County Grading Permit.
Inspection by SHA.

Howard (HO) County
Site Plan approved by Soil Conservation District.
County Grading Permit.
Inspection by County.

BALTIMORE CITY (BC)

Site plan approved Baltimore City Department of Public Works (BCDPW).
Inspection by BCDPW.

STATE AND FEDERAL PROPERTY

Borrow pits located on state and federal property are subject to Maryland Department of the Environment approval.
Inspection by SHA.

CATEGORY 200
GRADING

SECTION 204 — EMBANKMENT AND SUBGRADE

204.03 CONSTRUCTION.

204.03.01 Embankment Foundation

227 **DELETE:** (c) **Test Rolling.** in its entirety.

INSERT: The following:

(c) **Test Rolling.** Test roll embankment foundation on this project with a 35 ton pneumatic tired roller, unless exempted by the Engineer.

204.03.05 Stability of Embankments

229 **INSERT:** The following after 204.03.05:

Unstable embankment foundations shall be treated by undercutting and backfilling with Geosynthetic Stabilized Subgrade using Graded Aggregate Base; bridging with a thick embankment lift; providing drainage; or other suitable treatment as determined by the Engineer at the time of construction.

CATEGORY 300
DRAINAGE

STORMWATER MANAGEMENT (SWM) FACILITY AS-BUILT CERTIFICATION

DESCRIPTION. Inspect stormwater management facilities during specified stages of construction, and furnish a completed (SWM) Facility As-Built Certification Package to [City of Takoma Park](#) certifying that the SWM facilities have been constructed as specified in the Contract Documents.

Inspection of SWM facilities and completion of the SWM Facility As-Built Certification Package may only be performed by an As-Built Inspector.

As-Built (AB) Inspector. Furnish an approved AB Inspector to complete the As-Built Certification. AB Inspectors require licensure in the State of Maryland as a Professional Engineer or Professional Land Surveyor, experienced in SWM design and construction.

To request approval, furnish a one-page resume for the AB Inspector at least two weeks prior to the start of construction of any SWM facility. The resume shall include the AB Inspector's name, contact information, relevant professional license(s), employer's name, and relevant work history. Failure to receive approval for the AB Inspector or to monitor the specified construction stages will be grounds for replacement.

SWM Facility As-Built Certification Package. The Certification Package certifies that the SWM Facilities have been constructed as specified. The submitted package shall include, but not limited to, photographs during specified construction phases, written descriptions of each phase, completed tabulations and checklists, completed certification forms, material testing reports, turf/vegetation establishment report and [red-lined as-built plans](#) for each facility.

MATERIALS. Not applicable.

CONSTRUCTION. Inspect and complete the AB checklist ([see contract plans](#)) for each facility. Ensure that the facility features are constructed as designed.

Stages for As-Built Inspections by the AB Inspector. At a minimum, perform regular inspections for SWM facilities as described in [Takoma Park Municipal Code Title 16.04.220](#) Inspection requirement during construction (included in this contract's Special Provisions & Technical Specifications Package).

Computations and Red-Line Plan Revision Requirements. Upon completion of each SWM facility, provide **red-line** revisions to the approved stormwater management plan that include the following items, as applicable:

- (a) Core trench location, dimensions, material and compaction,
- (b) **Contours.** Indicate the grading of the SWM facility using one foot contour intervals.
- (c) Inflow and outflow ditches,
- (d) **Riprap.** Indicate the locations and dimensions of riprap within SWM facilities and immediately outside of SWM footprints.
- (e) **Emergency spillways.** Indicate locations of emergency spillways for SWM facilities.
- (f) **Outfall structures.** Indicate locations of outfall structures, such as risers and weirs, and include all relevant information such as elevations, dimensions at top, orifice elevations, weir lengths and elevations, and openings.
- (g) **Miscellaneous Features.** Include all other pertinent features in and around the SWM facility, such as freeboard, water surface elevations, and setbacks.

Tolerances. Tolerance limits for **red-line** as-built information is as follows:

- (a) **Earthwork Tolerance.** Elevations must be within 3 in. of elevations specified in the Contract Documents.
- (b) **Structures.** Elevations must be within 1.2 in. (0.1 ft) for spillways, pipe inverts, orifices, and weirs.
- (c) **Freeboard.** Freeboard must be no less than specified in the Contract Documents.

When tolerances are exceeded, furnish computations for the storage volumes, discharge rates, detention times, and other applicable documentation to demonstrate that the SWM facilities meet all of the designed parameters.

Submission Requirements. Furnish two hard-copies and one digital copy in PDF format of the SWM Facility As-Built Certification Package to [City of Takoma Park](#). Incomplete SWM Facility As-Built Certification Packages will not be accepted.

When SWM facilities do not meet the design parameters, reconstruct, re-inspect and recalculate deficient aspects of the SWM facilities and furnish the revised information in the SWM Facility As-Built Certification Package.

SPECIAL PROVISIONS
300 — STORMWATER MANAGEMENT (SWM) FACILITY
AS-BUILT CERTIFICATION

SHA TRACKING NO. 15APMO015XX/FAP No. TAP-3(481)E
 IFB No. HCD-20170201
 3 of 3

MEASUREMENT AND PAYMENT. Stormwater Management (SWM) Facility As-Built Certification will not be measured but will be paid for at the Contract lump sum price. The payment will be full compensation for inspection, photographs, documentation, computations, red-line revisions, completion and submission of the SWM Facility As-Built Certification Package, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Modifications to rejected SWM Facility As-Built Certification Packages including any associated corrective construction, reconstruction, grading, inspection, planting, stabilization, surveying, engineering analysis and services, and resubmittals will be at no additional cost to the City of Takoma Park.

Payment Schedule. Payments will be made according to the following schedule when requirements are met:

STORMWATER MANAGEMENT (SWM) FACILITY AS-BUILT CERTIFICATION PAYMENT SCHEDULE		
REQUIREMENTS	PERCENT OF TOTAL CONTRACT PRICE	PAYMENT FOR COMPLETED WORK
Furnish completed SWM Facility As-Built Certification Package	50	At submission to City of Takoma Park
Receive approval from City of Takoma Park	50	At project close-out



CATEGORY 300
DRAINAGE

SECTION 303 – PIPE CULVERTS

303.03 CONSTRUCTION.

303.03.04 Joints.

Reinforced Concrete Pipe.

240 **DELETE:** The second paragraph Reinforced Concrete Pipe in its entirety.

INSERT: The following.

Seal circular pipe joints using rubber gaskets meeting C 433. Seal elliptical pipe joints using preformed flexible joint sealants meeting C 990.

Plastic Pipe.

DELETE: In its entirety.

INSERT: The following.

Use integral bell and spigot joints with flexible elastomeric seals meeting D 3212.



CATEGORY 300
DRAINAGE

SECTION 305 – MISCELLANEOUS STRUCTURES

305.03.06 Precast Drainage Structures.

247 **DELETE:** The third paragraph “Do not ship.....untested precast unit” in its entirety.

INSERT: The following.

Do not ship any precast unit without complete documentation showing that all materials meet specifications per 305.02 or the Contract Documents; or without complete identification markings per Sections 440, 905 and 915.

CATEGORY 300
DRAINAGE

SECTION 305 – MISCELLANEOUS STRUCTURES

305.02 MATERIALS.

REVISE:

“Concrete Mix No. 2, No. 3 or No. 6” to read “Concrete Mix No. 2, No. 3, No. 6 or No. 9”

305.03 CONSTRUCTION.

INSERT: After the last paragraph:

305.03.08 Concrete Encasement. Where specified in the Contract Documents, concrete encasement for grate inlets shall be constructed around existing inlets and as directed by the Engineer. Make all necessary inlet adjustments, repairs, removals, and replacements including: elevation adjustments to frames and grates; removal of existing concrete encasement; replacement of damaged frames and grates; concrete wall transitions; and, replacement of inlet curbs. Refer to the Storm Drain Details for more information.

305.04 MEASUREMENT AND PAYMENT.

ADD: At the end of the Section:

305.04.08 Concrete Encasements will be measured and paid for at the Contract unit price per cubic yard of Mix No. 9 Concrete for Miscellaneous Structures. Saw cuts, excavation, removal of existing concrete collars; reinforcement, removing and resetting of frame and grate and support beam, expansion joints, and all material, labor, equipment, tools and incidentals necessary to complete the work will not be measured but shall be incidental to the item Mix No. 9 Concrete for Miscellaneous Structures.

Elevation adjustments to frames and grates with Mix 9 concrete shall be measured and paid for at the Contract unit price per cubic yard of Mix No. 9 Concrete for Miscellaneous Structures.

Replacement of damaged frames and grates will not be measured but shall be incidental to the item Mix No. 9 Concrete for Miscellaneous Structures.

Concrete wall transitions from existing brick walls, shall be measured and paid for at the Contract unit price per cubic yard of Mix No. 9 Concrete for Miscellaneous Structures.

Replacement of inlet top slabs will not be measured but shall be incidental to the item Mix No. 9 Concrete for Miscellaneous Structures.



CATEGORY 300
DRAINAGE

SECTION 308 — EROSION AND SEDIMENT CONTROL

253 **DELETE:** In its entirety.

INSERT: The following.

SECTION 308 — EROSION AND SEDIMENT CONTROL

308.01 DESCRIPTION. Apply and maintain erosion and sediment control measures to disturbed areas throughout the life of the project to control erosion and to minimize sedimentation in rivers, streams, lakes, reservoirs, bays, and coastal waters. Implement the approved Erosion and Sediment Control Plan and any approved modifications to the plan. Identify staging and stockpile areas, and apply erosion and sediment controls measures as approved.

308.01.01 Erosion and Sediment Control Manager (ESCM). Provide an Erosion and Sediment Control Manager to implement the Erosion and Sediment Control (ESC) Plan and to oversee the installation, maintenance and inspection of the ESC controls.

308.01.02 Severe Weather Event. A severe weather event occurs when rainfall exceeds 3 in. over a 24-hr period based upon rainfall data obtained from the nearest official National Weather Service (NWS) gauge station to the Site.

308.02 MATERIALS.

Riprap	901.03
4 to 7 in. Stone	901.05
Asphalt Mixes	904
Pipe	905
Gabion Wire	906
Steel Plate	909.02
Welding Material	909.03
Fence Fabric for Super Silt Fence	914.01.01
Compost	920.02.05
Soil Amendments	920.02
Fertilizer	920.03
Mulch	920.04
Soil Stabilization Matting	920.05
Seed	920.06
Straw Bales	921.08
Geotextile, Woven and Non-Woven	921.09, Class E



Geotextile, Woven Slit Film	921.09, Class F
2 to 3 in. Stone	M 43, No. 2
3/4 to 1-1/2 in. Stone	M 43, No. 4
No. 57 Stone	M 43, No. 57

308.02.01 Filter Log Casing. Casing shall be 12 in., 18 in. or 24 in. diameter and produced from 5 mil thick continuous high-density polyethylene or polypropylene, woven into a tubular mesh netting material with openings in the knitted mesh 1/8 in. - 3/8 in.

Compost shall have a soluble salt concentration less than 5.0 mmhos/cm.

308.03 CONSTRUCTION.

308.03.01 Contractor Responsibilities. Prior to beginning any earth disturbing activity, complete the following:

- (a) Demarcate all wetlands, wetland buffers, floodplains, waters of the United States, tree protection areas, and the Limit of Disturbance (LOD) according to Section 107. Ensure the demarcations are inspected and approved.
- (b) Construct erosion and sediment control measures according to 308.01.02. Ensure that controls are inspected and approved.
- (c) Ensure that all runoff is directed from disturbed areas to the sediment control measures.
- (d) Do not remove any erosion or sediment control measure without approval from the REC. Refer to GP-7.12 for unforeseen conditions.
- (e) Ensure that dewatering practices do not cause any visible change to stream clarity.

308.03.02 Schedule. Within 14 days after the Notice of Award, submit an Erosion and Sediment Control Schedule to implement the ESC Plan. Ensure the schedule indicates the sequence of construction, implementation and maintenance of controls, temporary and permanent stabilization, and the various stages of earth disturbance. Changes to the Plan must be approved prior to implementation. Include the following on the submitted plans:

- (a) Demarcation of all wetlands, wetland buffers, jurisdictional waters, floodplains, tree protection areas, and the LOD prior to any earth disturbing activity.
- (b) Clearing and grubbing of areas necessary for installation of perimeter controls specified in the Contract Documents.



- (c) Construction of perimeter controls specified in the Contract Documents.
- (d) Remaining clearing and grubbing.
- (e) Roadway grading including off-site work.
- (f) If applicable, utility installation and whether storm drains will be used or blocked during construction.
- (g) Final grading, landscaping, and stabilization.
- (h) Removal of perimeter controls.

Work is prohibited on-site and off-site until the Erosion and Sediment Control schedules and methods of operation have been accepted by the Administration.

308.03.03 Standards and Specifications. Construct and maintain the erosion and sediment control measures and devices in accordance with the latest Maryland Department of the Environment (MDE) Erosion and Sediment Control and Stormwater Management regulations, “Maryland Standards and Specifications for Soil Erosion and Sediment Control”, “Maryland Stormwater Design Manual, Volumes I and II”, “SHA Field Guide for Erosion and Sediment Control”, and as specified in the Contract Documents. Keep a copy of the latest “Maryland Standards and Specifications for Soil Erosion and Sediment Control” on the site at all times.

308.03.04 Erosion and Sediment Control Plan (ESC Plan) and Sequence of Construction. Implement the Administration’s approved ESC Plan and Sequence of Construction. Minor adjustments to the sediment control locations may be made in the field with the approval of the Engineer and the REC. Major revisions, deletions, or substitutions to the ESC Plan require a formal review and written approval. Submit changes to the approved ESC Plan to the Administration in writing at least 14 days prior to implementing the change. Ensure that any changes to the ESC Plan or Sequence of Construction are approved prior to implementing the change.

308.03.05 Erosion and Sediment Control Manager. At least 10 days prior to beginning any work, assign and submit the name and credentials for approval an Erosion and Sediment Control Manager (ESCM). Ensure that the ESCM and the superintendent have successfully completed the MDE “Responsible Personnel Training for Erosion and Sediment Control” and the Administration’s “Erosion and Sediment Control Certification Training for Contractors and Inspectors”. The certifications must be current at all times. If the certification expires or is revoked for either person, immediately replace the person with an appropriately certified person acceptable to the Administration. No work may proceed without the appropriate certified personnel in place. Any substitutes for the



ESCM will be subject to approval. The Administration reserves the right to require a reassignment of the ESCM duties to another individual for any reason.

Ensure that the ESCM is thoroughly experienced in all aspects of construction and has the required certifications. The ESCM is primarily responsible for and has the authority to implement the approved erosion and sediment control plans, schedules and methods of operation for both on-site and off-site activities. The ESCM's duties include:

- (a) Attend the Pre-Construction Erosion and Sediment Control Field Meeting and periodic field Erosion and Sediment Control Meetings to evaluate the effectiveness of measures already installed, and to plan for the implementation of necessary controls proposed for succeeding areas of soil disturbance.
- (b) Inspection of the erosion and sediment controls on a daily basis to ensure that all controls are in place at all times and to develop a list of activities and schedules to ensure compliance with the Contract Documents.
- (c) Maintenance of a daily log of these inspections, including actions taken, and submit a written report at the end of the work day.
- (d) Accompanied by the Engineer, conducting after storm inspections both during and beyond normal working hours and submitting a written report.
- (e) Having the authority to mobilize crews to make immediate repairs to the controls during working and nonworking hours.
- (f) When requested, accompanying the Engineer during REC Inspections and inspections made by the regulating agencies.
- (g) Coordination with the Engineer to ensure that all corrections are made immediately and that the project is in compliance with the approved plan at all times.

308.03.06 Quality Assurance Ratings. A Regional Environmental Coordinator (REC) will frequently inspect each project to ensure compliance with the approved Erosion and Sediment Control and Stormwater Management Plans. The scores will be reported on Form No. OOC61/QA-1, Erosion/Sediment Control and Stormwater Management Field Investigation Report. The REC will use the scores to determine the following ratings.



Quality Assurance Ratings

SCORE	RATING
≥90.0	A
80.0 - 89.9	B
70.0 - 79.9	C
60.0 - 69.9	D
< 60.0	F

- (a) **Rating A.** The project is in compliance. Minor corrective action may be necessary.
- (b) **Rating B.** The project is in compliance; however, corrective action is necessary.
- (c) **Rating C.** The project is in compliance; however, deficiencies noted require corrections. Shutdown conditions could arise quickly. Project will be reinspected within 72 hours.
- (d) **Rating D.** The project is in non-compliance. The Administration will shut down earthwork operations. Focus work efforts on correcting erosion and sediment control deficiencies. The project will be reinspected within 72 hours. Complete all required corrective actions within the 72 hour period for the project to be upgraded to a 'B' rating. Failure to upgrade the project from a 'D' rating to a 'B' or A will result in the project being rated an 'F'. Liquidated damages will be imposed for each day the project has a 'D' rating.
- (e) **Rating F.** The project is in non-compliance. An 'F' rating indicates a score less than 60 or the appropriate permits and approvals have not been obtained; or that the limit of disturbance has been exceeded, or that wetlands, wetland buffers, Waters of the United States (WUS), floodplains, and tree preservation areas as specified in Section 107 have been encroached upon; or that work is not proceeding according to the approved Erosion and Sediment Control Plan and schedules. The Administration will shut down the entire project until the project receives a 'B' or better rating. Focus all work efforts on correcting erosion and sediment control deficiencies. Liquidated damages will be imposed for each day the project has an 'F' rating.

308.03.07 Shutdowns. If a project is rated 'C', correct all deficiencies within 72 hours. The project will be reinspected at the end of this period. If the deficiencies have not been satisfactorily corrected, the project will be rated 'D' and all earthwork operations will be shut down until the project is rated 'B' or better.



If consecutive 'C' ratings are received, the Contractor will be alerted that their overall effort is marginal and a shutdown of all earthwork operations is imminent if erosion and sediment control efforts do not substantially improve within the next 72 hours. The project will be reinspected at the end of this period. If the deficiencies are not satisfactorily corrected or other deficiencies are identified that result in less than a 'B' rating on Form No. OOC61/QA-1, a 'D' rating will be given and all earthwork operations will be shut down.

If these deficiencies are not corrected, an 'F' rating will be given, and the entire project will be shut down until the project receives a 'B' or 'A' rating. When degradation to a resource could occur, or if the Contractor is unresponsive, the Administration may elect to have these corrective actions performed by another contractor or by Administration maintenance staff. All costs associated with this work will be billed to the original Contractor in addition to liquidated damages.

The second time that a project is rated 'F', the Erosion and Sediment Control Training Certificate issued by the Administration will be immediately revoked from the project superintendent and the Erosion and Sediment Control Manager for at least a six month period and until successful completion of the Administration's Erosion and Sediment Control Certification Program.

308.03.08 Incentive Payments. When specified in the Contract Documents, a project may include incentive payments. Starting at the Notice to Proceed, an Incentive Payment will be made for a rating quarter consisting of 3 months when at least four inspections were performed by the REC and an average score equal to or greater than 85.0 for the entire rating quarter is received. The quarterly incentive payment will be made within 60 days after the end of the rating quarter. No incentive will be paid for partial quarters or for quarters with less than four inspections. No incentives will be paid for any quarter in which a 'D' or 'F' rating is received. When a project receives no 'D' or 'F' ratings and the overall average score is equal to or greater than 85.0, the final incentive payment will be made at final project closeout. If a time extension is granted, additional quarterly incentive payments will be drawn from the final incentive payment.

308.03.09 Liquidated Damages. Whenever a project is rated 'D' or 'F', the Liquidated Damages will be assessed. Liquidated Damages must be paid within 30 days from the date of notification.

308.03.10 Severe Weather Event. Maintain, repair, or replace any damaged erosion and sediment control devices within 48 hours of a severe weather event occurrence.

308.03.11 Preconstruction Conference. Present a general overview at the Preconstruction Conference of how erosion and sediment control measures will be implemented on the project.



308.03.12 Initial Controls. Install all perimeter controls such as silt fence, earth dikes/swales, check dams, traps, and basins, prior to the grubbing operation.

If it is determined that the clearing area has been disturbed and a potential for sediment runoff or erosion exists, install the controls at that time as directed.

308.03.13 Maintenance. Maintain erosion and sediment control devices at all times whether the project is active or inactive. Maintain access to all erosion and sediment controls until the controls are removed. Lack of this maintenance will affect the Quality Assurance Rating.

Inspect controls immediately following storm events. Clean out as necessary and repair all damage as the first order of business after the storm event.

308.03.14 Stabilization Requirements. Following initial soil disturbance, complete permanent or temporary stabilization within:

- (a) Three calendar days for the surface of all perimeter dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3 horizontal to 1 vertical (3:1); and
- (b) Seven calendar days as to all other disturbed or graded areas on the project site not under active grading.

When the excavation or embankment reaches the bottom of the subgrade, those areas in which paving will be placed are exempt from the stabilization requirements. Areas between temporary berms, except median areas, need not be stabilized during incremental stabilization.

Sensitive areas may require less than three or seven day stabilization. Maintain as necessary to ensure continued stabilization.

Track slopes within two days of establishment according to 701.03.

308.03.15 Waste Areas. Off-site waste areas on State or Federal property require MDE approval. All other off-site waste areas must be approved by the appropriate Soil Conservation District for each county or the Baltimore City Department of Public Works. Protect waste areas and stockpile areas with erosion and sediment control measures within the three or seven day stabilization requirement.

308.03.16 MDE Inspections. Work is subject to field inspections by MDE. If noncompliance with erosion and sediment control provisions is determined, their representative will immediately notify the Engineer relative to corrective action. This corrective action may require a shutdown of construction activities until the



noncompliance is satisfactorily corrected.

308.03.17 Stabilized Construction Entrance. Construct stabilized construction entrances at the specified locations.

Rehabilitate stabilized construction entrance consists of periodic top dressing with additional aggregate, replacement of pipe, or other repairs to the entrance and sediment trapping devices.

Place wash racks as directed to prevent tracking of mud and sediment from disturbed areas.

308.03.18 Side or Berm Ditches and Culverts. Construct side ditches in fill areas and berm ditches in cuts, including lining. Protect these linings from sediment deposits. Place silt fence along the banks of existing streams as shown in the Contract Documents prior to placing any culverts. To avoid sedimentation during construction, divert the streams around the location of the culvert until the proposed culvert and channel are stabilized.

308.03.19 Erosion and Sediment Control Original Excavation. Excavate, construct embankments, grade, and backfill for sediment traps, sediment basins, and other sediment controls.

Ensure that excavation and embankments meet the dimensions for each sediment control as specified. Stockpile excavated material and use for backfill when the sediment controls are removed. ■

308.03.20 Erosion and Sediment Control Cleanout Excavation. Remove accumulated sediment from sediment controls or other areas during routine maintenance of sediment controls, or as directed.

Clean out sediment traps as necessary to ensure that at least 50 percent of the wet storage capacity is available at all times. Ensure that riprap outlet sediment traps have at least 75 percent of the wet storage capacity available at all times. Remove sediment from silt fence, super silt fence, stone outlet structures, stone check dams, and straw bales when it reaches 50 percent of the height of the device.

Place removed sediment in an approved waste site. Material stored on-site may be reused once it is dried and it meets embankment requirements.

308.03.21 Heavy Use Areas. Locate and size Heavy Use Areas used for activities such as staging and storage. Obtain any necessary permits or modifications for non-specified areas.



308.03.22 Stockpile Areas. Locate and size Stockpile Areas. Obtain any necessary permits or modifications for non-specified stockpile areas.

308.03.23 Earth Dike. Do not use sod as stabilization unless specifically approved.

308.03.24 Temporary Swale. Do not use sod as stabilization unless specifically approved.

308.03.25 Perimeter Dike Swale. Do not use sod as stabilization unless specifically approved.

308.03.26 Pipe Slope Drain. When slope drains are placed on grade, construct interceptor berms to direct flow into the flared end section.

308.03.27 Gabion Inflow Protection. Construct according to Section 313.

308.03.28 Rock Outlet Protection. Construct according to Section 312.

308.03.29 Gabion Outlet Protection. Construct according to Section 313.

308.03.30 Plunge Pool. Construct according to Section 312.

308.03.31 Super Silt Fence. Construct as specified with the following exception:

Run a 7 gage top tension wire continuously between posts.

308.03.32 Filter Berms. Construct berms of wood chips and up to 50 percent Compost.

308.03.33 Filter Log. Use Compost for the filter media. Install Filter logs parallel to contours and perpendicular to sheet flow from disturbed areas.

Where a connection is needed, there are two options based on whether the sock is being filled on or offsite. Overlap prefilled socks by 1-ft minimum and staked where they connect. Sleeve socks that are filled onsite. After one log section is filled and tied off (knotted), pull the second log section over the first (2-ft) and “sleeve,” creating an overlap.

Remove sediment when it has accumulated to a depth of half the exposed height of the sock. Replace the filter sock if torn or damaged. Reinstall the filter sock if undermining or dislodging occurs.

Drive stakes perpendicular to water flow at a maximum of 8 ft intervals. Do not permit traffic to cross filter socks.



Upon stabilization of the area tributary to the sock and approval, remove stakes. The sock may be left in place and vegetated or removed. In the former case, cut the mesh open, remove all non-biodegradable material, spread the compost as a soil supplement, and seed as specified.

308.03.34 Filter Bag. Determine the bag dimensions necessary to provide the required storage volume. Determine pump and hose sizes.

308.03.35 Straw Bales for Sediment Control. Embed the bales to a depth of at least 4 in., and anchor in place with two No. 4 reinforcement bars, steel pickets, or 2 x 2 in. wood stakes, 36 in. length. Locate the anchoring devices at approximate third points along the longitudinal center line of each bale, driven through the bale and into the ground to a depth of 12 to 18 in.

308.03.36 Stone Outlet Structure. Stabilize the area immediately after removal of the structure.

308.03.37 Temporary Gabion Outlet Structure. As specified in Section 313. Grade and stabilize the area beneath the structure, immediately upon removal.

308.03.38 Portable Sediment Tank. Determine the dimensions necessary to provide the required storage volume.

308.03.39 Dewatering. Dewater only when conditions allow. Ensure that dewatering activities do not cause any visible change to stream clarity. If a sediment plume is visible, immediately cease the dewatering activity. Direct any pumping activity, including dewatering sediment traps and basins, through an approved dewatering device.

308.03.40 Sediment Traps. Excavate sediment traps to the specified length, width, and depth.

At sites where filtration or infiltration devices are used for the control of storm water, prevent runoff from unstabilized areas from entering the infiltration devices. Ensure that bottom elevations of sediment control devices are at least 2 ft higher than the finish grade bottom elevation of the filtration or infiltration device. When converting a sediment trap to a permanent stormwater facility, remove and dispose of all accumulated sediment prior to final grading of the device.

When grading and paving operations are complete and vegetation is established on the slopes and channels to the satisfaction of the Engineer, refill the sediment traps with suitable materials, and shape and treat them as specified.

308.03.41 Stone for Sediment Control. Place No. 57 stone, 3/4 to 1-1/2 in. stone, 2 to 3 in. stone, 4 to 7 in. stone, and riprap for sediment control as specified.



308.03.42 Maintenance of Stream Flow. Maintain the continuous flow of waterways during operations as specified or directed.

- (a) Implement the approved plan included in the Contract Documents. Any changes to the approved plan require approval from the appropriate regulatory authorities.
- (b) A different plan for maintenance of stream flow may be submitted, but approval from the Engineer and the appropriate approval authority will be required.
- (c) If the stream diversion system as shown is not capable of blocking the flow of water through the soil beneath the system, design and provide an effective means of diverting the water away from the designated areas.
- (d) Ensure that all excavation performed within the diverted stream is performed in a dewatered condition, which may require additional pumps, sheeting, shoring, cofferdams, etc.
- (e) If the proposed system does not perform satisfactorily or additional material and equipment is required to dewater the site and excavated areas, adjust the stream diversion system and obtain approvals.
- (f) Securely anchor the stream diversion system in place to prevent movement during high water events. Submit the proposed method of anchoring for approval. Do not install anchors beyond the limits of disturbance or infringe on the channel area available for stream flow.
- (g) Upon completion of construction and after temporary drainage devices have served their purpose, remove and dispose of the devices in an acceptable manner.

308.03.43 Removal of Controls. Do not remove erosion and sediment control measures until all previously disturbed areas are vegetated with at least a 3 in. growth of grass, and the removal has been approved. Backfill, grade, and stabilize.

308.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. The maintenance, repair, resetting, and final removal of all erosion and sediment control devices will not be measured, but the cost will be incidental to the Contract price to construct the device unless otherwise specified in the Contract Documents.

308.04.01 Erosion and sediment control manager will not be measured but the cost will be incidental to Erosion and Sediment Control items specified in the Contract Documents.



308.04.02 Implementation of the Erosion and Sediment Control Plan will not be measured but the cost will be incidental to the Erosion and Sediment Control items specified in the Contract Documents.

308.04.03 No claims against the Administration will be considered due to a shutdown of the grading operations or the entire project.

308.04.04 Incentive Payments and Liquidated Damages. The Contract Documents will specify the amounts of incentive payments and liquidated damages that apply if applicable.

308.04.05 Erosion and Sediment Controls that are damaged and replaced as a result of a Severe Weather Event will be measured and paid for at the Contract unit price applicable to the pertinent items.

308.04.06 Stabilized Construction Entrance will be measured and paid for per each and includes all excavation, geotextile, aggregate, pipe, rehabilitation, relocation and incidentals to complete the work.

308.04.07 Wash Racks for Stabilized Construction Entrance will be measured and paid for per each and includes racks, excavation, wash water and incidentals to complete the work.

308.04.08 Erosion and Sediment Control Original Excavation will be measured and paid for at the Contract unit price per cubic yard. The payment will include excavation, backfill, grading and disposal.

308.04.09 Erosion and Sediment Control Cleanout Excavation will be measured and paid for at the Contract unit price per cubic yard. The payment will also include excavation and disposal.

308.04.10 Temporary Mulch will be measured and paid for as specified in 704.04.01.

308.04.11 Temporary Seed will be measured and paid for as specified in 704.04.02.

308.04.12 Turfgrass Sod will be measured and paid for as specified in 708.04.01.

308.04.13 Soil Stabilization Matting will be measured and paid for as specified in 709.04.

308.04.14 Temporary earth berms and interceptor berms for incremental stabilization will not be measured, but the cost will be incidental to the excavation items specified in the Contract Documents.



308.04.15 Heavy Use Areas will not be measured but will be incidental to the pertinent items.

308.04.16 Stockpile Areas will not be measured but will be incidental to the pertinent items.

308.04.17 Earth Dikes will be measured and paid for at the Contract unit price per linear foot. 4 to 7 in. stone, temporary seeding, and soil stabilization will be measured and paid for as specified in 308.04.58, 704.04, and 709.04, respectively.

308.04.18 Temporary Swales will be measured and paid for at the Contract unit price per linear foot. 4 to 7 in. stone, temporary seeding, and soil stabilization matting will be measured and paid for as specified in 308.04.58, 704.04, and 709.04, respectively.

308.04.19 Perimeter Dike/Swales will be measured and paid for at the Contract unit price per linear foot. Temporary seeding and soil stabilization matting will be measured and paid for as specified in 704.04 and 709.04, respectively.

308.04.20 Temporary storm drain diversions will be measured and paid for at the Contract unit price per linear foot of the size specified and will include all grading, pipe, connections and any incidentals necessary to complete the work.

308.04.21 Temporary Asphalt Berm will be measured and paid for at the Contract unit price per linear foot. The removal of the temporary asphalt berm will not be measured but the cost will be incidental to the Contract price.

308.04.22 Clear Water Diversions will be measured and paid for at the Contract unit price per linear foot of the size specified and will include all pipe, connections, anchors, sandbags, sheeting, dewatering and any incidentals necessary to complete the work.

308.04.23 Temporary Barrier Diversions will be measured and paid for at the Contract unit price per linear foot and will include all barrier, sandbags, sheeting, dewatering and any incidentals necessary to complete the work.

308.04.24 Mountable Berms will be measured and paid for at the Contract unit price per each and will include all earthwork, stone, geotextile, and any incidentals necessary to complete the work.

308.04.25 Diversion Fence will be measured and paid for at the Contract unit price per linear foot.

308.04.26 Pipe Slope Drain will be measured and paid for at the Contract unit price per linear foot. The payment will also include excavation, backfill, flared end section, geotextile, anchors, coupling bands, and pipe elbows.



308.04.27 Stone Check Dam will be measured and paid for as specified in 308.04.17.

308.04.28 Riprap Inflow Protection will be measured and paid for as specified in 308.04.17.

308.04.29 Gabion Inflow Protection will be measured and paid for as specified in 313.04.

308.04.30 Rock Outlet Protection will be measured and paid for at the Contract unit price per square yard of Riprap Slope and Channel Protection.

308.04.31 Plunge Pool will be measured and paid for at the Contract unit price per square yard of Riprap Slope and Channel Protection.

308.04.32 Silt Fence will be measured and paid for at the Contract unit price per linear foot.

308.04.33 Silt Fence on Pavement will be measured and paid for at the Contract unit price per linear foot of Silt Fence.

308.04.34 Super Silt Fence will be measured and paid for at the Contract unit price per linear foot.

308.04.35 Clear Water Pipes through Silt Fence or Super Silt Fence will not be measured but will be incidental to the pipe and silt fence items.

308.04.36 Filter Berms will be measured and paid for at the Contract unit price per linear foot.

308.04.37 Filter Logs will be measured and paid for at the Contract unit price per linear foot for the size specified.

308.04.38 Temporary Stone Outlet Structures will be measured and paid for as specified in 308.04.58. The baffle board and stakes will not be measured but the cost will be incidental to the Contract price.

308.04.39 Temporary Gabion Outlet Structures will be measured and paid for at the Contract unit price per each.

308.04.40 Standard Inlet Protection will be measured and paid for at the Contract unit price per each for Inlet Protection.



308.04.41 At Grade Inlet Protection will be measured and paid for at the Contract unit price per each for Inlet Protection.

308.04.42 Curb Inlet Protection will be measured and paid for at the Contract unit per each for Inlet Protection.

308.04.43 Median Inlet Protection will be measured and paid for at the Contract unit per each for Inlet Protection.

308.04.44 Median Sump Inlet Protection will be measured and paid for at the Contract unit per each for Inlet Protection.

308.04.45 Combination Inlet Protection will be measured and paid for at the Contract unit per each for Inlet Protection.

308.04.46 Gabion Inlet Protection will be measured and paid for at the Contract unit per each for Inlet Protection.

308.04.47 Catch Basin Insert will be measured and paid for at the Contract unit price per each for Inlet Protection.

308.04.48 Removable Pumping Station will be measured and paid for at the Contract unit price per each. The payment will also include excavation, pipe, geotextile, wire mesh, steel plate, hose, pump, and connections.

Stone will be measured and paid for as specified in 308.04.58.

308.04.49 Sump Pit will be measured and paid for at the Contract unit price per each. The payment will also include excavation, pipe, geotextile, wire mesh, steel plate, hose, pump, and connections.

Stone will be measured and paid for as specified in 308.04.58.

308.04.50 Portable Sediment Tank will be measured and paid for at the Contract unit price per each. The payment will also include pipe, geotextile, wire mesh, steel plate, hose, pump, and connections. No adjustments will be made for resizing or relocating portable sediment tanks to meet stream clarity discharge requirements.

308.04.51 Filter Bags will be measured and paid for at the Contract unit price per each and will include pump, hoses, connections, straw bales, sizing, locating, relocating, disposal and any other incidentals necessary. No adjustments will be made for resizing or relocating to meet Permit conditions or turbidity requirements.



308.04.52 Sediment traps will be measured and paid for at the Contract unit price for one or more of the items listed below:

- (a) Erosion and Sediment Control Original Excavation as specified in 308.04.03.
- (b) Pipe as specified in 303.04.
- (c) Stone as specified in 308.04.58.
- (d) Inflow protection as specified in 308.04.09 and 308.04.10.
- (e) Baffle board and stakes will not be measured but the cost will be incidental to the other items.
- (f) Temporary risers will be measured and paid for at the Contract unit price per each.
- (g) Anti-seep collars will be measured and paid for at the Contract unit price per each.
- (h) Geotextile will not be measured but the cost will be incidental to the stone.

308.04.53 Sediment Basins will be measured and paid for at the Contract unit price for one or more of the following items:

- (a) Earthwork as specified in 201.04.
- (b) Pipe as specified in 303.04.
- (c) Stone as specified in 308.04.58.
- (d) Baffle board and stakes will not be measured but the cost will be incidental to the other items.
- (e) Temporary risers will be measured and paid for at the Contract unit price per each and include trash racks, draw down devices, concrete bases, projection collars, riser connectors and any other incidentals.
- (f) Modifying Stormwater Management Riser Structures and installing dewatering pipe systems will be measured and paid for at the Contract unit price per each for Convert Stormwater Management Riser for Sediment Control. Converting the risers back to their permanent state will be incidental to pipe.
- (g) Anti-seep collars will be measured and paid for at the Contract unit price per each.
- (h) Geotextile will not be measured but the cost will be incidental to the stone.



308.04.54 Temporary Access Bridge will be measured and paid for at the Contract Lump Sum price.

308.04.55 Temporary Access Culvert will be measured and paid for at the Contract unit price per linear foot.

308.04.56 Onsite Concrete Washout Structures will not be measured but will be incidental to the various concrete mixes.

308.04.57 Restabilization will not be measured when permanently stabilized areas are disturbed by grading operations or other activities not specifically approved.

308.04.58 Stone for sediment control will be measured and paid for at the Contract unit price per ton for the pertinent Stone for Sediment Control item. Geotextile, excavation, and backfill will not be measured but the cost will be incidental to the Contract price.

308.04.59 Straw Bales will be measured and paid for at the Contract unit price per linear foot measured along the approximate center line of the row of bales. Excavation and anchoring the straw bales will not be measured but the cost will be incidental to the Contract price.

308.04.60 Maintenance of Stream Flow will not be measured but will be paid for at the Contract lump sum price. The payment includes design, redesign providing diversion structures regardless of the type required to satisfactorily divert the stream flow, anchoring of the system, excavation, backfill, dewatering the site and excavation within the stream diversion area, maintenance of the diversion system, sandbags, polyethylene sheeting, diversion pipes, pumps, hoses, connections, portable sediment tanks and obtaining any necessary permits. Payment will not be adjusted for alternative stream diversion systems regardless of any changes in quantities from that shown in the Contract Documents. The provisions of GP-4.05 will not apply to this work.



CATEGORY 300
DRAINAGE

SECTION 314 – FLOWABLE BACKFILL

314.02 MATERIALS.

276 **DELETE:** 314.02 Materials in its entirety.

INSERT: The following.

314.02 MATERIALS.

Controlled Low Strength Material

902.16



SPECIAL PROVISIONS INSERT
316 — STORMWATER MANAGEMENT (SWM)
FILTRATION FACILITIES

SHA TRACKING NO. 15APMO015XX

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CATEGORY 300
DRAINAGE

SECTION 316 — STORMWATER MANAGEMENT (SWM)
FILTRATION FACILITIES

316.01 DESCRIPTION. Construct stormwater management (SWM) filtration facilities as specified.

SWM Filtration Facilities Identification. SWM filtration facilities are identified by unique six-digit inventory numbers and include the following designations.

- (a) Bioretention.
- (b) Micro-Bioretention.
- (c) Organic Filters.
- (d) Surface Sand Filters.
- (e) Submerged Gravel Wetlands.
- (f) Landscape Infiltration.
- (g) Rain Gardens.
- (h) Infiltration Berms.
- (i) Bio-swales.

316.02 MATERIALS.

No. 57 Aggregate	901.01
No. 7 Aggregate	901.01
No. 2 Aggregate	M-43, No. 2
Concrete	902.10
Topsoil	920.01.01 and 920.01.02
Bioretention Soil Mix (BSM)	920.01.05
Coarse Sand	920.01.05(a) (1)
Fertilizer	920.03.01
Shredded Hardwood Bark (SHB) Mulch	920.04.03
Soil Stabilization Matting (SSM)	920.05
Seed and Turfgrass Sod	920.06

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SPECIAL PROVISIONS INSERT
316 – STORMWATER MANAGEMENT (SWM)
FILTRATION FACILITIES

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Plant Materials	920.07
Water	920.09.01
Geotextile, Class PE, Type III	921.09
Securing Pins or Staples	921.09

Aggregate. Ensure aggregate has been adequately washed and is free of soil and fines.

Subdrain Pipe, Fittings and Geotextile Sock. Perforated and solid-wall polyvinyl chloride profile wall drain pipe (PPWP) meeting M-304 or corrugated polyethylene drainage pipe (CPP) meeting M-252, Type S and Type SP. Perforated pipe shall have two rows of slotted perforations with an opening area of 20 cm²/m to 21 cm²/m. When specified, use the geotextile sock recommended and supplied by the subdrain pipe manufacturer.

316.03 CONSTRUCTION.

316.03.01 Site Protection. Prior to constructing SWM filtration facilities, ensure that the SWM facility site areas are protected from vehicular traffic and is not used for erosion and sediment controls, stockpiles or equipment storage.

316.03.02 Site Preparation. Unless facilities are off-line and will receive no runoff, construct facilities only after all surrounding and adjacent areas are permanently stabilized. Divert flow from entering the SWM filtration facility areas unless same-day stabilization is specified for the SWM filtration facility location. Prevent trash, debris and sediment from entering SWM filtration facilities during construction.

316.03.03 Schedule. Perform SWM filtration facility activities during dry weather and when soil moisture conditions are suitable and unless the facility is off-line or flow diversions are in place. Only work with soil that is friable and not in a muddy or frozen condition. Cease operations when soil and overall conditions are otherwise unsuitable.

316.03.04 Excavation. Use methods of excavation that minimize compaction of the underlying soils. Where feasible, operate equipment from locations adjacent to SWM filtration facilities rather than within the facility area. Use only wide-track or marsh-track equipment, or light equipment with turf-type tires to excavate, grade, and place materials. Do not use equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high-pressure tires.

310.03.05 Excavation Area Bottom Preparation. Only work with soil that is friable and not in a muddy or frozen condition. When present, remove any standing water from the excavation area. Prepare the bottom of the excavated area as follows.

Submerged Gravel Wetlands. Rake surface to loosen soil.

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SPECIAL PROVISIONS INSERT
316 – STORMWATER MANAGEMENT (SWM)
FILTRATION FACILITIES

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All Other SWM Filtration Facilities. Till to a minimum depth of 8 in. to loosen soil.

316.04.06 Geotextile. Place tightly against the vertical sides of the excavation area, pulling tight to eliminate wrinkles and folds and pin securely. Eliminate any voids between the geotextile and the underlying soil and avoid wrinkling and folding the geotextile. Maintain a minimum 12 in. overlap at the geotextile joint ends or breaks. Pin longitudinal joints, overlaps and edges securely with pins spaced no greater than 10 ft on center. Do not place geotextile on the bottom of the excavated area.

316.03.05 Miscellaneous Structures. Furnish and install according to Section 305.

316.03.06 Aggregate. Place aggregate in layers as specified. Prevent soil, fines, and other debris from contaminating the aggregate. Remove contaminated aggregate and replace with clean aggregate.

316.03.07 Subdrain Pipe. Cap the ends of all subdrain pipe not terminating in a cleanout, vent, or drainage structure unless otherwise specified. Ensure perforations are placed on the bottom of the horizontal subdrain pipe runs.

- (a) **Cleanouts.** Install solid-wall pipe vertically and connect to horizontal subdrain with approved manufactured connections. Provide a counter-sunk screw cap on the exposed ends.
- (b) **Vents.** Install solid-wall pipe vertically and connect to the horizontal subdrain with approved manufactured connections. Provide a ventilated screw cap on the exposed ends. Ventilation holes or slots shall be no larger than 1/4 in. in diameter or width. The sum total area of the openings shall be no less than 1 in². Ensure that the ventilation openings are above the maximum specified water surface elevation.
- (c) **Observation Wells.** Use perforated and solid-wall pipe. Place the geotextile sock over the perforated pipe portion and secure at both ends. Provide a screw cap on the exposed end extending 2 in. above the surface. When a concrete collar is specified, ensure the top of the well is flush with the surface of the concrete collar.

316.03.08 Coarse Sand. Place coarse sand in horizontal layers not exceeding 12 in. After each lift, spread the coarse sand to provide a uniform surface then spray or sprinkle water to saturate the lift until water flows from the subdrain outlet. Use an appropriate sediment control device to capture any discharged sediment-laden water from the subdrain outlet. Place, spread, and water course sand to uniform surface true to depth, line, cross section and elevation to ensure the completed work is as specified after settlement. Prevent soil, fines and other debris from

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SPECIAL PROVISIONS INSERT
316 – STORMWATER MANAGEMENT (SWM)
FILTRATION FACILITIES

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contaminating the coarse sand. Remove contaminated coarse sand and replace with clean coarse sand.

316.03.09 Bioretention Soil Mix (BSM). Place BSM in horizontal layers not exceeding 12 in. After each lift, spread the BSM to provide a uniform surface and spray or sprinkle water to saturate the entire area of BSM until water flows from the subdrain outlet. Use an approved sediment control device to capture any discharge sediment-laden water. Place, spread, and water BSM to uniform surface true to depth, line, cross section and elevation to ensure the completed work is as specified after settlement. Prevent soil, fines, and other debris from contaminating the BSM. Remove contaminated BSM and replace with uncontaminated BSM.

316.03.10 Topsoil. Place topsoil as specified. Do not blend topsoil into BSM when topsoil is placed on top of BSM.

316.03.11 Check Dams.

- (a) **Topsoil Check Dams.** Construct topsoil check dams to the dimensions, grades, and depths specified.
- (b) **Concrete Check Dams.** Furnish and install concrete check dams as specified and according to Section 305.

316.03.12 Soil Stabilization Matting (SSM). As specified in Section 709.

316.03.13 Vegetation Installation and Establishment. Unless facilities are off-line or flow diversions are in place, install seed, sod, trees, shrubs, perennials, and annuals within SWM filtration facility areas immediately after final grading. In the event that vegetation cannot be installed and established due to time-of-year or weather restrictions, keep diversion controls in place until such time that permanent vegetation may be established. Do not use machinery other than hand held within the BSM footprint.

- (a) **Turfgrass Establishment.** As specified in Section 705.
- (b) **Meadow Establishment and Wildflower Seeding.** As specified in Section 707.
- (c) **Turfgrass Sod Establishment.** As specified in Section 708.
- (d) **Tree, Shrubs and Perennial Installation and Establishment.** As specified in Section 710.
- (e) **Annuals & Bulb Installation and Establishment.** As specified in Section 711.

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SPECIAL PROVISIONS INSERT
316 – STORMWATER MANAGEMENT (SWM)
FILTRATION FACILITIES

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316.03.14 Soil Amendments and Fertilizer. Apply according to Section 705, 706, 707, 708, 710, or as specified. Use the following for plant materials installed in BSM.

- (a) **Non-Vegetated BSM.** Do not apply compost, other soil amendments, or fertilizer to non-vegetated BSM.
- (b) **Trees, Shrub, and Perennials in BSM.** Do not apply compost or other soil amendments to backfill soil or to planting beds.

Apply fertilizer to each planting pit per 710.03.04 when trees, shrubs, perennials, perennial plugs, or other plant materials are installed in BSM per Section 710.

- (c) **Seeded or Sodded BSM.** Do not apply compost or other soil amendments.

Uniformly apply either of the fertilizers in Table 1 at the rate specified over the installed surface of the BSM when BSM will be permanently vegetated with Turfgrass Establishment, Shrub Seeding Establishment, Meadow Establishment, Turfgrass Sod Establishment, or other seeded or sodded vegetation establishment as specified.

BIORETENTION SOIL MIX		
TABLE 1 - FERTILIZER APPLICATION RATES		
FERTILIZER	LB PER SY	LB PER ACRE
20-16-12 (83% UF with MAP and SOP)	0.052	200
14-14-14 polymer coated or granular	0.062	275

- (d) **Nutrient Management Reporting.** Record the fertilizer analysis, the square yards covered, and the pounds of fertilizer applied on the Nutrient Management Reporting Form. Submit the Form within 24 hours after applying fertilizer.
- (e) **Fertilizer.** Refer to (b). Rake fertilizer that is broadcast over the surface of the BSM for seeding or sodding to a depth of 1/8 to 1/2 in. Raking may be performed as part of seeding or sodding operations. Complete raking before soil stabilization matting or sod is installed.

316.03.15 Shredded Hardwood Bark (SHB) Mulch. As specified in 710.03.13.

316.03.16 Inspection and SWM Facility As-Built Certification. Inspect and document each step of construction of SWM filtration facilities and complete the applicable checklists and furnish the SWM facility as-built certification as specified.

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SPECIAL PROVISIONS INSERT
316 – STORMWATER MANAGEMENT (SWM)
FILTRATION FACILITIES

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316.04 MEASUREMENT AND PAYMENT. Payment will be full compensation for all control of discharge from subdrain pipe, geotextile, watering, sheeting, shoring, dewatering, hauling, storing, re-handling of material, removal and disposal of excess and unsuitable material, tilling, grading and slope adjustments and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Excavation. Excavation will be measured and paid for as specified in SP- Section 201.

Miscellaneous Structures. Miscellaneous Structures will be measured and paid for per cubic yard of the specified mix concrete.

Aggregate. Aggregate will be measured and paid for at the Contract unit price for one or more of the following.

- (a) No. 2 Aggregate for Stormwater Management Facilities per cubic yard.
- (b) No. 7 Aggregate for Stormwater Management Facilities per cubic yard.
- (c) No. 57 Aggregate for Stormwater Management Facilities per cubic yard.

Removal of contaminated aggregate and replacement with clean aggregate will be at no additional cost to the Administration.

Geotextile. Geotextile will not be measured but the cost will be incidental to the excavation.

Subdrain Pipe. Perforated and solid-wall subdrain pipe will be measured and paid for at the Contract unit price per linear foot for the specified size of subdrain pipe. Fittings, caps, geotextile sock, cleanouts, vents, observation wells, and other incidentals will not be measured but the cost will be incidental to the subdrain pipe.

Coarse Sand. Coarse Sand will be measured and paid for at the Contract unit price per cubic yard for Coarse Sand for Stormwater Management Facilities.

Removal of contaminated coarse sand and replacement with uncontaminated coarse sand will be at no additional cost to the Administration.

Check Dams. Check dams will be measured and paid for at the Contract unit price for one or more of the following.

- (a) Topsoil Check Dams per each.

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SPECIAL PROVISIONS INSERT
316 – STORMWATER MANAGEMENT (SWM)
FILTRATION FACILITIES

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(b) Concrete Check Dams per each.

Bioretention Soil Mixture (BSM). BSM will be measured and paid for at the Contract unit price per cubic yard.

Removal of contaminated BSM and replacement with clean BSM will be at no additional cost to the Administration.

Water. Water used for saturation of coarse sand and BSM will not be measured but the cost will be incidental to the pertinent items.

Shredded Hardwood Bark (SHB) Mulch. SHB Mulch will be measured and paid for at the Contract unit price per square yard for Shredded Hardwood Bark Mulching, 3 in. depth.

Sediment Control for Discharge from Subdrain Pipe Outlets. Control for any sediment-laden discharge from subdrain pipe outlets will not be measured but will be incidental to the pertinent Erosion and Sediment Control items.

Topsoil. As specified in 701.04.

Vegetation Installation and Establishment. Vegetation installation and establishment will be measured and paid for at the Contact unit price for the pertinent landscaping items as specified in 705.04, 707.04, 708.04, 710.04 and 711.04.

Soil Stabilization Matting. As specified in 709.04.

Stormwater Management (SWM) Facility As-Built Certification. As specified.

**CATEGORY 300
DRAINAGE**

**SECTION 316 – STORMWATER
FILTRATION FACILITIES**

316.02 MATERIALS.

<u>DELETE:</u>	Bioretention Soil Mix (BSM)	920.01.05
<u>INSERT:</u>	Rain Garden Soil Mix (RGSM)	920.01.05
<u>INSERT:</u>	High Flow Treatment Media (HFTM)	920.01.06
<u>ADD:</u>	Fine Sand	920.01.06(a)(2)
	Medium Sand	920.01.06(a)(3)
	Very Coarse Sand	920.01.06(a)(4)
	Peat	920.01.06(a)(5)
	Stone for SWM Facility	901.06

316.03 CONSTRUCTION.

DELETE: 316.03.09 In its entirety.

INSERT: The following:

316.03.09 Rain Garden Soil Mix (RGSM). Place RGSM in horizontal layers not exceeding 12 in. After each lift, spread the RGSM to provide a uniform surface and spray or sprinkle water to saturate the entire area of RGSM until water flows from the subdrain outlet. Use an approved sediment control device to capture any discharge sediment-laden water. Place, spread, and water RGSM to uniform surface true to depth, line, cross section and elevation to ensure the completed work is as specified after settlement. Prevent soil, fines, and other debris from contaminating the RGSM. Remove contaminated RGSM and replace with uncontaminated RGSM.

High Flow Treatment Media (HFTM). Place HFTM in horizontal layers not to exceed 6 in. in thickness. Do not compact media. After each lift, apply water by spraying or sprinkling to saturate the entire area of HFTM until water flows from the subdrain. Continue backfilling and hydraulic saturation, leveling media to elevation shown on plans.

Use an appropriate sediment control device to capture any discharged sediment laden runoff. Prevent soil, fines, and other debris from intermixing with the HFTM. Remove and replace any contaminated HFTM.

DELETE: 316.03.10 In its entirety.

INSERT: The following:

316.03.10 Topsoil. Place topsoil as specified. Do not blend topsoil into RGSM when topsoil is placed on top of RGSM.

DELETE: 316.03.14 In its entirety.

INSERT: The following:

316.03.14 Soil Amendments and Fertilizer. Apply according to Section 705, 706, 707, 708, 710, or as specified. Use the following for plant materials installed in RGSM.

- (a) **Non-Vegetated RGSM.** Do not apply compost, other soil amendments, or fertilizer to non-vegetated RGSM.
- (b) **Trees, Shrub, and Perennials in RGM.** Do not apply compost or other soil amendments to backfill soil or to planting beds.

Apply fertilizer to each planting pit per 710.03.04 when trees, shrubs, perennials, perennial plugs, or other plant materials are installed in RGSM per Section 710.

- (c) **Seeded or Sodded RGSM.** Do not apply compost or other soil amendments.

Uniformly apply either of the fertilizers in Table 1 at the rate specified over the installed surface of the RGSM when RGSM will be permanently vegetated with Turfgrass Establishment, Shrub Seeding Establishment, Meadow Establishment, Turfgrass Sod Establishment, or other seeded or sodded vegetation establishment as specified.

RAIN GARDEN SOIL MIX		
TABLE 1 - FERTILIZER APPLICATION RATES		
FERTILIZER	LB PER SY	LB PER ACRE
20-16-12 (83% UF with MAP and SOP)	0.052	200
14-14-14 polymer coated or granular	0.062	275

- (d) **Nutrient Management Reporting.** Record the fertilizer analysis, the square yards covered, and the pounds of fertilizer applied on the Nutrient Management Reporting Form. Submit the Form within 24 hours after applying fertilizer.
- (e) **Fertilizer.** Refer to (b). Rake fertilizer that is broadcast over the surface of the RGSM for seeding or sodding to a depth of 1/8 to 1/2 in. Raking may be performed as part of seeding or sodding operations. Complete raking before soil stabilization matting or sod is installed.

316.04 MEASUREMENT AND PAYMENT.

DELETE:

Bioretention Soil Mixture (BSM). BSM will be measured and paid for at the Contract unit price per cubic yard.

Removal of contaminated BSM and replacement with clean BSM will be at no additional cost to the Administration.

INSERT: The following:

Rain Garden Soil Mixture (RGSM). RGSM will be measured and paid for at the Contract unit price per cubic yard.

Removal of contaminated RGSM and replacement with clean RGSM will be at no additional cost to the Administration.

High Flow Treatment Media (HFTM). HFTM will be measured and paid for at the Contract unit price per cubic yard for High Flow Filter Media.

Removal of contaminated HFTM and replacement with uncontaminated HFTM will be at no additional cost to the Administration.

Water. Water used for saturation of course sand, RGSM and HFTM will not be measured but the cost will be incidental to the pertinent item.

Stone for SWM Facility. Stone for Stormwater Management Facility will be measured and paid for at the Contract unit price for one or more of the following.

(a) 2" – 3" Stone for Stormwater Management Facility per cubic yard.

(b) 4" – 7" Stone for Stormwater Management Facility per cubic yard.

Removal of contaminated stone and replacement with clean stone will be at no additional cost.



CATEGORY 500
PAVING

SECTION 504 — HOT MIX ASPHALT PAVEMENT

466 **DELETE:** SECTION 504 — HOT MIX ASPHALT PAVEMENT in its entirety.

INSERT: The following.

SECTION 504 — ASPHALT PAVEMENT

504.01 DESCRIPTION. Construct Asphalt Pavement.

504.02 MATERIALS.

Performance Graded Asphalt Binders	904.02
Tack Coat	904.03
Asphalt Mixes	904.04
Crack Filler	911.01
Production Plants	915

504.03 CONSTRUCTION.

Quality Control Plan. Submit a Plant Quality Control Plan and a Field Quality Control Plan (QCP) at least 30 days prior to placement of any asphalt pavement. Submit the Plant QCP to the Office of Materials Technology (OMT) for approval. Submit the Field QCP to the District Engineer for approval. The Plans shall contain a statistically based procedure of random sampling and show methods proposed to control the equipment, materials, production, and paving operations. Discuss the QCP requirements in the pre-construction, pre-pave and progress meetings.

The Plant and Field QCP shall contain:

- (a) Name and location of asphalt production plants,
- (b) Laboratory and field personnel qualifications,
- (c) Inspection and record keeping methods, and
- (d) Minimum frequencies of sampling and testing.

Use the Quality Control Plant Template (www.roads.maryland.gov) to address all requirements necessary for plant quality control and plant approval.



Corrective actions will be taken for unsatisfactory construction practices and deviations from the Contract Documents.

Plan Administrator and Certified Technicians. The QCPs shall designate a Plan Administrator who shall have full authority to institute any action necessary for the successful implementation of the Plan. The Plan Administrator may supervise the QCP on more than one project if that person can contact the job site within one hour after being notified.

The QCP shall also designate a Certified Asphalt Plant Technician – Level 2, a Certified Asphalt Field Technician, a Certified Inertial Profiler Operator, a Certified Asphalt Plant Technician – Level 1, or Trainee Technicians per the Mid-Atlantic Region Technician Certification Program (MARTCP) and the Maryland Technician Certification Program.

A Certified Plant Technician shall be present at the plant during asphalt production and shipment unless otherwise approved in the Plant QCP. The technician shall perform quality control sampling, testing and documentation as specified.

A Certified Field Technician shall be present at the job site unless otherwise approved in the Field QCP. The technician shall be responsible for the required field quality control sampling and testing. Deviations from the QCP shall be cause for immediate suspension of production and paving operations.

The Certified Technicians shall perform sampling for quality control, quality assurance, acceptance, split sampling, and verification. Submit quality control test results to the Engineer.

MARTCP-Certified Technicians found deficient in their duties will have their certification(s) rescinded, as determined. Replace the deficient technician with a certified technician before resuming production and paving operations.

Records. Maintain complete records of sampling, testing, corrective actions and quality control inspection results. Provide copies of the reports upon request.

Maintain linear control charts or use other types of control charts (such as standard deviation or range), as approved. Control charts may be maintained by production, by mix, or by mix per project. Maintain the control charts in the quality control laboratory per the QCP. The control charts shall identify the mix design number, each test result, and the upper and lower limits specified for each test. Retain all original Quality Control worksheets for five years.

Quality Assurance (QA). The Administration will perform independent QA sampling, testing and inspections. QA consists of the following:

- (a) Periodically observe the performance of Quality Control (QC) or QA testing,
- (b) Monitoring control charts,



- (c) Directing the sampling of mixes behind the paver prior to compaction,
- (d) Directing the sampling of mixes at the plant site,
- (e) Directing the sampling of cores taken from the compacted pavement,
- (f) Monitoring conformance with the approved QCP(s), and
- (g) Quality control sampling and testing procedures and quality control sampling and testing equipment will be evaluated per the Independent Assurance (IA) program.

504.03.01 Equipment. All production and paving equipment will subject to approval. Ensure the plant is ready for inspection per 915.01.02.

Hauling Units. Refer to 915.02(f).

Pavers. Pavers shall be equipped with a means of preventing the segregation of the coarse aggregate particles when moving the mix to the paver augers. The means and methods used may consist of chain curtains, deflector plates, or other such devices, or any combination of these per the manufacturer's recommendations. Demonstrate that modifications to the paving equipment have been implemented on all pavers prior to use on the project.

Use a self-contained, self-propelled unit for mainline paving. Inspection and approval will be based upon the manufacturer's recommendations. The paver shall:

- (a) Produce a finished surface of the required smoothness and texture without tearing, shoving, or gouging the mix.
- (b) Be operated in a manner which delivers a homogeneous mix the full width of the pavement.
- (c) Have automatic controls capable of maintaining the grade and transverse slope within the required tolerances set forth in the contract documents.
- (d) Use auger extensions to maintain a distance no greater than 18 in. from the end of the auger to the end gate when screed extensions are used.

Provide reference lines or other approved markings to control the horizontal alignment.

Manual operation will be permitted to make grade changes for constructing irregularly shaped and minor areas.

The equipment may be operated manually for the remainder of the workday if a malfunction of any automatic control occurs, as directed.



Rollers. Rollers shall be self-propelled, reversible, and steel wheeled or pneumatic tired. Inspect all rollers and present them for approval before use. Rollers shall be operated:

- (a) In conformance with the manufacturer's recommendations.
- (b) In a manner that does not damage the pavement.
- (c) In a manner that delivers the optimal combination of density and ride requirements.
- (d) In a manner that protects bridge decks. Do not use rollers in vibratory mode when paving bridge decks.

504.03.02 Weather Restrictions. Place mixes used as the final surface when the ambient air and surface temperatures are at least 40 F. Ensure that surfaces to be paved are clean and dry before paving, as approved.

- (a) Place mixes used as intermediate and base layers when the ambient air and surface temperatures are at least 32 F.
- (b) Place polymer-modified surface mixes when the ambient air and surface temperatures are at least 50 F.
- (c) When it begins raining while the work is underway, material en route from the plant may be used at risk.
- (d) The Administration reserves the right to perform any testing necessary to ensure the quality of the pavement.
- (e) All additional testing and associated costs, including maintenance of traffic, will be at no cost.

If material placement is halted due to weather conditions, waste all material en route at no additional cost.

Do not place asphalt on a frozen graded aggregate base.

504.03.03 Foundation Preparation. Construct the foundation as specified prior to paving. Remove all excess crack filler and patch material before paving over existing pavement. All spalls and potholes shall be cleaned, tack coated, filled with asphalt, and tamped before paving. Adjust to grade manholes, valve boxes, inlets, and other construction appurtenances within the area to be paved as directed.

504.03.04 Tack Coat. Ensure the surface is dry and clear of all loose and foreign materials prior to application. Apply the tack coat uniformly across the surface using an application rate of 0.01 to 0.05 gal/yd² as directed.



504.03.05 Non-Tracking Tack Coat (NTTC). The Manufacturer shall supply a QCP for the NTTC detailing the handling and application procedures per PP71-11, and test results from an independent, accredited laboratory for shear and tensile strength.

- (a) Sample the NTTC as directed and submit to OMT's Asphalt Technology Division. All samples will be tested against the manufacturer's specifications. Material out of compliance will not be accepted for use.
- (b) Use equipment to heat and apply the NTTC at an application temperature range that conforms to the manufacturer's recommendations. Apply the NTTC in accordance with 504.03.02 and as directed.
- (c) Apply the NTTC uniformly with a pressure distributor. Use hand spraying equipment only in areas inaccessible to the pressure distributor. Apply the NTTC using an application rate of 0.05 to 0.10 gal/yd² and do not dilute with water. The quantity, rate of application, temperature, and areas to be tacked shall be approved prior to application.
- (d) Do not clean or discharge the tack coat distributor into ditches, onto shoulders or along the right of way. Park the distributor so the spray bar will not drip NTTC onto the surface of the traveled pavement.
- (e) Exclude all traffic from sections treated with NTTC until the tack has cured and will no longer track onto adjacent non-treated areas. Adjacent pavement surfaces shall show minimal visible evidence and pavement markings shall show no visible evidence of tracking.

504.03.06 Asphalt Placement. Delivery and placement of the asphalt should be continuous. Place the asphalt while the temperature is at least 225 F, or as specified in the Field QCP. Place the asphalt with a paver used that conforms to 504.03.01. Do not broadcast loose mix over the new surface.

504.03.07 Compaction. Roll the asphalt immediately after placement and compact to the proper in-place density and ride smoothness. Incentive or disincentive price adjustment for density will be as specified in 504.04.02. Use steel wheel rollers for the first rolling of all joints and edges, the initial breakdown rolling, and the finish rolling. Use a power driven trench roller when base widening is too narrow to permit the use of conventional rollers.

Construct an earth berm or shoulder against the loose asphalt as soon as it is placed. The trench must be excavated wider than the proposed width. Roll and compact the two materials simultaneously.

No traffic is permitted on the pavement after rolling until it has cooled to less than 140 F. Roller marks shall not be visible after rolling operations.



504.03.08 Joints. Construct joints as directed and as follows:

- (a) Stagger longitudinal and transverse joints in successive courses so that one is not directly above the other.
- (b) Stagger transverse joints by the length of the paver.
- (c) Stagger longitudinal joints at least 6 in. and arrange so that the longitudinal joint in the top course is within 6 in. of the line dividing the traffic lanes.
- (d) Construct joints in a manner that provides a continuous bond between the old and new surfaces.
- (e) Overlap the existing pavement 1 to 1.5 in. when constructing longitudinal joints adjacent to existing asphalt pavements.
- (f) The initial longitudinal roller pass shall be on the uncompacted hot mat and 6 in. to 1 ft from the joint. The successive roller pass shall compact the overlapped material and the 6 in. to 1 ft material simultaneously.
- (g) Apply tack coat to joints as directed. Cut back the edge of the existing pavement for its full depth at transverse joints when placing a surface course, and apply tack coat material as directed.
- (h) Apply tack coat to all contact surfaces before placing the mix against curbs, gutters, headers, manholes, etc.

504.03.09 Edge Drop-off. When paving highways carrying traffic:

- (a) Match all compacted pavement courses exceeding 2-1/2 in. in depth with the abutting lane or shoulder on the same working day.
- (b) For compacted pavement courses of 2-1/2 in. or less are placed, use the option of paving the abutting lane or shoulder on alternate days.
- (c) Pave all abutting lanes or shoulders prior to weekends and temporary shutdowns.
- (d) Place advance warning traffic control devices per Section 104 where uneven pavement joints.

504.03.10 Tie-In. When paving highways carrying traffic:

- (a) Construct a temporary tie-in at least 4 ft in length for each 1 in. of pavement depth when the posted speed \leq 40 mph.



- (b) Construct a temporary tie-in at least 10 ft in length for each 1 in. of pavement depth when the posted speed >40 mph.
- (c) Construct temporary tie-ins before traffic is allowed to cross the transverse joint.
- (d) Construct temporary tie-ins 10 ft or greater using a paver meeting 504.03.01.
- (e) Remove a transverse portion of the existing pavement at the final tie-in point to maintain the design thickness of the final surface course.
- (f) Construct the final tie-in to a length equal to the posted speed per 1 in. depth of the design thickness of the final course, with a length of at least 25 ft per 1 in. depth and a maximum length of 50 ft per 1 in. depth.

504.03.11 Mix Sampling & Testing. Mix sampling and testing for Quality Control (QC) is the responsibility of the Producer or Contractor. Identify the QC sampling locations in the Field QC Plan (plant or project site). Perform Quality Assurance (QA) sampling as directed and witnessed by the Administration. Obtain QA samples from behind the paver prior to compaction. The Administration will perform all QA testing.

- (a) **QC Sampling at the Plant.** Refer to MSMT 457. The Engineer will retain all random sampling documentation. The producer shall sample the mix at the plant. The sample shall be obtained or witnessed by the certified technician. QC plant mix sample results shall not be used in the pay factor calculation. Submit the results to the Administration and identify as Plant samples.
- (b) **QC Sampling at the Project Site.** Refer to MSMT 457. QC and QA samples shall not be split samples. The certified technician shall sample the mix at the project site. Sampling will be witnessed by the Administration.
 - (1) A mix lot constitutes all sublots of a mix created during the production of required tonnage for a lot.
 - (2) A mix subplot size should not exceed 1000 tons.
 - (3) A subplot size up to 200 tons can be combined with the previous 1 000 ton subplot placed on the same day.
 - (4) A new lot number for a mix will be given when there is a change in the approved job mix formula.
 - (5) QC project site mix sample results may be used in the pay factor calculation.



(c) **QA Sampling at the Project Site.** Refer to MSMT 457. Sample mixes at the project site as specified.

- (1) Obtain the samples from behind the paver prior to compaction. Documentation of random sampling shall be retained by the Engineer.
- (2) The Contractor's Certified Technician shall sample the mix at the project site as witnessed by the Administration.
- (3) The Administration will take possession of the QA samples and deliver to the Laboratory for testing.
- (4) A mix subplot size should not exceed 1 000 tons. A subplot size up to 200 tons can be combined with the previous 1 000 ton subplot placed on the same day. A mix lot constitutes all sublots of a mix created during the production of required tonnage for a lot. A new lot number for a mix will be given when there is a change in the approved job mix formula.

(d) **Mix Acceptance Determination.** Obtain at least three behind the paver mix samples per acceptance lot for mix acceptance determination. An acceptance lot size is approximately equal to 6 000 tons of mix per project. A mix acceptance lot ends on the day when 6 000 tons is reached.

- (1) QC and QA results from behind the paver will be compared based on the F test and t test methods per MSMT 733 for each pay factor property.
- (2) When F test and t test method results indicate a QC and QA pay factor property is not from different populations, QC and QA results will be combined to calculate the mix pay factor property per MSMT 735 and 504.04.02.
- (3) When F test and t test method indicate a QC and QA pay factor property is from different populations, the pay factor property will be determined using QA results only.
- (4) The Administration will determine the acceptance evaluation procedure when less than three QA samples are obtained for an acceptance lot. The results will be made available within five working days.

504.03.12 Sampling & Testing for Density Determination. Refer to MSMT 457. Random core sampling locations will be selected for each subplot as specified. Sample the QC and QA cores in the presence of the Engineer. Cut four or six inch cores for mixes smaller than 25 mm and 6 in. cores for mixes 25 mm and larger.

A density lot is defined as a day's paving per mix. A subplot shall not exceed 500 tons. A paving day shall begin with a new lot and sublots. The Engineer shall witness the random



location coring. At the end of the day's paving, the Engineer will designate one randomly selected core subplot set for QC and one for QA. The Engineer will note specific reasons for any density waivers and submit the proper forms to the Administration.

- (a) **Quality Control for Density.** The density of the core samples will be expressed as a percentage of the maximum specific gravity of the mixture for each lot's placement. The maximum specific gravity will be determined in accordance with T 209 and the core's percent density will be expressed to the nearest 0.1 percent.

If more than one mix sample is obtained per day's placement, an average of all maximum specific gravity tests for the day will be used for the determination of percent density of each core sample. The QC Laboratory will make results of individual days paving available to the Engineer and the Contractor no later than the next working day. Retain core samples until notified of the results of the F& t test.

- (b) **Quality Assurance for Density.** The Engineer will take possession of the core samples and deliver the cores to the Administration's Laboratory for testing. The density of the core samples will be expressed as a percentage of the maximum specific gravity of the mixture for each lot's placement. The maximum specific gravity will be determined in accordance with T 209 and the core's percent density will be expressed to the nearest 0.1 percent.

- (c) **If more than one mix sample** is obtained per day's placement, an average of all maximum specific gravity tests for the day will be used for the determination of percent density of each core sample. The Laboratory will make results of individual days paving available to the Engineer and the asphalt Producer within five working days.

- (d) **Acceptance.** Each asphalt density lot will be evaluated for compliance using the Engineer's quality assurance test data and the Contractor's QC data. The QC and QA core specific gravity data will be analyzed in conformance with MSMT 733 (F test and t test method).

- (1) If test results are determined to be from the same population, QC and QA subplot results will be averaged to calculate the density pay factor in accordance with 504.04.02.
- (2) If results are determined not to be from the same population, the pay factor will be calculated using QA subplot results only. The average QC maximum specific gravity test results and the average project site behind the paver QA maximum specific gravity test results shall be compared.
- (3) If QC results and QA results compare within 0.026, the average of the combined QC and QA results shall be used to calculate each core density. If they do not compare within 0.026, QA maximum specific gravity results shall be used to determine each core density.



- (4) Pay reduction or incentive for the pavement compaction lot will be calculated in conformance with 504.04.02. Statistical outliers will be determined per MSMT 734.
- (5) An asphalt density lot size shall equal one paving day's production per mix. A lot shall be divided into a minimum of five equal sublots. A subplot shall not be greater than 500 tons. When a paving day's production per mix is greater than 2 500 tons, then each subplot size shall be 500 tons or fraction thereof.

Acceptance on projects requiring less than 500 tons of asphalt or when asphalt is used in non-traffic areas or on bridge decks will be determined with a thin layer density gauge used per the manufacturer's recommendations.

504.03.13 Thin Lifts and Wedge/Level Courses. If an asphalt course is determined to be a thin lift in accordance with the "Thin Lift Mix Design Identification Table" in 904.04.03, construct a 400 to 500 ft control strip on the first day of paving to determine optimum pavement density.

- (a) Use a thin-lift nuclear or non-nuclear asphalt density gauge in accordance with the manufacturer's recommendations to take readings from the control strip in five random locations to determine roller patterns and the number of passes needed to obtain optimum density. Optimum density is defined as when the average density does not change by more than 1.0 percent between successive roller passes and the percent density is between 90.0 and 97.0.
- (b) Core the five random gauge reading locations to verify the gauge calibration and to determine the percent pavement density. The cores will be tested by the contractor's QC laboratory and results will be verified by the Office of Materials Technology. The QC/QA cores will be saved by the contractor and made available to the Administration for retesting ten days past after the paving date or as directed.
- (c) On the first day of paving, the target optimum density will be determined using the density gauge readings from the control strip; verified by the core results. The lot average density from the five control strip cores will be used as the target optimum density.
- (d) Take a minimum of ten QC/QA gauge readings daily from random locations per day's paving per mix or two per 500 tons of paving per mix; whichever yields the higher frequency of locations. A density lot is defined as a day's paving per mix. A subplot shall not exceed 500 tons. A paving day shall begin with a new lot and sublots.
- (e) Any lot average 2.0 percent or more below optimum and below 92 percent shall require a new control strip to be constructed, tested and approved before paving continues.



- (f) Take 2 QA cores daily when production is in excess of 500 tons per location, or when successive days of less than 500 tons production totals 1 000 tons or greater. If the average of the two density gauge readings and the average of the two respective QA core densities are within 3.0 lb/ft³, the Administration will accept all the daily density gauge readings. If they do not compare within 3.0 lb/ft³, construct a new control strip and recalibrate the density gauge.
- (g) Wedge/Level courses placed at variable thicknesses and any area greater than 3/4 in. shall be tested and accepted in accordance with this Thin Lift specification. Incentives are not applicable for Thin Lift or Wedge/Level courses.

504.03.14 Control Strip. When mixes are not determined to be Thin Lifts per 504.03.12, use the option of constructing a control strip for guidance in determining roller patterns. Construct the control strip on the first workday in which asphalt is placed between 400 and 500 ft in length. Remove any control strip, if necessary and as determined at no additional cost. The construction a control strip may be required at any time during placement of asphalt based on the evaluation of compaction results, as determined.

504.03.15 Pavement Surface Checks. Ensure an approved 10 ft straightedge is available at all times. The surface of each pavement course shall be true to the established line and grade after final compaction of each course. The surface shall also be sufficiently smooth so that the surface does not deviate more than 1/8 in. when the straightedge is placed parallel to the centerline. The transverse slope of the finished surface of each course shall not deviate more than 3/16 in. when the straightedge is placed perpendicular to the centerline.

Check transverse joints using the straightedge immediately after the initial rolling. When the surface of each course varies more than 1/8 in. from true, make immediate corrections so the finished joint surface is within tolerance.

Areas that are tested and reported in accordance with the Pavement Surface Profile Specification are not applicable to 504.03.14.

504.03.16 Curbs, Gutters, Etc. Construct permanent curbs, gutters, edges, and other supports as shown and as specified, then backfill prior to placing the asphalt.

504.03.17 Shoulders. Construct shoulders as specified. Shoulders abutting the asphalt surface course of any two-lane pavement being used by traffic shall be completed as soon as possible after placement of the surface course on that lane.

504.03.18 Pavement Profile. Refer to Section 535.

504.04 MEASUREMENT AND PAYMENT. Asphalt pavement will be measured and paid for at the Contract unit price per ton. The payment will be full compensation for furnishing, hauling, placing all materials including anti-stripping additive, tack coat, control strip, pot hole and spall



repairs, setting of lines and grades where specified, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Temporary Tie-Ins. Placement and removal of the temporary tie-in where asphalt is being applied to the traveled way carrying traffic will not be measured but the cost will be incidental to the pertinent asphalt item.

Removal of the existing pavement or structure for the final tie-in will be measured and paid for at the Contract unit price for the pertinent items used. The asphalt for the final tie-in will be measured and paid for at the Contract unit price for the pertinent Asphalt item.

Adjustments. Adjustment of existing visible manholes, valve boxes, inlets, or other structures will not be measured but the cost will be incidental to the asphalt item. Adjustment of existing manholes, valve boxes, inlets, or other structures that are encountered below the existing grade will be considered for payment in conformance with GP-4.07.

Removal of Existing Raised/Recessed Pavement Markers. Removal of existing raised/recessed pavement markers will not be measured but the cost will be incidental to the asphalt item. Removal of existing raised/recessed pavement markers that are encountered below the existing pavement will be considered for payment in conformance with GP-4.07.

504.04.01 Price Adjustment for Asphalt Binder. A Price Adjustment (PA) will be made to provide additional compensation to the Contractor or a credit to the Administration for the fluctuation in the cost of asphalt binder.

For adjustment purposes, the prevailing base index price will be the price specified for PG 64-22 (PG64S-22) at time of bid opening. Cost differentials between PG 64-22 (PG64S-22) and a binder specified shall be included in the price bid per ton for Asphalt. A historical database will be maintained by the Administration.

The PA will be made when the index price for the month of placement increases or decreases more than 5 percent of the prevailing base index price. Computations will be as follows:

$$\text{Percent Change} = ((P_p - P_b) / P_b) \times 100$$

$$PA = T \times Q \times ((P_p - (D \times P_b))$$

Where:

- PA= Price Adjustment for the current month
- T = Design target asphalt content expressed as a decimal
- Q = Quantity of asphalt placed for the current month
- Pp = Index price for PG 64-22(PG64S-22) asphalt binder per ton for the month of placement
- D = 1.05 for increases over 5 percent; 0.95 for decreases over 5 percent
- Pb = Prevailing base index price for PG 64-22 (PG64S-22) asphalt binder per ton



PA resulting in increased payment to the contractor will be paid under the item Price Adjustment for Asphalt Binder. The item amount will be established by the Administration and shall not be revised by the Contractor. PA resulting in a decreased payment will be deducted from monies owed the Contractor.

504.04.02 Payment Adjustments for Asphalt Mix and Pavement Density. Payment adjustments for pavement density will be based on individual subplot core test data for a given lot and the lot average density as specified in this section and Table 504A. Payment reductions for density and for mix will be made by adjusting the payment for Asphalt. Incentive payments will be made using the Contract items for Asphalt Mix and Pavement Density. The item amounts established by the Administration shall not be revised. Payment reductions for density will be waived for portions of the pavement where a poor foundation is determined as the cause for inadequate density.

TABLE 504A		
Dense Graded Asphalt Mixes – Percent of Maximum Density		
<i>Lot Average % Minimum</i>	<i>No Individual Subplot Below %*</i>	<i>Pay Factor (DF)</i>
94.0	94.0	1.050
93.8	93.7	1.045
93.6	93.4	1.040
93.4	93.1	1.035
93.2	92.8	1.030
93.0	92.5	1.025
92.8	92.2	1.020
92.6	91.9	1.015
92.4	91.6	1.010
92.2	91.3	1.005
92.0	91.0	1.000
91.8	90.8	0.990
91.6	90.6	0.980
91.4	90.4	0.970
91.2	90.2	0.960
91.0	90.0	0.950
90.8	89.8	0.940
90.6	89.6	0.930
90.4	89.4	0.920
90.2	89.2	0.910
90.0	89.0	0.900
89.8	88.8	0.890
89.6	88.6	0.880
89.4	88.4	0.870



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89.2	88.2	0.860
89.0	88.0	0.850
88.8	87.8	0.840
88.6	87.6	0.830
88.4	87.4	0.820
88.2	87.2	0.810
88.0	87.0	0.800
Less than 88.0	87.0	0.750 or rejected by Engineer

Note 1: Lots with test data above 97.0 may be rejected. Lots that are accepted will receive a pay adjustment in accordance with the following:

- (a) When the density lot average is above 97.5, the pay factor = 75%
- (b) When 3 subplot densities are above 97.0, the pay factor = 95%
- (c) When 4 or more subplot densities are above 97.5, the pay factor = 75%

Note 2: Pay incentive or pay disincentive will not be paid for placements identified as wedge/level courses or thin lift courses.

Note 3: When the Contractor's core specific gravity data does not compare with the Administration's core specific gravity data, only the Administration's single subplot values and lot average value will be used in acceptance decision.

Note 4: The average subplot values and the lot average will be used in acceptance decision.

Lots in conformance will be accepted per Sections 904, 915, and MSMT 735. A composite pay factor (CPF) for Asphalt content and gradation will be based on the total estimated percent of the lot that is within specification limits using the quality level analysis.

Payment adjustments will be computed as follows:

$$\begin{aligned} \text{Density Lot Payment Adjustment} &= (DF - 1) \times (AP) \times (TL) \\ \text{Mix Design Lot Payment Adjustment} &= (MF - 1) \times (AP) \times (TL) \end{aligned}$$

Where:

- MF = Mixture pay factor [0.55 + (0.5 x CMPWSL)]
Refer to MSMT 735 for CMPWSL.
- DF = Density pay factor from Table 504A.
- AP = Adjusted/applicable unit price per 504.04.01.
- TL = Applicable tonnage per lot.

- (a) A lot containing material with a pay factor of less than 1.000 may be accepted at the reduced pay factor if the pay factor is at least 0.800 and there are no isolated defects.
- (b) A lot containing material with a pay factor of less than 1.000 may be accepted at the reduced pay factor provided the composite pay factor for asphalt content and grading is at least 0.750, and there are no isolated defects.



- (c) A in-place density lot containing nonconforming material that fails to obtain at least a 0.800 pay factor and a mixture lot containing nonconforming material that fails to obtain at least a 0.750 pay factor for asphalt content and gradation will be evaluated to determine acceptance. Lots that are rejected shall be replaced.
- (d) Lots with less than five Quality Control or Quality Assurance samples per in-place density lot will not be evaluated for incentive payment.
- (e) When less than three mix samples have been obtained at the time of the acceptance sampling or at the time a lot is terminated, the Engineer will determine if the material in a shortened lot will be considered a part of the previous lot or whether it will be accepted based on the individual test data.

504.04.03 Dispute Resolution. Refer to 915.02.03.



**CATEGORY 500
PAVING**

SECTION 505 — HOT MIX ASPHALT PATCHES

483 **DELETE:** SECTION 505 — HOT MIX ASPHALT PATCHES in its entirety.

INSERT: The following.

SECTION 505 — ASPHALT PATCHES

505.01 DESCRIPTION. Repair rigid, flexible, or composite pavements by removing part or all of the section of the existing pavement and replace with asphalt paving material. The locations and extent of the repairs will be as specified or as directed.

Partial Depth Patching (PDP). PDP consists of removing areas of unsound pavement up to 50 percent of the pavement thickness and replacing with an asphalt mix. The pavement thickness is defined as the thickness of all bound materials in the pavement structure including asphalt mix, portland cement concrete (PCC), and any other asphalt or cement modified material.

Full Depth Patching (FDP). FDP consists removing the full thickness of the pavement sections to the top of the aggregate base and replacing with an asphalt mix. Perform FDP whenever more than 50 percent of the pavement thickness requires repair.

505.02 MATERIALS.

Graded Aggregate Base	901.01
Aggregates for Asphalt Mixes	901.01
Performance Graded Asphalt Binders and Asphalt Mixes	904
Crack Filler	911.01
Production Plants	915
Cold Patch Material	924

505.03 CONSTRUCTION. Keep disturbance of the base material to a minimum. The faces of the remaining pavement shall be square and vertical without ragged edges. Do not use equipment that could damage the existing pavement.

505.03.01 Weather Restrictions. Refer to 504.03.02.

505.03.02 Existing Pavement. Complete all repairs on the same day in which excavation is completed. Do not leave open excavated areas at the end of the workday.

505.03.03 Removal of Pavement for PDP. Remove existing pavement by milling, grinding, or saw cutting to the specified depth. Maintain square vertical faces after removal.



- (a) If concrete is encountered during removal, limit the depth of the patch to the top elevation of the PCC.
- (b) For PDP of composite pavements, protect the PCC from damage during removal of the HMA.
- (c) When the material at the bottom of the PDP is determined to be unsuitable, remove the unsuitable material until sound material is encountered.
- (d) When PCC present in a composite pavement is determined to be unsuitable, follow the removal and replacement procedures for a FDP.
- (e) Remove all loose and foreign materials before placing the patch, then treat all spalled cracks and joints by tack coating, filling and tamping with asphalt.

505.03.04 Removal of Pavement for FDP. Make a perpendicular saw cut full depth around the perimeter and remove the existing pavement to the top of the aggregate base. Refer to 522.03.03 for the concrete portion of a composite pavement. Maintain square vertical faces after saw cutting.

505.03.05 Base and Subgrade Preparation. The aggregate base of the FDP area will be evaluated to determine its suitability.

- (a) When the aggregate base is determined to be unstable, compact it as specified in 501.03.10.
- (b) When no aggregate base is present, construct the subgrade foundation per Section 208 or as directed.
- (c) Removal of Unsuitable Material:
 - (1) When the aggregate base or subgrade material is unsuitable, remove and dispose of the unsuitable material.
 - (2) Replace the unsuitable material with graded aggregate base conforming to Section 501.
 - (3) Compact the replacement material in layers no greater than 4 in. depth.
 - (4) Protect the aggregate base or subgrade after placement.
 - (5) Remove and replace any aggregate base or subgrade damaged due to lack of protection at no additional cost.



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505.03.06 Subgrade Drains. Refer to Section 306. The construction of subgrade drains may be required in areas of wet underlying subgrade or in areas where future drainage problems may be a concern, as determined.

505.03.07 Emergency Filler. Have sufficient approved cold patch material readily available to fill the void of the repair area. Place and compact the material as directed. Completely remove the material at the beginning of the next workday.

505.03.08 Steel Plates. Ensure an ample supply of 12 x 14 ft by 1 in. thick steel plates are available on site to cover the emergency filler.

505.03.09 Patch Construction. Refer to Section 504. Furnish equipment and perform placement, compaction, and quality control procedures as specified. Manual placement of the asphalt patches is permissible, as directed.

505.03.10 Patch Placement. Thoroughly clean and tack the exposed vertical surface of adjacent pavement prior to placing the asphalt patch per 504.03.04. Spread the asphalt with a shovel, rake, or by other approved methods. Do not place asphalt patches on a frozen base.

Maintain lift thickness in conformance with the following:

ASPHALT LIFT THICKNESS		
MIX DESIGNATION (mm)	MINIMUM (in.)	MAXIMUM (in.)
9.5	1.0	2.0
12.5	1.5	3.0
19.0	2.0	4.0
25.0	3.0	5.0
37.5	4.0	6.0

505.03.11 Mix Sampling Requirements. One random sample per mix will be required daily for projects using more than 200 tons. Quantities of 200 tons or less of asphalt may not require daily field sampling; however, one random sample per mix for every 1 000 tons of asphalt or one sample per mix will be required for every five days of patching, whichever yields the greater frequency. Random mix samples for patching will only be required for patches placed with a paver and will not be required for patches less than 1 000 ft².

505.03.12 Testing and Acceptance. Acceptance of Base and/or Surface of each patch will be determined by using an asphalt density gauge with test data witnessed by the Engineer. Calibrate the density gauge to the mix in order to obtain acceptable readings.



505.03.13 Density Determination Requirements. On the first day of patching, the Engineer will select three test locations and witness the testing. Sample the cores and label with the date sampled. Cores will be tested and retained in the QC Laboratory until OMT verifies the results. Submit the completed core sheets to OMT.

- (a) The average pcf of the three cores and the average pcf of the three corresponding gauge readings shall be within 3.0 lb/ft^3 of each other, recalibrate the density gauge according to the manufacturer's recommendation. When the difference between the gauge readings and the core tests are greater than 3.0 lb/ft^3 , verify the gauge's accuracy by reading three new random locations.
- (b) Report density gauge test data as a percentage of the maximum specific gravity determined for each day's production. An in-place density of 92.0 to 97.0 percent is required for each patch. Compliance will be determined for each patch separately by averaging all density tests performed within each specific patch. Submit compaction sheets to OMT daily for all production.

505.04 MEASUREMENT AND PAYMENT. Refer to 504.03.10 and MSMT 735. Payment will be full compensation for saw cutting, milling, grinding, removal, disposal, trimming of the existing pavement, subgrade preparation, placing all materials including tack coat, steel plates, emergency filler, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. After removal, steel plates and emergency filler will remain the property of the Contractor.

505.04.01 Partial Depth Patching and Full Depth Patching. Payment will be measured and paid for at the Contract unit price per square yard or per ton as specified. The payment will be full compensation for furnishing, hauling, placing all material, additional removal of pavement above the aggregate base, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

505.04.02 Removal of Unsuitable Material. Payment will be measured and paid for at the Contract unit price per cubic yard. The payment will also include excavation and disposal of unsuitable material, backfilling with aggregate, and compaction.

505.04.03 Price Adjustment for Asphalt Binder. Refer to 504.04.01. An adjustment will be made to the final Contract unit price for asphalt mixture if the price of asphalt binder fluctuates significantly from the prevailing price on the date of placement. This includes asphalt patching material converted to tons.

CATEGORY 500
PAVING

SECTION 509 — GRINDING ASPHALT PAVEMENT

509.03 CONSTRUCTION.

509.03.03 Pavement Grinding

494 **ADD:** The following after the third paragraph

INSERT:

The ground pavement surface areas shall not be left exposed to traffic for more than two weeks before resurfacing operations begin. When the resurfacing operations have not begun within the two week allotted time frame, a deduction of \$1,500 per day for Interstates and \$750 per day for all other roadways will be assessed against the Contractor until paving begins. The daily penalty will be deducted from the next progress payment and is a permanent deduction.

Temporary pavement tie-ins shall be constructed a minimum of 10 ft in length for each 1 inch of grinding depth.



SPECIAL PROVISIONS INSERT
520 — PLAIN AND REINFORCED PORTLAND CEMENT
CONCRETE PAVEMENTS

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CATEGORY 500
PAVING

SECTION 520 — PLAIN AND REINFORCED
PORTLAND CEMENT CONCRETE PAVEMENTS

520.03 CONSTRUCTION.

503 **DELETE:** 520.03.11 Texturing and Edging in its entirety.

INSERT: The following.

520.03.11 Texturing and Edging.

Texturing. Texture the surface of the pavement with longitudinally tined grooves using a mechanical device (such as a wire comb), following concrete finishing and surface check. The device shall have a single row of tines with nominal widths of 5/64 inch to 1/8 in. each. The nominal spacing of the tines shall be $3/4 \pm 1/8$ in. center-to-center. The nominal depth of the tined grooves shall be $1/8 \pm 1/32$ in. The device shall have horizontal and vertical controls to ensure straight, tined grooves of uniform depth.

Begin texturing when the concrete is plastic enough to allow texturing to the depth specified, but dry enough to prevent the concrete from flowing back into the grooves. Avoid overlaps and tearing of the concrete. Protect a 2 to 3-in. wide strip of pavement surface from tining for the length of the pavement; centered along longitudinal joints. Extend the tining as close as possible to the edge of any adjacent pavement to be placed without damaging the edge. Do not tine areas 6 in. from the edge of pavements where adjacent pavement is not placed. Do not tine areas 1 ft from the curb in closed sections. Hand operated tining equipment that produces an equivalent texture with the specified spacing may be used on small or irregularly shaped areas. The completed textured finish shall exhibit a uniform appearance.

Edging. Edge textured transverse and longitudinal slabs using a 1/4 in. radius edging tool when the concrete has reached its initial set.

506 **ADD:** The following after 520.03.16.

520.03.17 Dowel Bar Placement Checks. After each day's placement of the PCC pavement is complete and cured, the alignment and placement of the dowel bars will be checked by the Administration using a non-destructive test method. All joints will be tested to determine conformance with the following.

- (a) **Vertical Skew.** The vertical skew shall be no greater than 1/2 in. tolerance over a 12 in. length of dowel bar.

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SPECIAL PROVISIONS INSERT
520 — PLAIN AND REINFORCED PORTLAND CEMENT
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- (b) **Horizontal Skew.** The horizontal skew shall be no greater than 1/2 in. tolerance over a 12 in. length of dowel bar.
- (c) **Depth of Dowel Bar.** The dowel bar shall be located within the middle third of the slab thickness. A minimum cover depth of 3 in. is required for the top, and a minimum cover depth of 2.5 in. is required for the bottom.
- (d) **Joint.** The joint saw cut shall be in the middle third of the dowel bar length. The minimum embedment length on either side of the joint shall be 4 in.
- (e) **Missing Dowel Bar.** A missing dowel bar shall be considered misaligned.

A joint is in nonconformance or misaligned if any dowel bar in the wheelpaths are not in conformance.

- (a) For 12 ft wide or narrower lanes, the 3 outermost bars and 3 bars under the inside wheelpath must be in conformance.
- (b) For widened slabs, the 3 bars under the outside wheelpath and the 3 bars under the inside wheelpath must be in conformance.
- (c) In addition, a joint is in nonconformance or misaligned if at least 3 dowel bars in non-wheelpath areas do not conform to the above.

After testing is complete, the percentage of those joints not meeting the above will be determined. Deficiency will be subject to a reduced payment as specified in 520.04. This is in addition to the reduced pay for slab thickness.

520.04 MEASUREMENT AND PAYMENT.

506 **ADD:** The following after 520.04.01.

520.04.02 Dowel Bar Misalignment Price Adjustment. Payment for the percentage of joints accepted at a reduced price for not conforming to the proper alignment will be adjusted by the factors shown in the following table. Alignment is determined by procedures specified in 520.03.17. This shall be a reduced price for the portland cement concrete pavement item in addition to any reduction due to pavement thickness.

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SPECIAL PROVISIONS INSERT
520 — PLAIN AND REINFORCED PORTLAND CEMENT
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DOWEL BAR PRICE ADJUSTMENT	
Percent of Misaligned Joints *	Percent of Payment, Contract Unit Price **
0 to 10	100
>10 to 15	95
>15 to 20	90
>20 to 25	85
>25 to 30	75
>30 to 50	70
Greater than 50	Corrective action***

*This is the percentage of all joints tested.

**This price adjustment is to the PCC price and not for the dowel bars or joints. This is in addition to any price adjustment for pavement thickness.

***Corrective action may include removal and replacement, dowel bar retrofit, or other method approved by the Administration.

CATEGORY 500
PAVING

**SECTION 520 – PLAIN AND REINFORCED PORTLAND
CEMENT CONCRETE PAVEMENTS**

520.01 DESCRIPTION.

456 **ADD:** The following after the first paragraph:

Where indicated on the roadway plans, driveway entrances must be reconstructed to the appropriate SHA (ADA compliant) standard.

520.04 MEASUREMENT AND PAYMENT.

462 **ADD:** The following after the first paragraph:

When vertical adjustments of existing utilities and sub-grade preparation is required to reconstruct driveway entrances, the cost will be incidental to the Contract unit price for 8 Inch Portland Cement Concrete for Driveway Mix 9.

When existing concrete or asphalt driveway entrances are removed and replaced with new concrete, the cost of the removal will be incidental to the Contract Unit Price for 8 Inch Portland Cement Concrete for Driveway Mix 9.

CATEGORY 500
PAVING

SECTION 535 — PAVEMENT SURFACE PROFILE

535.01 DESCRIPTION. Measure the roughness of the final surface of Superpave Asphalt Mix (SAM) or Portland Cement Concrete (PCC) pavements using an International Roughness Index (IRI) Inertial Profiler to collect Quality Control (QC) data. The IRI Inertial Profiler shall conform to E 950 and MSMT 563. The Administration will use an IRI Inertial Profiler to perform all Quality Assurance (QA) testing and acceptance. Measure all final roadway surfaces unless otherwise indicated.

535.01.01 Existing Conditions. Following are the IRI values for this project:

IRI INDICATOR	REPORTED VALUES FOR BOTH WHEEL PATHS (in./mile)	REPORTED STATEWIDE PRINCIPAL OTHER ARTERIAL VALUES (2014) (in./mile)
Average	126	107
Maximum	369	637
Minimum	80	27
Standard Deviation	111	70

- NOTE 1: IRI is an abbreviation for the International Roughness Index developed under World Bank Technical Report No. 46.
- NOTE 2: IRI values were generated from the most recent pavement longitudinal profile data available, measured in the outside travel lane.
- NOTE 3: The average, maximum, minimum, and standard deviation IRI values are based on intervals of 1/10 of a mile in length.

A definition of ride quality based on IRI (as defined by The Federal Highway Administration) is given below:

IRI RANGE (in./mile)	RIDE QUALITY
< 60	Very Good
≥ 60 to < 95	Good
≥ 95 to ≤ 170	Fair
>170 to ≤ 220	Mediocre
> 220 to ≤ 640	Poor

535.02 MATERIALS. Not applicable.

535.03 CONSTRUCTION.

535.03.01 Equipment Standardization Testing. MSMT 563. Perform standardization testing on Administration specified sites at regular intervals. Additional testing may be required for a device that may be out of conformance between regular standardization tests. Send a copy of the completed standardization test results to the Administration's Office of Materials Technology (OMT). QC test data obtained with a profiler that has not completed standardization testing will not be accepted.

535.03.02 Quality Control Testing for Pavement Profile. E 950 and MSMT 563. Measure the pavement profiles in the direction of travel in both wheel paths simultaneously and parallel to the right edge of the lane. Document a regular schedule of pavement profiling in the SAM Field Quality Control Plan (504.03) or the PCC Proposed Paving Plan (520.03). Notify the Engineer prior to performing any QC measurements. Submit the results to the Engineer per the approved QC plan within 72 hours of completion of the paving operations.

Data Submittal. Submit all data to the Engineer and OMT (in electronic format) via one of the following:

- (a) **E-mail:** ridespec@sha.state.md.us
- (b) **Delivered:** Office of Materials Technology
7450 Traffic Drive
Hanover, MD 21076
Attention: Paving Quality Assurance Team Leader

Profile measurements and data submission that has not been completed for all sections on the project as specified will not be eligible for incentive payment per 535.04.03(a). QC data is required for materials clearance.

- (a) Measure and report the QC IRI in sections equal to 25 ft in length and one lane in width. Sections measured that are shorter than 25 ft due to exempt areas or the project end are required to be reported but not used in the pay calculation.
- (b) Measure a full 25 ft section after each exempt area.
- (c) Perform three measurement runs per MSMT 563. The coefficient of variation of the overall average IRIs shall be less than or equal to 4 percent for three runs.
- (d) When the first three runs do not meet the above criteria, perform additional runs until three measured runs meet the criteria. Submit the acceptable three runs to the Administration. Only the median run (based on average IRI) will be considered for the QC IRI data, and will be used to compute any pay adjustments.

(a) **Areas Not Profiled.** The following pavement areas are exempt from profiling and reporting for pay adjustment:

- (1) Shoulder areas.
- (2) Parking areas of ride sharing facilities or park and ride lots.
- (3) Pavements of ramps, side street tie-ins, acceleration lanes, or deceleration lanes less than 1,000 ft in length.
- (4) Bridge decks, railroad crossings, stop signs and pavement within 50 ft thereof.
- (5) Pavement within 50 ft of transverse joints that separate it from existing pavement. This does not apply when a transverse joint is paved on both sides as part of one contract.
- (6) Pavements on projects with less than 1,000 center lane feet, after elimination of areas not to be profiled under items 1 through 5.
- (7) Ramps greater than 1,000 centerline feet with radius less than 2,000 feet.

Perform Pavement Surface Checks on areas listed above per 504.03.14.

(b) **Defects.** 535.04. When any section IRI is greater than or equal to IRI_e per the table, take one of the following corrective actions as directed and at no additional cost:

- (1) Remove and replace the pavement that is greater than or equal to IRI_e , or
- (2) Grind the section to bring the section IRI into conformance, or
- (3) Accept the Defect Cost per 535.04 for any defective section where corrective action is not performed.

Perform the above corrective actions to each defective section as determined. Approval to waive (1) or (2) does not constitute a waiver of (3) unless explicitly stated.

- (1) Re-profile all affected pavement sections after any corrective work, including any additional transverse paving joints created, to determine if the sections are within specification.
- (2) The re-profiled data shall include the section prior to the corrected sections and the four sections after the corrected sections.
- (3) The re-profiled data shall be used for final pay calculations; however, the minimum IRI value for any corrected section shall be limited to IRI_c .

Defects Not Due to Workmanship. When it is determined that a defect is not the result of substandard workmanship, a written justification for removing the defect from final pay calculations will be provided to OMT’s Asphalt Technology Division. The Engineer will discuss this matter with OMT’s Asphalt Technology Division before making the final pay adjustment determination.

535.03.03 Paving Quality Assurance Testing for Pavement Profile (IRI). The Administration may measure sections of the pavement to verify the QC data. The QC data will be used for any pay adjustments on the project if the QA measurements have not been performed within 14 calendar days from the date that the completed QC data was submitted. Perform QA testing per 535.03. The initial QA test will consist of one run on all 25 ft sections. The initial QA run and the median QC run will be compared to determine QC data acceptance. The average IRI, the number of defects, and the number of tested sections will be compared as follows:

STATISTIC	UNIT	QC DATA TOLERANCE WITH RESPECT TO QA DATA
Average IRI	in./mile	$\pm (2 \% + 2)$
Number of Defects	Sections	$\pm (10 \% + 2)$
Number of Tested Sections	Sections	$\pm (1 \% + 1)$

The QC data will be used for all pay adjustments when it falls within the above tolerances.

- (a) Perform a minimum of two additional QA runs when the QC data does not agree with the initial QA data and a cause cannot be determined.
- (b) The initial and two additional QA runs will then be evaluated to determine if the coefficient of variation of the overall average IRIs is less than or equal to 4 percent for the three runs.
- (c) When the three QA runs do not meet the above criteria, additional runs will be performed until three measured QA runs meet the criteria.
- (d) The median run (based on average IRI) of the three QA runs will then be re-compared with the QC data in conformance with the above tolerances.

Corrective Actions. If the QC and QA data are still not within the tolerances described above for Average IRI or Number of Defects, both profilers shall be retested on a standardization test site per MSMT 563 to determine their conformance and recalibrated or repaired as necessary.

- (a) If the QC profiler is not brought into compliance within three paving days, cease paving operation or use another standardized profiler to collect QC data.
- (b) Once the QC profiler is brought into compliance, previously tested sections may be retested for comparison with the QA data or the QA data can be accepted as the basis for any pay adjustment on all sections.

- (c) If the QA profiler is out of compliance, then the QC data for all sections tested will be accepted.
- (d) If both profilers are found to be in noncompliance, they shall be repaired or recalibrated as necessary and all QC and QA testing since the previous comparison repeated.

When the QC and QA data for Number of Tested Sections are not within tolerance, the respective Distance Measuring Instruments (DMIs) shall be recalibrated and additional QC testing performed until the QC data meets the tolerance criteria.

535.04 MEASUREMENT AND PAYMENT. Pavement surface profile testing costs will be incidental to the SAM surface material or PCC material as specified. Payment will be full compensation for all set up, technicians, traffic control, any type of corrective work to bring the pavement into conformance, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

The Administration will perform the pay adjustment calculations for the Overall IRI per 535.04.01 and for Defect Cost per 535.04.02 and then will calculate the Total Pay Adjustment per 535.04.03.

535.04.01 Overall IRI. The overall average IRI for the project (IRI_{AVG}) will be calculated as the average IRI value of all tested 25 ft sections on the project. The pay adjustment for Overall IRI will then be calculated based on the factors below.

Incentive. $PF = P_{max}$, when IRI_{AVG} is less than or equal to IRI_a
 $PF = P_{max} \times (IRI_b - IRI_{AVG}) / (IRI_b - IRI_a)$, when IRI_{AVG} is greater than IRI_a
and less than IRI_b

$INCENTIVE = PF \times NS \times (25/5280 \text{ lane miles per section})$
 $DISINCENTIVE = 0$

Full Pay. When IRI_{AVG} is greater than or equal to IRI_b and less than or equal to IRI_c

$INCENTIVE = 0$
 $DISINCENTIVE = 0$

Disincentive. $PF = P_{min} \times (IRI_{AVG} - IRI_c) / (IRI_d - IRI_c)$, when IRI_{AVG} is greater than IRI_c
and less than IRI_d ,
 $PF = P_{min}$, when IRI_{AVG} is greater than or equal to IRI_d

$INCENTIVE = 0$
 $DISINCENTIVE = PF \times NS \times (25/5280 \text{ lane miles per section})$

535.04.02 Defect Cost. The IRI for each individual section will be used to calculate any cost to be applied for defects on the project. This pay adjustment applies only to the pavement within the tested sections. The pay adjustment for defects will be calculated based on the factors shown below.

DEFECT COST = Sum of the defect costs ($P_{\text{defect},i}$) for all defect sections

Where:

	DESCRIPTION	VALUE	UNITS
P_{max}	Maximum Incentive for Overall IRI	6,150	Dollars per lane-mile
P_{min}	Maximum Disincentive for Overall IRI	6,150	Dollars per lane-mile
$P_{\text{defect},i}$	Defect Cost for a given 25' section	*	Dollars per section
PF	Pay Factor for Overall IRI	*	Dollars per lane-mile
INCENTIVE	Incentive for Overall IRI	*	Dollars
DISINCENTIVE	Disincentive for Overall IRI	*	Dollars
DEFECT COST	Sum of the defect costs ($P_{\text{defect},i}$) for all defect sections	*	Dollars
IRI_a	IRI for Maximum Incentive	42	Inches per mile
IRI_b	Minimum IRI for Full Pay	57	Inches per mile
IRI_c	Maximum IRI for Full Pay	86	Inches per mile
IRI_d	IRI for Maximum Disincentive	101	Inches per mile
IRI_e	IRI threshold for Defects	170	Inches per mile
IRI_{AVG}	Overall average IRI for the project	*	Inches per mile
IRI_{defect}	IRI for a given 25' defect section	*	Inches per mile
NS	Number of tested 25 foot Sections	*	Sections

* Value to be determined on the project.

The defect cost ($P_{\text{defect},i}$) for each defect section will be computed using the following formula: [

$$P_{\text{defect},i} = 100 + \left(\frac{190 * (IRI_{\text{defect}} - IRI_e)}{(600 - IRI_e)} \right)$$

535.04.03 Total Pay Adjustment. A total pay adjustment (TPA) will be made based on the total of any incentive and disincentive for Overall IRI minus any defects. TPA resulting in increased payment will be paid under the item Pavement Surface Profile Pay Adjustment. This item amount has been established by the Administration and shall not be revised. TPA resulting in decreased payment will be deducted from monies owed. The TPA shall be subject to conditions (a) and (b) below.

$$\text{Total Pay Adjustment} = \text{INCENTIVE} - \text{DISINCENTIVE} - \text{DEFECT COST}$$

- (a) Regardless of the measured profile of any test section, incentive payment will not be permitted for the project when the Contractor's QC data was not submitted on time in conformance with 535.03.02.

Total Pay Adjustment = 0 - DISINCENTIVE - DEFECT COST

- (b) The total value of Overall IRI disincentive and Defect Cost shall not be more than the Maximum Disincentive pay adjustment for all of the profiled 25 foot sections.

If DISINCENTIVE + DEFECT COST is greater than $P_{\min} \times NS \times (25/5280 \text{ lane miles per section})$ then Total Pay Adjustment = $- P_{\min} \times NS \times (25/5280 \text{ lane miles per section})$

CATEGORY 500
PAVING

SECTION 550 — PAVEMENT MARKING PAINT

550.01 DESCRIPTION. Furnish and apply nontoxic lead free waterborne pavement marking paint to pavement surfaces as specified in the Contract Documents or as directed by the Engineer. These markings includes lines (striping), legends (letters and numbers) and symbols.

550.02 MATERIALS. Paint is a nontoxic lead free waterborne pavement marking and is a non-durable material. All Paint Pavement Marking material shall be selected from the Qualified Products List.

Nontoxic Lead Free Waterborne Pavement Marking Material	951.01
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550.03 CONSTRUCTION.

550.03.01 Quality Control / Quality Assurance. Refer to Section 549.

550.03.02 Application. The location, width, and type of marking shall be as specified in the Contract Documents or as directed by the Engineer.

- (a) **Temperature.** The markings shall be applied when the paint, ambient and surface temperature, and relative humidity conform to the manufacturer's recommendations.
- (b) **Glass Beads.** The Contractor shall apply the Maryland Blend gradation of glass beads uniformly across the surface of the stripe, at the rate of 7 to 9 lb/gal of paints.
- (c) **Thickness.** The paint shall be applied at a wet film thickness of 18 ± 1 mils.
- (d) **Color.** The color of the dry markings shall match Federal Standard 595 (38907 - yellow or 37925 - white). The Contractor shall make available the specified color chips for the Engineer's use to visually determine that the waterborne material matches the specified color.
- (e) **No-Track.** The paint shall conform to 60 second no-track requirements. The no-track condition shall be determined by passing over the applied line at approximately 30 degrees with a standard passenger car or pickup truck. When viewed from a distance of 50 ft, the pavement surface shall show no evidence of the paint being picked up and redeposited on the pavement by the vehicle.
- (f) **Retroreflectance.** The minimum retroreflectance shall be 150 millicandelas/lux/square meter for yellow and 250 millicandelas/lux/square meter for white as determined in conformance with MSMT 729.

550.03.03 Application Equipment. The equipment used for application of the paint shall be approved by the Engineer prior to start of work, and shall be capable of applying waterborne traffic paint that has been approved by the Administration. The Contractor shall provide access to the paint application equipment for inspection by the Engineer.

The paint carriage on the left side of the paint truck shall have three paint and bead guns. The paint carriage on the right side of the paint truck shall have two paint and bead guns.

All 10 in. lines shall be applied using two paint and bead guns. Raising the paint carriage in order to paint these lines with one paint gun and bead gun is prohibited.

The footage counters used to measure pavement markings shall be calibrated, and a notarized certification shall be submitted to the Engineer as part of the Quality Control Plan.

Temperature gauges shall be calibrated every six months and a copy of the calibration certification shall be submitted to the Engineer as part of the Quality Control Plan.

The applicator shall apply the surface dressing beads to the wet paint marking by means of a pressurized bead dispenser or other mechanical conveying method not dependent upon gravity for uniform application. The bead dispenser shall be equipped with an automatic cutoff system that will stop the flow of the paint material whenever there is a disruption in the application of the beads so that all markings placed shall be covered with a uniform layer of surface dressing beads.

Application equipment shall be capable of applying the markings at multiple width settings ranging from 4 to 12 in.

The applicator shall provide a method for cleanly cutting off stripe ends and shall be capable of applying all longitudinal pavement markings.

The equipment shall be mobile and maneuverable to the extent that straight lines can be followed and all standard curves can be made in true arcs.

All parts of the equipment shall be thoroughly cleaned of foreign material or different colored material prior to the introduction of a new batch of material.

550.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for all pavement preparation, furnishing and placing of markings, testing, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Refer to 549.04.

Pavement Marking Paint will be measured and paid for at the Contract unit price for one or more of the following items:

- (a) Pavement Marking Paint lines (striping) will be measured and paid for at the Contract unit price per linear foot for the color and width specified.
- (b) Pavement Marking Paint Legends (letters and numbers) and Symbols will be measured and paid for at the Contract unit price per square foot. The square foot pay quantity for Legends (letters and numbers) and Symbols will be as specified in the Administrations Standard Details.

CATEGORY 500 PAVING**SECTION 556 — PREFORMED
THERMOPLASTIC PAVEMENT MARKINGS**

556.01 DESCRIPTION. Furnish and install heat applied preformed thermoplastic pavement marking symbols, legends, and lines as specified in the Contract Documents or as directed by the Engineer.

556.02 MATERIALS.

Preformed Thermoplastic is a durable pavement marking material. All Preformed Thermoplastic Pavement Marking material shall be selected from the Qualified Products List.

Heat Applied Permanent Preformed Thermoplastic Pavement Marking Material	951.06
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556.03 CONSTRUCTION.

556.03.01 Quality Assurance/Quality Control. Section 549.

556.03.02 Application. The location, width, and type of marking, shall be as specified in the Contract Documents or as directed by the Engineer.

Applying pavement markings over longitudinal joints is prohibited; they shall preferably be offset 2 in. from them.

Thermoplastic Pavement Marking shall conform to the following:

- (a) **Temperature.** The markings shall be applied when the thermoplastic, ambient, and surface temperature, and relative humidity conform to the manufacturer's recommendations.
- (b) **Color.** The color of the dry markings shall match Federal Standard 595 (13538 - yellow or 17886 - white). The Contractor shall supply the specified color chips for the Engineer's use to visually determine that the thermoplastic material matches the specified color.
- (c) **Primer.** When specified by the manufacturer, a primer shall be used if thermoplastic is applied to Portland cement concrete.
- (d) **Retroreflectance.** The minimum retroreflectance shall be 150 millicandelas/lux/square meter for yellow and 250 millicandelas/lux/square meter for white as determined in conformance with 549.03.

556.03.05 Packaging. The material shall be handled for shipping, unloading and storage as recommended by the manufacturer. Each shipping package shall be marked with the following information:

- (a) Manufacturer's name.
- (b) Description of item.
- (c) Date of manufacture.
- (d) Contractor's name.
- (e) Purchase order number.
- (f) Lot number.
- (g) Color.

556.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for all pavement preparation, furnishing and placing of markings, testing, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Prefomed Thermoplastic Pavement Marking Legends (letters and numbers) and Symbols will be measured and paid for at the Contract unit price per square foot. The square foot pay quantity for Legends (letters and numbers) and Symbols will be as specified in the Administrations Standard Details

Prefomed Thermoplastic Pavement Marking lines will be measured and paid for at the Contract unit price per linear foot for the color and width specified.

**CATEGORY 500
PAVING**

SECTION 557 – SNOWPLOWABLE RAISED PAVEMENT MARKERS

557.01 DESCRIPTION. Furnish and install new Snowplowable Raised Pavement Markers (SRPM) and replacement components as specified in the Contract Documents or as directed by the Engineer.

557.02 MATERIALS.

Castings	Qualified Products List / 951.05
Pavement Marker Reflector Lenses	Qualified Products List / 951.05
Epoxy	951.05

Snowplowable Raised Pavement Markers are durable materials.

557.03 CONSTRUCTION.

Casting. Recycled iron castings are prohibited.

Placement. Snowplowable Raised Pavement Markers shall be installed and located as specified in the Contract Documents and in conformance with the Maryland Manual of Uniform Traffic Control Devices (MdMUTCD).

General Installation Requirements.

- (a) The Contractor shall install the SRPM no later than two weeks after the completion of the final surface or as directed by the Engineer.
- (b) At the time of installation, the road surface and ambient temperature shall be as specified in the manufacturers’ recommendations. Installing markers on wet pavement surfaces as determined in MSMT 729 is prohibited.
- (c) At the time of installation, the Contractor shall have on the jobsite all the materials necessary to complete the installation.
- (d) The quality control test strip containing a minimum of 10 groove cuts spaced as specified in the Contract Document shall be constructed to verify the accuracy and ability of the equipment and personnel. The contractor shall replace at no additional cost to the Administration any incorrect groove cuts and any incorrect casting placements within the test strip.
- (e) At the time of installation, SRPM castings delivered with Pavement Marker Reflector Lens affixed should be free of dirt, dust, oil, grease, rust, moisture, or any foreign matter that will impair adhesion to the pavement. Any residual material that inhibits retroreflectivity of the reflector lens shall be removed without damage to the lens surface. It shall be the contractor’s responsibility to clean each contaminated casting by sand blasting, wire brushing or other procedure approved by the Engineer to remove all foreign matter prior to installation. The use of chemicals to remove rust from the castings is prohibited.

- (f) The contractor shall replace at no additional cost to the Administration any incorrect groove cut and any incorrect casting placement. An additional test strip may be required by the Engineer in the event of incorrect installations. Incorrect installations, as determined by the Engineer, shall be corrected and repaired by the contractor at no additional cost to the Administration.

Pavement Marker Reflector Lens. Reflector lenses for pavement markers shall be the same color as the adjacent pavement marking except the back side shall be as follows;

- (a) One-Way Applications: The backside for One-Way Markers shall be red or blank as specified in the Contract Documents or as directed by the Engineer.
- (b) Two-Way Applications: The backside for Two-Way Markers shall be the same color as the adjacent pavement marking.

The pavement marker reflector lens shall be imprinted with the model/batch number and the manufacturers' name.

Castings. The casting shall be imprinted with the model number and the manufacturer's name.

New Installation.

- (a) The SRPM shall be installed in accordance with manufacturer's recommendations and D 4383. The installed height shall not exceed 0.25 in. above the road surface. The surface of the keel and web shall be free of scale, dirt, oil, grease or any other contaminant which may reduce its bond to the epoxy adhesive. All requirements of the manufacturer's installation instructions shall be met.
- (b) The groove cut for the casting shall be the appropriate dimensions to allow 0.125 in. movement side to side of the casting. All leveling lugs on the casting must contact the pavement. The leading and trailing edges of the casting must lie below the pavement surface and the casting properly seated. All other requirements of the manufacturer's installation instructions shall be met.
- (c) Lenses used shall be of a type specifically manufactured and approved for use as SRPM reflector lenses. Lenses that are manufactured exclusively for recessed pavement markers are not permitted as substitutes for SRPM reflector lenses.

Replacement.

- (a) Casting Replacement. The re-use of damaged or removed castings is prohibited.
- (b) Pavement Marker Reflector Lens Replacement. The Contractor shall remove and dispose of any damaged reflector lens and replace with a new lens. Previously installed undamaged castings which are missing a reflector lens shall have a new reflector lens installed. The replacement lenses shall be installed per manufacturer's written instructions.
- (c) Casting Groove Cut Replacement and Accuracy. The re-use of existing groove cuts is prohibited; castings shall only be installed in new groove cuts. Previously used groove cuts shall be permanently patched in accordance with applicable sections of 504, 505 and 522 or

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as directed by the Engineer. The location of the replacement groove cut shall be within 10 percent longitudinally in front (with the direction of traffic) and no lateral deviation exceeding 1½ in.

Casting Adhesive. The epoxy adhesive used to fasten the castings to the pavement surface shall conform to D 4383-05 Table X1.1.

Reflector Lens Adhesive in Casting. The adhesive used to fasten the reflector lens to the casting shall meet the manufacturers' recommendations.

Quality Assurance/Quality Control. Section 549.

Observation Period. The Contractor shall replace at no additional cost to the Administration, any SRPM or Pavement Marker Reflector Lenses found to be damaged, non-retroreflective or missing due to improper installation or manufacturing defects within 180 days after opening to traffic.

557.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for all pavement preparation, furnishing and placement of SRPM's, testing, removal, groove cutting, repair and all materials, labor, equipment, tools and all incidentals necessary to complete the work.

- (a) Snowplowable Raised Pavement Markers will be paid for at the Contract unit price per each. Furnishing and installing SRPM includes the casting, reflector, adhesive and grooving.
- (b) Removal of existing Castings, excluding any incorrect installation by the Contractor, and repair of Groove Cuts will be paid for at the Contract unit price per each.
- (c) Replacement of Pavement Marker Reflector Lenses will be paid for at the Contract unit price per each.

**CATEGORY 500
PAVING**

**SECTION 559 — PERMANENT PREFORMED PATTERNED
REFLECTIVE PAVEMENT MARKINGS**

559.01 DESCRIPTION. Furnish and apply permanent preformed patterned reflective pavement (PPPRP) markings.

559.02 MATERIALS.

Permanent Preformed Patterned Reflective
Pavement Marking Materials 951.07

559.03 CONSTRUCTION.

559.03.01 General. PPPRP markings shall be applied in conformance with the manufacturer’s recommendations or as directed by the Engineer.

On new hot mix asphalt projects, the PPPRP markings shall be inlaid into the hot surface of the top course of pavement. No top course paving shall be permitted unless the stripping crew and marking materials are at the project site.

When the Contract Documents specifies the use of PPPRP markings on concrete pavements or existing asphalt pavements, the Contractor shall use heat, solvent, or other type of adhesive primer in conformance with the manufacturer’s recommendations.

Preformed legends and symbols shall conform to the applicable shape and sizes as specified in the MdMUTCD, and Contract Documents.

PPPRP markings shall conform to pavement contours and be resistant to deformation by traffic and damage from snow removal equipment. Surface preparation, use of solvents and primers and equipment used in the application of PPPRP markings shall conform with the manufacturer’s recommendations and be approved by the Engineer. After PPPRP markings are applied, they shall be immediately ready for traffic.

559.03.02 Quality Assurance/Quality Control. Refer to 549.03.01.

559.03.03 Cleaning Pavement Surfaces. Refer to 549.03.02.

559.03.04 Application. Refer to 549.03.03 and the following:

(a) **Manufacturer’s Recommendations.** The Contractor shall provide a copy of the manufacturer’s recommendations to the Engineer, and shall follow them for the installation of the line markings.

(b) **Adherence.** Adherence of PPPRP markings shall be randomly checked by using a paint scraper or another approved tool, which shall be held nearly parallel with the highway surface, so there is no dislodging of the tape.

SPECIAL PROVISIONS

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- (c) **Thickness.** The finished thickness of the PPPRP markings shall have a minimum caliper of 0.060 in. at the thickest portion of the patterned cross section, and a minimum caliper of 0.020 in. at the thinnest portion of the cross section. Measurements shall be made from the top of finished pavement surface.
- (d) **Color.** The color of the markings shall match Federal Standard 595 (33538 - yellow, 37886 – white, or 37038 - black). The Contractor shall supply the specified color chips for the Engineer’s use to visually determine that the PPPRP markings match the specified color.
- (e) **Retroreflectance.** Refer to MSMT 729 and the following:

MINIMUM RETROREFLECTANCE

COLOR	RETROREFLECTIVITY	CORRECTIVE ACTION
White	350 or higher	None
Yellow	250 or higher	
White	less than 350	Necessary corrective actions, removal, replacement
Yellow	less than 250	

- (f) **Width.** Refer to 549.03.01(a).
- (g) **Alignment.** Refer to 549.03.01(a).
- (h) **Layout Markings.** Refer to 549.03.01(a).

559.03.05 Quality Control Test Strip. Refer to 549.03.03.

559.03.06 Responsibility. Section 549.

559.03.07 Observation Period. The Contractor shall be responsible for any defects in materials and workmanship of the PPPRP markings for a period of 180 days from the date the markings are applied and under traffic.

The Engineer will not assess time charges during the observation period provided all other work on the Contract is complete. At the end of the observation period, the Engineer will inspect the pavement marking for durability, color, reflectivity, and inform the Contractor of all pavement markings that have failed and require replacement. The pavement marking will be considered failed for any of the following conditions:

- (a) More than five percent of the substrate is exposed in any 2000 ft section of longitudinal pavement marking line.
- (b) Retroreflectance values have dropped below 300 mcd/L/m² for white or 220 mcd/L/m² for yellow.
- (c) Marking is discolored on a visual comparison with the color chips.

SPECIAL PROVISIONS

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The Contractor shall remove and replace all failed PPRP markings within 30 days of receiving written notification from the Engineer at no additional cost to the Administration. Work shall be in conformance with the manufacturer's recommendation and as approved by the Engineer before the project is accepted. The replacement markings shall conform to the same requirements as the original markings. If the work is not completed in this period, the Engineer will resume time charges until this work is completed.

At the end of the observation period, the Engineer will accept the work and terminate the Contractor's responsibilities upon satisfactory inspection of the PPRP markings.

559.04 MEASUREMENT AND PAYMENT. Measurement and payment for the pertinent Permanent Preformed Patterned Reflective Pavement Marking items will be as specified in 549.04. The reflectometer will become the property of the Contractor at the completion of the project.

**CATEGORY 500
PAVING****SECTION 565 — REMOVAL OF EXISTING PAVEMENT MARKINGS**

565.01 DESCRIPTION. Remove existing pavement markings (lines, letters, numbers, arrows, and symbols) during temporary or permanent traffic shifts, and repairing any roadway areas damaged during the removal process. This Specification does not apply to raised or recessed pavement markers. Temporary blackout tape shall be applied when existing pavement markings will require salvaging for reuse after completion of temporary traffic shifts necessary to perform work specified in the Contract Documents. Refer to 104.11.02.

565.02 MATERIALS. Not applicable.

565.03 CONSTRUCTION. The Contractor shall layout and apply all new pavement markings (temporary or permanent) as specified in Section 549 before any removal of existing pavement markings begin.

565.03.01 Quality Control/Quality Assurance. At least two weeks prior to the start of pavement markings removal, the Contractor shall submit a Quality Control Plan (QCP) to the Engineer for review. The QCP shall contain (as a minimum) the following information:

- (a) How the Contractor proposes to perform the work while ensuring conformance with the Specifications.
- (b) Proposed method of removal based on road conditions, type and number of equipment to be used, manpower expectations, and time frame to complete the work based on maintenance of traffic (MOT) restrictions.
- (c) Location and quantity of markings to be removed.
- (d) Protective shielding plan and containment system, particularly in the case of markings that may contain toxic materials.

The QCP shall also detail when, how, and what corrective actions will be taken for unsatisfactory construction practices and deviations from the Contract Documents. Any deviation from the QCP shall be cause for immediate suspension of work. Operations shall not resume without the Engineer's approval.

565.03.02 Quality Control Test Strip. Prior to the beginning of work, the Contractor shall demonstrate the removal method to the Engineer for approval. A minimum of 100 ft of existing pavement markings shall be removed as a test strip at a location determined by the Engineer. If the method does not work or shows signs of damaging the road surface, then another method shall be tried. Additional control strips will be required. The preferred method is that which least damages the roadway and completely removes the markings.

565.03.03 Methods of Removal. The following removal methods are based on the pavement condition and type of marking material:

- (a) **Manual.** A scraper or putty knife shall be used to lift tape from the pavement surface. Open flame for tape removal is prohibited.
- (b) **High Pressure Water Blasting.** A high pressure water blast shall be used to break the bond between the marking material and the pavement surface. The water blast may contain fine grit.
- (c) **Alternate Methods.** Abrasive blasting or grinding methods shall be submitted for approval to the Office of Materials Technology prior to use.

565.03.04 Cleaning Pavement Surfaces. Immediately behind the removal operation, a vacuum equipped street sweeper capable of removing all loose material shall be used to remove all dust and debris generated by the removal process prior to returning the area to traffic. The Contractor shall prevent debris from draining into inlets and waterways, and all debris shall be collected and disposed of on an approved spoil area or landfill.

565.03.05 Alignment. Removal shall be performed in a straight and uniform manner, and shall follow the longitudinal alignment of the markings with a lateral deviation of no more than 1 in. in any 10 ft section. Affected area shall not exceed 1/2 in. on either side of the existing marking. The depth shall be uniform throughout, 1/8 in. or less, with no gouge areas in the pavement surface. If a second pass is necessary to completely remove the markings, the edges of the groove shall be feathered to a width of 1.25 in. on each side for every additional 1/8 in. of depth.

565.03.06 Corrective Action. Any pavement surface damaged beyond the requirements specified herein by the Contractor's operations shall be repaired or repaved as determined by the Engineer at no additional cost to the Administration.

565.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for the removal of the markings, pavement clean up, test strips, protective shielding, containment, disposal of marking material and pavement debris, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Removal of the existing pavement markings will be measured and paid for at the Contract unit price for one or more of the following items:

- (a) Removal of Existing Pavement Marking Lines per linear foot, any width.
- (b) Removal of Existing Pavement Marking Letters, Symbols, Arrows, and Numbers per square foot.

CATEGORY 600
SHOULDERS

UNIT PAVERS

DESCRIPTION. This work shall consist of furnishing and installing Type 2 (non-permeable) unit pavers on a bituminous setting bed with sand filled joints, with steel edge restraints in the locations on the plans, the patterns specified herein and in accordance with these Special Provisions and as directed by the Engineer.

MATERIALS.

Type 2 Pavers. Type 2 Pavers shall be similar to the City of Takoma Park's New Ave Streetscape Standards (2014) Hanover Prest Pavers, size 2-3/8 in. x 8 in. x 8 in., pattern shall be running bond parallel to the curb line, color shall be Limestone Gray. Unit Pavers shall be provided by one of the following manufacturers:

- (1) Hanover Pavers, www.hanoverpavers.com
- (2) Belgrad Pavers, <http://www.belgard.com/>
- (3) E.P. Henry, <http://www.ephenry.com/>
- (4) Or approved equal by City of Takoma Park

(a) **Concrete Slab.** Accordance with Section 902.10.03 Mix No. 3.

(b) **Bituminous Setting Bed.** Dried fine aggregate shall be combined with hot asphalt cement and the mix shall be heated to approximately 300 degrees F at an asphalt plant. The approximate proportion of materials shall be 7 percent asphalt cement and 93 percent fine aggregate. Determine the exact proportions of materials to produce the best possible mixture for construction of the bituminous setting bed to meet construction requirements.

(c) **Neoprene Modified Asphalt Adhesive.** Adhesive shall consist of 2 percent neoprene (Grade WM1) oxidized asphalt with a 155 degree F softening point (80 percent penetration) and 10 percent asbestos free fibers.

(d) **Tack Coat.** The tack coat shall conform to AASHO Designation T 59.

(e) **Joint Filler.** Joint filler shall be sand in accordance with Standard Specification 901.01, Type M45 Mortar Sand. The moisture content of the leveling course material and joint filler shall not exceed 12 percent. Stock piles shall be covered each day after construction and during each precipitation event so that this moisture content is not exceeded at any time. The joint filler shall be free of contaminants which would cause efflorescence or staining.

(f) **Expansion Joint Material and Sealant.** Preformed Expansion Joint Material shall be the bituminous type which meets the requirements of AASHO Designation M 213 with the

exception of the weathering test. All joint material shall be ¼ in. thick except at walls, curbs and other adjacent surfaces, where joints shall be ½ in. thick.

(g) Joint Sealant. Joint Sealant for expansion joints shall be a two component polyurethane caulk. Sealant color shall match adjacent paver joints.

(h) Steel Edge Restraint. Steel Edge restraints shall be 3/16 in. thickness, by 4 in. height, black or brown powder-coated, and shall include stakes to attach to anchor edging as shown on the Detail Plans.

Submittals. Submit product data and test reports for materials other than water and aggregates.

(a) Samples for Initial Selection, for the following

1. A minimum of three (3) full size units of each type of unit paver specified showing full range of color selection.

Quality Assurance.

(a) Source Limitations. Obtain concrete unit pavers from a single source with resources to provide quantity of materials and products of consistent quality in appearance and physical properties.

(b) Mockups. Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

CONSTRUCTION.

General. Hold a pre-installation meeting prior to placing pavers. The pre-installation meeting will be held to coordinate the placement of the paver patterns. For the pre-installation meeting, construct a 5 ft x 5 ft sample panel of a typical section, which shall include a full treatment of the paver field including a 90 degree corner representing the quality of finish work of the unit pavers, for the entire project. The sample patterns shall remain until the corresponding pattern is in place and approved by the Engineer. Do not place any pavers on setting bed until receiving written approval from the Engineer.

Concrete substrate shall be clean and free of stones, dirt or other debris prior to beginning work or placement of bituminous for setting bed.

Install preformed joint filler. Extend filler from the bottom of concrete to below the finished surface. Filler material should not extend through the unit pavers to finish grade of the unit pavers.

Make splices in the filler in a manner to prevent penetration of concrete between joint faces.

Install steel edge restraints where the paving units abut planting pits per the locations and methods shown on the Contract Landscape Details and where described in these Special Provisions.

Do not use pavers with chips, frogs, cracks, voids, discolorations, and other defects which might be visible or cause staining in the finished work.

Use full pavers without cutting wherever possible. Where necessary, cut pavers with motor driven saw equipment designed to cut masonry with clean, sharp, un-chipped edges. Cut units as required to provide the pattern shown and to fit adjoining work neatly.

Set pavers in a running bond pattern, running parallel to the curb, with 1/8 inch uniform joints to accept sand between joints

Maintain surface plane for finished paver floors not exceeding a tolerance of 1/8 inches in ten feet when tested with a ten-foot straightedge.

Use the paver face which matches the color of adjacent pavers to yield the tightest color range possible.

Bituminous Setting Bed. Bituminous setting bed shall have a 3/4" uniform thickness. The Contractor shall adjust the elevation of the setting bed so that when the pavers are placed, the top surface of the pavers will be at the required finished grade and flush with the adjacent concrete.

Control and Expansion Joints. The Contractor shall install control and expansion joints where pavers abut restraining surfaces such as walls, curbs, adjacent concrete paving, etc., and as directed by the Engineer.

Curb Joint Sealant. The Contractor shall prepare curb joints adjacent to the concrete pavers as specified in Standard Specification 523.03.02. Joints shall be treated to prevent the leveling course from migrating through the joints using Roofing Paper, Joint Sealer, or similar material approved by the Engineer. The curb joint sealant shall be installed prior to installation of paver base and leveling course. Joints shall be filled with Joint Sealer so that excess sealer is pushed out at the top. The excess sealer shall be removed, leaving a clean, smooth surface.

Weather. Cover stockpiles of grout, mortar, and joint materials each day after construction and during each precipitation event so that the maximum moisture content is not exceeded at any time.

Setting bed materials and unit pavers shall not be installed during rain or snowfall or frozen substrate conditions.

Cleaning. Clean unit pavers after installation per the manufacturer's instructions as required or as directed by the Engineer. Do not use muriatic acid.

MEASUREMENT AND PAYMENT.

Type 2 Pavers will be measured and paid for at the Contract unit price per Square Foot of Type 2 Pavers installed and accepted. The payment for Item Type 2 Pavers as specified in the Contract Documents will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work including; compacted sub-grade, concrete slab, bituminous setting bed, tack coat, sand joint filler, expansion joint material and sealant, and joint sealant, steel edge restraints, and all materials, equipment, labor, tools, and incidentals necessary to complete the work.

**CATEGORY 600
SHOULDERS**

SITE FURNISHINGS

DESCRIPTION. This work shall consist of the procurement, finish, and installation of site furnishings, including benches, trash and recycling receptacles and bicycle racks at the locations designated on the Plans and all necessary material, labor, incidentals, tools and equipment to complete this work. Site furnishings shall be installed in accordance with the Standard Specifications, the Plans, these Special Provisions, the manufacturer's recommendations, and as directed by the Engineer. Site furnishings shall match those described herein, and shall match those furnishings specified in the City of Takoma Park's New Ave Streetscape Standards (2014).

MATERIALS.

Benches. Benches shall be the "*Towne Square*" model, as manufactured by Landscape Forms, and shall match in quantity as shown on the plans and in fabrication and style as follows: Benches shall be 70 inches in length. The color shall be "Cranberry" powder coat finish to coordinate with the NHA style-guide colors, page 29. **All benches must be furnished with center armrests.** Benches shall be provided by the following manufacturer, or as approved equal by the City of Takoma Park:

www.landscapeforms.com

Benches shall be located where shown on the Plans and anchored to the pavement with stainless steel vandal-resistant anchors.

Trash And Recycling Receptacles. Trash and recycling receptacles shall be in the Style MLWR200-32, as manufactured by Maglin, and shall match in quantity as shown on the plans and in fabrication and style as follows: Trash and recycling receptacles shall be 32-gallon metal cans with tapered form lid. Colors shall match existing green and yellow colors currently found along the corridor, similar to the City of Takoma Park's New Ave Streetscape Standards (2014). Trash and recycling receptacles shall be provided by the one of the following three (3) manufacturers, as approved by the City of Takoma Park:

1. Litter Receptacle MLWR200-32 Heavy duty steel flat bar. A 32 gallon, commercial grade black plastic liner, Height: 38.00" (96.5cm) Diameter: 29.00" (73.7cm). As manufactured by Maglin Site Furnishing, Maglin Corporation 999 18th Street, Suite 3000 Denver, CO 80202, (800) 716-5506, <http://www.maglin.com/>
2. Steelsites RB Collection Series litter receptacle, Model RB-36. Electrostatically powder-coated with TGIC polyester powder coating, rain bonnet lid, and 36-gallon capacity high density plastic liner. As manufactured by Victor Stanley, Inc., P.O. Drawer 330, Dunkirk, MD 20754, phone: (301) 855-0300.
3. Receptacle 157 Style litter container, open top style, model 157-32-FTO, Side door access, powder coated steel, and 32-gallon plastic liner. As manufactured by DuMor Site

Furnishings, and provided by AR All Recreation, 20609 Gordon Park Square, Suite 190, Ashburn, VA 20147, Phone: (888) 419-0001, Fax: (703) 589-1493.

4. Or approved equal by City of Takoma Park

Trash and recycling receptacles shall be located where shown on the Plans and anchored to the pavement with stainless steel vandal-resistant anchors.

Bicycle Racks. Bicycle racks shall be in the similar style of the “Bike Hitch” as manufactured by Dero Bike Rack Company, and shall match in quantity, fabrication and style those shown on the Plans and as follows: Bicycle racks shall be surface mounted and color shall be similar to Blue RAL 5005 powder coat finish. Bicycle racks shall be provided from one of the following three manufacturers, as approved by the City of Takoma Park.

1. Bike Hitch, powder-coated Gloss Black, Dero, www.dero.com/ 504 Malcolm Ave SE, Suite 100 Minneapolis, MN 55414, Phone: (612) 359-0689
2. Cycle Sentry™ Series bike racks, model BRBS-103, Victor Stanley, <http://www.victorstanley.com/> powder-coated Gloss Black constructed of 2-3/8” O.C. tubular steel pipe as manufactured and provided by Victor Stanley, Inc., P.O. Drawer 330, Dunkirk, MD 20754, phone: 301-855-8300.
3. Pedestal Bicycle Rack Item 342-1607, powder-coated Gloss Black Highland Products Group, <http://www.highlandproductsgroup.com/> 3350 NW Boca Raton Blvd. Suite B2 Boca Raton, FL 33431 Phone: 561.620.7878
4. Or approved equal by City of Takoma Park

Bicycle racks shall be located where shown on the plans and anchored to the pavement with stainless steel vandal-resistant anchors.

Submittals. Supply the following submittals for approval by the Engineer:

- (a) Shop Drawings: Submit complete shop drawings of the each site furnishing as specified. Drawings shall include overall dimensions, sizes, materials, accessory details, methods of assembly, hardware data, and milling details of the items specified. Include elevations, details of sections and connections, methods of construction and assembly, type, gage and finish of metals or other materials. Include anchorage and accessory items and integration details of related work.
- (b) Samples: Submit samples of type and finish color of each site furnishing specified.
- (c) Qualification Data: Submit installer qualifications verifying years of experience; include list of completed projects having similar scope of work identified by name, locations, date, reference names and phone numbers.

CONSTRUCTION.

Site Furnishings. Anchor each site furnishing to the pavement set level and plumb. Refer to the manufacturer's specifications and recommendations for anchoring devices. All anchoring devices and fasteners shall be stainless steel and vandal resistant.

Delivery, Storage, and Handling - Deliver, store, handle and protect products in accordance with manufacturer's instruction. Store products in a protected and secure area in manufacturer's protective shipping crates or packaging.

Examine the contents of all packages delivered to the site immediately upon delivery and any units damaged during shipping will be rejected. Inspect the shipment to assure that all items are complete.

MEASUREMENT AND PAYMENT.

Benches will be measured and paid for at the Contract unit price per each, complete and installed. The payment shall be full compensation for bench, finish, anchoring devices and for all materials, equipment, labor, tools, and incidentals necessary to complete the work.

Trash And Recycling Receptacles will be measured and paid for at the Contract unit price per each, complete and installed. The payment shall be full compensation for trash or recycling receptacle, finish, anchoring devices and for all materials, equipment, labor, tools, and incidentals necessary to complete the work.

Bicycle Racks will be measured and paid for at the Contract unit price per each, complete and installed. The payment shall be full compensation for bicycle rack, finish, anchoring devices and for all materials, equipment, labor, tools, and incidentals necessary to complete the work.

CATEGORY 600
SHOULDERS

REMOVE AND RELOCATE WOOD FENCE

DESCRIPTION.

This work shall consist of removing and relocating existing wood fence where indicated on the contract plans.

MATERIALS.

Concrete footings for wood fence posts: MSHA Mix No. 3 concrete.

CONSTRUCTION.

Wood fence shall be relocated behind the proposed concrete sidewalk and Type A curb. Coordinate the fence relocation with the City of Takoma Park and the adjacent property owner.

Take care not to damage the wood fence during removal or relocation. If existing posts are encased in concrete, install new posts and concrete footings to match in the new location.

MEASUREMENT AND PAYMENT.

Remove and Relocate Wood Fence will be measured and paid for at the Contract unit price per linear foot. Measurement will be made along the length of satisfactorily installed wood fence, as determined by the Engineer. Concrete Footings and new wood fence posts, if determined necessary by the Engineer, will not be measured but will be incidental to the contract unit price per linear foot of the Remove and Relocate Wood Fence pay item. The payment will be full compensation for material, labor, supervision, equipment, tools and incidentals necessary to complete the work including disposal of surplus materials in accordance with the specifications, or as directed by the Engineer.

Removal and disposal of existing concrete encasements and wood posts will not be measured but will be incidental to the lump sum price for Clearing and Grubbing.

CATEGORY 600
SHOULDERS

SECTION 602 – COMBINATION CURB AND GUTTER

602.04 MEASUREMENT AND PAYMENT.

524 **ADD:** The following after the third paragraph:

When vertical adjustments of existing utilities and sub-grade preparation is required for roadway width reduction (curb line bump outs), the cost will be incidental to the Contract unit price for Standard Type A Combination Curb and Gutter Any Height or Depth. Vertical adjustment will include any required coordination and for all materials, labor, equipment, tools, and incidentals necessary to complete the work.

When existing concrete sidewalk and curb and gutter is removed and replaced with subsoil, topsoil, turfgrass sod or landscaping, the cost of the removal will be measured and paid for at the Contract unit price per cubic yard of Class 1 Excavation.

CATEGORY 600
SHOULDERS

SECTION 603 – SIDEWALKS

603.01 DESCRIPTION.

524 **ADD:** The following after the first paragraph:

The minimum width for concrete sidewalk and/or sidewalk ramps shall be 5'-0". A Design Waiver approved by the Director of the Office of Highway Development (SHA) must be obtained for any locations where the width of the sidewalk is less than 5'-0".

603.04 MEASUREMENT AND PAYMENT.

527 **ADD:** The following after the third paragraph:

When vertical adjustments of existing utilities and sub-grade preparation is required to construct sidewalk (concrete or Type 2 unit pavers) and/or sidewalk ramps, the cost will be incidental to the Contract unit price for 5 Inch Concrete Sidewalk or Type 2 Pavers. Vertical adjustment will include any required coordination and for all materials, labor, equipment, tools, and incidentals necessary to complete the work.

Temporary and permanent stabilization of disturbed area for sidewalk installation shall be incidental to the pertinent item and shall include all necessary backfill, topsoil, reseedling, sod, seed and mulch, and for all materials, labor, equipment, tools and incidentals necessary to temporarily or permanently stabilize the disturbed area adjacent to the sidewalk installation.

When existing concrete sidewalk is removed and replaced with subsoil, topsoil, turfgrass sod or landscaping, the cost of the removal will be measured and paid for at the Contract unit price per cubic yard of Class 1 Excavation.

CATEGORY 600
SHOULDERS

DETECTABLE WARNING SURFACES

611.02 MATERIALS.

542 **INSERT:** The following after the first paragraph.

The color of the detectable warning surfaces as shown in the Contract Plans, shall be **Red.**

**CATEGORY 700
LANDSCAPING**

LANDSCAPE BOULDERS AND STONE DUST MULCH

DESCRIPTION. This item shall consist of furnishing and installing landscape boulders within the right of way along sidewalks and of furnishing as specified in the Contract Documents, where shown on the plans, or as directed by the Engineer.

MATERIALS. Landscape boulders shall be provided by one of the following, or an approved equal by the Landscape Architect:

Geotextile Fabric All geotextile fabric to be class PE, type I

Boulders

Supply boulders as provided field stone boulders from one of the following. The City shall select boulders for approval prior to purchase by the Contractor.

Bodolato Stone Supply, Inc. 10816 Williamson Lane, Cockeysville Md 21030, 410-785-1901

Field Stone Boulders Luck Stone Corporation, 12202 Clarksville Pike, Clarksville, MD 21029, 888-923-5825

Carderock Stone Tri-State Stone and Building Supply, Inc. 8200 Seven Locks Road, Bethesda, Md 20817, 301-365-2100

The Stone Store 7535 Railroad Avenue, Hanover, Md 21076, 1.888.766.4242

Size. Landscape boulders shall be random sizes, and shall conform to the following minimum/maximum sizes.

Boulder Sizes	Minimum	Maximum	Excavation Depth
Height	30 inches	36 inches	1/3 height = 10 in. to 12 in.
Length	24 inches	48 inches	
Width	24 inches	48 inches	

(a) Color. Landscape boulders and river stone shall be of earth-tone colors within the range of medium to dark grey to match on site outcroppings. “Red” or “white” color ranges will not be accepted. Purchased boulders are to have been field weathered for six months minimum and have lichens and/or moss on the surface of the stone.

Submittals. Supply the following submittals for approval by the Engineer.

(a) **Samples.** Submit samples of the color range proposed for the boulders and stone dust mulch. Submit samples no larger than 6" L,W,H for the boulders and a one pound labeled bag of the stone dust mulch.

CONSTRUCTION.

Boulders shall be dressed to remove any weak or sharp edges on the exposed surfaces. Boulders shall be set in locations shown on the plans. Boulders shall be placed in a regular orientation along the long access of the boulder to imitate a naturally occurring rock outcropping or seam. In all cases, a minimum of two-thirds of the boulder shall remain above-grade, exposed to visibility. Under no circumstances shall the boulders be more than one-third buried below grade.

Excavate a portion of the ground to the required depths necessary to initially set each of the individual boulders. Displaced soil may be utilized on site directly around the boulder to blend the boulder in with the existing field conditions and a 4:1 maximum slope for a distance of 5' from the boulder. Soil in excess of this or producing an artificial looking condition shall be hauled off-site. Final placement of the boulders shall be approved by the Engineer should appear as a natural in configuration

MEASUREMENT AND PAYMENT.

Purchased Boulders shall be measured and paid for at the Contract unit price per ton basis, complete and installed. The payment shall be full compensation for procurement, delivery, excavation, installation, hauling of excavated material, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.



CATEGORY 700
LANDSCAPING

SECTION 701 — TOPSOIL AND SUBSOIL

544 **DELETE:** Section 701 — Topsoil and Subsoil, in its entirety.

INSERT: The following.

SECTION 701 — SUBSOIL AND TOPSOIL

701.01 DESCRIPTION. Prepare existing topsoil, or salvage and place subsoil and topsoil for vegetation establishment. Perform Temporary Mulch or Temporary Seed in conformance with Section 704 to provide temporary soil stabilization.

Performance of Subsoil and Topsoil as specified herein complies with all requirements of the Maryland Department of the Environment for handling and placing soils in preparation for permanent seeding or other permanent vegetation establishment.

701.02 MATERIALS.

Existing Topsoil	920.01.01
Salvaged Topsoil	920.01.01
Furnished Topsoil	920.01.02
Salvaged Subsoil	920.01.03
Furnished Subsoil	920.01.04
Water	920.09.01
Pesticides	920.09.03

701.03 CONSTRUCTION.

701.03.01 General.

(a) **Schedule.** Perform subsoil and topsoil operations when soil moisture and weather conditions are suitable. Cease operations when soil is muddy, frozen, or otherwise unsuitable.

(b) **Pesticide Application.** Apply pesticides in conformance with the Maryland Pesticide Applicator’s Law and the manufacturer’s label. The Contractor shall possess a Maryland Department of Agriculture Commercial Pesticide Business License and a Pesticide Applicator Certificate for the pertinent pesticide application Category: (2) Forest; (3-A) Ornamental Plant Exterior; (3-C) Turf; (5) Aquatic; (6) Right-of-Way and Weed. Pesticides shall be applied by a Maryland Certified Pesticide Applicator, or by a Registered Pesticide Applicator under the supervision of a Certified Pesticide Applicator.



- (c) **Pesticide Application Reporting.** Record the location, acreage treated, pesticide name and quantity applied on the Pesticide Application Reporting Form. Submit the Form within 24 hours after applying pesticide.
- (d) **Nutrient Management Plan (NMP).** The specified application rates of the pertinent vegetation establishment will be the NMP unless the Administration develops a substitute NMP. Replace application rates of the pertinent specification as required by the NMP.
- (e) **Nutrient Management Reporting.** Record the fertilizer analysis, the square yards covered, and the pounds of fertilizer applied on the Nutrient Management Reporting Form. Submit the Form within 48 hours after applying fertilizer.

701.03.02 Site Preparation and Salvaging.

- (a) **Prohibited Weeds.** Refer to 920.01.01. Existing topsoil, and topsoil and subsoil to be salvaged, will be inspected and shall be free of prohibited weeds. Control prohibited weeds when preparing existing topsoil for vegetation establishment, or before salvaging operations. Prevent the spread of prohibited weeds as needed or as directed.

When herbicide application is necessary for control of prohibited weeds, apply glyphosate 3 percent solution in water, or other herbicide as directed. Refer to 701.03.01(b) and complete the Pesticide Application Reporting Form in conformance with 701.03.01(c).

- (b) **Removal.** Remove vegetation, brush, and other debris from the areas of existing topsoil, and from areas where topsoil and subsoil will be salvaged. Remove topsoil and subsoil to the depth as specified or directed. Transport salvaged topsoil and subsoil separately, and keep them apart from other materials. Do not remove existing topsoil.
- (c) **Storage.** Constructing stockpiles on well drained land, away from streams, drainage areas, and floodplains as specified in Section 308. Maintain stockpiles of salvaged topsoil and salvaged subsoil away from other materials, and separate from each other.

Apply temporary mulch or temporary seed in conformance with Section 704 immediately after constructing stockpiles. Install and maintain silt fence around stockpiles in conformance with 308.03.29. Control prohibited weeds as needed or as directed.

- (d) **Excess.** Existing topsoil, salvaged topsoil, and salvaged subsoil, are the property of the Administration. Do not remove soils without written approval.

701.03.03 Placing Subsoil and Topsoil.

- (a) **Removal from Stockpile.** Stockpiles of salvaged subsoil and salvaged topsoil will be inspected and shall be free of prohibited weeds.



Do not remove surface debris or transport soil from stockpiles before the inspection is completed, or before prohibited weeds are controlled. Control prohibited weeds as needed or as directed.

Remove grass, weeds, brush and other debris from the surface of stockpiles before transporting soil.

- (b) Spreading Subsoil.** Ensure the site where subsoil will be spread is uniformly graded true to line and cross section. Spread and compact subsoil in layers up to 8 in. thickness to provide a firm and uniform subsoil base, and to ensure spreading of the specified depth.

Track slopes 4:1 and steeper with clefted track equipment operated perpendicular to the slope. Check subsoil thickness, lines, grades, and elevations to ensure the completed work is as specified.

Remove stones and other debris with a length or width greater than 4 in. from the surface of the subsoil before spreading topsoil.

- (c) Spreading Topsoil.** Ensure the site where topsoil will be spread is uniformly graded true to line and cross section, and that the surface of the subsoil base is loose and able to provide a suitable bond for the topsoil layer to be spread.

If the subsoil is crusted or excessively compacted, then roughen and loosen the surface of the subsoil base with approved machinery before spreading topsoil.

Spread topsoil over the designated areas and lightly firm the topsoil to ensure uniform thickness of the specified depth, and to meet the required grades.

Track slopes 4:1 and steeper with clefted track equipment operated perpendicular to the slope.

When placing topsoil for grading adjustment, the minimum thickness shall be 1/2 in. and the maximum thickness shall be 8 in.

Ensure that topsoil is uniformly spread and firmed near sidewalk and pavement edges, and that the topsoil surface is without gaps, mounds, depressions, soft spots, or areas that may impair surface drainage or future maintenance. Check topsoil thickness, lines, grades, and elevations to ensure the completed work is as specified.

In areas within 10 ft of the pavement edge and near commercial and residential property, remove stones, wood, metal, and other debris with a length or width greater than 2.0 in. from the soil surface when spreading is completed. In all other areas, remove debris with a length or width greater than 4.0 in., or as directed.



SPECIAL PROVISIONS INSERT
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(d) Soil Amendments and Fertilizer. Apply limestone, sulfur, gypsum, compost, and fertilizer to existing topsoil, salvaged topsoil, and furnished topsoil as specified in the NMP, or as specified in the pertinent section for vegetation establishment.

701.03.04 Inspection and Acceptance. Submit a request for Acceptance when operations are completed. Inspection will be conducted to verify that operations were completed as specified. Acceptance will be granted at that time.

701.04 MEASUREMENT AND PAYMENT. Subsoil and topsoil will be measured and paid for at the Contract unit price for one or more of the specified items. The payment will be full compensation for all material, labor, equipment, tools, disposal fees and incidentals necessary to complete the work.

701.04.01 Existing topsoil will not be measured but the cost of preparing existing topsoil will be incidental to the Contract unit price for clearing and grubbing, or will be incidental to the pertinent Contract unit price for the vegetation establishment.

701.04.02 Salvaging Subsoil and Salvaging Topsoil will not be measured but the cost will be incidental to the Contract unit price for Class 1 Excavation.

701.04.03 Placing Salvaged Subsoil and Placing Salvaged Topsoil will be measured and paid for at the pertinent Contract unit price per square yard for the specified depth, or per cubic yard.

701.04.04 Placing Furnished Subsoil and Placing Furnished Topsoil will be measured and paid for at the pertinent Contract unit price per square yard for the specified depth, or per cubic yard.

701.04.05 Placing Salvaged Topsoil for Grading Adjustment and Placing Furnished Topsoil for Grading Adjustment will be measured and paid for at the pertinent Contract unit price per square yard, or per cubic yard. No payment will be made for topsoil placed less than 1/2 in. depth.

701.04.06 Temporary Mulch, Temporary Seed, Turfgrass Establishment and other permanent vegetation establishment will be measured and paid for at the pertinent Contract unit price.



SPECIAL PROVISIONS INSERT

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**CATEGORY 700
LANDSCAPING**

**SECTION 704 — TEMPORARY MULCH
AND TEMPORARY SEED**

547 **DELETE:** Section 704 — Temporary Seed and Temporary Mulch, in its entirety.

INSERT: The following.

**SECTION 704 — TEMPORARY MULCH
AND TEMPORARY SEED**

704.01 DESCRIPTION. Perform Temporary Mulch and Temporary Seed to provide temporary soil erosion protection as follows.

For areas that are not at final grade or which are not ready for permanent stabilization, apply Temporary Mulch to stabilize topsoil, subsoil, common borrow, or other specified soil substrate for up to 2 months after installation.

For areas that are not at final grade or when redisturbance is expected in 2 to 6 months, apply Temporary Seed to stabilize topsoil, subsoil, common borrow, or other specified soil substrate up to 6 months after installation.

When redisturbance is expected in more than 6 months, refer to Section 705 and perform Turfgrass Establishment.

Performance of Temporary Mulch and Temporary Seed as specified herein complies with all requirements of the Maryland Department of the Environment for temporary stabilization of soils.

704.02 MATERIALS.

Fertilizer	920.03.01
Straw Mulch	920.04.01
Wood Cellulose Fiber Mulch	920.04.02
Soil Stabilization Matting	920.05.01
Fasteners	920.05.02
SHA Temporary Seed Mix	920.06.07
Water	920.09.01



704.03 CONSTRUCTION.

704.03.01 General.

- (a) **Schedule.** Apply Temporary Mulch and Temporary Seed any time of the year.
- (b) **Nutrient Management Plan (NMP).** The fertilizer application rate specified in 704.03.03 shall be the NMP rate for Temporary Seed unless the Administration develops a substitute NMP.
- (c) **Nutrient Management Reporting.** Record the fertilizer analysis, the square yards covered, and the pounds of fertilizer applied on the Nutrient Management Reporting Form. Submit the Form within 24 hours after applying fertilizer.

704.03.02 Temporary Mulch. Temporary Mulch may be either temporary straw mulch or temporary matting mulch.

Apply temporary straw mulch or temporary matting mulch to provide temporary erosion protection in flat or mildly sloping areas.

Apply temporary matting mulch to provide temporary erosion protection in slopes or channels where flowing water may dislodge temporary straw mulch.

- (a) **Temporary Straw Mulch.** Lightly smooth excessively rough areas, but do not till the soil. Immediately apply straw and cover with wood cellulose fiber. Apply materials as follows.

TEMPORARY MULCH AND TEMPORARY SEED		
TABLE 1 - APPLICATION RATES - TEMPORARY STRAW MULCH		
MATERIAL	LB PER SY	LB PER ACRE
Straw Mulch	0.826	4000
Wood Cellulose Fiber Mulch	0.155	750

Cover at least 90 percent of the soil surface with straw mulch. When applied with mulch blower, apply straw mulch to a loose depth of 3/4 to 2 in. When applied by hand, apply straw mulch to a loose depth of 1-1/2 to 3 in.

Secure straw mulch immediately after the completion of mulching operations by applying wood cellulose fiber uniformly over the straw without displacing the mulch.

Do not operate machinery during windy weather that may interfere with uniform application. Do not allow materials to blow onto sensitive areas or structures.

- (b) **Temporary Matting Mulch.** Select Type A, Type B, Type D, or Type E soil stabilization matting for installation in areas that will be redisturbed within 2 months. Install any of



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704 — TEMPORARY MULCH AND TEMPORARY SEED

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these matting types using methods and fasteners as per Section 709 for Type E Soil Stabilization Matting.

Smooth the soil surface to allow uniform installation of matting. Install matting over the soil surface without tenting. Overlap edges of the matting at least 2 in. Install fasteners no more than 24 in. apart along edges, overlaps, and throughout the matting to firmly secure the matting to the soil surface. Do not water the matting.

Remove matting and fasteners before performing permanent vegetation establishment. When approved, matting and fasteners may be removed and reused as Temporary Mulch in the same or different locations when their integrity is not degraded by damage or decomposition.

704.03.03 Temporary Seed. Prepare the soil and apply seed, fertilizer, straw mulch, and wood cellulose fiber mulch to areas that will remain undisturbed for 2 to 6 months.

Complete grading and shaping operations as directed. Loosen soil surfaces before applying seed and fertilizer.

Refer to 705.03.06(b) regarding application equipment and apply fertilizer materials according to Table 2. Immediately apply straw and wood cellulose fiber over seeded and fertilized areas as specified in 704.03.02(a).

TEMPORARY MULCH AND TEMPORARY SEED		
TABLE 2 - APPLICATION RATES - TEMPORARY SEED		
MATERIAL	LB PER SY	LB PER ACRE
SHA Temporary Seed Mix	0.026	125
Fertilizer (15-30-15)	0.031	150
Straw Mulch	0.826	4000
Wood Cellulose Fiber Mulch	0.155	750

704.03.04 Repair. Repair Temporary Mulch or Temporary Seed that is defective before Acceptance.

704.03.05 Acceptance. Submit a request for Acceptance when operations are completed. Inspection will be conducted to verify completion.

704.03.06 Replacement. Replace Temporary Mulch and Temporary Seed as additional work when directed.

- (a) **Replace Temporary Mulch** with approved materials when it has degraded, or when more than 2 months have elapsed since Acceptance.



(b) Replace Temporary Seed with approved materials when it has degraded, or when more than 6 months have elapsed since Acceptance.

704.04 MEASUREMENT AND PAYMENT. Temporary Mulch and Temporary Seed will be measured and paid for at the Contract unit price for one or more of the specified items. The payment will be full compensation for all material, labor, equipment, tools, disposal fees and incidentals necessary to complete the work.

704.04.01 Temporary Mulch, applied as either temporary straw mulch or temporary matting mulch, will be measured and paid for at the Contract unit price per square yard.

704.04.02 Temporary Seed will be measured and paid for at the Contract unit price per square yard.

704.04.03 Turfgrass Establishment will be measured and paid for at the Contract unit price per square yard.



CATEGORY 700
LANDSCAPING

SECTION 705 — TURFGRASS ESTABLISHMENT

550 **DELETE:** Section 705 — Turfgrass Establishment, in its entirety.

INSERT: The following.

SECTION 705 — TURFGRASS ESTABLISHMENT

705.01 DESCRIPTION. Perform Turfgrass Establishment as follows.

For areas that are at final grade, establish turfgrass in topsoil or other specified soil substrate to provide permanent vegetation groundcover.

For areas that are not at final grade, or areas that will not be redisturbed for at least 6 months after seeding operations are completed, establish turfgrass in topsoil, subsoil, common borrow, or other specified soil substrate to provide temporary vegetation groundcover.

When it is not possible to perform Turfgrass Establishment, refer to Section 704 and perform Temporary Mulch or Temporary Seed, or as directed.

Performance of Turfgrass Establishment as specified herein complies with all requirements of the Maryland Department of the Environment for permanent seeding.

705.02 MATERIALS.

Limestone	920.02.01
Sulfur	920.02.02
Gypsum	920.02.04
Compost	920.02.05
Fertilizer	920.03.01
Straw Mulch	920.04.01
Wood Cellulose Fiber	920.04.02
Seed	920.06
SHA Turfgrass Seed Mix	920.06.07(a)
SHA Special Purpose Seed Mix	920.06.07(b)
SHA Temporary Seed Mix	920.06.07(c)
Water	920.09.01



705.03 CONSTRUCTION.

705.03.01 General.

(a) **Regions.** Maryland is divided into Regions by counties as follows:

Region 1. Garrett, Allegany, and Washington, west of Clear Spring MD.

Region 2. Washington, east of Clear Spring, MD, Frederick, Carroll, Baltimore, Harford, Cecil, Howard, Montgomery, and Baltimore City.

Region 3. Anne Arundel, Prince George’s, Calvert, Charles, St. Mary’s, Kent, Queen Anne's, Talbot, Caroline, Dorchester, Wicomico, Worcester, and Somerset.

(b) **Seeding Seasons and Seed Mixes.** Perform operations according to Table 1 when soil moisture and weather conditions are suitable, when the temperature is above 32 F, and the soil is not frozen. Cease operations when conditions are unsuitable.

TURFGRASS ESTABLISHMENT				
TABLE 1 - SEEDING SEASONS AND SEED MIXES				
REGION	SEEDING SEASON - MONTH/DAY			
	Spring	Summer	Fall	Late Fall
	SHA Turfgrass Seed Mix ¹			
1	3/1 to 6/14	6/15 to 7/31	8/1 to 9/30	10/1 to 11/15
2	2/1 to 5/14	5/15 to 7/31	8/1 to 10/14	10/15 to 11/15
3	2/1 to 4/30	5/1 to 7/31	8/1 to 10/31	11/1 to 11/15
		Plus Additive ²		Plus Additive ²
Notes:				
¹ When seeding within 4 miles of a State airport: Use no additives and use SHA Special Purpose Seed Mix in lieu of SHA Turfgrass Seed Mix on slopes 4:1 and steeper, or in designated areas.				
² Additive = SHA Temporary Seed Mix				

(c) **Nutrient Management Plan (NMP).** Soil testing will be performed and a NMP will be developed by the Administration. Replace application rates of 705.03.02 as required by the NMP. When a NMP has not been developed, apply 200 lb. per acre of 20-16-12 (83 percent UF with MAP & SOP) fertilizer as the NMP rate for Turfgrass Establishment.

(d) **Nutrient Management Reporting.** Record the fertilizer analysis, the square yards covered, and the pounds of fertilizer applied on the Nutrient Management Reporting Form. Submit the Form within 24 hours after applying fertilizer.



SPECIAL PROVISIONS INSERT
705 — TURFGRASS ESTABLISHMENT

705.03.02 Application Rates. Apply materials according to Table 2.

TURFGRASS ESTABLISHMENT		
TABLE 2 - APPLICATION RATES ^{a, b, c, d}		
MATERIAL	LB PER SY	LB PER ACRE
SOIL AMENDMENTS per Nutrient Management Plan for topsoil or other specified soil substrate.		
Compost	0 to 1.033	0 to 5,000
Gypsum	0 to 0.455	0 to 2,200
Limestone	0 to 0.930	0 to 4,500
Sulfur	0 to 0.052	0 to 250
MATERIAL	LB PER SY	LB PER ACRE
INITIAL FERTILIZER		
20-16-12 (83% UF with MAP & SOP)	0 to 0.041	0 to 200
38-0-0 (UF)	0 to 0.021	0 to 100
11-52-0 (MAP)	0 to 0.036	0 to 175
0-0-50 (SOP)	0 to 0.041	0 to 200
SEED MIXES; select one		
SHA Turfgrass Seed Mix, applied to roadsides, facilities, and other designated areas	0.041	200
or		
SHA Special Purpose Seed Mix, applied to slopes 4:1 and steeper within four miles of a State airport, and other designated areas.	0.041	200
ADDITIVE SEED; when required per Table 1		
SHA Temporary Seed Mix	0.006	25
STRAW MULCH	0.826	4000
WOOD CELLULOSE FIBER to secure straw mulch	0.155	750
REFERTILIZING		
20-16-12	0.041	200
Notes:		
<p>^a Apply compost, gypsum, limestone, sulfur, and initial fertilizer at rates specified in the NMP.</p> <p>^b For salvaged topsoil, the application rates will be included in the Contract documents. For furnished topsoil, the application rates will be developed for the approved source of supply.</p> <p>^c When no NMP has been developed, apply 200 lb per acre of 20-16-12 initial fertilizer, and do not apply any soil amendments. Apply refertilizing when specified in the Contract documents.</p> <p>^d UF = Ureaform; MAP = Monoammonium Phosphate; SOP = Sulfate of Potash. When application rate of 20-16-12 fertilizer is below 200 lb. per acre, apply UF, MAP, and SOP per NMP.</p>		

705.03.03 Modification Request. Submit a written Modification Request to perform seeding between Late Fall and Spring Seeding Seasons; to install an approved tackifier at manufacturer's recommended application rates in lieu of wood cellulose fiber to secure straw mulch; or to use



Type A, Type D, or Type E Soil Stabilization Matting per Section 709 in lieu of straw mulch and wood cellulose fiber in areas where those mattings have not been specified.

The Engineer in consultation with the Landscape Operations Division will evaluate the Request. If granted, a notice of approved modification will be returned within 14 days after the request is received.

705.03.04 Grade Repair. Ensure that soil meets specified grades. Repair any gullies, washes, or disturbed areas that develop before preparing soil.

705.03.05 Preparing Topsoil. Provide a uniform and porous surface that is free of debris and weeds as follows:

- (a) **Areas Flatter than 4:1.** Apply soil amendments and till to a depth of 2 in. to uniformly incorporate amendments into the soil. After tilling, remove clods, stones, wood, metal and other debris with a length or width greater than 1-1/2 in. from the soil surface.
- (b) **Slopes 4:1 and Steeper.** Track slopes 4:1 and steeper with cleated track equipment operated perpendicular to the slope. After tracking, remove stones, wood, metal, and other debris with a length or width greater than 3.0 in. from the soil surface. Apply soil amendments to tracked soil.

705.03.06 Seeding and Initial Fertilizer. Apply seed and initial fertilizer after preparing soil. Do not apply fertilizer from November 15 thru March 1.

- (a) **Application Equipment.** Use hydroseeders, spreaders, drills, or other approved machinery. Calibrate equipment before application. Apply materials accurately and uniformly to avoid misses and overlaps. Do not operate machinery during windy weather that may interfere with uniform application.
- (b) **Hydroseeders.** Hydroseeders shall be equipped with an agitation system able to keep solids in suspension, and have a gauge to show fill levels and tank capacity. Apply fertilizer and seed mixtures within two hours after mixing. Direct hydroseeding mixtures so the droplets produce a uniform spray. Do not allow materials to runoff or cause erosion, or to blow onto sensitive areas or structures.
- (c) **Mechanical Seeders.** Mechanical seeders shall be capable of uniformly placing seed and fertilizer at the specified rate.

705.03.07 Mulching. Apply mulch immediately after seeding.

- (a) **Soil Stabilization Matting.** Refer to Section 709 and install soil stabilization matting in lieu of straw mulch in designated areas.



- (b) **Straw Mulch.** Cover at least 90 percent of the soil surface with straw mulch. When applied with mulch blower, apply straw mulch to a loose depth of 3/4 to 2 in. When applied by hand, apply straw mulch to a loose depth of 1-1/2 to 3 in. Secure straw mulch immediately after the completion of mulching operations by applying wood cellulose fiber uniformly over the straw without displacing the mulch.

Do not operate machinery during windy weather that may interfere with uniform application. Do not allow materials to blow onto sensitive areas or structures.

705.03.08 Seeding Phase Acceptance. Submit a request for Seeding Phase Acceptance when operations are completed. Inspection will be conducted to verify completion, and Seeding Phase Acceptance will be granted at that time.

705.03.09 Establishment Phase. The Establishment Phase will begin upon Seeding Phase Acceptance.

- (a) **Period of Maintenance.** Maintain seeded areas until Final Acceptance.

- (b) **Required Maintenance.** Perform the following during the Establishment Phase.

- (1) **Watering.** Apply water as needed to ensure survival of the turfgrass. Apply water to seeded and mulched areas with approved machinery. Do not allow water to cause erosion or to displace the mulch.
 - (2) **Overseeding.** Overseeding consists of seeding and mulching in areas where living turfgrass coverage is 40 to 90 percent. When living turfgrass groundcover is not acceptable, perform overseeding as directed. In areas to be overseeded, cut the turfgrass to a height of 3 to 5 in. and remove debris that may interfere with seeding. Apply seed mixtures, seed additives, fertilizer, mulch, and secure mulch as specified in 705.03.01 thru .07, but do not repair grade or prepare soil.
 - (3) **Reseeding.** Reseeding consists of tilling, seeding and mulching in areas where turfgrass coverage is less than 40 percent. When living turfgrass groundcover is not acceptable, perform reseeding as directed. In areas to be reseeded, cut the turfgrass to a height of 3 to 5 in. and remove debris that may interfere with seeding. Repair grades, prepare soil, apply seed, fertilizer, and mulch, and secure mulch as specified in 705.03.01 thru .07.
 - (4) **Mowing.** Mow turfgrass in areas flatter than 4:1 before the grass grows to a height of 12 in. when directed. Use approved machinery to cut to a height of 3 to 5 in.
- (c) **Refertilizing.** Apply 20-16-12 fertilizer as specified in 705.03.02 at least 1 month after initial fertilizer was applied. Do not refertilize from November 15 thru March 1.



SPECIAL PROVISIONS INSERT
705 — TURFGRASS ESTABLISHMENT

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705.03.10 Final Acceptance. The Engineer and the Landscape Operations Division will complete an Inspection Report of turfgrass height, color, and percent groundcover. When it is not possible to perform the Inspection, Final Acceptance will be delayed until Inspection is possible. The Inspection Report will be included in the Punch List requirements for the project. Complete the Punch List requirements as directed.

Final Acceptance will be granted after all operations have been completed, and when the seedlings of turfgrass species have grown at least 4 in. tall, exhibit dark green color, and are least 95 percent groundcover.

705.04 MEASUREMENT AND PAYMENT. Turfgrass Establishment will be measured and paid for at the Contract unit price for one or more of the specified items. The payment will be full compensation for all material, labor, equipment, tools, disposal fees and incidentals necessary to complete the work.

705.04.01 Turfgrass Establishment, including grade repair, preparing soil, applying fertilizer, soil amendments, seed mixes, seed additives, mulching, securing mulch, watering, overseeding, reseeding, and mowing, will be measured and paid for at the Contract unit price per square yard. The use of other materials in conformance with an approved Modification Request shall be incidental to the Contract unit price, and will not be measured or paid for.

(a) Payment Schedule. Payments will be made according to Table 3 when construction requirements are met.

TURFGRASS ESTABLISHMENT		
TABLE 3 - PAYMENT SCHEDULE		
CONSTRUCTION REQUIREMENTS	PERCENT OF TOTAL CONTRACT PRICE	PAYMENT FOR COMPLETED WORK
705.03.01 thru .08	80	At Seeding Phase Acceptance
705.03.09 (a) and (b) and 705.03.10	20	At Final Acceptance
Total Payment	100%	

(b) Forfeiture. Failure to complete operations as required in conformance with the Payment Schedule will result in forfeiture of that percentage of payment.

705.04.02 Refertilizing will be measured and paid for at the Contract unit price per square yard.

705.04.03 Temporary Mulch and Temporary Seed will be measured and paid for at the pertinent Contract unit price.



**CATEGORY 700
LANDSCAPING**

SECTION 708 — TURFGRASS SOD ESTABLISHMENT

578 **DELETE**: Section 708 — Turfgrass Sod Establishment, in its entirety.

INSERT: The following.

SECTION 708 — TURFGRASS SOD ESTABLISHMENT

708.01 DESCRIPTION. Establish turfgrass sod on topsoil or other specified soil substrate to provide permanent vegetation groundcover. When it is not possible to perform Turfgrass Sod Establishment, refer to Section 704 and perform Temporary Mulch, or as directed. Performance of Turfgrass Sod Establishment as specified herein complies with all requirements of the Maryland Department of the Environment for permanent vegetation groundcover.

708.02 MATERIALS.

Limestone	920.02.01
Sulfur	920.02.02
Gypsum	920.02.04
Compost	920.02.05
Fertilizer	920.03.01
Turfgrass Sod	920.06.03
Fasteners	920.05.02
Water	920.09.01

708.03 CONSTRUCTION.

708.03.01 General.

(a) **Regions.** Refer to 705.03.01(a).

(b) **Installation Season and Species.** Perform operations when soil moisture and weather conditions are suitable. Cease operations when sod or soil is frozen, or conditions are unsuitable.

(1) **Tall Fescue Sod.** Install in Region 1, Region 2, and Region 3 regions unless another species is specified, from August 15 to November 15, and from March 1 to May 31.

(2) **Zoysiagrass Sod.** Install in specified areas of Region 2 and Region 3 from March 1 to June 15, and from August 1 to September 15.



SPECIAL PROVISIONS INSERT
708 — TURFGRASS SOD ESTABLISHMENT

(3) Bermudagrass Sod. Install in specified areas of Region 3 from March 1 to June 15, and from August 1 to September 15.

(c) Nutrient Management Plan (NMP). Soil testing will be performed and a NMP will be developed by the Administration. Replace application rates of 708.03.04 as required by the NMP. When a NMP has not been developed, apply 200 lb. per acre of 20-16-12 (83% UF with MAP & SOP) fertilizer as the NMP rate for Turfgrass Sod Establishment.

(d) Nutrient Management Reporting. Record the fertilizer analysis, the square yards covered, and the pounds of fertilizer applied on the Nutrient Management Reporting Form. Submit the Form within 24 hours after applying fertilizer.

708.03.02 Grade Repair. Refer to 705.03.04.

708.03.03 Preparing Soil. Refer to 705.03.05.

708.03.04 Application Rates. Apply materials according to Table 1.

TURFGRASS SOD ESTABLISHMENT		
TABLE 1 - APPLICATION RATES^{a, b, c, d}		
MATERIAL	LB PER SY	LB PER ACRE
SOIL AMENDMENTS per Nutrient Management Plan for topsoil or other specified soil substrate		
Compost	0 to 1.033	0 to 5000
Gypsum	0 to 0.455	0 to 2200
Limestone	0 to 0.930	0 to 4500
Sulfur	0 to 0.052	0 to 250
INITIAL FERTILIZER		
20-16-12 (83% UF with MAP & SOP)	0 to 0.041	0 to 200
38-0-0 (UF)	0 to 0.021	0 to 100
11-52-0 (MAP)	0 to 0.036	0 to 175
0-0-50 (SOP)	0 to 0.041	0 to 200
REFERTILIZING		
20-16-12	0.027	200
Notes:		
^a Apply compost, gypsum, limestone, sulfur, and initial fertilizer at rates specified in the NMP. ^b For salvaged topsoil, the application rates will be included in the Contract documents. For furnished topsoil, the application rates will be developed for the approved source of supply. ^c When no NMP has been developed, apply 200 lb per acre of 20-16-12 initial fertilizer, and do not apply any soil amendments. Apply refertilizing when specified in the Contract documents. ^d UF = Ureaform; MAP = Monoammonium Phosphate; SOP = Sulfate of Potash. When application rate of 20-16-12 fertilizer is below 200 lb. per acre, apply UF, MAP, and SOP per NMP.		



708.03.05 Initial Fertilizer. Use spreaders, drills, or other approved machinery. Apply initial fertilizer after preparing soil, or after installing sod. Seeders shall be capable of uniformly placing fertilizer at the specified rate. Calibrate equipment before application. Apply materials accurately and uniformly to avoid misses and overlaps. Do not operate machinery during windy weather that may interfere with uniform application.

708.03.06 Transporting and Handling Sod. Transport and install turfgrass sod within 48 hours after harvest. Handle sod without excessive breaking, tearing, or loss of soil.

708.03.07 Placing Sod. Place sod neatly over the soil surface. Ensure that sod edges are tightly abutted. Do not overlap edges of sod, or leave gaps between strips of sod.

708.03.08 Securing. Install fasteners in locations where sod may be dislodged by water flow. Secure turfgrass sod to the soil of ditches and slopes with at least two fasteners per strip spaced no more than 2 ft apart. Drive the fasteners through the sod and firmly into the soil, so there is no gap at the top of the fastener.

708.03.09 Firming. Tamp or roll turfgrass sod after installation and securing sod to close press the sod firmly into the soil. Hand tampers shall weigh approximately 15 lb with a flat surface of approximately 100 in². Rollers shall weigh approximately 40 lb per ft of width.

708.03.10 Initial Watering. Gently apply water with a sprinkler or water-breaker nozzle over the surface of the sod. Do not allow water to cause erosion or to displace the sod. Perform the first watering within 4 hours after placing sod. Wet the soil to a depth at least 2 in. below the sod.

708.03.11 Installation Acceptance. Submit a request for Installation Phase Acceptance when operations are completed. Inspection will be conducted to verify completion. Installation Phase Acceptance will be granted at that time.

708.03.12 Establishment Phase. The Establishment Phase will begin upon Installation Phase Acceptance. Perform the following during the Establishment Phase.

(a) **Period of Maintenance.** Maintain areas of sod until Final Acceptance.

(b) **Required Maintenance.** Perform the following during the Establishment Phase.

(1) **Watering.** Apply water to ensure survival of sod in good condition. Apply water with approved machinery. Do not allow water to cause erosion, or to displace the sod.

(2) **Reset Sod.** When sod is not firmly fastened to the soil, repair the unsecured areas using fasteners as needed or as directed.



SPECIAL PROVISIONS INSERT
708 — TURFGRASS SOD ESTABLISHMENT

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(3) **Sod Replacement.** When sod does not meet acceptance standards, remove the unacceptable sod and install new sod as needed or as directed.

(4) **Mowing.** Mow sod before it grows to a height of 12 in. when directed. Use approved machinery to cut to a height of 3 to 5 in.

(c) **Refertilizing.** Apply 20-16-12 fertilizer as specified in 708.03.04 at least 1 month after initial fertilizer was applied. Do not refertilize from November 15 thru March 1.

708.03.13 Final Acceptance. The Engineer and the Landscape Operations Division will complete an Inspection Report of sod height, color, and percent groundcover. When it is not possible to perform the Inspection, Final Acceptance will be delayed until Inspection is possible. The Inspection Report will be included in the Punch List requirements for the project. Complete the Punch List requirements as directed.

Final Acceptance will be granted after all operations have been completed, and when the turfgrass sod has grown at least 4 in. tall, exhibits dark green color, is firmly rooted into the soil, and is at least 99 percent groundcover.

708.04 MEASUREMENT AND PAYMENT. Turfgrass Sod Establishment will be measured and paid for at the Contract unit price for one or more of the specified items. The payment will be full compensation for all material, labor, equipment, tools, disposal fees and incidentals necessary to complete the work.

(a) **Payment Schedule.** Payments will be made according to Table 2 when construction requirements are met.

TURFGRASS SOD ESTABLISHMENT		
TABLE 2 - PAYMENT SCHEDULE		
CONSTRUCTION REQUIREMENTS	PERCENT OF TOTAL CONTRACT PRICE	PAYMENT FOR COMPLETED WORK
708.03.01 thru .11	80	At Installation Phase Acceptance
708.03.12 (a) and (b) and 705.03.13	20	At Final Acceptance
Total Payment	100%	

(b) **Forfeiture.** Failure to complete operations as required in conformance with the Payment Schedule will result in forfeiture of that percentage of payment.

708.04.01 Turfgrass Sod Establishment, including grade repair, preparing soil, applying fertilizer at installation, soil amendments, sod, fasteners, watering, resetting sod, sod replacement, and mowing will be measured and paid for at the Contract unit price per square yard.



SPECIAL PROVISIONS INSERT
708 — TURFGRASS SOD ESTABLISHMENT

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708.04.02 Zoysiagrass Sod Establishment, including grade repair, preparing soil, applying fertilizer at installation, soil amendments, sod, fasteners, watering, resetting sod, sod replacement, and mowing will be measured and paid for at the Contract unit price per square yard.

708.04.03 Bermudagrass Sod Establishment, including grade repair, preparing soil, applying fertilizer at installation, soil amendments, sod, fasteners, watering, resetting sod, sod replacement, and mowing will be measured and paid for at the Contract unit price per square yard.

708.04.04 Refertilizing will be measured and paid for at the Contract unit price per square yard.

708.04.05 Temporary Mulch will be measured and paid for at the Contract unit price.



CATEGORY 700
LANDSCAPING

SECTION 709 — SOIL STABILIZATION MATTING

583 **DELETE:** Section 709 — Soil Stabilization Matting, in its entirety.

INSERT: The following.

SECTION 709 — SOIL STABILIZATION MATTING

709.01 DESCRIPTION. For areas that are at final grade, install soil stabilization matting in conjunction with permanent vegetation groundcover per Section 705, 706 and 707, or as specified.

For areas that are not at final grade or that will be redisturbed at least 6 months after seeding operations are completed, install soil stabilization matting in conjunction with Section 704 or 705.

Performance of Soil Stabilization Matting as specified herein complies with all requirements of the Maryland Department of the Environment for permanent seeding.

709.02 MATERIALS.

Topsoil	920.01
Turfgrass Sod	920.04.06
Soil Stabilization Matting	920.05.01
Fasteners	920.05.02
Water	920.09.01

709.03 CONSTRUCTION.

709.03.01 Modification Request. Certain types of matting may be substituted for other matting when the substitution will provide improved erosion protection.

Submit a written Modification Request to substitute one type of soil stabilization matting for another type in areas where specific types of matting have been specified.

The Engineer in consultation with the Landscape Operations Division will evaluate the Request. If granted, a notice of approved modification will be returned within 14 days after the request is received.

The following modifications and others may be approved:



- (a) Turfgrass Establishment: Type D SSM in lieu of Type A SSM.
- (b) Turfgrass Establishment: Type A SSM in lieu of Type E SSM.
- (c) Meadow Establishment: Type D SSM in lieu of Type E SSM.
- (d) Shrub Seeding Establishment: Type D SSM in lieu of Type E SSM.

709.03.02 Soil Preparation. Perform operations when soil moisture and weather conditions are suitable. Cease operations when conditions are unsuitable.

Perform operations for the SSM type as follows:

- (a) **Type A.** Prepare soil and seedbed for Turfgrass Establishment per Section 705, or for other specified vegetation, but do not apply mulch.

Install SSM as specified in 709.03.03 thru .06 immediately after seeding and fertilizing.

- (b) **Type B.** Prepare soil and seedbed for Turfgrass Establishment per Section 705, or for other specified vegetation, but do not apply mulch.

Firm soil with an approved roller to ensure uniform soil surface and firmness. The roller shall weigh approximately 40 lb per ft of width.

Install SSM as specified in 709.03.03 thru .06 immediately after seeding, fertilizing and rolling are completed.

- (c) **Type C.** Prepare soil and firm with an approved roller to ensure uniform soil surface and firmness.

Install Type C SSM as specified in 709.03.03 thru .06 and infill with soil per 709.03.07.

- (1) Immediately perform Turfgrass Sod Establishment per Section 708, but do not till; or
- (2) Immediately perform Turfgrass Establishment per Section 705, but do not till or apply mulch, and then cover with Type B SSM; or
- (3) Immediately install other specified material and vegetation.

- (d) **Type D.** Prepare soil and seedbed for Meadow Establishment per Section 707, or for other specified vegetation, but do not apply mulch.

Install SSM as specified in 709.03.02 thru .05 immediately after seeding and fertilizing.



SPECIAL PROVISIONS INSERT
709 — SOIL STABILIZATION MATTING

- (e) **Type E.** Prepare soil and seedbed for Turfgrass Establishment per Section 705, or for other specified vegetation, but do not apply mulch.

Install SSM as specified in 709.03.03 thru .06 immediately after seeding and fertilizing.

709.03.03 Unrolling. Unroll SSM in the direction of the flow of water. Lay matting smoothly in firm, uniform contact with the soil surface, without stretching or tenting.

709.03.04 Overlapping. Overlap SSM with the upslope portion on top. Overlap edges at least 2 in., and ends at least 6 in. Do not install longitudinal overlaps in channel bottoms.

709.03.05 Keying-in. Key-in matting by digging a trench, fastening and backfilling one or more edges of the matting into the bottom of the trench.

- (a) **Type of Matting.** Key-in the areas described in Table 1 for each type of matting:

SOIL STABILIZATION MATTING	
TABLE 1 - AREAS OF MATTING TO KEY-IN	
MATTING TYPE	AREA OF MATTING
A, B	Uppermost or leading-edge.
A, B, D	Edges adjacent to pavement, catch basins, and structures.
B	Lowermost or toe-edge.
B	Check trenches; folds of matting perpendicular to water flow every 40-45 ft.
C	All edges.
C	Check trenches; folds of matting perpendicular to water flow every 20-25 ft.
D	Edges exposed to flow in BSM, ponds, swales, channels, slopes. All edges when installed in streams.
E	As directed.

- (b) **Trenching.** Trench into the soil perpendicular to the flow of water to at least 6 in. depth.

- (c) **Fastening.** Install fasteners per 709.05.05 through SSM into the bottom of the trench.

- (d) **Backfilling.** Backfill the trench with firmly tamped soil, and secure the matting over the backfilled area.

709.03.06 Fastening. Secure SSM with fasteners driven perpendicular to the soil grade, and flush with the surface of the matting.

- (a) **Fastener Selection.** Refer to 920.05.02 and use fasteners of the shape and length approved for the matting type according to Table 2.

When more than one fastener is acceptable, install the fastener type and length best suited to the installation conditions, or as directed.



SOIL STABILIZATION MATTING					
TABLE 2 - FASTENER SELECTION					
MATTING TYPE	FASTENER SHAPE	FASTENER LENGTH ¹			
		6 in. Length	8 in. Length	12 in. Length	18 in. Length
A & E	U-Shaped Staple	X	X		
	Circle-Top Pin	X	X		
	Round Head Pin	X	X		
	T-Head Pin	X	X		
B	U-Shaped Staple		X	X	
	Fabric Pin			X	X
C	U-Shaped Staple			X	X
	Fabric Pin			X	X
D	U-Shaped Staple in BSM, Ponds, Swales, Slopes	X	X	X	
	U-Shaped Staple or Fabric Pin in Channels, Streams		X	X	X
Note: ¹ X = Denotes fasteners acceptable for the matting type.					

(b) Placement of Fasteners. Install fasteners at the specified distance apart as required for the matting type and the area of matting according to Table 3.

SOIL STABILIZATION MATTING		
TABLE 3 - FASTENER PLACEMENT		
AREA OF MATTING	MATTING TYPE	MAXIMUM DISTANCE BETWEEN FASTENERS In.
Uppermost or Leading-Edge of Matting	A, B, C, D, E	6
Overlapping Edges of Matting	A, B, C, D, E	18
Center of Ditch	A, B, C, D, E	18
Lowermost or Toe-Edge of Matting	A, B, C, D, E	18
Throughout Matting	A, B, C, D, E	24
Check Trenches in Folds Every 40-45 ft	B ¹	12
Check Trenches in Folds Every 20-25 ft	C	12
Note: ¹ Do not install check trenches in Type B SSM installed over Type C SSM.		

709.03.07 Infilling Type C SSM. Infill the matting with approved topsoil to fill matting voids and to slightly cover the matting. Immediately install sod, or seed and cover with Type B SSM, or as specified.



SPECIAL PROVISIONS INSERT
709 — SOIL STABILIZATION MATTING

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709.03.08 Watering. Gently apply water with a sprinkler or water-breaker nozzle immediately after installation is completed as follows:

- (a) For Type E SSM, apply water over the surface of the matting as needed to settle the matting and soil.
- (b) For Types A, B, and D SSM, apply water over the surface of the matting to wet the soil at least 2 in. depth.
- (c) For Type C SSM, apply water over the sod, over the Type B SSM, or over other specified material, to wet the soil at least 2 in. depth.

709.03.09 Installation Phase Acceptance. Inspection will be conducted to verify that matting and vegetation installation operations were completed as specified. Installation Phase Acceptance will be granted at that time.

709.03.10 Establishment Phase. The Establishment Phase will begin upon Installation Phase Acceptance. Perform the following during the Establishment Phase.

- (a) **Period of Maintenance.** Maintain areas of soil stabilization matting until Final Acceptance.
- (b) **Required Maintenance.** Perform the following during the Establishment Phase.
 - (1) **Watering.** Apply water to ensure survival of the seeded species or sod as needed. Apply water with approved machinery. Do not allow water to cause erosion or to displace the matting, seed, or sod.
 - (2) **Reset Matting.** When matting is not firmly fastened to the soil, or if keyed-in areas or check trenches are not secure, repair the unsecured areas using fasteners as needed or as directed.
 - (3) **Reseeding.** When live seedling groundcover is not acceptable, perform overseeding in conformance with specifications for the pertinent vegetation as directed.

When Turfgrass Establishment or other seeded vegetation has not met acceptance standards, remove Type A, B, D, or E SSM to perform reseeding operations. Remove Type C matting when directed.

Prepare soil, reseed the specified vegetation, and apply water. Install new matting unless the original matting is approved for reuse.

- (4) **Sod Replacement.** When Turfgrass Sod Establishment does not meet acceptance standards, remove the unacceptable sod and install new sod.



SPECIAL PROVISIONS INSERT
709 — SOIL STABILIZATION MATTING

709.03.11 Final Acceptance. The Engineer and the Landscape Operations Division will complete an Inspection Report of the installed soil stabilization matting and vegetation establishment in conformance with the pertinent specifications. When it is not possible to perform the Inspection, Final Acceptance will be delayed until Inspection is possible.

The Inspection Report will be included in the Punch List requirements for the project. Complete the Punch List requirements as directed. Final Acceptance will be granted when the SSM is secure, and when the specified vegetation has met acceptance standards.

709.04 MEASUREMENT AND PAYMENT. Soil stabilization matting will be measured and paid for at the Contract unit price per square yard for one or more of the specified items. The payment will be full compensation for all material, fasteners, water, labor, equipment, tools, disposal fees and incidentals necessary to complete the work.

(a) Payment Schedule. Payments will be made according to Table 4 when construction requirements are met.

SOIL STABILIZATION MATTING		
TABLE 4- PAYMENT SCHEDULE		
CONSTRUCTION REQUIREMENTS	PERCENT OF TOTAL CONTRACT PRICE	PAYMENT FOR COMPLETED WORK
709.03.01 thru .09	80	At Installation Phase Acceptance
709.03.10 and .11	20	At Final Acceptance
Total Payment	100	

(b) Forfeiture. Failure to complete operations as required in conformance with the Payment Schedule will result in forfeiture of that percentage of payment.

709.04.01 Type A Soil Stabilization Matting. The measurement will be the area actually covered by matting, per square yard. Payment for Turfgrass Establishment or other specified vegetation will be measured and paid for separately.

709.04.02 Type B Soil Stabilization Matting. The measurement will be the area actually covered by matting, per square yard. Payment for Turfgrass Establishment or other specified vegetation will be measured and paid for separately.

709.04.03 Type C Soil Stabilization Matting. The measurement will be the area actually covered by matting, per square yard. Topsoil used for infilling will be incidental to the Contract price. Payment for Type B Soil Stabilization Matting, Turfgrass Sod Establishment, Turfgrass Establishment, or other specified vegetation will be measured and paid for separately.



SPECIAL PROVISIONS INSERT
709 — SOIL STABILIZATION MATTING

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709.04.04 Type D Soil Stabilization Matting. The measurement will be the area actually covered by matting, per square yard. Payment for Meadow Establishment or other specified vegetation will be measured and paid for separately.

709.04.05 Type E Soil Stabilization Matting. The measurement will be the area actually covered by matting, per square yard. Payment for Turfgrass Establishment or other specified vegetation will be measured and paid for separately.



SPECIAL PROVISIONS INSERT
710 — TREE, SHRUB, AND PERENNIAL INSTALLATION
AND ESTABLISHMENT

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CATEGORY 700
LANDSCAPING

SECTION 710 — TREE, SHRUB, AND PERENNIAL
INSTALLATION AND ESTABLISHMENT

587 **DELETE:** Section 710 — Tree, Shrub, and Perennial Installation and Establishment in its entirety.

INSERT: The following.

SECTION 710 — TREE, SHRUB, AND PERENNIAL
INSTALLATION AND ESTABLISHMENT

710.01 DESCRIPTION. Install and establish trees, shrubs, perennials, vines, and grasses in topsoil or Bioretention Soil Mix. When it is not possible to perform this work, refer to Section 704 and perform Temporary Mulch, or as directed to provide temporary soil stabilization.

710.02 MATERIALS.

Furnished Subsoil	920.01.04
Limestone	920.02.01
Sulfur	920.02.02
Compost	920.02.05
Fertilizer	920.03
Shredded Hardwood Bark (SHB) Mulch	920.04.03
Plant Materials	920.07
Marking and Staking Materials	920.08
Water	920.09.01
Pesticides	920.09.03
Marking Dye	920.09.04
Spray Adjuvant and Wetting Agent	920.09.05

710.03 CONSTRUCTION.

710.03.01 General.

(a) **Planting Seasons.** Perform operations when soil moisture and weather conditions are suitable, when the temperature is above 32 F, and the soil is not frozen. Cease operations when conditions are unsuitable.



SPECIAL PROVISIONS INSERT

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710 — TREE, SHRUB, AND PERENNIAL INSTALLATION
AND ESTABLISHMENT

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- (b) **Modification Request.** Submit a written Modification Request to install plants of different species, cultivars, sizes, growth habits, or planting stock type. The Engineer in consultation with the Landscape Operations Division will evaluate the Request. If granted, a Notice of Approved Modification will be returned within 14 days afterwards.
- (c) **Pesticide Application.** Apply pesticides in conformance with the Maryland Pesticide Applicator's Law, OSHA and MOSH regulations, and the manufacturer's label and Material Data Safety Sheets (MSDS).

The Contractor shall possess a Maryland Department of Agriculture Commercial Pesticide Business License and a Pesticide Applicator Certificate for the pertinent pesticide application Category: (2) Forest; (3-A) Ornamental Plant Exterior; (3-C) Turf; (5) Aquatic; (6) Right-of-Way and Weed.

Pesticides shall be applied by a Maryland Certified Pesticide Applicator, or by a Registered Pesticide Applicator under the supervision of a Certified Pesticide Applicator.

- (d) **Pesticide Application Reporting.** Record the location, acreage treated, pesticide name and quantity applied on the Pesticide Application Reporting Form. Submit the Form within 24 hours after applying pesticide.
- (e) **Nutrient Management Plan (NMP).** The specified application rates of 14-14-14 fertilizer will be the NMP unless the Administration develops a substitute NMP. Replace application rates of 710.03.04 and .05 as required by the NMP.
- (f) **Nutrient Management Reporting.** Record the fertilizer analysis, the square yards covered, and the pounds of fertilizer applied on the Nutrient Management Reporting Form. Submit the Form within 48 hours after applying fertilizer.
- (g) **Plant Storage and Handling.** Refer to 920.07.05.

710.03.02 Submittals and Inspection. Submit the following items:

- (a) **Breakdown List of Contract Prices.** Refer to 710.04.01 and develop a Breakdown List of Contract Prices for each plant in the Contract. Include the cost of all installation and establishment operations in the per plant price.

Submit the written Breakdown List within 14 days after Award of Contract. The Breakdown List will be reviewed by the Engineer and Landscape Operations Division for completeness and balance, and will be approved or returned for correction.

- (b) **Installation Phase Schedule.** Develop a Schedule with dates for completing operations related to 710.03.01 thru .15 according to Table 1.

02-03-15



SPECIAL PROVISIONS INSERT
710 — TREE, SHRUB, AND PERENNIAL INSTALLATION
AND ESTABLISHMENT

TREE, SHRUB, AND PERENNIAL	
TABLE 1 - OPERATIONS IN INSTALLATION PHASE SCHEDULE	
1	Layout, utilities review and marking.
2	Undesirable vegetation removal and herbicide application.
3	Planting pit excavation, soil preparation, and plant installation.
4	Planting beds rototilling and soil preparation, applying shredded hardwood bark (SHB) mulch, and plant installation.
5	Applying fertilizer solution after installation, and cleanup.

Submit the written Schedule at least 30 days before beginning landscape work. The Schedule will be reviewed by the Engineer and Landscape Operations Division for completeness and feasibility, and will be approved or returned for correction.

- (c) **Plant Material Inspection and Approval.** The Inspection will be conducted by the Landscape Operations Division as specified in 920.07.03.
- (d) **Establishment Phase Schedule & IPM Program.** Develop a Schedule with dates for completing 710.03.22. Include an Integrated Pest Management (IPM) Plan with methods of pest monitoring (weeds, diseases, insects, mammals, etc.), pesticide selection, application rates, and scheduling.

Submit the written Establishment Phase Schedule & IPM Program at the Installation Phase Inspection.

The Schedule will be reviewed by the Engineer and the Landscape Operations Division, and will be approved or returned for correction.

710.03.03 Utilities Marking, Layout, and Inspection. Refer to Section 875 when included in the Contract Documents.

- (a) **Utilities Marking.** Contact ‘Miss Utility’ or another approved service to identify and mark utilities in the rights-of-way. Contact the District Utilities Engineer to mark utilities on Administration property.
- (b) **Conflicts.** Notify the Administration of conflicts that may involve design changes. Conflicts will be reviewed by the Landscape Operations Division and resolved within 14 days after notice.
- (c) **Planting Layout.** Provide the necessary materials and lay out the locations of planting pits and planting beds specified in the Contract Documents, or as adjusted by the Landscape Operations Division.



SPECIAL PROVISIONS INSERT
710 — TREE, SHRUB, AND PERENNIAL INSTALLATION
AND ESTABLISHMENT

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(d) **Inspection.** At least 7 days notice will be required to schedule each stage of a layout inspection in consultation with the Landscape Operations Division. Proceed with operations after layout approval.

710.03.04 Preparing Planting Pits. Perform the following operations when preparing planting pits for individual plants:

(a) **Undesirable Vegetation.** Manually remove undesirable vegetation or refer to 710.03.01(c) and 710.03.01(d) and apply non-selective herbicide in water with wetting agent and dye according to Table 2 at least 14 days before plant installation. Cut and remove dead vegetation or debris that interferes with soil preparation, plant installation or future maintenance.

TREE, SHRUB, AND PERENNIAL	
TABLE 2 - NON-SELECTIVE HERBICIDE APPLICATION	
MATERIAL	RATE PER ACRE
Glyphosate Herbicide	5 lb of active ingredient
Marking Dye	6 to 15 oz
Water	40 to 50 gal

(b) **Excavation.** Excavate planting pits to the depth required for the placement of root collars as specified in 710.03.09(c). Retain the excavated soil for preparation as backfill soil. Remove excess soil from the site, or spread as directed.

For Expanded Tree Pits (ETP), refer to the detail provided in the Contract documents. Excavate additional depth and width as shown in the detail, place furnished subsoil to the dimensions shown in the detail, and complete tree installation using Table 3. Remove excess soil from the site, or spread as directed.

(c) **Planting Pit Diameter.** Use Table 3 to determine the diameter of the planting pit based upon the container or root ball diameter.



SPECIAL PROVISIONS INSERT
710 — TREE, SHRUB, AND PERENNIAL INSTALLATION
AND ESTABLISHMENT

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TREE, SHRUB, AND PERENNIAL					
TABLE 3 - PREPARING PLANTING PITS AND BACKFILL SOIL					
Container or Root Ball Diameter In.	ANSI Z60 Container Size	Planting Pit Diameter In.	Compost Ft.³	14-14-14 Fertilizer Oz.	Water per Event Gal.
3	#SP3	6	0.02	0.10	0.15
5	#SP4	10	0.02	0.12	0.2
6	#SP5 or #1	12	0.03	0.18	0.3
8	#2	17	0.09	0.30	0.5
10	#3	21	0.18	0.55	1.0
12	#5	24	0.28	0.75	1.5
14	#7	28	0.44	1.0	2.3
16	#10	32	0.65	1.3	3.5
18	#15	36	0.94	1.6	5.0
20	#20	40	1.27	2.0	6.8
24	#25	48	2.20	3.0	12
30	-	60	4.30	4.5	23
36	#45	72	7.40	6.5	40
42	#65	84	11.80	8.8	60
<p>Note:</p> <p>When water is applied over the surface of planting beds where most plants are less than 36 in. apart, apply water per plant in conformance with 'Water per Event', or apply at least 5 gallons of water per SY of planting bed.</p>					

(d) Compost and Fertilizer. Use Table 3 to determine the quantity of compost and 14-14-14 fertilizer to mix into backfill soil, based upon planting pit diameter. Uniformly mix compost and fertilizer into the backfill soil.

Use a scale with 0.01 oz or gram accuracy to calibrate measures and verify application rates of 14-14-14 fertilizer when directed.

(e) Water. Use Table 3 to determine the quantity of water to apply for each installed plant based upon planting pit diameter.

710.03.05 Preparing Planting Beds. Perform the following operations when preparing planting beds.

(a) Undesirable Vegetation. Remove undesirable vegetation as specified in 710.03.04(a). Cut or mow dead vegetation to a height of 1 in. and remove the debris.

(b) Compost and Rototilling.



SPECIAL PROVISIONS INSERT
710 — TREE, SHRUB, AND PERENNIAL INSTALLATION
AND ESTABLISHMENT

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(1) **Areas Flatter than 4:1.** Apply 2 in. layer of compost over the soil surface of the planting bed. Rototill to a depth of 6 in. to thoroughly mix compost and any materials specified in the NMP. Do not apply compost or rototill Bioretention Soil Mix (BSM) unless specified otherwise.

(2) **Slopes 4:1 and Steeper.** Do not rototill.

(c) **Fertilizer.** Mix 14-14-14 fertilizer into the backfill soil of each planting pit within the bed according to Table 3.

(d) **Debris Removal.** Remove debris, stones, and soil clods with a length or width greater than 2 in. that are uncovered during rototilling.

(e) **Leveling.** Level the soil surface after rototilling, and leave it in a condition ready for shredded hardwood bark (SHB) mulching and plant installation.

710.03.06 Plant Acclimation. Ensure that container grown plants are acclimated to prevailing weather conditions before installing. Install bare root plants while dormant when soil and air temperatures are above freezing.

710.03.07 Plant Care. Begin plant care at the time each plant is installed, and continue until Installation Phase Acceptance is granted.

710.03.08 Pruning. Remove dead branches, damaged branches, water sprouts, and other undesirable growth manually with pruners. Preserve the natural appearance of trees and shrubs. Remove branches or portions of branches over sidewalks to ensure 8 ft clearance for pedestrians.

710.03.09 Installing. Install plants vertically in planting pits and beds prepared as specified in 710.03.04 and .05, and as follows:

(a) **Removing Containers, Burlap, Wire Baskets.** Remove containers. Remove twine, burlap or other fabric from the tops of root balls to a depth at least 6 in. below the surface of the backfilled planting pit. Cut and remove the tops of wire baskets from the upper half of the rootball. Discard containers and any removed twine, wire, burlap or other fabric.

(b) **Preparing Roots.** Carefully remove the containers of container grown plants, and loosen the soil mass to eliminate girdling roots.

Spread the roots of bare root plants in a natural position, and firmly press backfill soil around the roots.

(c) **Placing Root Collar.** Place the root collar of plants at or above the average soil surface grade outside the planting pit according to Table 4.



SPECIAL PROVISIONS INSERT
710 — TREE, SHRUB, AND PERENNIAL INSTALLATION
AND ESTABLISHMENT

TREE, SHRUB, AND PERENNIAL	
TABLE 4- ROOT COLLAR PLACEMENT	
SOIL CONDITIONS	HEIGHT OF ROOT COLLAR
Normal, Well Drained	Place collar at same level to 1 in. above average surface grade.
Compacted	Place collar at 1 to 2 in. above average surface grade.
Poorly Drained or Wet	Place collar as needed to ensure 25% of root mass is above average surface grade.

- (d) **Backfilling.** Remove clods, stones and other foreign material with a length or width greater than 2 in. from soil used for backfilling.

Place backfill soil that has been mixed with compost and fertilizer as specified in 710.03.04 and .05 under and around roots to stabilize plants in upright position and restore the grade. Lightly firm and compact backfill soil to reduce air pockets.

710.03.10 Soil Berming. Form a 4 in. high berm of backfill soil around planting pits and planting beds as follows:

- (a) **Planting Pits.** On areas flatter than 4:1, form the berm around the entire planting pit. On slopes 4:1 and steeper, take soil from the upslope rim of the pit and place it on the downslope rim to form the berm.
- (b) **Planting Beds.** On slopes 4:1 and steeper, form the berm as a shoulder at the lower edge of the bed. Berm individual trees and shrubs installed within beds on slopes 4:1 and steeper as described in (a) above.

710.03.11 Edging. Cut edging at a steep angle into the mulched area to a 3 in. depth into the soil. On slopes 4:1 and steeper, cut edging outside of the bermed area on the lower edge of berm. Remove and discard excess soil.

- (a) **Planting Pits.** Edge entirely around all planting pits except planting pits within planting beds.
- (b) **Planting Beds.** Smoothly cut edging around all planting beds to the shapes specified.

710.03.12 Staking and Guying. Stake and guy trees the same day they are installed.

- (a) **Installation.** When two or three stakes are specified for trees, install two stakes parallel to the direction of traffic, or as directed. Drive stakes vertically to a depth of 10 in. below the bottom of the pit, and 5 to 8 in. away from roots according to Table 5.



SPECIAL PROVISIONS INSERT
710 — TREE, SHRUB, AND PERENNIAL INSTALLATION
AND ESTABLISHMENT

TREE, SHRUB, AND PERENNIAL				
TABLE 5 - STAKING AND GUYING				
TREE TYPE	CALIPER In.	HEIGHT Ft	SUPPORT	
			No. of Stakes	Length, ft
Shade	Under 1	6 and 8	2	6
	1 to 2	—	2	8
	2-1/2 to 3-1/2	—	3	10
	4 and over	—	—	3 guy wires attached to tree anchors
Flowering	3/4 to 2-1/2	—	2	5-8
	3 and over	—	—	3 guy wires attached to tree anchors
Evergreen	—	5 and 6	2	5-6
	—	7, 8 and 9	3	7-8
	—	10 and over	—	3 guy wires attached to tree anchors

(b) Maintenance. Promptly straighten trees that become crooked after installation. Repair or replace stakes, guys, and other support materials as needed.

710.03.13 Mulching. Spread SHB mulch uniformly over the soil surface to a 3 in. depth. Promptly repair damage caused by washouts or construction activities.

(a) Planting Pits. Spread SHB mulch the same day that plants are installed. Mulch around the base of each plant to cover the soil of the planting pit to its outside edge, including the soil berm. Do not allow mulch to touch the bark or main stem of the plant.

(b) Planting Beds. SHB mulch may be spread before or after installing plants. Spread mulch over the entire bed and rake it to an even surface, including berms and shoulders. Ensure that mulch does not cover plants.

For rototilled beds, spread mulch the same day after rototilling. For non-rototilled beds, spread mulch within 3 days after plant installation. When installation is completed, ensure that mulch uniformly covers the soil to a uniform 3 in. depth.

710.03.14 Watering after Installation.

(a) Application Equipment. Watering equipment shall consist of sprinklers or hoses equipped with water breaker nozzles so the materials are applied with care to prevent damage to plants and minimize disturbance to SHB mulch.



SPECIAL PROVISIONS INSERT
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For planting pits, refer to Table 4 and apply the required quantity of water to each plant.

For planting beds, apply water to the entire bed area to wet the soil to a depth of 3 in.

(b) Follow-Up Watering. Monitor and apply water during the Installation Phase to supply plant needs.

710.03.15 Cleanup. Remove growers tape, plant stakes, pot markers, field tags, and similar materials at the time of installation. Ensure that the Administration's Material Inspection Approval Seals and plant tags remain on trees and shrubs until the end of the Establishment Phase.

Keep turfgrass areas, paved surfaces, and sidewalks clean. Promptly remove excess and waste materials. Take precautions to avoid damage to existing structures, plants, and turfgrass. Repair damage caused to surrounding areas during installation, and fill ruts and reestablish turfgrass as necessary.

710.03.16 Relocating Plants. Begin plant relocation operations within 7 days after notice to relocate, and continue until work is completed. Remove plants installed in undesirable locations as directed by the Engineer, and reinstall these plants as specified in herein.

710.03.17 Abandoned Planting Pits. Backfill abandoned planting pits when directed with excavated soil or approved backfill. Compact the backfill in 8 in. layers to the finished grade. Establish turfgrass as specified in Section 705.

710.03.18 Unacceptable Plants and Replacement Plants. Promptly remove and replace plants that are unacceptable at any time during the Installation Phase as specified in 920.07, or when requested.

Plants that are determined to be missing, dead, dying, damaged, diseased, deformed, underdeveloped, damaged by pesticides, or not true to species, cultivar, size or quality shall be replaced.

Refer to GP-5.09 regarding removal of defective work and materials, and GP-7.16 regarding Contractor responsibility for work, theft, damage, and loss.

(a) Criteria. The criteria of Table 6 will be used to identify unacceptable plants.



SPECIAL PROVISIONS INSERT
710 — TREE, SHRUB, AND PERENNIAL INSTALLATION
AND ESTABLISHMENT

TREE, SHRUB, AND PERENNIAL			
TABLE 6 - CRITERIA FOR UNACCEPTABLE PLANTS			
Item	Plant Type	Condition	Unacceptable
1	Tree, Shrub, Vine, Perennial Grass	Dead or Missing	Any dead or missing plant, any cause.
2	Tree, Shrub, Vine, Perennial Grass	Defoliation	More than 25% of leaf area dead, lost or dropped.
3	Tree, Shrub, Vine	Bark Wound	More than 15% of bark circumference or 2 in. length.
4	Shrub or Vine	Height Die-back	More than 25% of the shrub or vine height.
5	Tree	Leader Die-back	More than 10% of tree height.
6	Tree	Branch Die-back	More than 6 in. on 75% of branches.

(b) Replacement Plants. Replacement plants shall be true to species, cultivar, size, and quality as specified in the Contract Documents unless a Substitution Request is approved.

Install replacement plants as soon as feasible during the current Planting Season, or if between Planting Seasons, during the next Planting Season. Promptly submit a Modification Request as specified in 710.03.01(b) when it is not possible to obtain plants that meet specifications.

Replacement plants shall meet the specifications of 920.07, and be installed and established as specified in Section 710 for 12 months, until Final Acceptance.

710.03.19 Installation Phase Inspection. Submit a request for Installation Phase Inspection when operations are completed, and provide the Establishment Phase Schedule as specified in 710.03.02(d).

The Installation Phase Inspection will be scheduled by the Engineer at the project with the Contractor and the Landscape Operations Division to verify completion. At least 14 days notice will be provided before the scheduled Inspection so that it may be completed in the company of the Contractor.

710.03.20 Installation Phase Punch List. The Engineer in consultation with the Contractor and the Landscape Operations Division will develop the Installation Phase Punch List and list of plants to be replaced. Complete the Punch List requirements and replace plants as required.

710.03.21 Installation Phase Acceptance. Re-inspection will be performed as needed. Installation Phase Acceptance will be granted when the Punch List and all Installation Phase requirements are completed according to Table 7.



SPECIAL PROVISIONS INSERT
710 — TREE, SHRUB, AND PERENNIAL INSTALLATION
AND ESTABLISHMENT

TREE, SHRUB, AND PERENNIAL		
TABLE 7 - REQUIREMENTS FOR INSTALLATION PHASE ACCEPTANCE		
Item	Requirement	Section
a	Submittals are accepted and Inspections are completed.	710.03.01(b), 710.03.02, 920.07
b	Damaging pests are controlled.	710.03.02(c)
c	Layouts are inspected and approved.	710.03.03
d	Fertilizer and compost is mixed soil, as required.	710.03.04 and 710.03.05
e	Planting pits and planting beds are weed free.	710.03.04(a) and 710.03.05(a)
f	Trees and shrubs are pruned.	710.03.08
g	Trees are installed vertically and straightened.	710.03.09
h	Planting pits and beds are bermed and edged.	710.03.10 and 710.03.11
i	Staking and guying are repaired or replaced.	710.03.12
j	SHB mulch is uniformly spread to the specified depth.	710.03.13
k	Washouts in planting pits and beds are repaired.	710.03.13
l	Plants receive initial watering and follow up watering.	710.03.04 and 710.03.14
m	Clean up is completed, plant tags and ribbons are removed.	710.03.15
n	Plants are relocated to approved locations.	710.03.16
o	Abandoned planting pits are filled and seeded.	710.03.17
p	Unacceptable plants are replaced.	710.03.18
q	Damage repairs and Installation Phase Punch List is completed.	710.03.20
r	Pesticide Application and Nutrient Management Reporting Forms are completed.	710.03.01(d) and (f)
s	Plants are properly installed, are none are unacceptable or require replacement.	710.03.01 thru .18
t	Establishment Phase Schedule & IPM Program is accepted.	710.03.02 (e) and 710.03.21

710.03.22 Establishment Phase. The Establishment Phase begins upon Installation Phase Acceptance. Maintain plants and provide care and replacement as specified in 710.03.01 thru 0.21, and as follows:

- (a) **Period of Maintenance.** Maintain plants for 12 months after installation, until Final Acceptance.
- (b) **Plant Watering.** Monitor the soil moisture and water needs of plants. Promptly apply water as specified in 710.03.14 to planting pits and planting beds as needed, or as directed.
- (c) **Pest Management.** Monitor and promptly control weeds, insects and other pests in conformance with the IPM Program, or when requested. Control weeds in mulched areas in preparation for inspection. Remove dead weeds taller than 6 in. Refer to 710.03.01(d) and complete the Pesticide Application Reporting Form.



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710 — TREE, SHRUB, AND PERENNIAL INSTALLATION
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- (d) **Unacceptable Plants and Replacement Plants.** Refer to 710.03.18. Promptly remove and replace plants that have become unacceptable during the Establishment Phase as needed or as directed.
- (e) **End-of-Season Foliage Removal.** For perennials, remove the aboveground parts that have declined during the months of November and December, or as directed. For grasses, remove the aboveground parts that have declined and in February or March, or as directed.
- (f) **Refertilizing.** Dissolve 40 lb of 20-20-20 water soluble fertilizer in 1 000 gal of water. Refer to 710.03.14 regarding application equipment. Apply fertilizer solution in the final 60 days of the Establishment Phase.

For planting pits, refer to Table 3 and apply gallons of fertilizer solution to each installed plant based upon the planting pit diameter and water per event gal.

For planting beds, apply 0.21 gal of fertilizer solution per SY of planting bed. Apply fertilizer solution to the entire bed area.

- (g) **Removing Supports and Seals.** Remove tree supports, hoses wires, guys and Material Inspection Approval Seals in the final 30 days of the Establishment Phase. Pull stakes from the soil or cut them to ground level.
- (h) **Partial Establishment Phase Inspection.** The Project Engineer will inspect plant establishment 6 months after Installation Phase Acceptance according to Table 8. The Inspection Report will include actions to perform before Partial Establishment Phase Acceptance is granted. Perform repairs, replacements, and other work as specified in the Contract Documents and Inspection Report.

710.03.23 Establishment Phase and Final Acceptance. The Engineer and the Landscape Operations Division will complete an Inspection Report 12 months after Installation Phase Acceptance. When it is not possible to perform the Inspection, Final Acceptance will be delayed until Inspection is possible.

Final Acceptance will be granted when the requirements of Table 8 are satisfactorily completed. The Inspection Report will be included in the Punch List requirements for the project. Complete the Punch List requirements as directed.



SPECIAL PROVISIONS INSERT
710 — TREE, SHRUB, AND PERENNIAL INSTALLATION
AND ESTABLISHMENT

TREE, SHRUB, AND PERENNIAL		
TABLE 8 - REQUIREMENTS FOR ESTABLISHMENT PHASE AND FINAL ACCEPTANCE		
Item	Requirement	Section
1	Water sprouts are manually pruned and removed.	710.03.08
2	Trees are straightened.	710.03.09
3	Staking and guying are repaired or replaced.	710.03.12
4	Washouts in planting pits and beds are repaired.	710.03.13
5	Plants are relocated to approved locations.	710.03.16
6	Abandoned planting pits are filled and seeded.	710.03.17
7	Plants are successfully established.	710.03.22(a) and (b)
8	Damaging pests are controlled.	710.03.22(c)
9	Planting pits and planting beds are weed free.	710.03.22(c)
10	Unacceptable plants are replaced.	710.03.22(d)
11	Annual foliage dieback of perennials and grasses is cut and removed.	710.03.22(e)
12	Plants are refertilized.	710.03.22(f)
13	Pesticide Application and Nutrient Management Reporting Forms are completed.	710.03.01(d) and (f)
14	Staking, guying, and Material Inspection Seals are removed.	710.03.22(g)
15	Damage repairs and Establishment Punch List are completed.	710.03.22(h)

710.04 MEASUREMENT AND PAYMENT. Tree, Shrub, and Perennial Installation and Establishment will be measured and paid for at the Contract unit price for one or more of the specified items. The payment will be full compensation for all plants, material, labor, equipment, tools, disposal fees and incidentals necessary to complete the work.

710.04.01 Tree, Shrub, and Perennial Installation and Establishment. Tree, Shrub, and Perennial Installation and Establishment shall include the cost of trees, shrubs, perennials, vines, and grasses, layout, marking, pruning, planting pit excavation and disposal of excavated soil, fertilizer, compost, backfilling, staking, guying, berming, edging, watering, pest management, plant maintenance, refertilizing, and all operations related to the Installation and Establishment Phases of each plant, until Final Acceptance.

Tree, Shrub, and Perennial Installation and Establishment will be paid according to Table 9 based upon the approved Breakdown List of Contract Prices. Refer to 710.03.02(a). In the event of change in the quantities required, payment adjustments will be based on the approved Breakdown List of Contract Prices.

(a) Payment Schedule. Payments will be made according to Table 9 when construction requirements are met.



SPECIAL PROVISIONS INSERT
710 — TREE, SHRUB, AND PERENNIAL INSTALLATION
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TREE, SHRUB, AND PERENNIAL			
TABLE 9 - PAYMENT SCHEDULE			
CONSTRUCTION REQUIREMENTS		PERCENT OF TOTAL CONTRACT PRICE	PAYMENT FOR COMPLETED WORK
710.03.01 thru .21	Installation Phase	70	At Installation Phase Acceptance
710.03.22(a) thru (e)	Establishment Phase	15	At Partial Establishment Phase Acceptance
710.03.22(a) thru (h) and 710.03.23	Establishment Phase and Final Acceptance	15	At Final Acceptance
Total Payment		100%	

(b) Forfeiture. Failure to complete operations as required or directed in conformance with the Payment Schedule will result in forfeiture of that percentage of payment based upon the Breakdown List of Contract Prices.

710.04.02 Constructing Planting Beds. Constructing Planting Beds will be measured and paid for at the Contract unit price per square yard. The price shall include the cost of layout, marking, fertilizer, soil amendments, rototilling, berming, edging, applying 3 in. of SHB mulch, refertilizing, and all operations related to construction of the planting bed.

Mulching individual planting pits of trees, shrubs, perennials, vines, and grasses within planting beds will not be measured but the cost will be incidental to 710.04.02.

710.04.03 Expanded Tree Pit. Expanded Tree Pit will be measured and paid for at the Contract unit price per each. The price shall include the cost of excavation to the specified dimensions, furnished subsoil, disposal of excavated soil, and all operations related to construction of the expanded tree pit.

710.04.04 Temporary Mulch will be measured and paid for at the Contract unit price.



**CATEGORY 700
LANDSCAPING**

**SECTION 711 — ANNUALS AND BULBS
INSTALLATION AND ESTABLISHMENT**

603 **DELETE:** Section 711 — Annuals and Bulbs Installation and Establishment in its entirety.

INSERT: The following.

**SECTION 711 — ANNUALS AND BULBS
INSTALLATION AND ESTABLISHMENT**

711.01 DESCRIPTION. Install and establish annuals and bulbs in topsoil. When it is not possible to perform this work, refer to Section 704 and perform Temporary Mulch, or as directed to provide temporary soil stabilization.

711.02 MATERIALS.

Limestone	920.02.01
Sulfur	920.02.02
Compost	920.02.05
Fertilizer	920.03
Shredded Hardwood Bark (SHB) Mulch	920.04.03
Plant Materials	920.07
Marking and Staking Materials	920.08
Water	920.09.01
Pesticides	920.09.03

711.03 CONSTRUCTION.

711.03.01 General.

(a) **Regional Areas.** Refer to 705.03.01(a).

(b) **Planting Seasons.** Perform operations when soil moisture and weather conditions are suitable. Cease operations when conditions are unsuitable. Install plants according to Table 1.



SPECIAL PROVISIONS INSERT

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ANNUALS AND BULBS					
TABLE 1 - PLANTING SEASONS					
SEASON	PLANTS	INSTALLATION DATE			
		Region 1	Region 2	Region 3	
Spring	Container Grown Summer Annuals	5/20 – 6/20	5/10 – 6/10	5/01 – 6/01	
Fall	Container Grown Winter Annuals	9/01 – 10/20	9/10 – 10/31	9/20 – 11/10	
	Spring Flowering Bulbs	9/01 – 11/30	9/10 – 12/31	9/20 – 12/31	

- (c) **Modification Request.** Refer to 710.03.01(b).
- (d) **Pesticide Application.** Refer to 701.03.01(b).
- (e) **Pesticide Application Reporting.** Refer to 701.03.01(c).
- (f) **Nutrient Management Plan (NMP).** Refer to 710.03.01(e).
- (g) **Nutrient Management Reporting.** Refer to 710.03.01(f).
- (h) **Plant Storage and Handling.** Refer to 920.07.05.

711.03.02 Submittals and Inspection. Submit the following items as indicated:

- (a) **Breakdown List of Contract Prices.** Refer to 710.03.02(a).
- (b) **Installation Phase Schedule.** Refer to 710.03.02(b) and submit the Schedule with dates for completing 711.03.02 thru .12.
- (c) **Plant Material Inspection and Approval.** The Inspection will be conducted by the Landscape Operations Division as specified in 920.07.01.
- (d) **Establishment Phase Schedule & IPM Program.** Refer to 710.03.02(d) and submit the Schedule with dates for completing 711.03.17.

711.03.03 Utilities Marking, Layout, and Inspection. Refer to 710.03.03.

711.03.04 Preparing Planting Beds and Planting Areas.

- (a) **Planting Beds.** Refer to 710.03.05 for preparing beds and planting holes for container grown annuals and bulbs. Dig holes for bulbs to the depth and width recommended for the species or variety by the grower.



SPECIAL PROVISIONS INSERT

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711 — ANNUALS AND BULBS INSTALLATION AND ESTABLISHMENT

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- (b) **Planting Areas for Naturalized Daffodils.** Dig planting holes to 3 in. diameter and to a 5 in. depth. Mix 0.20 oz of 14-14-14 fertilizer into the backfill soil of each bulb, or as specified in the NMP. Firmly cover each bulb with backfill soil to the level of the surrounding grade. Omit 711.03.05 thru .10 when installing naturalized daffodils.

711.03.05 Soil Berming. Refer to 710.03.10.

711.03.06 Edging. Refer to 710.03.11.

711.03.07 Mulching. Refer to 710.03.13.

711.03.08 Plant Acclimation. Refer to 710.03.06.

711.03.09 Plant Care. Refer to 710.03.07.

711.03.10 Installing. Handle annuals and bulbs with care to avoid damage or bruising. Refer to 710.03.09 and the following:

- (a) **Foliage Removal.** Remove dead foliage of annuals and other unwanted vegetation from the previous season without damaging or disturbing perennials or other desirable vegetation.
- (b) **Mulch.** Remove and conserve SHB mulch at sites where annuals or bulbs will be installed before digging the planting hole. Replace mulch to a depth of 2 in. over bulbs and around the stems of annuals.

711.03.11 Watering After Installation.

- (a) **Application Equipment.** Refer to 710.03.14(a).

- (b) **Follow-Up Watering.** Refer to 710.03.14(d).

711.03.12 Cleanup. Refer to 710.03.15.

711.03.13 Unacceptable Plants and Replacement Plants. Refer to 710.03.18, 920.07 and replace unacceptable plants as specified in Section 711 for the remainder of the growing season until Final Acceptance.

711.03.14 Installation Phase Inspection. Refer to 710.03.19.

711.03.15 Installation Phase Punch List. Refer to 710.03.20.

711.03.16 Installation Phase Acceptance. Refer to 710.03.21 and provide the Establishment Phase Schedule as specified in 711.03.02(e).



SPECIAL PROVISIONS INSERT

Installation Phase Acceptance will be granted when the Punch List and all Installation Phase requirements are completed according to Table 2.

ANNUALS AND BULBS		
TABLE 2 - REQUIREMENTS FOR INSTALLATION PHASE ACCEPTANCE		
Item	Requirement	Section
a	Submittals are accepted and Inspections are completed.	710.03.01(b), 711.03.02, 920.07
b	Dead foliage in existing beds is removed.	711.03.10(a)
c	Fertilizer and compost is applied, as required.	711.03.04
d	Planting pits and planting beds are bermed and edged.	710.03.10 and 710.03.11
e	SHB mulch is uniformly spread to the specified depth.	710.03.13 and 711.03.10(c)
f	Plants receive initial watering and follow up watering.	711.03.04 and 711.03.11
g	Damaging pests are controlled.	711.03.02(c)
h	Cleanup is completed, plant tags and ribbons are removed.	710.03.15
i	Washouts in and around planting beds are repaired.	710.03.13
j	Unacceptable plants are replaced as needed or required.	710.03.18
k	Damage repairs and Installation Phase Punch List is completed.	710.03.20
l	Pesticide Application and Nutrient Management Reporting Forms are completed.	710.03.01(d) and (f)
m	Plants are properly installed, are none are unacceptable or require replacement.	711.03.01 thru .13
n	Establishment Phase Schedule & IPM Program is accepted.	710.03.02(e) and 711.03.16

711.03.17 Establishment Phase. The Establishment Phase for annuals and bulbs planted in beds begins upon Installation Phase Acceptance. Maintain all plants except naturalized daffodils as specified in 711.03.01 thru 0.16 and as follows:

- (a) **Period of Maintenance.** Plants shall be maintained for one Planting Season, until Final Acceptance.
- (b) **Plant Watering.** Refer to 710.03.22(b).
- (c) **Pest Management.** Refer to 710.03.22(c).
- (d) **Unacceptable Plants and Replacement Plants.** Refer to 710.03.18. Promptly remove and replace plants that have become unacceptable during the Establishment Phase as needed, or at the request of the Engineer.
- (e) **End-of-Season Foliage Removal.** Remove the foliage of annuals that have declined in late summer or fall, as directed by the Engineer. Remove the foliage and flower stems of bulbs planted in beds after they have declined at the end of their growing season in June.
- (f) **Refertilizing.** Refer to 710.03.22(f).



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(g) Partial Establishment Phase Inspection. The Project Engineer will inspect plant establishment 2 to 4 months after Installation Phase Acceptance according to Table 8. The Inspection Report will include actions to perform before Partial Establishment Phase Acceptance is granted. Perform repairs, replacements, and other work as specified in the Contract Documents and Inspection Report.

711.03.18 Establishment Phase and Final Acceptance. The Engineer and the Landscape Operations Division will complete an Inspection Report 12 months after Installation Phase Acceptance. When it is not possible to perform the Inspection, Final Acceptance will be delayed until Inspection is possible.

Final Acceptance will be granted when the requirements of Table 3 are satisfactorily completed. The Inspection Report will be included in the Punch List requirements for the project. Complete the Punch List requirements as directed.

ANNUALS AND BULBS		
TABLE 3 - REQUIREMENTS FOR ESTABLISHMENT PHASE AND FINAL ACCEPTANCE		
Item	Requirement	Section
1	Washouts in and around planting beds are repaired.	710.03.13
2	Plants are watered as needed and refertilized when directed.	710.03.22(b) and (f)
3	Damaging pests are controlled.	710.03.22(c)
4	Planting beds are weed free.	710.03.22(c)
5	Pesticide Reporting and Nutrient Management Reporting Forms are completed.	710.03.01(d) and (f)
6	Unacceptable plants are replaced as requested.	711.03.17(d)
7	End-of-season foliage removal is completed.	711.03.17(e)
8	Damage repairs and Establishment Punch List are completed.	711.03.17(f)

711.04 MEASUREMENT AND PAYMENT. Annuals and Bulbs Installation and Establishment will be measured and paid for at the Contract unit price for one or more of the specified items. The payment will be full compensation for all plants, material, labor, equipment, tools, disposal fees and incidentals necessary to complete the work.

711.04.01 Annuals and Bulbs Installation and Establishment. Annuals and Bulbs Installation and Establishment shall include the cost of plants, layout, marking, pruning, planting pit excavation, fertilizer, compost, backfilling, berming, edging, watering, pest management, plant maintenance, refertilizing, and all operations related to the Installation and Establishment Phases of each plant, until Final Acceptance.

Annuals and Bulbs Installation and Establishment will be paid according to Table 4 based upon the approved Breakdown List of Contract Prices. Refer to 711.03.02(a). In the event of change in the quantities required, payment adjustments will be based on the approved Breakdown List of Contract Prices.



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(a) **Payment Schedule.** Payments will be made according to Table 4 when construction requirements are met.

ANNUALS AND BULBS					
TABLE 4 - PAYMENT SCHEDULE					
INSTALLATION AND ESTABLISHMENT PHASE COMPLETION		PERCENT OF TOTAL CONTRACT PRICE			PAYMENT FOR COMPLETED WORK
		Annuals in Beds	Bulbs in Beds	Naturalized Bulbs	
711.03.0 thru .16	Installation Phase	70	70	100	At Installation Phase Acceptance
711.03.17(a) thru (d)	Establishment Phase In-Season Maintenance	15	15	–	At Partial Establishment Phase Acceptance
711.03.17(e) thru (g)	End-of-Season Maintenance, Removal & Replacement, and Final Acceptance	15	15	–	At Final Acceptance
Total Payment		100	100	100	

(b) **Forfeiture.** Failure to complete operations as required or directed in conformance with the Payment Schedule will result in forfeiture of that percentage of payment based upon the Breakdown List of Contract Prices.

711.04.02 Constructing Planting Beds. Refer to 710.04.02.

711.04.03 Temporary Mulch will be measured and paid for at the Contract unit price.



CATEGORY 700
LANDSCAPING

SECTION 712 — TREE BRANCH PRUNING

610 **DELETE:** Section 712 — Tree Branch Pruning, in its entirety.

INSERT: The following.

SECTION 712 — TREE BRANCH PRUNING

712.01 DESCRIPTION. Prune tree branches as indicated in the SP 700 Tree Preservation Program, or in the plans. Perform Tree Branch Pruning within a Tree Preservation Area per Section 120 when specified, but do not perform these operations within areas of Clearing and Grubbing.

712.02 MATERIALS. Not applicable.

712.03 CONSTRUCTION.

712.03.01 General.

- (a) **Permits.** Obtain a Roadside Tree Permit from the Maryland Department of Natural Resources - Forest Service.
- (b) **Tree Preservation Program (TPP).** Conform to the requirements of the TPP when developed by the Administration.
- (c) **Schedule.** Perform operations when weather conditions are suitable. Cease operations when conditions are unsuitable.

712.03.02 Breakdown List of Contract Prices. Refer to 712.04 and develop a Breakdown List of Contract Prices for each tree or group of trees in the Contract. Include costs for pruning and completing all operations per tree or group of trees.

Submit the written Breakdown List within 14 days after Notice of Award. The Breakdown List will be reviewed by the Engineer and Landscape Operations Division for completeness and balance, and will be approved or returned for correction.

712.03.03 Maryland Licensed Tree Expert (LTE). A LTE shall perform or directly supervise the Operations in conformance with the Maryland Roadside Tree Law, the Forest Conservation Act, and accepted arboricultural practices.



712.03.04 Meetings. Meet with the Engineer, the LTE, and the LOD to review areas, Operations, and the approved Breakdown List of Contract Prices before beginning Operations.

712.03.05 Marking. Identify trees to be pruned, and obtain approval before beginning Operations.

712.03.06 Equipment. Equipment and tools shall conform to accepted arboricultural practices.

712.03.07 Notice. Notify the Engineer at least 10 days before beginning Operations.

712.03.08 Operations. The Contract Documents will indicate the trees to be pruned or the dimensions or goals to be achieved by pruning. Meet ANSI A300 Standards for Tree Care Operations in conformance with one or more of the following Operations, or as specified:

- (a) **Cleaning.** To remove dead, diseased, and broken branches.
- (b) **Thinning.** To reduce the density of live branches; or to remove crossed branches or a codominant leader.
- (c) **Raising.** To provide vertical clearance to a height of 15 ft, or as specified in the Contract Documents.
- (d) **Reducing.** To decrease the height or spread.
- (e) **Specialty Pruning.** To meet the needs of young trees, at planting, once established, pollarding, for restoration, to maintain vistas, or to accommodate utilities.

712.03.09 Wood Chipping. Dispose of wood, or chip wood and disperse chips to a depth of 1 in. as directed.

712.03.10 Cleanup and Restoration. Avoid damage to existing structures, plants, and turfgrass. Keep turfgrass areas, paved surfaces and sidewalks clean. Restore ruts and damaged turfgrass areas by seeding in conformance with Section 705, or perform Turfgrass Sod Establishment in conformance with Section 708 when directed, before beginning any other landscape operations.

712.03.11 Damage Repair. Do not injure vegetation to be preserved. Repair injuries to bark, trunks, or limbs by cutting, smoothing, and tracing the bark in accordance with ANSI A300 Standards for Tree Care Operations.

712.03.12 Damage Compensation. Monetary compensation for damage or loss of trees will be calculated and assessed in conformance with the Guide for Plant Appraisal of the Council of Tree & Landscape Appraisers.



SPECIAL PROVISIONS INSERT
712 — TREE BRANCH PRUNING

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712.04 MEASUREMENT AND PAYMENT. Tree Branch Pruning will not be measured, but will be paid for at the Contract lump sum price based upon the Breakdown List of Contract Prices. The payment will be full compensation for all labor, material, equipment, tools, wood chipping, cleanup and restoration, damage repair, disposal fees and incidentals necessary to complete the work. If the Administration requests a change, the units and payment will be adjusted on the basis of the approved Breakdown List of Contract Prices.



**CATEGORY 700
LANDSCAPING**

SECTION 715 — TREE ROOT PRUNING

617 **DELETE:** Section 715 — Tree Root Pruning, in its entirety.

INSERT: The following.

SECTION 715 — TREE ROOT PRUNING

715.01 DESCRIPTION. Prune tree roots as indicated in the SP 700 Tree Preservation Program, or in the plans. Perform Tree Root Pruning within a Tree Preservation Area per Section 120 when specified.

715.02 MATERIALS.

Salvaged Topsoil	920.01.01
Furnished Topsoil	920.01.02

715.03 CONSTRUCTION.

715.03.01 General.

- (a) **Permits.** Obtain a Roadside Tree Permit from the Maryland Department of Natural Resources - Forest Service.
- (b) **Tree Preservation Program (TPP).** Adhere to the requirements of the TPP when developed by the Administration.
- (c) **Schedule.** Perform operations when soil moisture and weather conditions are suitable. Cease operations when conditions are not suitable.

715.03.02 Maryland Licensed Tree Expert (LTE). A LTE shall perform or directly supervise the Operations in conformance with the Maryland Roadside Tree Law, the Forest Conservation Act, and accepted arboricultural practices.

715.03.03 Meetings. Meet with the Engineer, the LTE, and the Landscape Operations Division before beginning Operations.

715.03.04 Utilities Marking and Conflicts. Refer to Section 875 when included in the Contract Documents.



SPECIAL PROVISIONS INSERT
715 — TREE ROOT PRUNING

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- (a) **Utilities Marking.** Contact ‘Miss Utility’ or another approved service to identify and mark utilities in the rights-of-way. Contact the District Utilities Engineer to mark utilities on Administration property.
- (b) **Conflicts.** Notify the Administration of conflicts that may affect operations. Conflicts will be reviewed by the Landscape Operations Division and resolved within 14 days after notice.

715.03.05 Marking. Mark areas to be root pruned, and obtain approval before beginning Operations.

715.03.06 Equipment. Use a vibratory knife or other equipment and tools that conform to accepted arboricultural practices.

715.03.07 Notice. Notify the Engineer at least 10 days before beginning Operations.

715.03.08 Operations. Meet ANSI A300 Standards for Tree Care Operations. Cleanly cut tree roots to a depth of 24 in. along the approved line, and immediately backfill trenches with excavated soil.

715.03.09 Cleanup and Restoration. Avoid damage to existing structures, plants, and turfgrass. Keep turfgrass areas, paved surfaces and sidewalks clean. Promptly remove, disperse, or dispose of wood debris and other waste materials as directed. Restore areas of root pruning, ruts and damaged turfgrass areas by seeding in conformance with Section 705, or perform Turfgrass Sod Establishment in conformance with Section 708 when directed, before beginning other landscape operations.

715.03.10 Damage Repair. Do not injure vegetation to be preserved. Repair injuries to bark, trunks, or limbs by cutting, smoothing, and tracing the bark in accordance with ANSI A300 Standards for Tree Care Operations.

715.03.11 Damage Compensation. Monetary compensation for damage or loss of trees will be calculated and assessed in conformance with the Guide for Plant Appraisal of the Council of Tree & Landscape Appraisers.

715.04 MEASUREMENT AND PAYMENT. Tree Root Pruning will be measured and paid for at the Contract unit price per linear foot. The payment will be full compensation for all labor, material, equipment, tools, cleanup and restoration, damage repair, disposal fees and incidentals necessary to complete the work.

CATEGORY 800
TRAFFIC

CATALOG CUTS AND WORKING DRAWINGS

DESCRIPTION. Prepare and transmit submittals to demonstrate the performance of the work in accordance with the Contract Documents. Submittal schedules, catalog cuts, shop drawings, installation methods, manufacturer's certifications, photometric data and working drawings shall be furnished on all Contractor furnished items for highway signing, sign lighting, highway lighting and traffic signals. Submit stakeouts of the sign locations for all sign structure locations, as specified in the Contract Documents.

MATERIALS. Not Applicable.

CONSTRUCTION.

Submittal Requirements. Schedule and Coordinate submittals with the Contractors construction schedule. Submit a complete submittal schedule and list of required submittals with the first submittal, but no later than three days after the pre-construction conference. Arrange the schedule for submission of submittals so that related equipment items are submitted concurrently.

The Engineer may require changes to the submittal schedule to permit concurrent review of related equipment. Submit shop drawings for closely related items such as a sign and ITS support structures together.

Submittal Documents. Provide drawings neat in appearance, legible and explicit to enable proper review. D size plans shall still be legible when reduced to one half size. They shall be complete and detailed to show fabrication, assembly and installation details, wiring and control diagrams, catalog data, pamphlets, descriptive literature, and performance and test data. They shall be accompanied by calculations or other sufficient information to provide a comprehensive description of the structure, machine or system provided and its intended manner of use. If drawings deviate from the Contract Documents, advise the Engineer in writing with the submittal and state the reason for the deviation.

No portion of the work requiring a Contractors drawing shall be started nor shall any materials be fabricated, delivered to the site, or installed prior to the approval or qualified approval of the drawings. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved Contractors drawings shall be at the Contractors risk. The Administration will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.

Shop drawings shall show types, sizes, accessories, layouts including plans, elevations and sectional views, component, assembly and installation details, and all other information required to illustrate how applicable portions of the Contract requirements will be fabricated and installed.

SPECIAL PROVISIONS
CATALOG CUTS AND WORKING DRAWINGS

SHA TRACKING NO. 15APMO015XX
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In case of fixed mechanical and electrical equipment, submit layout drawings drawn to scale, to show required clearances for operation, maintenance and replacement of parts. Provide manufacturers certified performance curves, catalog cuts, pamphlets, descriptive literature, installation and application recommendations, and indicate conformance to the Contract Documents. Certifications shall be originals. Certification shall also be sent to the Office of Materials and Technology (OMT) as required in the Contract Documents.

Provide manufacturer's catalog, product and equipment data that includes materials type, performance characteristics, voltage, phase, capacity, and similar data along with wiring diagrams, when applicable. Indicate catalog, model and serial numbers representing specified equipment. Provide complete component information to verify all specified required items. Installation recommendations and instructions shall provide written Manufacturer's detail step by step preparation and installation of the materials, and products including recommended tolerances and space for maintenance and operation.

Provide catalog cuts for sign luminaires with photometric data attached for each sign to be illuminated. Photometric printouts shall include the sign number, the illumination on a one foot square grid covering the entire sign face, the average illumination, the maximum to minimum uniformity ratio, and a working drawing for the sign face attached.

Catalog cuts for roadway luminaires shall have photometric data attached as specified in the Contract Documents.

Submit working drawings as required for changes, substitutions, contractor design items, and Contractor designed methods of construction. Requirements for working drawings will be listed in appropriate Specification Sections and in Special Provisions. Drawings shall be accompanied by calculations or other information to completely explain the structure, machine or system described and its intended use. Review and approval of such drawings by the Engineer shall not relieve the Contractor from his responsibility with regard to the fulfillment of the terms of the Contract.

Working drawings and calculations as submitted shall be sealed, dated and signed by a Professional Engineer registered in the State of Maryland.

The review and approval of Contractor's drawings by the Administration shall not relieve the Contractor from his responsibility with regard to the fulfillment of the terms of the Contract. The Contractor shall be responsible for the verification and accuracy of all dimensions and insuring that all Contractor furnished items are compatible, and conform to all design and performance criteria.

All risks of error and omission are assumed by the Contractor and the Engineer will have no responsibility therefor.

Submittal Process. Each drawing submitted shall have affixed to it the following Certification Statement, signed by the Contractor:

SPECIAL PROVISIONS
CATALOG CUTS AND WORKING DRAWINGS

SHA TRACKING NO. 15APMO015XX
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"By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and pertinent data and I have checked and coordinated each item with other applicable approved drawings and Contract requirements."

With the first submittal, include a submittal schedule, listing by Specification Section number, all submittals required and approximate date submittal will be forwarded.

Each submittal having catalog descriptions, shop drawings, working drawings, photometric data, manufacturer's certifications, method of construction and manufacturer's installation recommendations shall be submitted to:

Chief, Traffic Operations Division
Maryland State Highway Administration
7491 Connelley Drive
Hanover, Maryland 21076

Each submittal shall have a transmittal page that indicates the Contractor's and Subcontractor's address and phone numbers. Submittals containing multiple items need the transmittal only on the exterior of each package. For original submittals, and each subsequent resubmittal that may be required, 9 copies will be submitted for projects administered by the District, and 6 copies will be submitted for projects administered by Office of Traffic and Safety. A separate copy shall be forwarded to the Engineer.

All submittals for approval shall have the following identification data, as applicable, contained thereon or permanently adhered thereto.

- (a)** Drawing title, drawing number, TIMS number, TOD number, revision number, and date of drawing and revision.
- (b)** Applicable Contract Drawing Numbers and Specification Section and Paragraph Numbers.

SPECIAL PROVISIONS
CATALOG CUTS AND WORKING DRAWINGS

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The first page of every catalog description, working drawing and material certification shall be stamped in red with the following. All pertinent Contract Document information shall be filled in the spaces provided.

MARYLAND STATE HIGHWAY ADMINISTRATION	
SUBMITTAL PACKAGE # _____ DATED _____	
CONTRACT # _____ LOCATION _____	
PROJECT DESC. _____	
ITEM # _____ THIS ITEM CONTAINS _____ PAGES	
ITEM DESCRIPTION _____	
<input type="checkbox"/> ACCEPTED <input type="checkbox"/> ACCEPTED AS NOTED <input type="checkbox"/> REJECTED - REVISE & RESUBMIT	
REVIEWERS NAME _____	DATE _____

Indicate the submittal package by sequential numbering and date of submittal. Catalog, product data or brochure submittals containing various products, sizes and materials shall be underscored or highlighted to indicate the salient features required to meet the specifications. Likewise, items not applicable to the Contract shall be marked "not applicable" or crossed out.

If one or more of the items in a submittal are not approved, resubmittal of only the unapproved items is required, highlighted to show the particular item being resubmitted. Resubmittals shall bear original submittal number and be lettered sequentially.

Three copies of all Contractors drawings will be returned to the Contractor.

Each submittal shall be in accordance with the submission schedule. Allow thirty days for checking and appropriate action by the Engineer.

Contractors submittals will be returned, marked with one of the following classifications:

ACCEPTED: no corrections, no marks

ACCEPTED AS NOTED: a few minor corrections. Item shall be installed in accordance with the corrected drawings.

REJECTED - REVISE & RESUBMIT: requires corrections or is otherwise not in accordance with the Contract Documents. No items shall be fabricated. Correct and resubmit drawings as per original submission. Allow thirty days for checking and appropriate action by the Engineer.

MEASUREMENT AND PAYMENT. Catalog Cuts, Manufacturers Certifications, Photometric Data and Working Drawings will not be measured but the cost will be incidental to the pertinent items specified in the Contract Documents.

CATEGORY 800
TRAFFIC

COATING NEW GALVANIZED STRUCTURES

DESCRIPTION. Coat new galvanized steel structures, including exposed anchor bolts, flange bolts, nuts, and washers, as specified in the contract documents or as directed by the Engineer. Color will be as specified in the contract documents.

MATERIALS. Materials shall conform to one of the systems described below. All coatings in the system shall come from the same manufacturer. The Manufacturer shall be on the “Approved List of Manufacturers” maintained by the Office of Materials and Technology, Metals, Coatings and Structural Materials Team.

Colors shall conform to the following Federal Standards, or as specified in the contract documents.

Brown	Federal Standard Number 595a-20040
Black	Federal Standard Number 595a-27038
Green	Federal Standard Number 595a-24108

Paint System.

- (a) **Primer.** Shall be an Epoxy Polyamide meeting the requirements of Section 912.03.02 and must have a dry film thickness of 2 to 5 mils (50 to 125 μm).
- (b) **Finish Coat.** Shall be an Aliphatic Polyurethane meeting the requirements of Section 912.04.02 and must have a dry film thickness of 2 to 4 mils (50 to 100 μm).

Fusion Bonded Polyester Powder System (all Signal & Lighting Structures).

Polyester Powder. Polyester Powder shall meet the requirements of Section 917.

CONSTRUCTION.

Paint System.

Surface Preparation. Galvanized steel shall not be permitted to have been water or chromate quenched. The surface shall be solvent cleaned per SSPC SP-1 using a non-residue solvent and a lint free cloth. The surface shall also be brush off blasted per SSPC SP-7 using Grit. Any damaged areas shall be repaired according to ASTM A-780. If repair is made using an Organic Zinc Rich primer, the primer shall conform to Section 912.02.03.

SPECIAL PROVISIONS
COATING NEW GALVANIZED STRUCTURES

SHA TRACKING NO. 15APMO015XX
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Paint Application. Following the brush off blasting and prior to the application of the prime coat, store each item in an environment free of moisture and dust. Apply the primer within twelve (12) hours of brush off blasting and in accordance with the manufactures recommendation.

Once the primer has properly cured, apply the finish coat in accordance with the manufacturers recommendations.

The finished painted surface shall be holiday free when tested with a low voltage holiday detector (minimum 30 volts) similar to a K – D Bird Dog, using regular tap water. If holidays are detected, the coatings could be repaired with additional coatings or they may be stripped and repainted at the Contractor’s expense.

Fusion Bonded Polyester Powder System.

Surface Preparation. Prepare the galvanized surface by solvent cleaning conforming to SSPC SP-1, followed by brush off blast cleaning conforming to SSPC SP-7 using grit. The blast profile shall be 2 to 3 mills as determined in conformance with D 4417, method C. When blast cleaning exposes bare steel, spot prime the bare steel with an Organic Zinc Rich Coating in conformance with A 780. Apply the polyester powder within 24 hours of surface preparation.

Application. Apply fusion bonded polyester powder per manufacturers recommendations.

MEASUREMENT AND PAYMENT. Coating New Galvanized Structures will not be measured and paid, but the cost will be incidental to the contract item. The payment will be full compensation for all material, labor, equipment, tools and incidentals necessary to complete the work.

SPECIAL PROVISIONS
GALVANIZED TRAFFIC SIGNAL PEDESTAL POLES
AND TRANSFORMER BASES

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CATEGORY 800
TRAFFIC

GALVANIZED TRAFFIC SIGNAL PEDESTAL POLES AND TRANSFORMER BASES

DESCRIPTION. Furnish and install galvanized traffic signal pedestal poles and transformer bases at locations specified in the Contract Document or as directed by the Engineer.

MATERIALS. Design shall meet 2001 edition of AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, except as noted. All welding shall conform to American Welding Society (AWS) Structural Welding Code D1.1 Steel, Tubular Structures.

Determine each pedestal pole's height by the total height of the pedestal pole including the transformer base.

- (a) 10 ft pole height consists of a 103 in. steel shaft with a steel base plate plus a 17 in. transformer base.
- (b) 14 ft pole height consists of a 151 in. steel shaft with a steel base plate plus a 17 in. transformer base.
- (c) 20 ft pole height consists of a 240 in. steel shaft with a steel base plate plus a 17 in. transformer base.

Each pedestal pole furnished shall consist of a design from a steel shaft with a steel base plate, transformer base and all miscellaneous hardware.

- (a) The pedestal pole shaft shall be fabricated of one length and shall have one longitudinal weld, parallel to the long axis of the pedestal pole shaft, with no transverse welds. The longitudinal weld shall be finished to form a smooth outside surface and the wall of the pedestal pole shaft shall be uniform in thickness including the welded area. The pedestal pole shaft shall be round or multi-sided (less than eight sides not acceptable) in cross section. 14 ft units shall be uniformly tapered from butt to tip with a 1 in. reduction in diameter for each 7 ft in length (0.14 in./ ft). 10 ft unit shall not be tapered.
 - (1) 10 ft pedestal pole shaft shall be 4-1/2 in. outside diameter, Schedule 40 pipe, and conform to A 501.
 - (2) All 14 ft pedestal poles shall be 7-1/2 in. outside diameter at the base and shall be made of 11 gauge (0.119 in.) thickness steel conforming to A 595, Grade A or equivalent.
 - (3) All 20 ft pedestal poles shall be 7-1/2 in. outside diameter at the base and shall be

SPECIAL PROVISIONS
GALVANIZED TRAFFIC SIGNAL PEDESTAL POLES
AND TRANSFORMER BASES

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made of 3 gauge (0.25 in.) thickness steel conforming to A 595, Grade A or equivalent.

- (b) The base plate material shall meet the requirements of A 709, Grade 36. Secure the base plate to the lower end of the pedestal pole shaft by two continuous electric arc welds. The base plate shall telescope the pedestal pole shaft with one weld on the inside of the base plate at the end of the pedestal pole shaft. The remaining weld shall be located on the outside of the base plate at the top of the pedestal pole shaft. The weld connection shall develop the full strength of the adjacent pedestal pole shaft to resist bending action. All bases plate shall be fabricated with the holes for anchor bolts to the size and location dimensions as shown in MD-818.16 and 818.17.
- (c) Furnish 14 ft pedestal poles with entrance ways for cable as noted in the contract documents. These holes shall be factory drilled and a straight tapped coupling, conforming to Underwriters Laboratory's UL-6 Specification, for 2 in. rigid conduits, shall be installed for each hole. A nipple with a unitized hexagonal fitting and integral inside radius on one end shall then be installed and fully seated on the interior side of the coupling. Location and installation of the coupling shall be as shown in MD-818.17.
- (d) All pedestal poles and hardware, except materials manufactured from stainless steel or cast aluminum, shall be hot dipped galvanized. The galvanized coating shall conform to the thickness, adherence and quality requirements of A 123 and A 153 for hardware. Threaded components shall be chased and cleaned after galvanizing. All internally threaded components shall be tapped oversize the minimum amount required to permit assembly on the coated externally threaded fastener. Internally threaded components shall be provided with a lubricant which shall be clean and dry to the touch.
- (e) Furnish each pedestal pole with a removable domed cap, fabricated from cast aluminum, circumferentially attached to the side of the pole with three hex head type 304 stainless steel bolts (1/4 in. – 20 UNC).
- (f) Each pedestal pole shall have an identification plate mechanically attached 6 in. above the pedestal pole base plate and oriented so that the identification plate may be read from a ground observation position.
- (g) Recessed hub type, galvanized malleable iron plugs shall be inserted flush into all couplings.

Transformer Bases.

- (a) All transformer bases shall be approved by FHWA as meeting breakaway under NCHRP 350.
- (b) Furnish each transformer base with four hex head bolts, four hex head nuts and all

SPECIAL PROVISIONS
GALVANIZED TRAFFIC SIGNAL PEDESTAL POLES
AND TRANSFORMER BASES

SHA TRACKING NO. 15APMO015XX

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associated hardware as shown on the appropriate detail for fastening the pedestal pole base plate to the top of the transformer base. All bolts shall conform to A 325 specifications and shall be galvanized.

Anchor Bolts.

- (a) Each pedestal pole anchor bolt shall be made of steel conforming to M 314, Grade 55 S1
- (b) Anchor bolt threads shall be of cut thread design with a minimum 6 in. of threads at the top.
- (c) The template and anchor plates shall be as shown on MD 801.01.
- (d) The diameter of the anchor bolt shall be stamped into the top of the threaded end of each anchor bolt.
- (e) Each anchor bolt shall be provided with two attached heavy hex nuts and two attached flat washers.
 - (1) Anchor bolt nuts shall conform to A 194, grade 2 or 2H, or A 563, D or DH.
 - (2) All nuts shall be tapped oversize the minimum amount required to permit assembly on the coated externally threaded fastener.
 - (3) Washers shall conform to F 436.
- (f) All nuts, washers, and the top 12 in. of all anchor bolts shall be hot dipped or mechanically galvanized. The galvanized coating shall conform to the thickness, adherence and quality requirements of A 123 or A 153 for hardware.

All high strength bolts (of a given length), nuts (of a given size) and washers (of a given diameter) shall be from the same manufacturing lot per each requisition of materials. The use of foreign made fasteners is prohibited.

CONSTRUCTION. Refer to 818.03

MEASUREMENT AND PAYMENT. Galvanized Traffic Signal Pedestal Poles and Transformer Bases will be measured and paid for at the Contract unit price per each type of pole and base furnished and installed. The payment will be full compensation for furnishing and installing pedestal poles, breakaway base and all materials, labor, equipment, tools and incidentals necessary to complete work.

Anchor bolts will be measured and paid for as specified in Section 801.

SPECIAL PROVISIONS
GALVANIZED TRAFFIC SIGNAL PEDESTAL POLES
AND TRANSFORMER BASES

SHA TRACKING NO. 15APMO015XX

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Tag Detail.

Mfg: _____ ^[1] Contract #: _____ ^[2]
Pole Diameter: _____ ^[3] Height: _____ ^[4] Gauge: _____ ^[5]
Anchor Bolts: _____ ^[6] Bolt Circle: _____ ^[7]

Tag Reference.

- [1] Name of the manufacturer of the pedestal pole.
- [2] Administration Contract Number of the pedestal pole.
- [3] Pole outside diameter at the base: 4-½ in. O.D. or 7-½ in. O.D.
- [4] Pole height¹: 10ft' , 14ft, 20 ft
- [5] Pole gauge: Schedule 40 or 11 GA
- [6] Anchor bolt size: 1 in. Dia. x 40 in. Length
- [7] Bolt circle diameter: 11 in. Dia.

Pole height includes the height of the pedestal pole and transformer base. Typically, the transformer base is 17 in. in height which corresponds to 10 ft pole having a height of 103 in.; and a 14 ft having a height of 151 in.

SPECIAL PROVISIONS
SIGNAL EQUIPMENT TURN ON, PICK UP, REMOVAL
AND MAINTENANCE

SHA TRACKING NO. 15APMO015XX

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CATEGORY 800
TRAFFIC

SIGNAL EQUIPMENT TURN ON, PICK UP, REMOVAL AND MAINTENANCE

DESCRIPTION. Pick up of Administration furnished materials, remove existing equipment, and maintain existing equipment as specified in the Contract Documents or as directed by the Engineer.

MATERIALS. Not applicable

CONSTRUCTION.

Equipment Turn On. Notify the Engineer and Traffic Operations Division representatives within 10 working days prior to completion of the project to allow the Administration to install any additional traffic control device.

Notify the Engineer and Traffic Operations Division representative five working days prior to the completion of the project to schedule a final inspection and turn-on.

Stakeout, with the Engineer present, the proposed construction as indicated on the plan.

Pick-Up of Administration Furnished Materials. Notify the appropriate OOTS warehouse a minimum of 72 hours in advance of the anticipated pick up or delivery of materials. The OOTS signal and sign warehouses are located at:

7491 Connelley Drive
Hanover, Maryland 21076
Signal Phone 410-787-7667
Sign Phone 410-787-7670

The Contractor shall be responsible for the transportation, labor, equipment, tools and incidentals necessary to obtain and load any Administration furnished materials.

Materials not furnished by the Administration shall be furnished by the Contractor.

Removal and Disposal of Existing Material and Equipment. Remove concrete foundations specified in 207.03.01. All holes caused by this removal shall be backfilled, compacted and restored to surrounding conditions.

Remove all existing hard rubber detectors and handholes not shown on the Plans. The holes shall be backfilled, compacted and restored to surrounding conditions. The sidewalk where handholes are removed shall be reconstructed to the nearest tooled joint or expansion joint. The roadway where hard rubber detectors are removed shall be reconstructed in conformance with

SPECIAL PROVISIONS
SIGNAL EQUIPMENT TURN ON, PICK UP, REMOVAL
AND MAINTENANCE

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Administration utility patch repair standards.

Disconnect existing inductive loop detectors and magnetic detectors not shown on the plans.

Dispose of all material not salvaged. Non-galvanized green painted structures may contain lead and the contractor will be responsible for proper disposal of such material.

Storage of Materials. Materials shall be bundled, stored, and protected in conformance with the manufacturers recommendations or as approved by the Engineer.

Maintenance of Materials and Equipment. The maintaining agency will continue maintenance of any existing signals until the Contractor places new equipment into operation.

When the work requires adjustments to the traffic control devices to maintain the minimum Administration standards, the adjustments to the traffic control devices shall be made within 4 hours of verbal notification by the Engineer. Failure to comply with this time period will result in the Administration performing adjustment and deducting the cost of the adjustment from the Contractor's payment.

Existing signals shall remain in their original condition until the new signals have been completed, satisfactorily tested and its operation accepted by the Engineer.

Maintain the continuous operation of all vehicular and pedestrian detectors. If any detector is damaged by the Contractor, it shall be repaired within 72 hours after notification by the Engineer.

All traffic signals and existing interconnect cable shall be operational and actuated as specified in the Contract Documents.

Plan the work to minimize interference with any existing traffic control device.

MEASUREMENT AND PAYMENT. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work for one or more of the items specified in the Contract Documents.

Equipment Turn On. Equipment Turn On will not be measured but the cost will be incidental to other pertinent items specified in the Contract Documents.

Pick-Up of Administration Furnished Materials. Pick-up of Administration Furnished Materials will not be measured but the cost will be incidental to other pertinent items specified in the Contract Documents.

Removal and Disposal of Existing Signal Material and Equipment. Removal and Disposal of Existing Signal Material and Equipment will be measured and paid for at the Contract unit lump sum price.

SPECIAL PROVISIONS
SIGNAL EQUIPMENT TURN ON, PICK UP, REMOVAL
AND MAINTENANCE

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Maintenance of Existing Signal Equipment. Materials storage, cable sealing and handling, adjustments to maintain minimum Administration standards on existing signals made necessary by new signal or geometric modifications and Contractor repair of any damaged detector caused as a result of Contractors error will not be measured but the cost will be incidental to other pertinent items specified in the Contract Documents.

CATEGORY 800
TRAFFIC

LED TRAFFIC SIGNAL MODULES

DESCRIPTION. Furnish and install self-contained LED signal head modules to be used in place of the incandescent lamp, reflector, socket, gasket, and lens assembly of standard vehicle signal sections, as specified in the Contract Documents or as directed by the Engineer.

MATERIALS. Manufacturers of red and green 8 in. and 12 in. LED traffic signal modules are required to file a statement with the Maryland Energy Administration, certifying that each signal to be sold or offered for sale in Maryland is in compliance with the State's energy efficiency standard. Information on this requirement can be found at the Maryland Energy Administration's website.

The modules shall employ a lens assembly that presents an appearance that is similar to those found on standard incandescent signals.

Provide LED signal heads, and all component parts that meet the latest edition of the National Electrical Manufacturers Association (NEMA). In addition, LED signals shall meet the requirements set forth in the most recent, formally-adopted version of the specification titled "Vehicle Traffic Control Signal Heads - Part 2: Light Emitting Diode (LED) Vehicle Traffic Signal Modules," published by the Institute for Transportation Engineers (ITE).

- (a) The manufacturer must certify all signals meet or exceed all requirements of that specification over their entire 5-year warranty period.
- (b) Permanently identify serial numbers and model numbers, if available, on all removable components and hardware. The serial number and model number shall be etched, stamped, molded, or attached using metallic self-adhesive labels. The use of adhesive backed paper labels is not acceptable.

CONSTRUCTION. LED modules shall fit in standard, incandescent vehicle traffic signal housings without modifications or the need for special tools, and shall be complete with a one-piece, integral lens assembly that is tinted for the appropriate color.

Design. LED traffic signal modules shall have:

- (a) A printed circuit board inclusive of all of the LEDs and required circuit components.
- (b) Minimum 39 in. wire leads, minimum # 20 AWG, 600 volt, 105 C, with strain relief and spade terminals. Screw-type terminals shall not be allowed.
- (c) A rigid housing for protection in shipping, handling and installation.

- (d) A one piece neoprene gasket shall be used to seal out water and contaminants.

Assembly Techniques.

- (a) The LEDs within the modules shall be mounted and soldered to a printed circuit board.
- (b) LED signal modules shall be watertight when properly installed in traffic signal housings.
- (c) LED signal modules shall utilize the same mounting hardware used to secure a standard incandescent lens and gasket assembly, and shall only require a screwdriver or basic installation tools to complete the mounting.
- (d) LED signal module assemblies shall weigh less than 5 lb.
- (e) LED signal modules may not protrude into the signal visor area more than two and three-quarters of an in. in depth.
- (f) LED signal modules shall be marked 'TOP' or have an up arrow to designate the proper orientation of the signal module in the traffic signal housing.
- (g) LED signal module housings shall utilize an integral metal layer in their design and construction.
- (h) LED signal modules shall utilize the latest technology in thermal management.

Lenses. Make lenses for ball type modules of ultraviolet stabilized polycarbonate, and incorporate facets that serve to enhance the optical efficiency of the LED traffic signal module. Individual lens-lets or external lens facets shall not be permitted.

- (a) The ball type signals shall incorporate a diffuser-type lens system that serves to collimate the light emitted by the LEDs. The lens and diffuser system shall focus the collimated light, to meet ITE intensity and distribution standards.
- (b) LED signals shall almost perfectly approximate the appearance of an incandescent traffic signal to the motorist.
 - (1) The face of the ball LED lamps shall appear to the motorist as uniform in illumination, and have a wide viewing angle that makes it suitable for installation on wide boulevards.
 - (2) The external lens surface for all vehicle signals shall be smooth, with no raised features, so as to minimize the collection of dirt, diesel smoke, and other particulate contaminants, and to facilitate periodic cleaning.

- (3) The lens shall be keyed to the housing of the LED signal module to insure the proper orientation and to avoid possible rotation during any handling.
- (4) Hard coat external lenses to prevent an accumulation of dust and dirt.
- (5) For LED turn arrow signals, the LED arrow lens may be a replaceable part without the need to replace the complete LED arrow.

Optical. The light intensity, chromaticity, and distribution from eight and twelve-in. red and green, and eight-in. yellow LED traffic signal modules shall meet all photometric values stated in the most recent, formally-adopted version of the specification titled “Vehicle Traffic Control Signal heads – Part 2: Light Emitting Diode (LED) Vehicle Traffic Signal Modules,” published by the Institute for Transportation Engineers (ITE). Twelve-in. Yellow LED traffic signal modules shall meet the chromaticity requirements of the most recently-adopted ITE specification, with a minimum intensity of 1,500 candelas.

- (a) Red and Green LED signals shall be certified by the manufacturer to meet or exceed all requirements of that specification over their entire 5-year warranty period.
- (b) The light output from twelve-in. Yellow LED signals shall be the peak instantaneous intensity, measured at instant-on and at the highest intensity point.

Design.

- (a) Connect the LEDs in series-parallel strings.
 - (1) No more than 1 percent of the total luminosity of the entire signal module may be lost in the event of a single string failure.
 - (2) The failure of a single LED shall cause loss of light from only that LED.
 - (3) No loss of light output from the complete module assembly shall occur as a result of a single LED failure.
- (b) The control circuitry shall prevent the current flow through the LEDs in the off state to avoid any false indication as may be perceived by the human eye, during daylight and evening hours.
 - (1) The LED traffic signal module shall be operationally compatible with NEMA TS – 1 and NEMA TS – 2 conflict monitoring parameters.
 - (2) The intensity of the LED signal module shall not vary by more than 10 percent over the allowable voltage range as specified in the electrical section below.

Electrical.

- (a) The Power factor shall be 0.90 or greater, at nominal rated voltage, at 25°C, after 60 minutes of operation.
- (b) Total harmonic distortion (THD) shall be less than 20 percent at rated voltage, at 25°C.
- (c) All LED traffic signal modules shall be in compliance with FCC noise regulations and must meet the FCC Title 47, SubPart B Section 15 regulation.
- (d) The LED junction technology used in all signal modules shall not exhibit degradation of more than 30 percent of the modules' initial light intensity following accelerated life testing (operating at 85 degrees C and 85 percent humidity, for 1000 hours). Under no circumstances shall AlGaAs technology be acceptable.
- (e) The LED signal modules shall be connected directly to line voltage, 120 Volts AC nominal, and shall be able to operate over the voltage range of 80 VAC to 135 VAC.
- (f) Red and Green LED traffic signal modules shall consume no more than a nominal 15 watts for either the 8 in. or 12 in. signal. Yellow signal modules shall consume no more than 24 watts.
- (g) Transient voltage suppression rated at 1500 watts for 1 millisecond and fusing with a maximum rating of 2 amps shall be provided to minimize the effect and repair cost of an extreme over voltage situation or other failure mode.
- (h) Low Voltage Turn OFF: There shall be no visible illumination from the LED signal module when the applied voltage is less than 50 VAC.
- (i) Turn-ON and Turn-OFF Time: A module shall reach 90 percent of full illumination (turn-ON) within 75 msec of the application of the nominal operating voltage. The signal shall cease emitting visible illumination (turn-OFF) within 75 msec of the removal of the nominal operating voltage.

Compatibility Testing. The LED module manufacturer shall certify that their modules meet the Load Switch and Signal Conflict Monitor Compatibility testing requirements found in the most recent, formally-adopted version of the specification titled "Vehicle Traffic Control Signal heads - Part 2: Light Emitting Diode (LED) Vehicle Traffic Signal Modules," published by the Institute for Transportation Engineers (ITE).

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LED TRAFFIC SIGNAL MODULES

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Electronic Failure Protection. To assure compatibility with NEMA TS1/TS2 controllers for both conflict monitoring and Red Fail, all signal colors (Red, Yellow, and Green) once energized, must turn off prior to 50 VAC, and if the signal fails it shall present a high impedance on the input side of the signal.

Warranty. Manufacturers shall provide a written with the following minimum provisions:

- (a) Modules shall be replaced, repaired or purchase value refunded if the module fails to function as intended due to workmanship or material defects within the first 60 months from the date of delivery.
- (b) Modules which exhibit luminous intensities less than the minimum specified values within the first 60 months of the date of delivery shall be replaced, repaired or purchase value refunded.

Miscellaneous. The manufacturers part number, date code, and electrical characteristics of the LED signal module shall be visible on the rear of the assembly.

MEASUREMENT AND PAYMENT. LED Traffic Signal Modules will be measured and paid for at the contract unit price per each. The payment will be full compensation for the LED module, hardware, assembly, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

CATEGORY 800
TRAFFIC

IP BASED VIDEO TRAFFIC DETECTION CAMERAS

DESCRIPTION. Furnish and install self contained internet protocol (IP) based video detection cameras that monitor vehicles on a roadway via the machine vision processing of color video images, and provide outputs to a traffic controller or similar device, as well as streaming MPEG-4 video over a common ethernet connection, as specified in the Contract Documents or as directed by the Engineer.

MATERIALS. Provide video traffic detection cameras, cabinets, and all component parts that meet the latest edition of the National Electrical Manufacturers Association (NEMA) Standards and Underwriters Laboratory (UL), as applicable. Provide ISO 9002 and CE certified camera components. Use the advertising date of this Contract to determine the date of the applicable standards.

If available, permanently engrave serial numbers and model numbers on all removable components and hardware. Etch, Stamp or mold the serial number and model number. The use of adhesive backed labels is not acceptable.

CONSTRUCTION. Provide video detection cameras that consist of an IP based video camera and a 3-conductor power cable that carries both power to the camera, and video and data signals back to Administration installed video processing equipment in the controller cabinet. The cabinet equipment permits direct connection to the signal controller via a 10/100 Ethernet connection and the industry standard TCP/IP communications protocol, or to contact-closure hardwired devices.

Features.

- (a) Built-in IP based addressing with a unique Ethernet MAC address. No plug-in devices or cards shall be necessary.
- (b) Web-server interface and network connection via standard CAT-5 cable.
- (c) Easy locking connector that allows technicians/installers to pull power cable either up or down a pole without splicing
- (d) Zoom configuration is conducted at the cabinet.
- (e) MPEG-4 streaming video via any standard digital video player, with viewing rates of 5 fps to 30 fps, depending on bandwidth.

- (f) An access point in the cabinet that provides standard NTSC or PAL full-motion video output to an analog video monitor.
- (g) Internet browser interface with common Internet browsers for password-protected access over the internet. The embedded web server capability shall enable access to streaming video, configuration editing, and camera monitoring via the Internet.
- (h) Dual core processor with DSP image processing and ARM general-purpose processing.
- (i) Direct real-time iris and shutter speed control.
- (j) Non-volatile memory data storage.

Camera Hardware. Supply hardware that consists of a color video image processing camera, and a 3-wire control & data transfer cable for signal control and streaming MPEG-4 video image transfer.

Machine Vision Processor (MVP). Provide MVP camera that is an integrated imaging color CCD array with zoom lens optics, high speed, dual-core image processing hardware bundled into a sealed enclosure.

- (a) The CCD array shall be directly controlled by a dual-core processor, thus providing high-quality video for detection that has virtually no noise to degrade detection performance.
- (b) It shall be possible to zoom the lens as required for setup and operation.
- (c) The MVP shall provide JPEG video compression as well as standard MPEG-4 digital streaming video with flashing detector overlay.
- (d) The MVP shall provide direct real-time iris and shutter speed control.
- (e) The MVP camera shall be equipped with an integrated 22x zoom lens that can be changed using either configuration computer software.
- (f) The digital streaming video output and all data communications shall be transmitted over the three-wire power cable.
- (g) The MVP camera shall operate on 120/220 VAC, 50/60 Hz, with a maximum wattage of 25 watts.
 - (1) The camera and processor electronics shall consume 10 watts.
 - (2) The enclosure heater shall consume 15 watts.

MVP Lens.

- (a) Low-power thermostatically-controlled ITO faceplate.
- (b) Built-in heater.
- (c) Hydrophilic faceplate coating to shed water.
- (d) Weatherproof rear connector (IDC rapid termination industrial connector).
- (e) The lens shall be available in a standard configuration or wide-angle.
- (f) The focal length shall be 4.1mm to 87.8mm.

Detection Zone Programming. Placement of detection zones shall be by means of a portable or desktop computer using the Windows XP, or Vista operating system, a keyboard, and a mouse.

- (a) The PC monitor shall be able to show the detection zones superimposed on images of traffic scenes.
- (b) The mouse and keyboard shall be used to draw detection zones on the PC monitor. It shall be possible to:
 - (1) Download detector configurations from the PC to the MVP camera and cabinet interface module.
 - (2) Retrieve the detector configuration that is currently running in the MVP camera.
 - (3) Back up detector configurations by saving them to the PC fixed disks or other removable media storage.
- (c) The supervisor's mouse and keyboard shall be able to:
 - (1) Edit previously defined detector configurations.
 - (2) Adjust the detection zone size and placement.
 - (3) Add detectors for additional traffic applications.
 - (4) Reprogram the camera for different traffic applications, changes in installation site geometry, or traffic rerouting.
 - (5) Perform the above upload, store, and retrieve functions for video snapshots of the MVP cameras view.

Optimal Detection. Provide video detection camera that provides optimal detection of vehicle passage and presence when the:

- (a) The MVP camera is mounted 10 m (30 ft) or higher above the roadway.
- (b) The image camera is adjacent to the desired coverage area.

- (c) The distance to the farthest detection zone locations is not greater than 10 times the mounting height of the MVP camera.
- (d) The deployment geometry provides an unobstructed view of each traveled lane where detection is required. Although optimal detection may be obtained when the MVP camera is mounted directly above the traveled lanes, the MVP camera shall not be required to be directly over the roadway.
- (e) The MVP camera is able to view either approaching or receding traffic or both in the same field of view. The preferred image camera orientation for optimal detection shall be to view approaching traffic since there are more high contrast features on vehicles as viewed from the front rather than the rear.
- (f) The MVP camera, when placed at a mounting height that minimizes vehicle image occlusion and equipped with a lens to match the width of the road, is able to monitor a maximum of 7 traffic lanes when mounted at the roadside, or up to 8 lanes when mounted in the center with four lanes on each side.

18-Gauge Camera-to-Cabinet Cable. The cable between the MVP and the cabinet interface shall consist of three conductors 18 AWG, with an overall UV-resistant low density polyethylene jacket.

(a) Conductors.

- (1) Three, 18 AWG, 19 strands of 30 gauge tin-plated copper conductor diameter .046”/.052”.
- (2) Extruded polyethylene 200 conductor insulation, with nominal .030” wall thickness.
- (3) Black, green, and white colors.

(b) Construction.

- (1) Extruded black polyethylene jacket .040”/.050” wall thickness, UV-resistant.
- (2) 0 .330” - .354” maximum outside diameter.
- (3) 600 volt (rms) rated.
- (4) The cable shall be imprinted with the manufacturer’s part number, number of conductors, conductor size, voltage rating, jacket material, and an indication that it is conduit rated.

Count Detection Performance. Using a MVP camera installed within the optimal viewing specifications described above for count station traffic applications; the camera shall be able to accurately count vehicles with:

- (a) At least 98 percent accuracy under normal operating conditions (day and night).

- (b) At least 93 percent accuracy under artifact conditions. Artifact conditions are combinations of weather and lighting conditions that result from shadows, fog, rain, snow, etc. The volume count shall be:
 - (1) Accumulated for the entire roadway (all traveled lanes).
 - (2) Accumulated over time intervals that contain a minimum of one hundred (100) vehicles to ensure statistical significance.

Demand Presence Detection Performance. Using a MVP camera installed within the optimal viewing specifications described above for intersection control traffic applications; the camera shall be able to accurately provide demand presence detection.

- (a) The demand presence accuracy shall be based on the ability to enable a protected turning movement on an intersection stop line, when a demand exists.
- (b) The probability of not detecting a vehicle for demand presence shall be less than 1- Percent error under all operating conditions.
- (c) In the presence of artifact conditions, the MVP camera shall minimize extraneous (false) protected movement calls to less than 7 percent.
- (d) To ensure statistical significance, the demand presence accuracy and error shall be calculated over time intervals that contain a minimum of 100 protected turning movements performance specifications shall be achieved with a minimum of 2 presence detectors coupled with a single detector function (Type-9) to provide adequate road coverage to sample the random arrival patterns of vehicles at the stop line.
- (e) The calculation of the demand presence error shall not include turning movements where vehicles do not pass through the presence detectors, or where they stop short or stop beyond the combined detection zones.

Speed Detection Performance. The MVP shall accurately measure average (arithmetic mean) speed of multiple vehicles with more than 97 percent accuracy under all operating conditions for approaching and receding traffic.

- (a) The average speed measurement will include a minimum of 100 vehicles in the sample to ensure statistical significance.
- (b) Optimal speed detection performance requires that camera location conform to the specifications described above for count station traffic applications with the exception that the camera must be higher than 13 m (40) ft.
- (c) The MVP will accurately measure individual vehicle speeds with more than 94 percent accuracy under all operating conditions for vehicles approaching the camera

(viewing the front end of vehicles), and more than 90 percent accuracy for vehicles receding from the camera (viewing the rear end of vehicles).

- (d) These specifications will apply to vehicles that travel through both the count and speed detector pair and will not include partial detection situations created by lane-changing maneuvers.
- (e) To ensure statistical significance, the average speed accuracy and error will be calculated over time intervals that contain a minimum of one hundred vehicles.

Modular Cabinet Interface Unit (Access Point). The modular cabinet interface unit will be furnished and installed by the Administration. This section is for reference only.

The modular cabinet interface unit shall communicate directly with up to eight (8) MVP cameras and shall comply with the form factor and electrical characteristics to plug directly into a NEMA type C or D detector rack providing up to thirty-two (32) inputs and sixty-four (64) outputs or a 170 input file rack providing up to sixteen (16) contact closure inputs and twenty-four (24) contact closure outputs to a traffic signal controller.

(a) Additional Features.

- (1) Easy IP addressable Ethernet connectivity using RJ-45 connectors.
- (2) USB 2.0 connector for a USB mouse.
- (3) Provides PAL or NTSC analog video output for MPEG-4 streaming digital video.
- (4) Detector rack or shelf mount installation.
- (5) 1500 volts RMS isolation between rack logic ground and street wiring.
- (6) Emulates the function of up to 4 TS2 Bus Interface Units (BIU).
- (7) Self diagnostics on power-up.
- (8) High-energy transient protection.

(b) Power: 12 to 24 VDC, 11W maximum.

(c) Environmental.

- (1) Temperature: -34° C to +74° C (-29° F to +165° F).
- (2) Relative Humidity: 0 to 95 Percent.

(d) Dimensions and Weight.

- (1) 114 mm H x 59 mm W x 175 mm L (4.5 in H x 2.34 in W x 6.9 in L)
- (2) Weight: 0.5 lb.

(e) Complies with: CE EN 55022, EN 61000-6-1 FCC Part 15, Class A.

Communications Interface Panel. The communications interface panel will be furnished and

installed by the Administration. This section is for reference only. The communications interface panel shall have the following features:

- (a) Four (4) sets of three (3) electrical terminations for three-wire cables for powering up to eight (8) MVP cameras.
- (b) High-energy transient protection to electrically protect the modular cabinet Interface unit and connected MVP cameras.
- (c) Single-point Ethernet connectivity via RJ45 connector for communication to and between the modular cabinet interface module and the MVP cameras.
- (d) Predefined wire termination blocks for MVP power connections.
- (e) A Broadband-Over-Power-Line (BPL) transceiver that supports up to 10 MB/s inter-device communications.
- (f) An interface connector to cable directly to the modular cabinet interface unit.
- (g) The option of using either 110/220 VAC 50/60 Hz power.
- (h) Fuse protection using SLO-BLO, 1/2 amp fuses.

Installation and Training. The supplier of the video detection camera shall supervise the installation and testing of the video detection camera and any optional computer equipment.

Warranty, Maintenance and Support. The video detection camera shall be warranted by its supplier for a minimum of 2 years.

Documentation. The equipment supplier shall deliver a CD containing operating manuals, service manuals, and maintenance instructions for the video traffic detection camera being supplied to the Administration's Office of Traffic & Safety, Signal Operations Division, located at 7491 Connelley Drive, Hanover, Maryland 21076. The phone number is 410-787-7650.

MEASUREMENT AND PAYMENT. IP Based Video Traffic Detection Cameras will be measured and paid for at the contract unit price per each. The payment will be full compensation for furnishing and installing the video traffic detection camera, equipment specified, all mounting hardware, including camera support to structure, 3 conductor cable from the camera to the controller cabinet, labor, and all incidentals necessary to complete this work.

The communications interface panel, modular cabinet interface unit, and all other cabinet equipment will be furnished and installed by the Administration.

CATEGORY 800
TRAFFIC

**RELOCATE EXISTING SIGNAL OR SIGN
ON SIGNAL STRUCTURE**

DESCRIPTION. This work shall consist of Relocating Existing Signal Heads Assemblies and or Signs on Signal Structures as specified in the Contract Documents or as directed by the Engineer and replacing existing mounting hardware.

MATERIALS. Not applicable

CONSTRUCTION.

The Contractor shall be responsible for maintaining the existing signals and signs by relocating equipment during phases of the Maintenance of Traffic. The work shall include relocating Traffic Signal Head Assemblies and Relocating Existing Signs On Signal Structures.

Relocate Signal Head Assembly shall consist of relocating all signal head indications connected in one assembly, rerouting and resealing all cables connected to the signal head assembly; and insuring the signal heads are aimed and working correctly. All mounting hardware shall be replaced.

Relocate Signs on Signal Structures shall consist of relocating one sign to different location on the same signal structure or span wire. All mounting hardware shall be replaced.

The Contractor along with the Engineer shall coordinate the equipment locations in accordance to the Contract Documents or at the Direction of the Engineer.

The Contractor shall plan the work to minimize interference with any existing traffic control device.

MEASUREMENT AND PAYMENT. The payment shall include replacement of mounting hardware and shall be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Relocate Traffic Signal Head Assemblies will be measured and paid for at the contract unit price per each.

Relocate Signs on Signal Structures shall be measured and paid for at the contract unit price per square foot.

Relocation of signs not mounted on signal structures will be measured and paid for as specified in the contract documents under Section 822.

CATEGORY 800
TRAFFIC

UTILITY CONNECTIONS AND UTILITY STAKEOUT

DESCRIPTION. Provide utility connections, and utility stakeout, as specified in the Contract Documents or as directed by the Engineer.

MATERIALS.

Disconnect Switches and Utility Connections 950.13.10

CONSTRUCTION. Arrange a meeting with the utility company representatives, Traffic Operations Division representatives, the Engineer and the District Utility Engineer, as specified in the Contract Documents to establish a schedule for utility connections before any equipment or material is installed.

Do not disconnect, de-energize, reconnect, tamper with, or otherwise handle any of a utility company's facilities. The Contractor shall be responsible for the utility service connections to the utility company's supplied point of service.

Make the necessary arrangements with the utility companies to insure having needed utilities available at the time of turn on. Any utility energization, connection or disconnection delays will not be considered a valid reason for any work time extension claim. Report difficulties in securing utility company services to the Engineer, at the earliest possible time.

Utility Stakeout. Notify the appropriate agencies listed in the Contract Documents, and those listed below a minimum of 72 hours (excluding weekends and holidays) prior to the Contractors anticipated beginning of any underground work.

- (a) In Montgomery County, request Montgomery County (240-777-2100) to stakeout their ITS and signal facilities.
- (b) Request the Statewide Operations Center (800-543-2515) to stake out SHA fibreoptic and communication cables.
- (c) Request the Communications Division (410-747-8590) to stake out ITS devices.
- (d) Request appropriate RME to stake out lighting.
- (e) Notify the Hanover Complex Signal Shop (410-787-7652) of all requests for signal and ITS stakeouts.

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UTILITY CONNECTIONS AND UTILITY STAKEOUT

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Plan the work to minimize interference with any existing traffic control devices.

Existing equipment shall remain in its original condition until the new equipment has been completed, satisfactorily tested and its operation accepted by the Engineer.

MEASUREMENT AND PAYMENT.

Utility Connection. Utility Service Equipment Connections will be measured and paid for as specified in 807.04.01.

All utility company energization, connection or disconnection costs will be the responsibility of the Maryland State Highway Administration.

Utility Stakeout. Utility Stakeout will not be measured but the cost will be incidental to other pertinent items specified in the Contract Documents.

**CATEGORY 800
TRAFFIC****AUDIBLE/TACTILE PEDESTRIAN PUSHBUTTON
STATION AND SIGNS**

DESCRIPTION. Furnish and install self-contained audible/tactile pedestrian pushbutton station and signs, as specified in the Contract Documents or as directed by the Engineer.

MATERIALS. Provide audible/tactile pedestrian pushbutton station and signs and all component parts that meet the latest edition of the National Electrical Manufacturers Association (NEMA) Standards and Underwriters Laboratory (UL) standards, as applicable

If available, permanently engrave serial numbers and model numbers on all removable components and hardware. The serial number and model number shall be etched, stamped, molded, or attached using metallic self-adhesive labels. The use of adhesive backed paper labels is not acceptable.

CONSTRUCTION. Design audible/tactile pedestrian pushbutton station and signs to mount near or at the bottom of the pedestrian display mounting post. The pushbutton assembly for the audible signal may replace or supplement an existing pedestrian signal pushbutton.

Design audible/tactile pedestrian pushbutton station and signs as follows.

- (a) A single base unit at the traffic control cabinet shall be able to control 2 to 12 (maximum of 3 per phase) push button stations.
- (b) Only a single 2 conductor cable will be required from traffic controller cabinet per each pushbutton to operate all pushbutton features.
- (c) Each station will have a 2 in. button with a tactile raised directional arrow on the button.
 - (1) It shall be possible to change the arrow direction to one of four directions.
 - (2) Arrow/button shall vibrate during the walk period following a push of the button.
- (d) The push button station frame shall be cast aluminum with mounting holes for a 5 in. by 7.75 in. or larger pedestrian sign.

Provide audible/tactile pedestrian pushbutton station and signs that have the following features:

- (a) Locating tone
- (b) 5 walk sound choices that shall be field selectable.

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AUDIBLE/TACTILE PEDESTRIAN PUSHBUTTON STATION AND SIGNS

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- (c) 3 pedestrian clearance sound choices that shall be field selectable.
- (d) A direction of travel message shall be standard with extended push.
- (e) An information message shall be optional with extended push.

The audible sounds emitted by the audible/tactile pedestrian pushbutton station and signs shall have the following properties.

- (a) All audible sounds shall emanate from the push button station.
- (b) All audible sounds for all push button stations shall be synchronized.
- (c) Each audible feature shall have independently-adjustable minimum and maximum volume limits.
- (d) All sounds shall automatically adjust over a 60 dB range to compensate for ambient noise levels.
- (e) All volumes and optional features shall be settable using a handheld infrared device with password security. The infrared device shall be capable of updating/setting all push button stations, or the intersection from a single pushbutton station (Global updating).
- (f) The ability to mute sounds at all crosswalks except activated crosswalks.

The system shall have user-selectable multiple language capability.

The system shall be able to play an emergency preemption message.

The system shall be able to self-test its buttons and to report any faults to the traffic controller.

Warranty. Audible/Tactile pushbutton station and signs shall be warranted by the manufacturer for a period of 24 months from the date of delivery.

Compatibility Testing. Audible/Tactile pushbutton station and signs manufacturers shall certify that their modules meet the load switch and signal conflict monitor compatibility testing requirements found in the most recent, formally-adopted version of the specification titled "Pedestrian Traffic Control Signal Indications – Part 2: Light Emitting Diode (LED) Pedestrian Traffic Signal Modules," published by the Institute for Transportation Engineers (ITE).

MEASUREMENT AND PAYMENT. Audible/Tactile Pedestrian Pushbutton Station and Signs will be measured and paid for at the contract unit price each. The payment will be full compensation for furnishing, programming, delivery to the specified signal shop for testing, pick

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AUDIBLE/TACTILE PEDESTRIAN PUSHBUTTON STATION AND SIGNS

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up, and installing the push button stations, signs, all cables, labor, equipment, tools, and incidentals necessary to complete this work.

Audible/Tactile Pedestrian 2 Wire Central Control unit will be measured and paid for at the contract unit price per each. The payment will be full compensation for furnishing, programming delivery to the specified signal shop for testing, pick up, and installing the audible/tactile pedestrian base unit and all cables, labor, equipment, tools, and incidentals necessary to complete this work.

CATEGORY 800
TRAFFIC

LED COUNTDOWN PEDESTRIAN SIGNALS

DESCRIPTION. Furnish and install self-contained LED pedestrian countdown signals, as specified in the Contract Documents or as directed by the Engineer.

MATERIALS. Provide LED pedestrian signals and all component parts that meet the latest edition of the National Electrical Manufacturers Association (NEMA) Standards and Underwriters Laboratory (UL), as applicable. In addition, LED pedestrian countdown signals shall meet the requirements set forth in the most recent, formally-adopted version of the specification titled "Pedestrian Traffic Control Signal Indications (PTCSI) – Part 2: Light Emitting Diode (LED) Pedestrian Traffic Signal Modules," published by the Institute for Transportation Engineers (ITE). All LED pedestrian countdown signals shall be certified by the manufacturer to meet or exceed all requirements of that specification over their entire 5 year warranty period. If available, permanently engrave serial numbers and model numbers, on all removable components and hardware. The serial number and model number shall be etched, stamped, molded, or attached using metallic self-adhesive labels. The use of adhesive backed paper labels is not acceptable.

CONSTRUCTION.

LED Countdown Signal Modules.

- (a) LED countdown modules shall fit into existing 16 in. traffic signal housings built to PTCSI standards without modification to the housing.
- (b) The LED countdown module shall be a single, self-contained device, not requiring on-site assembly for installation into existing traffic signal housing.
- (c) Design the assembly of the LED countdown module to assure all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.
- (d) The signal module shall be protected by a ¼ in. thick non-glare UV treated polycarbonate face lens.
- (e) The signal shall have 2 individual sets of wires for electrical connections. One set for the hand/man section and another for the countdown section. Each set shall be made of three secured, color coded (blue, red, white), 36 in. long, 600V, 16 AWG jacketed wires, rated for service at +105°C.

Environmental.

- (a) The LED countdown module shall be rated for use in the ambient operating temperature range of -40°C (-40°F) to +74°C (+165°F).
- (b) Completely seal the LED countdown module against dust and moisture intrusion per the requirements of NEMA Standard 250 – 1991 sections 4.7.2.1 and 4.7.3.2 for type 4 enclosures to protect all internal components.

Chromaticity.

- (a) The measured chromaticity coordinates for the white walking Person and the Portland Orange Hand and Digits shall conform to the chromaticity requirements of section 8.04 and figure 1 of the PTCSI standard.
- (b) The chromaticity measurements shall remain unchanged over the input line voltage range of 80 VAC to 135 VAC.

Display.

- (a) The LED countdown signal module shall consist of a double overlay message combining the symbols of a Hand and walking Person and two “7 segment” digits forming the time display.
- (b) Arrange the Pedestrian icon LEDs to form solid icon symbols. The shape of the symbols shall conform to the standard symbols for pedestrian signals.
- (c) Distribute the LED's evenly in each Pedestrian icon. The distance between each LED shall be evenly spaced.
- (d) The Hand/Person symbols shall be at least 10 in. high and 6.5 in. wide and shall incorporate sufficient LED's to assure adequate luminous intensity.
- (e) The countdown digits shall be at least 9 in. high and shall be made of 2 rows of at least 144 LED's.
- (f) Provide Portland Orange LED's shall be of the latest AlIn GaP technology and the white LED's of the latest In GaN technology.
- (g) Interconnect the individual LED light sources so that a catastrophic failure of a single LED will result in a total loss of not more than 3 LED's or 5 percent of the signal light output.

Drive circuitry.

- (a) The LED drive current shall be regulated to compensate for line voltage fluctuations over

the range of 80VAC to 135 VAC. The luminous output shall not vary more than 1 percent over the voltage range and shall not be perceptible to the human eye.

- (b) The drive circuitry shall include voltage surge protection to withstand high-repetition noise transients and low-repetition high-energy transients as stated in section 2.1.6, NEMA Standard TS-2, 1992.
- (c) The on-board circuitry shall meet FCC title 47, Sub-Part B, Section 15 regulations concerning the emission of electronic noise.
- (d) The circuitry shall ensure compatibility and proper triggering and operation of load switches and conflict monitors in signal controllers currently in use by the procuring traffic authority.
- (e) The countdown signal shall not be activated by input signals under 80 VAC.
- (f) The “countdown” portion of the signal shall have a high “off state” input impedance to ensure it does not prevent the conflict monitor from detecting an open load failure on the pedestrian signals. The input impedance of the countdown signal shall be such as to produce a load switch leakage voltage above 25 VAC to the conflict monitor for up to 4 units per channel.
- (g) The countdown signal drive circuitry shall not suffer any damage when subjected to defective load switches providing a half wave signal output.
- (h) Typical power consumption of the countdown display shall not exceed 5 watts with a power factor greater than 90 percent.

Countdown Function.

- (a) The countdown module shall be compatible with all types of traffic controllers.
- (b) The countdown timer module shall have a micro-processor capable of recording its own time when connected to a traffic controller.
- (c) When connected, the module shall blank out the display during the initial cycle while it records the countdown time using the Walk & D/Walk signal indications.
- (d) The display of the number of remaining seconds shall begin only at the beginning of the pedestrian change interval.
 - (1) After the countdown displays “zero,” the display shall remain dark until the beginning of the next countdown.
 - (2) The countdown pedestrian signal shall display the number of seconds remaining until

the termination of the pedestrian change interval.

- (3)** Countdown displays shall not be used during the walk interval, nor during the yellow change interval of a concurrent vehicular phase.
- (e)** The countdown timer module shall continuously monitor the traffic controller for any changes to the pedestrian phase time and re-program itself automatically if needed.
- (f)** The countdown module shall register the time for the walk and clearance intervals individually and shall begin counting down from the start of the clearance time or the sum of both interval times if selected.
- (g)** If the walk interval is pre-empted (emergency vehicle), the countdown module shall skip the remaining walk time and begin the clearance interval countdown to reach 0 at the same time as the flashing hand becomes solid.
- (h)** If the clearance interval is pre-empted (train), the countdown module shall skip the remaining clearance time and reach 0 at the same time as the flashing hand becomes solid.
- (i)** In the cycle following a pre-emption call, the signal shall display the correct time and not be affected by the reduced previous cycle. The countdown shall always reach 0 at the same time as the flashing hand becomes solid.
- (j)** When the flashing hand becomes solid, the module will display "0" for one second and then blank-out.
- (k)** The countdown timer shall be capable of timing 2 consecutive complete pedestrian cycles outputted by the traffic controller (no steady hand signal between cycles).
- (l)** The countdown module shall have an internal conflict monitor preventing any possible conflicts between the Hand/Person signal indications and the time display. It shall be impossible for the countdown to display any time during a solid hand indication.
- (m)** The countdown module shall have accessible dip-switches for the following user selectable options:
 - (1)** Display 0 during stand-by.
 - (2)** Turn on all LEDs for testing
 - (3)** "Coordinated" mode, (displays clearance time only)
 - (4)** Disable countdown display.
- (n)** The LED module shall have a removable plug on the rear of the unit to allow for easy

access to dip switches.

- (o) If the pedestrian change interval is interrupted or shortened as a part of a transition into a preemption sequence, the countdown pedestrian signal display shall be discontinued and go dark immediately upon activation of the preemption transition.

Housing. Countdown Pedestrian Signals shall have a single piece cast aluminum case housing, a lens, and a single piece cast aluminum swing down door frame.

- (a) The maximum overall dimension of the signal shall be 18.5 in. W x 18.75 in. H x 9 in. D. (470 x 476 x 229 mm), including the visor and hinges. The distance between the mounting surfaces of the upper and the lower openings shall be 15.75" (400 mm).

- (b) The case shall be one piece corrosion resistant aluminum alloy die casting, complete with integrally cast top, bottom, sides and back.

- (1) Four integrally cast hinge lug pairs, two at the top and two at the bottom of each case, shall be provided for operation of the swing down door.

- (2) When properly mated to other pedestrian signal components and mounting hardware, the case shall provide a dustproof and weatherproof enclosure and shall provide for easy access to and replacement of all components.

- (3) The case shall be mounted via upper and lower openings, suitable for either post top or bracket mounting. The openings shall accommodate standard 1.5" (39 mm) pipe brackets. The bottom opening of the case shall have a shurlock boss integrally molded into the case. The dimension of the shurlock boss shall be:

- Outside diameter 2.625 in. (667 mm)

- Inside diameter 1.969 in. (50 mm)

- Number of teeth 72

- Angle of teeth 90°

- Depth of teeth 5/64 in. (2 mm)

A shurlock boss of the same dimensions shall be an option for the top opening of the case. The radial angular grooves of the shurlock boss when used with the shurlock fittings shall provide positive positioning of the entire signal to eliminate rotation or misalignment of the signal.

- (c) The door frame shall be a one piece corrosion resistant aluminum alloy die casting, complete with two hinge lugs cast at the bottom and two latch slots cast at the top of each door.

- (1) The door shall be attached to the case by means of two Type 304 stainless steel spring pins.

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- (2) Two stainless steel hinged bolts with captive stainless steel wingnuts and washers shall be attached to the case with the use of stainless steel spring pins.
- (3) Latching or unlatching of the door shall require no tools.

Warranty. Manufacturers shall provide a written warranty with the following minimum provisions:

- (a) LED countdown signal modules shall be replaced, repaired or purchase value refunded if the module fails to function as intended due to workmanship or material defects within the first 60 months from the date of delivery.
- (b) LED countdown signal modules which exhibit luminous intensities less than the minimum specified values within the first 60 months of the date of delivery shall be replaced, repaired or purchase value refunded.

Compatibility Testing: The LED Pedestrian Countdown Signal manufacturer shall certify that their equipment meets the Load Switch and Signal Conflict Monitor Compatibility testing requirements found in the most recent, formally-adopted version of the specification titled “Pedestrian Traffic Control Signal Indications – Part 2: Light Emitting Diode (LED) Pedestrian Traffic Signal Modules,” published by the Institute for Transportation Engineers (ITE).

MEASUREMENT AND PAYMENT. LED Pedestrian Countdown Pedestrian Signals will be measured and paid for at the contract unit price each. The payment will be full compensation for furnishing and installing the signals, LED modules, equipment specified, all mounting hardware, labor, and incidentals necessary to complete this work.

Video Traffic Detection Systems will be measured and paid for at the contract unit price each. The payment will be full compensation for furnishing and installing the all cables, labor, and incidentals necessary to complete this work.

CATEGORY 800
TRAFFIC

SQUARE PERFORATED TUBULAR STEEL POSTS

DESCRIPTION. Furnish and install square perforated tubular steel posts and square perforated tubular steel anchor bases for mounting traffic signs as specified in the contract documents, or as directed by the Engineer.

MATERIALS.

Steel Posts	A570 Grade 50
Galvanizing	A653 Designation G-90
Spray Galvanizing Compound	A780

Square tubular steel posts and square tubular steel anchor bases shall be formed from 12 gauge steel. All sides of the tubes shall have 7/16 in. die punched circular holes or perforated knock-outs, at 1 in. centers along their entire length.

The tubular steel posts shall be 2 in. square tubes 12 ft long.

Square tubular steel anchor bases shall be comprised of two telescoping tubes. The first shall be 2 -1/4 in. square, three ft long, formed from 12 gauge steel and shall snugly fit over the sign post. The second section shall be a 2-1/2 in. square, 18 in. long, formed from 12 gauge steel, and shall snugly fit over the 2-1/4 in. section.

CONSTRUCTION. Construct the square tubular steel anchor base assembly by placing the 18 in. base section over the 3 ft base section so that they are flush at the top and the holes are aligned. Drive the entire unit into the ground so that one or two rows of holes in the square perforated tubular steel base are exposed. Drive the base so that it remains plumb and provides the final sign assembly with the correct orientation.

Determine the finished length of the tubular steel posts by adding the total height of the signs to 8 ft, 2 in. Cut the sign post to the correct length, and apply cold spray galvanizing to the cut end. Bolt the signs to the top of the post, using tamper proof bolts or drive rivets. Lower the square tubular steel posts 8 in. into the base, and secure the post to the base using two corner bolts designed for this purpose.

MEASUREMENT AND PAYMENT. Square Perforated Tubular Steel Posts will be measured and paid for at the contract unit price per each. The payment will be full compensation for the sign post, corner bolts, and painting as required, and for all materials, labor, equipment, tools, and incidentals necessary to complete the work.

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SQUARE PERFORATED TUBULAR STEEL POSTS

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Square Tubular Steel Anchor Bases will be measured and paid for at the contract unit price per each. The payment will be full compensation for both tubes comprising the base section, all excavation, and for all materials, labor, equipment, tools, and incidentals necessary to complete the work.

CATEGORY 800
TRAFFIC

DISCONNECT, PULLBACK AND REROUTE EXISTING CABLE

DESCRIPTION. Disconnect existing cable(s) from traffic control device(s), pullback and reroute through new or existing conduit systems, handholes, span wires, mast arms and/or structures for reconnecting the traffic control device(s) as specified in the contract documents, or as directed by the Engineer.

MATERIALS. Not Applicable

CONSTRUCTION. Notify the Engineer and Traffic Operations Division representatives at least 5 working days before intended work is to be completed. Plan the work to minimize interference and/or down time of any existing traffic control device.

Disconnect specified cable(s) from the traffic control device and pullback to the point noted or as directed, reroute the cables through the specified raceway(s) and back to the device specified.

MEASUREMENT AND PAYMENT. Disconnect, Pullback & Reroute Cable will be measured and paid for at the contract price per linear foot and shall apply for one or as many cables as are disconnected from a specified device and rerouted back to a device (not per cable). The payment will be full compensation for all materials, labor, equipment, tools, and incidentals necessary to complete the work.

CATEGORY 800
TRAFFIC
SECTION 800.02 - GENERAL ELECTRICAL WORK AND TESTING

DESCRIPTION. Furnish, install, and test of all applicable electrical items referred to in Category 800 items.

MATERIALS. All materials and equipment installed as part of the permanent installation shall be new, UL listed, or labeled and shall conform to NFPA 70 (NEC), NESC, NEMA, IES, and local codes applicable to the area of installation.

CONSTRUCTION. All installations shall conform to NFPA 70 (NEC), NESC, local utility company requirements, and State and local laws and ordinances governing the work. All the work shall be performed by or under the direct supervision of a licensed master electrician. The Contractor shall obtain and pay for all permits, licenses and inspection fees.

Supply all personnel and equipment required to successfully perform the following tests and shall furnish four certified copies of the complete test reports to the Engineer.

Not less than 30 days prior the commencement of each required test, the Contractor shall submit to the Engineer the types, styles or catalog numbers of all testing equipment to be use for the tests. A written certification shall be included stating when the testing equipment was last calibrated by an Administration approved testing agency. The calibration date shall be within 20 days of the date when the tests are to be performed. All tests are to be performed in the presence of the Engineer.

Any defects found in the completed materials installation and specified equipment performance or workmanship shall be repaired or replaced immediately at no cost to the City.

- a) Ground resistance testing shall be conducted using a megger ground tester, using the null balance fall of potential method. Corrected readings greater than 25 ohms will not be accepted.
- b) Circuit test to determine insulation resistance shall be performed on all cables of every circuit except those installed in lighting structures. The test shall conform to the City's testing requirements. Cable insulation resistance shall be a minimum of 10 megohms at 500 volts D.C. except loop detector wire and loop detector lead in shall have a minimum of 100 megohms at 500 volts D.C. The Contractor shall demonstrate in a manner acceptable to the Engineer that all conductors are continuous, free from short circuits and unspecified grounds, and that all circuits are properly connected as specified in the Contract Documents.
- c) A performance test using the design power source shall be conducted by the Contractor prior to acceptance. The electrical system, including automatic control equipment, shall be operated for **30** consecutive days without failure. If any

component fails, it shall be immediately replaced and the test shall be continued. The Contractor shall record each fault, the method and date of correction of each, and the beginning and end of the **30** day test period. If more than 5 percent of any components fail during the test, the component shall be replaced and the 30 days test cycle for the entire system shall be restarted.

- d) An illumination test shall be conducted by the Contractor to determine the illumination characteristics of the roadway lighting installation. The test shall conform to procedures approved by the City. Traffic signal testing shall be accomplished without hazard to the traveling public. The Contractor shall be responsible to maintain all new materials until satisfactorily tested and their operation accepted by the Engineer. All signal heads and signs in place but not in use shall be entirely covered with opaque burlap type or approved plastic material.

A minimum of five working days prior to the completion of a traffic signal installation including detection and interconnect communications systems, the Contractor through the Engineer shall contact the Utility representative for Signal Engineering to schedule a test prior to signal activation.

Perform all required testing of the completed signal installation and shall demonstrate that all traffic signal equipment is correctly installed and operating properly. The Contractor shall provide a temporary electric generator if needed to perform these tests.

After completion of all required tests, a final inspection of the completed installation will be scheduled by the Engineer. After final inspection, acceptance and electric service connection, the completed signal will be placed into operation by the Utility representative for Signal Engineering.

The signal may be placed into the flashing mode of operation for 72 hours prior to the full color mode at the discretion of the Utility representative for Signal Engineering.

All signal heads, signs, spans and mast arms not in use shall be removed upon acceptance by the Engineer and the placing of the new traffic control device into operation. After completion of the project, the Contractor shall furnish to the City **3** sets of green lined drawings showing the exact location and sizes of all structures, cable, conduits, manholes, junction boxes, control and distribution cabinets, and identification of all circuits leaving the control and distribution cabinets and routing to structures. One set shall be submitted to the Engineer, one set shall be submitted to the Utility representative for Signal Engineering and one set shall be submitted to the Utility representative for Street Lighting.

MEASUREMENT AND PAYMENT. Item "General Electrical Work and Testing" will not be measured and will not be paid for separately; the cost will be incidental to other pertinent items specified in the Contract Documents.

CATEGORY 800
TRAFFIC

SECTION 806 — LUMINAIRES AND LAMPS

DELETE per Section 806 in its entirety, and REPLACE with the following:

806. 01 DESCRIPTION. Furnish and install decorative pendant LED luminaires and associated hardware, in accordance with the detailed drawings.

806. 02 MATERIALS. Contractor shall submit catalog cuts to the City of Takoma Park for approval prior to installing this item.

806.02.01. Optics. Illuminating Engineering Society of North America (IESNA) Type III Distribution, 4000K Color Temperature, BUG Rating B1-U0-G1, Flat Glass with Skirt.

806.02.02. Dimensions. Luminaire mounted at 30 feet shall be 26.5 inches tall by 25 inches wide with a maximum effective projected area of 1.86 square feet and a maximum weight of 60 pounds. Luminaire mounted at 12 feet shall be 19.5 inches tall by 17 inches wide with a maximum effective projected area of 0.86 square feet and a maximum weight of 45 pounds.

806.02.03. Finish. The luminaire shall have a black powder coat finish utilizing a premium polyester powder. The finish is a three-stage process which consists of drying, powder application and curing. Before coating, the parts are treated with a five stage pretreatment process, consisting of a heated alkaline cleaner, rinse, phosphate coating, rinse and sealant.

806.02.04. LED Array and Electronic Driver. Luminaires mounted at 30 feet shall have a 63 LED array, 350mA driver current, 75 Watt power consumption and 6300 initial lumens. Luminaires mounted at 12 feet shall have a 49 LED array, 350mA driver, 60 Watt power consumption and 4600 initial lumens. All drivers shall be rated for multi-volt input, capable of operating on 120V, 208V, 240V, and 277V.

806.02.05. Certifications. Luminaire shall be CSA listed and suitable for wet locations.

806.03 CONSTRUCTION. Install all associated equipment and incidentals required for a functioning luminaire. Install luminaires of the types indicated as shown on the plans, in accordance with the Manufacturer's recommendations. Comply with the National Electric Code as applicable for construction and installation of Electrical Wiring Devices.

806.03.01. Cleaning. Prior to 30 day performance test, clean reflector and refractor with product approved by the manufacturer.

806.03.02. Photometric Data and Calculations.

- (a) **Photometric Data.** A photometric file for the luminaire selected, in standard IES electronic format. Clearly indicate the name of the file on the catalog cut.

(b) Photometric Calculations.

For 30 ft. Light Emitting Diode (LED) Decorative Pendant Luminaires, correction factors shall be applied for the lumen retention at 50 000 hours. The illuminance shall not decrease by more than 30 percent at 50 000 hours, which results in a Lamp Lumen Depreciation (LLD) factor of 0.70. Apply an additional factor of 0.9 for Luminaire Dirt Depreciation (LDD), to obtain a total maintenance factor of 0.64 for calculations. Provide a luminaire mounting height of 30 ft with light centers directly over the edge of the sidewalk. Assume four poles in a straight line, parallel to the sidewalk, spaced at 80 ft each. The calculation grid shall be based on a 5ft wide sidewalk and shall be placed between the center two poles. Calculate one line of points for the sidewalk, located in the middle. Start each line of calculation points directly under the second luminaire and continue every 4 ft until directly under the third luminaire. The line shall have 20 points to be calculated. To be acceptable, the average maintained illuminance of all 20 points shall be 0.70 foot candles or greater with an average to minimum uniformity ratio no greater than 2 to 1.

For 12 ft. Light Emitting Diode (LED) Decorative Pendant Luminaires, correction factors shall be applied for the lumen retention at 50 000 hours. The illuminance shall not decrease by more than 30 percent at 50 000 hours, which results in a Lamp Lumen Depreciation (LLD) factor of 0.70. Apply an additional factor of 0.9 for Luminaire Dirt Depreciation (LDD), to obtain a total maintenance factor of 0.64 for calculations. Provide a luminaire mounting height of 12 ft with light centers directly over the edge of the sidewalk. Assume four poles in a straight line, parallel to the sidewalk, spaced at 50 ft each. The calculation grid shall be based on a 5ft wide sidewalk and shall be placed between the center two poles. Calculate one line of points for the sidewalk, located in the middle. Start each line of calculation points directly under the second luminaire and continue every 2.5 ft until directly under the third luminaire. The line shall have 20 points to be calculated. To be acceptable, the average maintained illuminance of all 20 points shall be 2.0 foot candles or greater with an average to minimum uniformity ratio no greater than 2 to 1.

806.03.03. Testing. Submittal and approval of photometric data and calculations shall not remove the responsibility to perform the photometric testing required by Section 820, or to correct or replace lighting where field measurements do not conform to Administration or IES requirements. The City of Takoma may waive the requirements of section 820.03.02 (d) for illuminance testing.

806.04 MEASUREMENT AND PAYMENT.

LED Decorative Pendant Luminaires will be measured and paid for at the contract unit price per each. The payment will be full compensation for the LED Decorative Pendant Luminaire and drivers, mounting hardware, wiring, integral transformer, shorting cap, and all material, labor, equipment, tools, and incidentals necessary to complete the work.

CATEGORY 800
TRAFFIC

SECTION 808 — LIGHTING STRUCTURES

As per Section 808, and as modified herein:

808.01 DESCRIPTION. Furnish and install decorative lighting poles and associated decorative arms and fittings, as indicated in the detailed drawings.

808.02 MATERIALS. Contractor shall submit catalog cuts to the City of Takoma Park for approval prior to installing this item.

808.02.01 12 FT. Decorative Lighting Structure.

- a) **Arms.** The arms, finials, plumb housing and swivel nipple shall be cast aluminum. The center spool, arm spools and bracket mounting plate shall be aluminum. All hardware shall be stainless steel. All exterior hardware shall be tamper resistant. Arm shall have a length of 24 inches and rise of 23.5 inches.
- b) **Poles.** The poles are one-piece aluminum construction with an integral anchor/base plate. The handhole cover and two piece base cover are cast aluminum and furnished with tamper resistant, stainless steel hardware. Decorative posts are one-piece aluminum construction with cast bases and extruded shafts. An integral 3.375" O.D. x 11" tenon shall be at the top of the poles for cross-arm mounting. Pole has a 4 inch diameter smooth shaft, 10.5 inch base diameter and 7 inch bolt circle diameter. Poles shall be provided with (4) hot-dip galvanized, L-type anchor bolts.

808.02.02 30 FT. Decorative Lighting Structure.

- a) **Arms.** The arms, finials, plumb housing and swivel nipple shall be cast aluminum. The center spool, arm spools and bracket mounting plate shall be aluminum. All hardware shall be stainless steel. All exterior hardware shall be tamper resistant. Arm shall have a length of 30 inches and rise of 30 inches.
- b) **Poles.** The poles are one-piece steel construction with an integral anchor/base plate. The handhole cover and two piece base cover are cast aluminum and furnished with tamper resistant, stainless steel hardware. Decorative posts are one-piece aluminum construction with cast bases and extruded shafts. An integral 4.375" O.D. x 11" tenon shall be at the top of the poles for cross-arm mounting. Pole has a 5 inch/7 inch "stepped" diameter smooth shaft, 16 inch base diameter and 11 inch bolt circle diameter. Poles shall be provided with (4) hot-dip galvanized, L-type anchor bolts.

808.02.03 Finish. The decorative light pole and arm shall have a black powder coat finish utilizing a premium polyester powder. The finish is a three-stage process which consists of drying, powder application and curing. Before coating, the parts are treated with a five stage pretreatment process, consisting of a heated alkaline cleaner, rinse, phosphate coating, rinse and sealant.

808.03 CONSTRUCTION.

Refer to Section 801 for concrete foundations.

The arms shall be one-piece construction. The cast rectangular arms shall be welded to a center spool and plumbizer housing. All welding shall be per ANSI/AWS D1.2. All welders shall be certified.

The arms shall slip-fit a 3.375" O.D. x 8" post top tenon or a 4.375" O.D. x 8" post top tenon and attach with (8) socket set screws. Matching poles shall be 4 inch or 5 inch/7 inch diameter. The center finial and arm finial shall be removable.

808.04 MEASUREMENT AND PAYMENT.

Lighting structures will be measured and paid for at the Contract unit price per each pole height, bracket arm length, and material type. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Concrete foundations will be measured and paid for as specified in 801.04.

CATEGORY 800
TRAFFIC

**SECTION 811 — ELECTRICAL HAND HOLES, MANHOLES,
PULL AND JUNCTION BOXES**

As per Section 811 of the Specifications and as modified herein.

DESCRIPTION

Furnish and install lighting hand boxes as specified in the Contract Documents.

MATERIALS

Handboxes shall conform to the Contract Documents.

Mortar shall conform to 903.06

Borrow excavation shall be a soil or soil aggregate mixture and shall conform to 916.01.

Concrete for handboxes shall be Mix No. 3 conforming to Section 902.10.

Frames and Covers shall conform to the Contract Documents.

Joint Sealing Compound shall conform to AASHTO D 1190.

Bell Ends shall be molded plastic and may be used as a substitute for terminators with the approval of the Engineer.

CONSTRUCTION

Handboxes and collector boxes shall be installed flush to drain with finished grade. Concrete shall be mixed, placed and tested as specified in Section 902. Excavation and backfill shall conform to Section 809. When handboxes/collector boxes are installed in sidewalks, the sidewalk shall be removed and reinstalled to the nearest joint.

Spaces between conduit and the handbox/collector box wall shall be filled or patched with concrete or other sealer as directed by the Engineer.

Handbox/collector box frames shall be set in a mortar or concrete bed as shown in the Contract Documents.

Remove and dispose of all unsuitable material around the manholes and backfill with common borrow or furnished subsoil as directed by the Engineer.

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MANHOLES, PULL AND JUNCTION BOXES

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Handboxes - Hand Boxes installed at locations shown on the Contract Plans and/or where directed by the Engineer, shall consist of a cement concrete base, a cement concrete cylinder, the frame, the cover and the cement concrete mortar to seal the frame to the cylinder and to seal the conduit to the box and base.

Excavation for Hand Boxes shall be done carefully when working over or adjacent to existing conduit lines. The cement concrete base must be set to the proper grade. The concrete cylinder of the Hand Box is to be grouted to the base and all conduit entries are to be sealed to prevent the loss of material from outside the structure. The frame is to be attached to the cylinder with cement concrete mortar and adjusted to meet finished grade. Approved material selected from excavation, shall be used for backfilling around the Hand Box.

Where a new handbox is to be connected to an existing conduit, the Engineer will, unless otherwise shown on the Plans, determine the exact conduit to be connected to the handbox.

When handboxes are specified to be installed on an existing conduit system, a specific conduit will be assigned for the proposed installation of cable. Prior to the installation of the handbox, the Contractor shall inspect the assigned conduit. Should the conduit contain cable, the Contractor shall contact the appropriate agency for identification. After receiving approval from the Engineer to break into the conduit for purposes of constructing the handboxes, the Contractor shall use extreme caution in performing the operations to ensure that the cable remains intact and fully functional. If the assigned conduit is empty, the Contractor shall rod the conduit to check for obstructions. If it is found that the assigned conduit is obstructed, the Contractor shall rod other available conduit, as directed by the Engineer, until a clear conduit run is found. Any damage caused by the Contractor shall be repaired at his own cost.

Extreme caution shall be observed at all times during work operations. Energized conductors may be in service during this construction.

Notify the Conduit Section at least two days in advance of starting any work on the existing system. Core shall be taken when an opening is made in an existing manhole wall for entry of a new conduit system.

Each conduit shall be tested in the presence of the Engineer. A test device made from rigid material not more than 1/2 in. smaller than the bore of the conduit, and a minimum of 2 ft. long, shall be passed through each conduit. The device shall be so constructed as to prevent its use through bends whose radius is less than 20 ft. Any conduit through which this device cannot be passed, shall be repaired by the Contractor to the satisfaction of the Engineer, with no additional compensation from the City.

1. The conduit line sizing device is to be used as a 'go' gauge for New PVC Conduit and will be used on the basis of a receipt signed by the Contractor.

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811 — ELECTRICAL HAND HOLES,
MANHOLES, PULL AND JUNCTION BOXES

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2. Use of the device must be observed by the Engineer. Arrangements are to be made at least two (2) days in advance.
3. Prior to testing, assure that the bores of all conduits are clean and clear of fins, burrs or sharp edges and dry.
4. Supply labor and equipment necessary to gauge the new conduit.
5. If the device meets any resistance within the run of conduit, the operation shall stop and the device recovered at its starting point.
6. Any conduit which has resistance to the passing of this device, will not be accepted.
7. Final acceptance of the Conduit System will not be made until completion of all the work in the Contract.

Multi-conduit sections shall have uniform spacing between each conduit for circulation of air.

MEASUREMENT AND PAYMENT

Lighting handboxes will be measured and paid for at the Contract unit price per each. The payment will be full compensation for all excavation, aggregate drain, concrete, bolts, bricks, pipes, backfill, sealer, frames, and covers, and for all material, labor, equipment, tools and incidentals necessary to complete the work.

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**SECTION 811 – ELECTRICAL HAND HOLES, MANHOLES, PULL AND JUNCTION
BOXES**

638 **811.03 CONSTRUCTION**

INSERT: The following after the last paragraph

811.03.03 Adjusting Handhole To Grade and Replace Frame and Cover. Remove existing handhole frame and cover. Adjust vertical elevation of concrete or brick handhole by removing material or installing additional bricks or concrete. Install frame and cover. Mix, place and test concrete as specified in Section 420 to be level with final grade. Install concrete collar.

For locations where handholes are installed in sidewalk, the handhole shall not create a vertical step of 0.25” or greater.

639 **811.04 MEASUREMENT AND PAYMENT.**

INSERT: The following after the last paragraph

Adjust Handhole To Grade and Replace Frame and Cover will be measured and paid for at the Contract unit price per each. The payment will be full compensation for all remove of existing frame and cover, adjusting vertical elevation of existing handhole, concrete repair of existing handhole, excavation, aggregate, concrete, concrete collar, frame, cover, bolts, bricks, pipes, backfill, sealer, and for all materials, labor, equipment, tools, and incidentals necessary to complete the work.



**CATEGORY 800
TRAFFIC**

SECTION 813 — SIGNS

813.02 MATERIALS.

640 **ADD:** The following.

Furnish and install or install vandalism installation date (VID) stickers to the back lower right hand corner of all installed signs. The Administration will supply VID stickers with all Administration supplied signs. Supply VID stickers with all non-Administration supplied signs.

813.03 CONSTRUCTION.

ADD: The following after the third paragraph.

Use the following minimum thickness for fabricated sheet aluminum signs.

Longest Dimension of Sheet Sign in.	Minimum Thickness in.
≤ 12	0.040
12+ to 24	0.063
24+ to 36	0.080
36+ to 48	0.100
> 48	0.125

Install sheeting in accordance with manufacturer's recommendations. Repair/replace defects in workmanship per manufacturer's recommendation.

813.04 MEASUREMENT AND PAYMENT.

641 **ADD:** The following after 813.04.03.

813.04.04. Furnish and Install or Install Vandalism Installation Date stickers will not be measured, but the cost will be incidental to the Contract unit price for furnishing and installing the signs.

CATEGORY 800
TRAFFIC

SECTION 814 — SIGNAL HEADS

814.01 DESCRIPTION.

641 **ADD:** The following after the first paragraph.

Furnish and install Aluminum and Polycarbonate 8 in. and 12 in. vehicle traffic control signal heads and hardware with LED Green, Yellow, and Red indications, as specified in the Contract Documents or as directed by the Engineer. All signal housing shall have a black face and yellow housing.

814.02 MATERIALS.

ADD: The following to the end of the list of materials.

LED Traffic Signal Modules	“Section 800 LED TRAFFIC SIGNAL MODULES”
ALL Red and Green Traffic Signals (LED or Incandescent)	COMAR 14.26.03 (Certification of compliance with Maryland Energy Efficiency Standards)

814.04 MEASUREMENT AND PAYMENT.

ADD: The following after the first paragraph.

Aluminum and Polycarbonate LED Signal heads will be measured and paid for at the contract unit price per each section of signal head type and size as specified in the Contract Documents. The LED signal heads will have the LED module fitted into the housing assembly. The payment will be full compensation for the housing, LED signal module, and, mounting hardware, assembly, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

SECTION 875-UTILITIES STATEMENT

DESCRIPTION. The Contractor's attention is called to the requirements of Sections GP-5.05, GP-7.13, GP-7.17, and TC-4.04.

MATERIALS. Not Applicable.

CONSTRUCTION.

- (a) Attention of the Contractor is directed to the presence of water, sewer, gas, electrical, telecommunication and television facilities, poles, cables, wires, conduit, ducts, mains, and house service connections in, over, under or adjacent to the street or highway in which the construction project is to be performed. The Contractor shall exercise special care and extreme caution to protect and avoid damage to utility company facilities as described in the preceding sentence. The Contractor shall take into consideration the adjustments and installations by public utilities in areas within the limits of this Contract. Existing utilities have been generally located and shown on the plans, as they are believed to exist; however, the City of Takoma Park and the SHA assumes no responsibility for the accuracy of these locations.

All notifications to the utility companies and “**MISS UTILITY**” 1-800-257-7777 shall be given 48 hours (two full working days) in advance of working in the area of the specific affected utility. The notification to “**MISS UTILITY**” is required by the Contractor whenever any excavating or similar work is to be performed. **Note that the SHA is now part of Miss Utility.** To file electronically, visit – www.missutility.net/itic/

- (b) The Contractor has an obligation to coordinate all work with Utility Companies that have facilities within the project. This includes pre-bid inquiries to ascertain the nature of the relocation work and a pre-bid site investigation. When underground facilities are encountered during the construction, the Contractor must coordinate with each utility company directly to determine if they are to be maintained or abandoned.
- (c) The Contractor shall locate all existing utilities and be responsible for their safety. Should any existing utilities be damaged or destroyed due to the operations of the Contractor, the damaged or destroyed components shall be immediately replaced or repaired as necessary to restore the utility to a satisfactory operating condition. These repairs or replacements shall be at no additional expense to the City of Takoma Park, the SHA or to the owner of the utility. In the event that the respective Utility Agency conducts these repairs, the Contractor will be entirely responsible to furnish the Utility with full payment for the work performed including all costs associated with any service disruptions.

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- (d) The existing utilities requiring relocation or adjustment shall be relocated or adjusted by the agency responsible for their maintenance or by the owner of the utility unless otherwise indicated in the Contract Documents. The Contractor shall inform the respective utility companies at least five days prior to working in any area. In addition, the Contractor shall give sufficient notice to the specific utilities of the Contractor’s overall plan for construction. The utility companies will establish the lead-time necessary to meet the applicable utility work schedule and coordinate with the Contractor’s work operations based upon the Contractor’s overall plan.
- (e) Activities with required durations (as determined by the Owner and Utility Companies) for all utility relocation work associated with this project shall be included in the CPM baseline schedule and updates for this project. Reasonable delays in the completion of these activities will not constitute a basis for project delay, and schedule adjustments made accordingly. Should utility or third party delays become unreasonable, as solely determined by the Owner, time extensions will be considered, but non-compensable.
- (f) Any submittal by the Contractor to vary the sequence of work and/or perform concurrent work in multiple phased differing from the recommended maintenance of traffic phasing, must be accompanied by an updated schedule or CPM reflecting all utility relocation’s and adjustments. The Contractor shall be responsible, upon gaining approval, for coordinating utility relocations and adjustments with the affected utility owners, City of Takoma Park engineer and the SHA District Utility Engineer. All requirements and lead times as stated in the Utility Statement and Special Provisions will remain in effect unless written approval from the utility company and the SHA District Utility Engineer is received by the Contractor prior to the commencing any requested work.

NOTE: ANY REQUIRED UTILITY RELOCATION WORK WILL BE CONCURRENT TO CONTRACTOR(S) WORK. IN ORDER TO ALLOW UTILITY COMPANIES TO COMPLETE THEIR RELOCATIONS THE CONTRACTOR MUST COORDINATE ALL WORK AND REFLECT IN SCHEDULE OR CPM.

- (g) The following known utility companies may have existing facilities or may have adjustments within the limits of this Contract:

Comcast Cable

Mr. Dwayne Douty
 5304 Kings Ct
 Frederick, MD 21703
 (301) 456-8957
 (240) 372-6694
dwayne_douty@cable.comcast.net

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PEPCO

Mr. Tewodros Ferede

(301) 548-4335

tewodros.ferede@delmarva.com**Verizon Communications**

Mr. Chip Lambert

13101 Columbia Pike

FDC-1, Floor 01

Silver Spring, MD 20904-5248

(301) 282-7039

christopher.l.lambert@verizon.com**Verizon Business**

Mr. Adam Rice

OSP-CO Engineering, MD

Office: (703) 391-5767

Cell: (571)-220-8978

adam.rice@verizon.com

Attention is called to the existing fiber optic cable that parallels the area of excavation for BMP #150970 (Sta. 303+00, LT). Test pit the utility and provide no mechanical excavation within 2 feet of the cable. Perform hand excavation only along the length of BMP#150970.

Washington Gas

Mr. Andrew King

6801 Industrial Road

Springfield, VA 22151

(703) 750-4793

(571) 422-2019

AndrewKing@washgas.com**Washington Suburban Sanitary Commission (WSSC)**

Mr. Kevin Lethbridge

WSSC Construction Manager

(301) 206-7339

See the WSSC water main relocation plan, details and specifications contained within these contract documents.

Maryland State Highway Administration

SHA Fiber Optic and Communication Cables

Statewide Operations Center (SOC)

800-543-2515

SPECIAL PROVISIONS

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SHA Traffic Signals

Hanover Complex Signal Shop

410-787-7652

(h) **CONTRACT PROVISION BUY
AMERICA UTILITIES**

This section applies to projects partially or totally funded with Federal Funds. The prime contractor or its subcontractors shall comply with Section 165 of the Surface Transportation Assistance Act of 1982 as amended by Section 1041(a) and 1048(a) of the Intermodal Surface Transportation Efficiency Act of 1991 with regard to the furnishing and coating of iron and steel products.

The prime contractor or its subcontractors shall supply certifications to the Project Engineer from the manufacturer of all coating, iron or steel products which document that the steel and iron have been manufactured and the coatings for iron or steel have been applied by the manufacturer in the United States. The Project Engineer shall forward copies of the certifications to the Office of Materials Technology for review and approval prior to such items being incorporated into the permanent work. Certifications shall extend to materials utilized in manufactured and fabricated products purchased by the Contractor.

Products manufactured of foreign steel or iron materials may be used, provided the cost of such products as they are delivered to the project does not exceed 0.1% of the total contract amount, or \$2500, whichever is greater. If a supplier or fabricator wishes to use a partial fabrication process where domestic and foreign source components are assembled at a domestic location, the "as delivered cost" of the foreign components should include any transportation, assembly and testing costs required to install them in the final product. This applies to all iron, steel and coating materials used for utility work incorporated into the project including materials/items supplied by the Utility Company.

MEASUREMENT AND PAYMENT. All work, or additional work, performed expediting utility relocations, working around, or protecting, utility facilities, and coordinating and cooperating with utility agencies or their contractors will not be measured but will be incidental to the items specified in the Contract Documents.



**CATEGORY 900
MATERIALS**

655 **ADD:** The following after the last paragraph of 900.02 TECHNICIAN QUALIFICATION REQUIREMENTS.

900.03 RECYCLED MATERIALS.

900.03.01 CERTIFICATION. All recycled or rehandled material furnished or supplied for use may require testing and certification to ensure compliance with all State and local applicable environmental and EPA regulations. The required testing may include, but not be limited to, the EPA Toxicity Characteristic Leaching Procedure (TCLP) or its successor. Provide testing and certification for all recycled materials at no additional cost to the Administration. Evaluation and interpretation of the test data will be made by an OMT Quality Assurance Manager. The above requirements do not preclude the normal materials acceptance process, and the recycled material shall meet all applicable specifications. EPA regulations governing the use of the material, certified test results, and material safety data sheets shall accompany the source of supply letter and sample submitted for approval.

Only highway demolition materials are to be used in constructing RC stockpiles for Administration projects. The use of building materials is prohibited.

Refer to the Contract Documents for recycled materials not covered by this specification.

900.03.02 RECLAIMED/RECYCLED CONCRETE (RC).

Usage. Use RC for the following with written approval.

(a) Graded Aggregate Base (GAB).

(b) Common, Select, or Modified Borrow.

(1) At least 2 ft above saturated soil or groundwater conditions, as determined.

(2) At least 100 ft from surface waters (streams, creeks, or rivers, ponds and lakes),

(3) At least 3 ft from exposed metal surfaces, and,

(4) At least 3 ft from geotextile.

(5) At least 3 ft from any water discharge locations.



Do not use RC as Capping Borrow nor as aggregate for the following.

- (a) Portland cement concrete.
- (b) Hot mix asphalt.
- (c) Drainage systems.
- (d) Mechanically stabilized earth (MSE) systems.
 - (1) MSE walls.
 - (2) Reinforced soil slopes (RSS).
 - (3) Reinforced earth slopes (RES).
- (e) In embankment construction as follows.

Within 1.5 ft of the top surface of any area to be vegetated.

- (1) Within 2 ft of saturated soil or groundwater conditions, as determined.
- (2) Within 100 ft of any surface water course (streams, creeks, or rivers, ponds and lakes).
- (3) Within 3 ft of any metal pipe or shoring.
- (4) Within 3 ft of any water discharge locations.
- (5) Under permeable or porous surfaces.

Grading Requirements. The grading requirements for the use of RC.

- (a) Table 901 A when used as GAB or for any other application within the pavement structure.
- (b) 204.02 when used in embankment construction.
- (c) 916.01 when used as Borrow material.

RC shall not contain more than 5 percent brick and hot mixed asphalt material by mass except when used as Common Borrow.



pH Requirements. RC pH shall be less than 12.4 for all applications. RC usage shall not cause any outfall and infiltration water leaving the site to exceed a pH of 8.5. Acid sulfate, sulfur or any other environmentally safe organic material may also be used to control the pH.

pH Testing.

- (a) **Plant:** The producer is required to test pH at the plant per T 289 every 1,000 tons shipped or once a day, whichever yields the greater frequency. Plant pH testing shall be recorded as specified and a history shall be kept at the producer's laboratory. The producer may be required to present TCLP and any other tests conducted by an independent laboratory as directed.

The Administration reserves the right to test the producer's RC at the plant for pH. Material delivery may be terminated if the test results repeatedly meet or exceed a pH of 12.4. In case of high pH the producer is required to use shorter stock pile by spreading the material at around the plant or mixing the RC-GAB with the natural GAB to reduce the pH issue.

- (b) **Construction Site:** The OMT representatives will perform QA testing to monitor, test, for the pH levels for any discharge associated with RC placement as directed. This includes monitoring and testing during periods of precipitation or dampness. In cases of high pH, the producer shall provide a reduction control plan for the pH.

Quality Control. The producer shall submit a Quality Control Plan and obtain approval prior to production. The plan shall include, but not be limited to, the operational techniques and procedures proposed to produce the RC product. Quality control includes the sampling, testing and data recording performed to validate the quality of the product during production operations.

Quality Assurance. OMT Quality Assurance personnel will perform quality assurance inspection, sampling, and testing at the RC plant and construction site. Additional inspection, testing and compaction control will be performed by the Project Engineer.

900.03.03 RECYCLED ASPHALT PAVEMENT (RAP).

Usage. Use RAP for Common, Select, Capping, or Modified Borrow.

Do not use RAP as aggregate for the following.

- (a) Graded Aggregate Base (GAB).



(b) Portland cement concrete.

(c) Drainage systems.

(d) Embankment construction.

(1) Within 1 ft of the top surface of any area to be vegetated.

Refer to MSMT 412 and M 323 for the use of RAP in hot mix asphalt mixes.

Grading Requirements. The grading requirements for the use of RAP.

(a) 204.02 when used in embankment construction,

(b) 916.01 when used as Borrow material,

(c) 901.02.01 when used as riprap.

Quality Control. Create a captive stockpile for storing the RAP prior to use. Create a new captive stockpile and take new acceptance samples for gradation approval whenever the source of the RAP changes.

Quality Assurance. OMT Quality Assurance personnel will sample and test the RAP stockpiles to ensure that they meet the above gradation requirements. The completed test results will be reviewed by the OMT Soils and Aggregate Division for approval.

Construction of Control Test Strip. The location, equipment, and methods used to construct the control test strip shall be as directed; prior to approval. The equipment and methods used to construct the control test strip shall be the same as those used in subsequent construction. Place and test the control test strip when the RAP is 32°F or higher to establish the maximum density. RAP is temperature sensitive, which may affect the density.

Construct the control test strip that shall be at least 100 ft long, 12 ft wide and a maximum compacted lift thickness of 6 in. Prepare the subgrade for the control test strip in accordance with 204.03.07. Do not construct the control strip, or perform any subsequent construction, on frozen subgrade.

Compact the RAP for the control test strip with one pass of the roller. Measure the density after one pass with a nuclear density gauge (backscatter method) at the frequency for capping material at five random locations distributed across the length and width of the control test strip, as directed. Record the measurements and mark the locations for future reference.



Compact the RAP for the control test strip with a second pass of the roller. Measure and record the density again at the exact locations previously tested and as described above. Prepare a plot of density versus the number of roller passes. Continue this process until the maximum dry density of the control strip is established.

There should be no drop in average density during construction of the control test strip for each lift. A drop in the average density of greater than 2 pcf during construction of the control test strip is an indication that the material is not properly compacting, and a new test strip shall be constructed.

The Project Engineer may require the Contractor to cut into the control test strip for visual inspection. All material, labor, equipment, tools, and incidentals necessary to provide an approved control test strip shall be at no additional cost to the Administration.

Compaction Control. Use the roller pattern and number of passes determined from the construction of the test strip to compact the RAP for production placement. The density of the RAP compacted for production work shall be at least 97 percent of the maximum density obtained from the control test strip. Recheck the density of the production work if it is less than 97 percent of the maximum density obtained from the control test strip. Construct a new control test strip if the second density does not meet the 97 percent requirement. Construct a new control test strip if the measured density of the compacted RAP for production work exceeds 105 percent.

Establish one rolling pattern to achieve maximum density for each use based on the control test strips. Samples or results produced prior to the construction of any new stockpiles will not be considered.



CATEGORY 900
MATERIALS

SECTION 901 — AGGREGATES

655 **DELETE:** 901.01 - Tables 901 A, 901 B, 901 C, and 901 D in their entirety.

INSERT: The following.



SPECIAL PROVISIONS INSERT
901 — AGGREGATES

TABLE 901 A
AGGREGATE GRADING REQUIREMENTS
TEST METHOD T 27

MATERIAL		SIEVE SIZE															
		2-1/2"	2"	1-1/2"	1"	3/4"	1/2"	3/8"	No. 4	No. 8	No. 10	No. 16	No. 30	No. 40	No. 50	No. 100	No. 200
		63 mm	50 mm	37.5 mm	25 mm	19 mm	12.5 mm	9.5 mm	4.75 mm	2.36 mm	2.0 mm	1.18 mm	600 µm	425 µm	300 µm	150 µm	75 µm
CRUSHER RUN AGGREGATE CR-6 (f)(g)		—	100	90-100	—	60-90	—	—	30-60	—	—	—	—	—	—	—	0-15
BANK RUN GRAVEL — SUBBASE		100	—	—	90-100	—	60-100	—	—	35-90	—	—	20-55	—	—	—	5-25
GRADED AGGREGATE — BASE DESIGN RANGE (a)		—	100	95-100	—	70-92	—	50-70	35-55	—	—	12-25	—	—	—	—	0-8
TOLERANCE (b)		—	-2	±5	—	±8	—	±8	±8	—	—	±5	—	—	—	—	±3(c)
BANK RUN GRAVEL — BASE		100	—	—	85-100	—	60-100	—	—	35-75	—	—	20-50	—	—	—	3-20
COARSE AGGREGATE - PORTLAND CEMENT CONCRETE	57 and UNDERDRAIN (h)	—	—	100	95-100	—	25-60	—	0-10	0-5	—	—	—	—	—	—	—
	67	—	—	—	100	90-100	—	20-55	0-10	0-5	—	—	—	—	—	—	—
	7	—	—	—	—	100	90-100	40-70	0-15	0-5	—	—	—	—	—	—	—
FINE AGGREGATE — PORTLAND CEMENT CONCRETE, UNDERDRAIN, and PNEUMATIC MORTAR (d)		—	—	—	—	—	—	100	95-100	—	—	45-85	—	—	5-30	0-10	—
COARSE AGGREGATE — LIGHTWEIGHT PORTLAND CEMENT CONCRETE		—	—	—	100	90-100	—	10-50	0-15	—	—	—	—	—	—	—	—
FINE AGGREGATE — LIGHTWEIGHT PORTLAND CEMENT CONCRETE (d)		—	—	—	—	—	—	100	85-100	—	—	40-80	—	—	10-35	5-25	—
FINE AGGREGATE/SAND MORTAR and EPOXIES (d)		—	—	—	—	—	—	—	100	95-100	—	—	—	—	—	0-25	0-10
MINERAL FILLER		—	—	—	—	—	—	—	—	—	—	—	100	—	95-100	—	70-100



SPECIAL PROVISIONS INSERT

901 — AGGREGATES

- (a) To establish target values for design.
- (b) Production tolerance.
- (c) ± 2 for field grading (omitting T 11).
- (d) Fine aggregate includes natural or manufactured sand.
- (e) Crushed glass shall not contain more than one percent contaminants by weight.
- (f) Not to be used in the structural part of any Administration project.
- (g) Recycled asphalt pavement may be used as a component not to exceed 15 percent and is not subject to aggregate physical property requirements in TABLE 901 B.
- (h) Recycled concrete is prohibited in drainage applications.



TABLE 901 B
AGGREGATE PHYSICAL PROPERTY REQUIREMENTS

MATERIAL	TEST METHOD				
	S P E C I F I C A T I O N	T 90	T 11	T 96	T 104
		PI	MATERIAL FINER THAN No. 200 SIEVE	LOS ANGELES ABRASION	SODIUM SULFATE SOUNDNESS
	max	% max	% max	% max	
CRUSHER RUN AGGREGATE CR-6	D 1241(a)	6	—	50	—
BANK RUN GRAVEL — SUBBASE	D 1241	6	—	50	—
GRADED AGGREGATE — BASE	D 1241	6	—	50	—
BANK RUN GRAVEL — BASE	D 1241	6	—	50	—
COARSE AGGREGATE — PCC (b)	M 80 CLASS A	—	1.0(c)	50	12
FINE AGGREGATE — PCC (b)(d)	M 6 CLASS B	—	4.0(e)	—	10
COARSE AGGREGATE — LIGHTWEIGHT PCC	M 195	—	—	—	—
FINE AGGREGATE — LIGHTWEIGHT PCC (f)	M 195	—	—	—	—
FINE AGGREGATE/SAND MORTAR and EPOXIES	M 45	—	—	—	10
MINERAL FILLER (g)	M 17	4	—	—	—
GLASS CULLET (h)	M 318	—	—	—	—

(a) Other approved inert materials of similar

- characteristics may be used provided they meet these provisions. For crushed reclaimed concrete, the soundness loss shall not exceed 18 percent after magnesium sulfate testing as specified in T 104.
- (b) Test coarse and fine aggregate for PCC for alkali silica reactivity (ASR) per MSMT 212.
 - (c) 1.5 if material passing No. 200 sieve is dust of fracture, free of clay or shale.
 - (d) In areas exposed to traffic, manufactured sand shall have a minimum ultimate Dynamic Friction Value (DFV) of 40, based on the parent rock.
 - (e) 5.0 for concrete not subject to surface abrasion.
 - (f) Fine aggregate meeting M 6 may be used if the lightweight concrete does not exceed the maximum unit weight specified in the Contract Documents.
 - (g) Fly ash shall not exceed 12 percent loss on ignition.
 - (h) For use as a granular road base material. Not intended for use in locations where surfacing will not be placed over the base.



SPECIAL PROVISIONS INSERT
901 — AGGREGATES

TABLE 901 C
ASPHALT MIXES
AGGREGATE GRADING REQUIREMENTS, % PASSING FOR MIX DESIGN
TEST METHOD T 27

MATERIAL		SIEVE SIZE									
		3/4in.	1/2in.	3/8in.	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
		19.0 mm	12.5 mm	9.5 mm	4.75 mm	2.36 mm	1.18 mm	600 µm	300 µm	150 µm	75 µm
GAP GRADED STONE MATRIX ASPHALT MIX - 9.5mm		100	100	75-90	30-50	20-30	—	—	—	—	8-13
GAP GRADED STONE MATRIX ASPHALT MIX - 12.5mm		100	90-99	70-85	28-40	18-30	—	—	—	—	8-11
GAP GRADED STONE MATRIX ASPHALT MIX - 19.0mm		100	82-88	60 max	22-30	14-20	—	—	—	—	9-11
OPEN GRADED FRICTION COURSE – 9.5mm (a)		—	100	85-100	20-40	5-10	—	—	—	—	2-4
OPEN GRADED FRICTION COURSE – 12.5 mm (a)		100	85-100	55-75	15-25	5-10	—	—	—	—	2-4
OPEN GRADED FRICTION COURSE – 12.5mm (b)		100	80-100	35-60	10-25	5-10	—	—	—	—	1-4
SLURRY SEAL (SS) AND MICRO -SURFACING (MS)	TYPE II	—	—	100	90-100	65-90	45-70	30-50	18-30	10-21	5-15
	TYPE III	—	—	100	70-95	45-70	28-50	19-34	12-25	7-18	5-15
CHIP SEAL SURFACE TREATMENT	7	100	90-100	40-70	0-15	0-5	—	—	—	—	—
	8	—	100	85-100	10-30	0-10	0-5	—	—	—	—

(a) Less than Design Level 4 (ESAL)
(b) Porous European Mix (PEM) – Design Level 4 (ESAL)



TABLE 901 D

AGGREGATE PHYSICAL PROPERTY REQUIREMENTS FOR ASPHALT MIXES

MATERIAL	S P E C I F I C A T I O N	TEST METHOD					
		T 11	T 96	T 104	D 4791	MSMT 216	T 279
		MATERIAL FINER THAN No. 200 SIEVE % max	LOS ANGELES ABRASION (LA) % max	SODIUM SULFATE SOUNDNESS % max	FLAT and ELONGATED (a) % max	DYNAMIC FRICTION VALUE (DFV) (b) (c) min	BRITISH PENDULUM NUMBER (BPN) (c) min
SURFACE COURSE 4.75mm, 9.5mm, 12.5mm, and 19.0mm	M323	—	45	12	10	25	—
SURFACE COURSE — HIGH DFV 4.75mm, 9.5mm, 12.5mm, and 19.0mm	M323	—	45	12	10	40 (e)	—
BASE COURSE 19.0mm, 25.0mm and 37.5mm	M323	—	45	12	10	—	—
GAP GRADED STONE MATRIX ASPHALT 9.5mm, 12.5mm, and 19.0mm	M323	—	30	12	20/5 (g)	40 (e)	—
OPEN GRADED FRICTION COURSE 9.5 mm, 12.5 mm, 12.5 mm PEM (h)	MSMT 409	0.5	30	12	20/5 (g)	40 (e)	—
SLURRY SEAL (SS) and MICRO-SURFACING (MS)	—	—	—	12	—	40 (f)	30
CHIP SEAL SURFACE TREATMENT	M 80, CLASS A	1.0 (d)	45	—	—	—	—

- (a) Testing for flat and elongated particles shall be conducted on the blended aggregates. Dimensional ratio of calipers shall be 5:1.
- (b) The minimum Dynamic Friction Value (DFV) shall be based on a single aggregate source or a blend of aggregates used. Determine proportions of blended aggregates using MSMT 416.
- (c) DFV and British Pendulum Number (BPN) determined on parent rock. Reclaimed asphalt pavement (RAP) shall have a DFV of 30.0.
- (d) 1.0 for samples taken at the point of production. Samples taken at any point after shipment shall have no more than 1.5 percent finer than 0.075 mm sieve.
- (e) Carbonate rock shall have a minimum of 25 percent insoluble residue retained on the 0.075 mm sieve.
- (f) No blending allowed.
- (g) Testing conducted on particles retained on the 4.75 mm sieve. Dimensional ratio of calipers shall be 3:1/5:1.
- (h) Porous European Mix

CATEGORY 900
MATERIALS

SECTION 901 – AGGREGATES

ADD:

901.06 STONE FOR SWM FACILITY. This section includes the material details, physical and chemical properties applicable to stone used for stormwater management facilities. Use round river stone uniform in size. Two size options are four to seven inches (4”- 7”) or two to three inches (2”- 3”). All fines shall be screened from the aggregate.

- (a) The round river stones shall selected from colors in gray and brown tones.
- (b) White colored stone will not be allowed.
- (c) The physical and chemical properties shall meet the following requirements:

Physical Properties:	
Absorption	1.17%
Bulk Specific Gravity (ASTM C97)	2.687
Compression Strength, PSI (ASTM C170)	
Perpendicular to Rift (against)	44,450.00
Parallel to Rift (with)	48,050.00
Abrasion Index (ASTM C241)	28.2

Chemical Properties:	
Slicon Dioxide as SiO ₂	98.02%
Iron Oxide as Fe ₂ O ₃	.42%
Aluminum Oxide as Al ₂ O ₃	.75%
Calcium Oxide as CaO	.23%
Magnesium Oxide as MgO	.30%
Sodium Oxide as Na ₂ O	.023%



SPECIAL PROVISIONS INSERT

SHA TRACKING NO. 15APMO015XX

902-PORTLAND CEMENT CONCRETE

1 of 16

**CATEGORY 900
MATERIALS**

665 **DELETE:** SECTION 902 — PORTLAND CEMENT CONCRETE AND RELATED PRODUCTS in its entirety.

INSERT: The following.

SECTION 902 — PORTLAND CEMENT CONCRETE AND RELATED PRODUCTS

902.01 STORAGE. Storage of materials shall conform to the Contract Documents and as directed by the Engineer.

902.02 CERTIFICATION OF PORTLAND CEMENT AND BLENDED HYDRAULIC CEMENT. The manufacturer shall furnish certification as specified in TC-1.03. The certification shall also include:

- (a) The mill shall report its quality control procedures, and submit a new report whenever there is a procedural change.
- (b) The mill's control laboratory shall be inspected by the Cement and Concrete Reference Laboratory of the National Institute of Standards and Technology on their regularly scheduled visits. The Engineer shall be provided with copies of the reports of these inspections along with an account of the action taken to correct cited deficiencies.
- (c) Records of data accumulated by the quality control procedures shall be produced upon request.
- (d) A certified document shall accompany each shipment stating that the contents conform to all applicable requirements. Additionally, the document shall show the producer's name, mill location, carrier number, date loaded, weight contained in carrier, silo number, consignee, destination, Contract number, and type of cement. The signature and title of the signer shall be shown on the document.
- (e) The mill shall, upon request, supply certified chemical and physical test values that can be associated with any sample representing cement drawn from a particular silo on a given date.
- (f) Acceptance of cement by certification will be terminated if test results differ from mill results by more than the precision limits given in the test method. The acceptance procedure will then revert to storage testing and approval prior to shipment.

902.03 HYDRAULIC CEMENT.

902.03.01 Portland Cement. M 85, with the fineness and the time of setting determined using T 153 and T 131, respectively.



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902.03.02 Ground Iron Blast Furnace Slag. M 302, Grade 100 or 120. The Contractor may request to substitute a maximum of 50 percent of the weight of cement with ground iron blast furnace slag. When ground iron blast furnace slag is used, the minimum cement factor and water/cement ratio will be determined on the basis of the combined weight of the portland cement and ground iron blast furnace slag. When ground iron blast furnace slag is used to control alkali silica reactivity, see Table 902 B for percentage.

902.04 BLENDED HYDRAULIC CEMENT. M 240, Type I (PM) or a Type IP containing 15 to 25 percent pozzolan by weight of cement. Maximum loss on ignition is 3.0 percent. Do not use ground iron blast furnace slag for blending. The requirement for a manufacturer's written statement of the chemical composition is waived.

902.05 MASONRY CEMENT. C 91, except the water retention and staining tests are waived.

902.06 CONCRETE ADMIXTURES. Do not use concrete admixtures that contribute more than 200 ppm of chlorides based on the cement content when tested per MSMT 610. Use only prequalified admixtures.

Do not use pozzolan and Type I (PM) or Type IP cement in the same mix. Since the strength gains are delayed with these materials, a longer period of time may be required for curing and form removal.

902.06.01 Air Entraining Admixtures. M 154.

902.06.02 Chemical Admixtures. M 194, Type A, D, or nonchloride C.

902.06.03 High Range Water Reducing Admixtures. M 194, except that it shall be a liquid, the water content shall be a maximum of 85 percent of that of the control, and the durability factor shall be a minimum of 90. Use Type F for early strength, which shall produce a minimum compressive strength in 12 hours of 180 percent of that of the control. Use Type G when early strength is not specified. The manufacturer shall furnish certification as specified in TC-1.03. The certification shall include curves indicating the fluid ounces of admixture per 100 lb of cement as related to water reduction and strength gain for 12 hours when used with a minimum cement factor of 700 lb.

902.06.04 Pozzolans. The use of pozzolans may be requested to control alkali silica reactivity or for other reasons. When a pozzolan is used, determine the minimum cement factor and water/cement ratio on the basis of the combined weight cement and pozzolan. See Table 902 B for percentage of fly ash, and microsilica.

(a) **Fly Ash.** M 295, pozzolan Class C or F, except that the maximum permissible moisture content shall be 1.0 percent, and when used in concrete Mix Nos. 3 and 6 the maximum loss on ignition 3.0 percent.

(b) **Microsilica.** C 1240, except that the oversize requirement is waived.

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902.06.05 Corrosion Inhibitors. Corrosion inhibitors shall be calcium nitrite based and contain a minimum of 30 percent active ingredients by mass. The gallonage of corrosion inhibitor used in the concrete mixture shall be included as water when determining the water/cementitious materials ratio.

902.07 PORTLAND CEMENT CONCRETE CURING MATERIALS. Use burlap cloth, sheet materials, liquid membrane forming compounds, or cotton mats.

902.07.01 Burlap. M 182, Class 1, 2, or 3.

902.07.02 Sheet Materials. M 171 with the following exceptions:

- (a) **White Opaque Burlap Polyethylene Sheeting.** Tensile strength and elongation requirements are waived. Use sheeting having a finished product weight of not less than 10 oz/yd².
- (b) **White Opaque Polyethylene Backed Nonwoven Fabric.** 902.07.02(a), with the thickness requirement waived. Use material having a finished product weight of not less than 5 oz/yd².
- (c) **White Opaque Polyethylene Film.** Tensile strength and elongation requirements are waived.

902.07.03 Liquid Membrane. C309. Field control testing of the white pigmented curing compounds is on the basis of weight per gallon. The samples shall not deviate more than ± 0.3 lb/gal from the original source sample.

902.07.04 Cotton Mats. Cotton mats consist of a filling material of cotton bats or bats covered with unsized cloth and tufted or stitched to maintain the shape and stability of the unit under job conditions of handling.

Use coverings of either cotton cloth, burlap or jute having the following properties:

- (a) Cotton cloth covering shall weigh not less than 6.0 oz/yd² and have an average of not less than 32 threads/in. of warp and not less than 28 threads/in. of filling. Use raw cotton, cotton comber waste, cotton card strip waste, or combinations thereof as the raw material used in the manufacture of the cotton cloth.
- (b) Burlap or jute covering for cotton mats shall weigh not less than 6.4 oz/yd² and shall have not less than 8 threads/in. of warp and not less than 8 threads/in. of filling. Use the grade known commercially as "firsts" and they shall be free from avoidable imperfections in manufacture and from defects or blemishes affecting the serviceability.

Use a cotton bat, or bats made of raw cotton, cotton waste, cotton linters, or combinations thereof, as the filling material for the mats. Mats shall weigh not less than 12 oz/yd².

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902.08 FORM RELEASE COMPOUNDS. Use form release compounds that effectively prevent the bond of the concrete to the forms. Form release compounds shall not cause discoloration of the concrete or adversely affect the quality or rate of hardening at the interface of the forms.

The flash point of the form release compound shall not be less than 100 F when tested per T 73.

902.09 PARAFFIN WAX. Use clear paraffin wax for use as a bond breaker for concrete. The flash point shall not be less than 380 F when tested under D 92.

902.10 PORTLAND CEMENT CONCRETE. Section 915 and as specified herein.

902.10.01 Proportioning. Prior to the start of construction, submit to the AME the source and proportions of materials to be used for each concrete mix. The mixture shall meet 902.10.03.

The concrete, with the exception of water and chemical admixtures, shall be proportioned by weight. Water and chemical admixtures may be proportioned by volume or weight. The mix shall be uniform and workable.

902.10.02 Materials.

Coarse Aggregate	901.01
Fine Aggregate	901.01
Cement	902.03 and 902.04
Concrete Admixtures	902.06
Synthetic Fibers	902.15
Water	921.01

902.10.03 Portland Cement Concrete Mixtures.



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The concrete mixes shall conform to the following:

TABLE 902 A

PORTLAND CEMENT CONCRETE MIXTURES									
MIX NO.	28 DAY SPECIFIED COMPRESSIVE STRENGTH	STANDARD DEVIATION	CRITICAL VALUE	MIN CEMENT FACTOR	COARSE AGGREGATE SIZE	MAX WATER/ CEMENT RATIO	SLUMP RANGE	TOTAL AIR CONTENT	CONCRETE TEMPERATURE
	psi	psi	psi	lb/yd ³	M 43 / M 195	by wt	in.	%	F
1	2500	375	2430	455	57, 67	0.55	2 – 5	5 – 8	70 ± 20
2	3000	450	3010	530	57, 67	0.50	2 – 5	5 – 8	70 ± 20
3	3500	525	3600	580	57, 67	0.50	2 – 5	5 – 8	70 ± 20
4	3500	525	3600	615	57, 67	0.55	4 – 8	N/A	70 ± 20
5	3500	525	3600	580	7	0.50	2 – 5	5 – 8	70 ± 20
6	4500	675	4770	615	57, 67	0.45	2 – 5	5 – 8	65 ± 15
7	4200	630	4420	580	57	0.50	1½ – 3	5 – 8	70 ± 20
8	4000	600	4180	750	7	0.42	2 – 5	5 – 8	65 ± 15
9	3000 (a)	N/A	N/A	800	57, 67	0.45	4 – 8	5 – 8	70 ± 20
10	4500	675	4770	700	¾” – No. 4	0.45	2 – 5	6 – 9	65 ± 15
11	4200	630	4420	—	57, 67	0.45	2 – 5	5 – 8	65 ± 15
12	4200	630	4420	—	¾” – No. 4	0.45	2 – 5	6 – 9	65 ± 15

- Note 1: When concrete is exposed to water exceeding 15,000 ppm sodium chloride content, Type II cement shall be used. In lieu of Type II cement, a Type I cement may be used in combined form with an amount of up to 50 percent replacement with ground iron blast furnace slag, or an amount of up to 25 percent replacement with Class F fly ash. The Contractor shall submit to the Engineer the proposed mix proportions and satisfactory test results per C 1012 showing a sulfate resistance expansion not exceeding 0.10 percent at 180 days
- Note 2: The temperature of Mix No. 6 when used for other than superstructure work as defined in TC-1.03 shall be 70 ± 20 F.
- Note 3: Type A or D admixture shall be added to bridge, box culvert, and retaining wall concrete.
- Note 4: Nonchloride Type C admixtures may be used when approved by the Engineer.
- Note 5: Other Slump Requirements:
 When a high range water reducing admixture Type F or Type G is specified, the slump shall be 4 to 8 in.
 When synthetic fibers are specified, the slump shall be 5 in. maximum.
 When concrete is to be placed by the slip form method, the slump shall be 2-1/2 in. maximum.
 When the absorption of the coarse aggregate is greater than 10 percent, the slump shall be 3 in. maximum.
- Note 6: Mix 9 shall contain a Type F high range water reducing admixture.
- Note 7: Mix 10 and 12 shall be proportioned as specified in 211.2 of the ACI's Recommended Practices for Selection Proportions for Structural Lightweight Concrete. The maximum average Density of Cured Concrete shall be 118 lb/ft³. Control testing for Density of Cured Concrete shall be two companion cylinders for each 100 yd³, or fraction thereof, as specified in M 195.
- Note 8: Mix 11 and 12 shall also conform to all requirements as specified in Table 902 C.
- (a) Acceptance will be based on a minimum compressive strength of 3000 psi in 24 hours. Design approval will be given based on trial batch obtaining a minimum compressive strength of 2500 psi in 12 hours. Testing shall conform to 902.10.08 except that cylinders shall remain in the molds until tests are conducted.

Coarse and fine aggregate having an expansion up to 0.10 percent when tested for alkali silica reactivity (ASR) MSMT 212 may be used without restriction. Aggregates having an expansion greater than 0.10 but less than 0.35 percent are considered reactive and may only be used when one of the options in table 902 B are employed. Those having an expansion of 0.35 percent and greater are prohibited.



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TABLE 902 B

OPTION	ALKALI CONTENT OF CEMENT % max	REPLACE CEMENT WITH		SPECIFICATION
		MATERIAL	% BY WEIGHT	
1	1.50	Class F Fly Ash	15 – 25	M 295
2	1.50	Ground Iron Blast Furnace Slag	25 – 50	M 302 Grade 100 or 120
3	1.50	Microsilica	5 – 7	C 1240
4	—	Blended Cement (a)	100	M 240
5	0.60 (b)	Low Alkali Cement	100	M 85

(a) Pozzolan content of 15 – 25 percent by weight of cement

(b) For mix 9 used for Portland cement concrete pavement repairs; the maximum allowable percentage of alkalis in Portland cement shall be 0.70.

When reactive aggregate is used, designate which option will be used to control the formation of the ASR gel. If an option other than option 5 in Table 902 B above is chosen, conduct tests per MSMT 212 using the reactive aggregate and the proposed cementitious material. The expansion test results shall not be greater than 0.10 percent. When more than one reactive aggregate is used in a concrete mix, each shall be tested individually and the maximum amount of pozzolan required to reduce the expansion of all the aggregates to 0.10 percent or less shall be used. Submit the aggregate source, test results, and the percent and type of replacement cement to the Engineer. The Engineer may withhold source approval pending verification testing.



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TABLE 902 C

MIX PHYSICAL PROPERTIES		
TEST PROPERTY	TEST METHOD	SPECIFICATION LIMITS
Minimum Cementitious Materials Factor, lb/yd ³	—	580
Maximum Content of Portland Cement, lb/yd ³	—	550
Water/Cementitious Materials Ratio by Wt.	—	0.45
Corrosion Inhibitor, gal/yd ³	902.06.05	2.0
Synthetic Fibers, lb/yd ³	902.15	1.5
Permeability of Field Concrete, moving average of three tests, coulombs max	T 277 Modified	2500
Permeability of Field Concrete, individual test, coulombs max	T 277 Modified	3000
Shrinkage at 28 days, microstrains	C 157	400

Note 1: Only Type I or II Portland cement shall be used.

Note 2: Mixes shall contain ground iron blast furnace slag, fly ash or microsilica.

Note 3: The water to cement ratio shall be based upon the total water to cementitious materials ratio. The gallonage of the corrosion inhibitor shall be included in the water/cementitious materials ratio.

Note 4: The permeability test value of field concrete shall be the average of two test specimens representing production concrete. Test specimens shall be molded on the project site in 4 x 8 in. molds conforming to M 205. Test specimens shall be handled under same conditions as compressive strength test specimens in conformance with C 31 for the first seven days. When seven days old, they shall be cured in a 100 F water bath for the remainder of the 28 day curing. The 28 day rapid chloride permeability of the specimens will be determined in conformance with T 277. Test for the geometry of test specimens will be waived.

Note 5: Shrinkage tests will be performed on trial mixes only.

Note 6: High range water reducing admixture may be used except the water reducing requirements will be waived.

Note 7: A sealer conforming to 902.12 shall be used on the finished surface.

902.10.04 Trial Batch. A trial batch shall be prepared to certify that each mix meets 902.10.05 and 902.10.06. Approval will be given when the test results meets the minimum required average strength.

Make arrangements with the AME at least two weeks in advance, to have an authorized representative present during the batching and testing. Each trial batch shall consist of at least 3 yd³ of concrete. Supply all equipment, and labor required to produce the trial batches and conduct the required tests at no additional cost to the Administration.

The AME may waive the requirement for a trial batch when past performance records show that the required average strength requirement has been met.



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902.10.05 Design Required Average Strength.

Specified compressive strength, f_c' , psi	Required average compressive strength, f_{cr}' , psi
$f_c' \leq 5000$	Use the larger value computed from Eq. (A-1) and (A-2) $f_{cr}' = f_c' + 1.34s$ (A-1) $f_{cr}' = f_c' + 2.33s - 500$ (A-2)
Over 5000	Use the larger value computed from Eq. (A-1) and (A-3) $f_{cr}' = f_c' + 1.34s$ (A-1) $f_{cr}' = 0.90 f_c' + 2.33s$ (A-3)

where:

- f_c' = the 28 day specified compressive strength.
- s = the standard deviation as specified in 902.10.06.

A test is defined as the average strength of two companion cylinders.

902.10.06 Standard Deviation.

- (a) When past performance records are available, a standard deviation will be established from documented performance records of the producer consisting of a minimum of 15 consecutive 28 day compressive strength tests obtained within the last 12 months.

The standard deviation will be established as the product of the calculated standard deviation and multiplier.

NUMBER OF TESTS	MULTIPLIER FOR STANDARD DEVIATION
15	1.16
20	1.08
25	1.03
30 or more	1.00

Interpolate for intermediate number of tests.



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(b) When past performance records are not available, the required average strength shall meet to the following:

Specified compressive strength, f_c' , psi	Required average compressive strength, f_{cr}' , psi
$f_c' < 3000$	$f_{cr}' = f_c' + 1000$
$3000 \leq f_c' \leq 5000$	$f_{cr}' = f_c' + 1200$
$f_c' > 5000$	$f_{cr}' = 1.10 f_c' + 700$

902.10.07 Standard of Control. The average of all sets of three consecutive strength tests shall equal or exceed the critical value as specified in 902.10.03 which shall be computed using the following formula:

$$\text{Critical Value} = f_c' + (1.14 \times S) - 500$$

Failure to conform to this criteria shall be cause for immediate investigation and remedial action up to and including suspension of production. A design standard deviation equal to 15 percent of the specified strength shall be used for calculation until a minimum of 15 test results are obtained.

The actual average strength and standard deviation shall be computed upon the availability of 28 day strength data comprising a minimum of 15 tests. Should this determination indicate an excessive margin of safety, the concrete mix may be modified to produce lower average strength as approved by the Engineer. If these calculations indicate a coefficient of variation greater than 15, the quality of the concrete and testing will be evaluated.



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902.10.08 Testing. Sampling per T 141. Testing as follows:

TEST	METHOD	MINIMUM TEST FREQUENCY	RESPONSIBILITY
Temperature (e)	T 309	1 per 50 yd ³ (or fraction thereof)	Project Engineer
Slump (a)(e)	T 119	1 per 50 yd ³ (or fraction thereof)	Project Engineer
Air Content (a)(e)	T 152 T 196	1 per 50 yd ³ (or fraction thereof)	Project Engineer
Compression (b)(c)(d)	T 23	1 per 50 yd ³ (or fraction thereof)	Project Engineer
Compression (b)(c)(d) Mix No. 7 Only	T 23	3 per Day	Project Engineer

- (a) A second test will be made when the first slump or air content test fails. Acceptance or rejection will be based on the results of the second test.
- (b) Compressive strength tests are defined as the average of two companion cylinders.
- (c) The Contractor shall be responsible for the making of all early break cylinders and furnishing the molds, stripping, curing/delivery of all cylinders, including 28 day cylinders, to the testing laboratory.
- (d) The Project Engineer will be responsible for making, numbering and signing the 28 day cylinders.
- (e) When constructing plain and reinforced concrete pavements, the testing frequency for slump, air content, and temperature shall be 1 per 100 yd³ or fraction thereof.

902.10.09 Acceptance. Concrete will be acceptable if both of the following requirements are met:

- (a) The average of all sets of three consecutive strength tests equal or exceed the specified design strength.
- (b) No individual strength test (average of two companion cylinders) falls below the specified design strength by more than 500 psi.

902.10.10 Price Adjustment. A price adjustment will be based on the Contract unit price per cubic yard of concrete. If the unit is a lump sum item, the price per cubic yard for the concrete will be determined by dividing the cubic yards into the Contract lump sum price.

- (a) **Test Results More Than 500 psi Below the Specified Design Strength.** Failing strength tests will be considered individually with a price adjustment being applied on the percentage basis as shown below.

(Price per yd³) X (quantity of yd³ represented by the failing concrete strength) X (percent of failure).

Example:

$$\$400.00 \text{ per yd}^3 \times 50 \text{ yd}^3 \times [1 - (3600 / 4500 \text{ psi})] = \$4,000.00$$



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No payment will be allowed when the test results fall below 50 percent of the specified design strength for structural concrete or 40 percent for incidental concrete.

The Engineer will determine when the strength of the concrete represented by the failing tests is sufficient to remain in place or whether it must be removed and replaced with Specification concrete.

- (b) Test Results 500 psi or Less than the Specified Design Strength.** Strength failures 500 psi or less than the specified design strength will be averaged with the next two consecutive tests. If those two tests include a failure greater than 500 psi, those tests will be evaluated as in 902.10.10(a) and replaced with the next consecutive test. If the resulting average falls below the specified design strength, a price adjustment will be applied as specified in the table below. Any failure will only be included in one grouping.

STRENGTH BELOW THE SPECIFIED (avg of 3 tests) DESIGN LEVEL, psi	ADJUSTMENT FACTOR
MIX NO. 1 THRU MIX NO. 7	
1 – 100	0.005
101 – 200	0.01
201 – 300	0.02
301 – 400	0.04
401 – 500	0.08

Adjustment price equals (price per yd³) X (quantity of yd³ represented by the failing cylinders) X (the adjustment factor).

Example:

$$\$400.00 \text{ per yd}^3 \times 50 \text{ yd}^3 \times 0.01 = \$200.00$$

902.11 MORTAR FOR GROUT. Mortar used for grouting anchor bolts, pipe, handrail posts, and miscellaneous items shall be composed in accordance with one of the following:

- (a) One part Portland cement or blended hydraulic cement and one part mortar sand by dry loose volume.
- (b) Prepared bag mixes consisting of Portland cement or blended hydraulic cement and mortar sand. The prepared mixes shall produce a mortar meeting the strength requirements specified in the Contract Documents.
- (c) Use nonshrink grout when specified. The grout shall have a minimum compressive strength of 5000 psi in seven days when tested as specified per T 106, except that the cube molds shall remain intact with a top firmly attached throughout the curing period. The



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nonshrink grout shall have a minimum expansion of 0.0 percent after seven days when tested as specified per T 160.

- (d) Epoxy grout shall consist of sand and epoxy mixed by volume in per the manufacturer's recommendations. The grout shall be capable of developing a minimum compressive strength of 6500 psi in 72 hours when tested per MSMT 501. Sand for epoxy grout as specified in 901.01.
- (e) An epoxy or polyester anchoring system may be used when approved by the Engineer in accordance with the manufacturer's recommendations. Strength values shall be as specified in the Contract Documents.

902.12 LINSEED OIL. Shall consist of a 50-50 mixture (by volume) of boiled linseed oil meeting Federal Specification TT-L-190 and kerosene per D 3699.

902.13 LATEX MODIFIED CONCRETE. Portland cement concrete containing prequalified Laboratory approved styrene butadiene latex emulsion is defined as Latex Modified Concrete (LMC).

Latex emulsion shall have a minimum of 90 percent of the nonvolatiles as styrene butadiene polymers. The latex emulsion as specified in Table 902.13 A. The material shall be stored in suitable containers and be protected from freezing and exposure to temperatures in excess of 85 F.

LMC shall be proportioned using volumetric mixing and designed as follows:

LATEX MODIFIED CONCRETE	
MATERIAL	SPECIFICATION LIMITS
Portland Cement, CWT/yd ³ , min	6.6
Latex Emulsion/Cement Ratio	0.31 – 0.34
Water/Cement Ratio, max	0.22
Entrained Air, %	6.0 ± 3
Slump, in.	5 ± 1

The physical properties of LMC shall conform to Table 902.13 B. The Contractor shall furnish the necessary 3 X 6 in. molds per M 205 to be used for the fabrication of compressive strength cylinders.

Control and Acceptance Sampling.

- (a) Submit a two qt minimum sample, of the styrene butadiene latex emulsion to the AME daily for each lot of material used in a day's production.



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- (b) A batch for LMC is defined as the capacity of the equipment being used on the project. Slump and air samples will be taken and tested before the placement of a batch is permitted. The slump shall be measured four to five minutes after discharge from the mixer. The test material shall be deposited off the deck and not be disturbed during this waiting period. One additional sample for slump and air will be taken randomly during the placement of each batch. For seven day compressive strength, two tests each per batch are required. A test is defined as consisting of two companion cylinders. The samples for these tests will be taken at random while the placement is in progress.

TABLE 902.13 A

REQUIREMENTS FOR CHEMICAL PROPERTIES OF LATEX EMULSION MATERIALS				
PROPERTY	SPECIFICATIONS		QUALITY ASSURANCE TESTS	
	LIMITS	TOLERANCE	PREQUALIFICATION TESTS	CONTROL AND ACCEPTANCE
Color	White	—	X	X
pH	9.0 – 11.0	—	X	X
Weight, lb/gal	8.40 – 8.47	—	X	X
Solids Content, %	46 – 53	—	X	X
*Butadiene Content, % of polymer	30 – 40	—	—	—
Viscosity @ 10 rpm-cps	Match Original	± 20	X	X
*Surface Tension, dynes/cm max	50	—	—	—
*Mean Particle Size, polymer – Å	1400 – 2500	—	—	—
Coagulum, % max	0.10	—	X	X
*Freeze-Thaw Stability, coagulum, % max	0.10	—	X	X
Infrared Spectra of Latex Film	Match Original	—	X	X
Infrared of Alcohol, Soluble Portion of Latex	Match Original	—	X	X
Shelf Life, min	1 yr	—	X	—

Note 1: Quality assurance tests shall be conducted as specified in MSMT 612 except those denoted by an * shall be conducted as specified in FHWA RD – 78-35.

Note 2: The original or prequalification sample shall be accompanied by the producer's certification on all of the tests and properties noted above and as specified in TC-1.03. The certification shall contain actual test values of the product and the infrared spectrograph.

Note 3: A separate certification is required for each lot of material. The certification shall note the date of manufacture, lot size, and whether or not the material is identical to the formulation of the original sample.



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TABLE 902.13 B

LATEX MODIFIED CONCRETE PHYSICAL PROPERTIES			
TEST PROPERTY	TEST VALUES	QUALITY ASSURANCE TESTS	
		PREQUALIFIED TESTS	CONTROL AND ACCEPTANCE
7 Day Compressive Strength, psi min	3000	X	X
28 Day Compressive Strength, psi min	3500	X	—
42 Day Compressive Strength, psi min	3500	X	—
7 Day Flexural Strength, psi min	550	X	—
28 Day Flexural Strength, psi min	650	X	—
42 Day Shear Bond Strength, psi min	2000	X	—
Durability Factor, 300 cycles, % min	85	X	—
Chloride Permeability, Ppm max	510	X	—
Scaling Resistance, 50 cycles, max	3	X	—

Note 1: Quality assurance tests shall be conducted as specified in MSMT 721.

Note 2: Seven Day Compressive Strength Test will be used for Control & Acceptance of the material. The minimum specified design strength is 3000 psi at seven days. The mix design approval and acceptance will be based on a coefficient of variation of 10 percent with a probability of 1 in 10 tests falling below the specified strength. Only test values 80% or greater than the specified strength will be accepted

902.14 RAPID HARDENING CEMENTITIOUS MATERIALS FOR CONCRETE PAVEMENT REPAIRS. Materials shall be a dry, packaged cementitious mortar having less than 5 percent by weight of aggregate retained on the 3/8 in. sieve and meet the following requirements:

Classification.

Class I — For use at ambient temperatures below 50 F.

Class II — For use at ambient temperatures of 50 to 90 F.

Class III — For use at ambient temperatures above 90 F.

Chemical Requirements. C 928 except that no organic compounds such as epoxy resins or polyesters as the principal binder.



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Physical Requirements. Meet the following when tested per MSMT 725:

COMPRESSIVE STRENGTH, psi min				
CLASSIFICATION	< 2 hr	2-6 hr	6 hr	28 days
Type I — Slow	—	—	2000	4500
Type II — Rapid	—	2000	—	4500
Type III — Very Rapid	2500	—	—	4500

TEST RESULTS	
TEST PROPERTY	LIMITS
Bond Strength, 7 days, psi min	2000
Length Change, increase after 28 days in water, based on length at 3 hr, % max	+ 0.15
Length Change, decrease after 28 days, % max	- 0.15
Freeze Thaw, loss after 25 cycles in 10% CaCl ₂ solution, % max	8
Initial Setting Time, minutes min	10

Marking. All packages delivered to the project shall be marked with the following information:

- (a) Date material was packaged.
- (b) Approximate setting time.
- (c) Recommended dosage of water or liquid component.
- (d) Mixing instructions.
- (e) Class or temperature range.

Certification. The manufacturer shall furnish certification as specified in TC-1.03 showing the actual test results for each class and type of material submitted to the Laboratory.

902.15 SYNTHETIC FIBERS. When synthetic fibers are specified in the Contract Documents, the fibers shall be 1/2 to 1-1/2 in. long and conform to C 1116, Type III. The manufacturer shall furnish certification as specified in TC-1.03. The quantity of fibers used and their point of introduction into the mix shall conform to the fiber manufacturer's recommendations.

902.16 CONTROLLED LOW STRENGTH MATERIAL.

902.16.01 Usage. Controlled Low Strength Material (CLSM) shall consist of the types described below:



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TYPE A – Used where future excavation of the CLSM may be necessary (e.g. utility trenches, pipe trenches, bridge abutments, and around box culverts).

TYPE B – Used where future excavation of the CLSM is not anticipated (e.g. filling abandoned conduits, pipes, tunnels, mines, etc. and replacing unsuitable soils below roadway and structure foundations where extra strength is required).

902.16.02 Materials.

Coarse Aggregate	901.01*
Fine Aggregate	901.01
Cement	902.03 and 902.04
Concrete Admixtures	902.06
Fly Ash	902.06.04
Water	921.01

*maximum size of 3/4 in.

Produce CLSM in conformance with the applicable portions of Section 915 and the following:

902.16.03 Proportioning. Submit the sources and proportions of materials, and test data for each CLSM mixture prior to construction. CLSM shall be proportioned, on the basis of field experience and/or laboratory trial mixtures, to produce a flowable and self-compacting mixture meeting the requirements of 902.16.04.

CLSM shall be proportioned by weight; with the exception of water and chemical admixtures. Water and chemical admixtures may be proportioned by volume or weight.

902.16.04 CLSM Mixtures. Proportion CLSM with sufficient amounts of Portland cement, fly ash, or ground granulated blast furnace slag; individually or in combination, to produce a cohesive, non-segregating mixture that conforms to the physical properties in the following table:

CLSM Mix	28 Day Compressive Strength, (psi) ASTM D4832	Flow Consistency, (in.) ASTM D6103
Type A	50 - 200	8 min.
Type B	500 min.	8 min.

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902 – PORTLAND CEMENT CONCRETE AND RELATED PRODUCTS

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**CATEGORY 900
MATERIALS**

SECTION 902 – PORTLAND CEMENT CONCRETE AND RELATED PRODUCTS

670 **DELETE:** 902.10.03 - Table 902 A in its entirety.

INSERT: The following.

TABLE 902 A

PORTLAND CEMENT CONCRETE MIXTURES										
MIX NO.	SPECIFIED COMPRESSIVE STRENGTH	COMPRESSIVE STRENGTH TEST AGE	STANDARD DEVIATION	CRITICAL VALUE	MIN CEMENT FACTOR	COARSE AGGREGATE SIZE	MAX WATER/ CEMENT RATIO	SLUMP RANGE	TOTAL AIR CONTENT	CONCRETE TEMPERATURE
	psi	days	psi	psi	lb/yd ³	M 43 / M 195	by wt	in.	%	F
1	2500	28	375	2430	455	57, 67	0.55	2 – 5	5 – 8	70 ± 20
2	3000	28	450	3010	530	57, 67	0.50	2 – 5	5 – 8	70 ± 20
3	3500	28	525	3600	580	57, 67	0.50	2 – 5	5 – 8	70 ± 20
4	3500	28	525	3600	615	57, 67	0.55	4 – 8	N/A	70 ± 20
5	3500	28	525	3600	580	7	0.50	2 – 5	5 – 8	70 ± 20
6	4500	28	675	4770	615	57, 67	0.45	2 – 5	5 – 8	65 ± 15
7	4200	28	630	4420	580	57	0.50	1½ – 3	5 – 8	70 ± 20
8	4000	28	600	4180	750	7	0.42	2 – 5	5 – 8	65 ± 15
9	3000	(a)	N/A	N/A	800	57, 67	0.45	4 – 8	5 – 8	80 ± 20
10	4500	28	675	4770	700	¾” – No. 4	0.45	2 – 5	6 – 9	65 ± 15
11	4200	28	630	4420	—	57, 67	0.45	2 – 5	5 – 8	65 ± 15
12	4200	28	630	4420	—	¾” – No. 4	0.45	2 – 5	6 – 9	65 ± 15
HE	3000	(b)	N/A	N/A	N/A	N/A	N/A	3 – 9	5 – 8	80 ± 20
PC (c)	N/A	N/A	N/A	N/A	450	7, 8	0.45	N/A	15-25	N/A
WT	2500	(d)	NA	NA	650	57	0.45	5 max	5 – 8	70 ± 20

Note 1: When concrete is exposed to water exceeding 15,000 ppm sodium chloride content, Type II cement shall be used. In lieu of Type II cement, a Type I cement may be used in combined form with an amount of up to 50 percent replacement with ground iron blast furnace slag, or an amount of up to 25 percent replacement with Class F fly ash. The Contractor shall submit to the Engineer the proposed mix proportions and satisfactory test results per C 1012 showing a sulfate resistance expansion not exceeding 0.10 percent at 180 days

Note 2: The temperature of Mix No. 6 when used for other than superstructure work as defined in TC-1.03 shall be 70 ± 20 F.

Note 3: Type A or D admixture shall be added to bridge, box culvert, and retaining wall concrete.

Note 4: Non-chloride Type C admixtures may be used when approved by the Engineer.

Note 5: Other Slump Requirements:

When a high range water reducing admixture Type F or Type G is specified, the slump shall be 4 to 8 in.

When synthetic fibers are specified, the slump shall be 5 in. maximum.

When concrete is to be placed by the slip form method, the slump shall be 2-1/2 in. maximum.

When the absorption of the coarse aggregate is greater than 10 percent, the slump shall be 3 in. maximum.

Note 6: Mix 9 shall contain a Type F high range water reducing admixture.

Note 7: Mix 10 and 12 shall be proportioned as specified in 211.2 of the ACI's Recommended Practices for Selection Proportions for Structural Lightweight Concrete. The maximum average Density of Cured Concrete shall be 118 lb/ft³. Control testing for Density of Cured Concrete shall be two companion cylinders for each 100 yd³, or fraction thereof, as specified in M 195.

Note 8: Mix 11 and 12 shall also conform to all requirements as specified in Table 902 C.

Note 9: Add Polyolefin Macro Fibers to Mix No. 9 and High Early Strength Patch Mix (HE). The dosage rate shall be per the manufacturer's recommendations.

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902 – PORTLAND CEMENT CONCRETE AND RELATED PRODUCTS

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- (a) Mix 9 is for concrete pavement repair only . Match cure of the samples is permissible in accordance with AASHTO PP 54. Strength tests shall be scheduled accordingly on weekdays and acceptance will be based on a minimum compressive strength of 3000 psi in 24 hours or 3600 psi in 3 days. Acceptance testing shall conform to 902.10.08 except that cylinders shall be field cured and remain in the molds until tests are conducted. Mix 9 when specified for incidental work and not requiring traffic control in conformance with 522.03.15 will not require the addition of fibers.
- (b) Match cure the samples in accordance with AASHTO PP 54. Design approval will be given based on trial batch obtaining a minimum compressive strength of 2500 psi in 6 hours. Strength tests shall be scheduled accordingly on weekdays and acceptance will be based on a minimum compressive strength of 3000 psi in 24 hours or 3600 psi in 3 days. Acceptance testing shall conform to 902.10.08 except that cylinders shall be field cured and remain in the molds until tests are conducted.
- (c) Pervious Concrete (PC) shall be proportioned as specified in 522R of the ACI's Recommended Practices for Pervious Concrete Mixture Proportions. Acceptance of freshly mixed Pervious Concrete shall be made based on Density and Total Void Content. Density and Total Air Voids of Freshly Mixed Pervious Concrete shall be performed per ASTM C1688.
- (d) Whitetopping (WT) mix shall contain a high range water reducing admixture, macro-fibers at 3 lbs/yd³ Max, and acceptance will be on a minimum compressive strength of 2500 psi in 24 hours.

672 **DELETE:** 902.10.04 Trial Batch in its entirety.

INSERT: The following.

902.10.04 Trial Batch. Prepare a trial batch to certify that each mix meets 902.10.05 and 902.10.06 except for Mix 9. Approval will be given when the test results meets the minimum required average strength. Mix 9 design approval will be given based on the trial batch obtaining a minimum compressive strength of 2500 psi in 12 hours.

Make arrangements with the AME to have an authorized representative present during the batching and testing at least two weeks in advance. Each trial batch shall consist of at least 3 yd³ of concrete. Supply all equipment and labor required to produce the trial batches and conduct the required tests at no additional cost.

The requirement for a trial batch may waived when past performance records show that the required average strength requirement has been met.

ADD: The following after 902.15 Synthetic Fibers.

902.15.01 Macro Polyolefin Fibers. D 7508 with a minimum length of 1-1/2 in.

omatsp 04-06-15



SPECIAL PROVISIONS INSERT
904 — PERFORMANCE GRADED ASPHALT BINDERS
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**CATEGORY 900
MATERIALS**

**SECTION 904 — PERFORMANCE GRADED
ASPHALT BINDERS AND ASPHALT MIXES**

683 **DELETE:** SECTION 904 — PERFORMANCE GRADED ASPHALT BINDERS AND
HOT MIX ASPHALT.

INSERT: The following.

**SECTION 904 — PERFORMANCE GRADED
ASPHALT BINDERS AND ASPHALT MIXES**

904.01 CERTIFICATION. The manufacturer and hauler shall furnish certifications as
specified in TC-1.03 and the following:

The manufacturer shall certify:

- (a) Date and time of loading.
- (b) Tank or blending system.
- (c) Identification of hauling unit.
- (d) Binder grade, temperature, and quantity of materials.
- (e) Complete certified analysis.
- (f) Lot number, if applicable.

The hauler shall certify:

- (a) Identification of hauling unit.
- (b) Binder grade and source of last delivery.
- (c) The date of the last delivery using this hauling tank and volume of material remaining in
the tank at the time of current loading.

904.02 PERFORMANCE GRADED ASPHALT BINDERS. M332 Table 1, for mixes
containing all virgin materials, recycled asphalt pavement materials, or roofing shingles from

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manufacturing waste. The Office of Materials Technology's (OMT) Asphalt Technology Division (ATD) will approve all PG binders. Submit certification from an approved supplier per M332 showing the final product meets specifications.

Chemical or organic additive suppliers shall supply the dosage rate and provide certification of the resultant PG binder.

The PG binder for asphalt mixes shall be achieved by the use of Neat Asphalt with elastomer polymer modifications when needed. Modifications to PG binder shall be as approved.

902.02.01 Warm Mix Asphalt (WMA) PG Binders. Include the PG binder performance grade test data over the range of WMA additive percentages proposed for WMA use. An AASHTO accredited laboratory shall be employed to perform all required WMA binder laboratory testing.

904.03 EMULSIFIED ASPHALTS. M140 or M208, and M316 with the following exceptions:

- (a) Cement mixing tests are waived.
- (b) Maximum of 3.0 percent by volume of oil distillate.
- (c) The sieve test requirement for field samples shall be a maximum of 0.4 percent.

904.04 ASPHALT MIXES. Section 915. Asphalt mixes shall be produced as specified.

904.04.01 Aggregates. M323 and Section 901. Test the aggregate retained on the 4.75 mm sieve for flat and elongated particles per D4791. Recycled asphalt pavement used in an asphalt mix shall be considered an aggregate source per 900.03.

904.04.02 Mix Design. Develop asphalt mix designs in conformance with R35, M323 and MSMT 416, except replace "Table 6, Superpave HMA Design Requirements" in M323 with the following:



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DESIGN LEVEL	20-Year Design Traffic, ESALs	N_{design}
1	<300,000	50
2	300,00 to <3,000,000	65
3	3,000,000 to <10,000,000	80
4	10,000,000 to <30,000,000	80
5	≥30,000,000	100

Design asphalt mixes for the Equivalent Single Axle Loading (ESAL) range specified.

Asphalt mixes designed with Reclaimed Asphalt Pavement (RAP) and/or Reclaimed Asphalt Shingles (RAS) shall also conform to MSMT 412.

904.04.03 Mix Design Approval. Submit data from the laboratory study to OMT for tentative approval at least 30 days prior to paving operations. Submit mix designs in an approved format. Include the following:

- (a) Mix designation.
- (b) Source, percentage, and grade of performance graded asphalt binder.
- (c) Source, gradation, and proportion of each component aggregate.
- (d) Target aggregate gradation.
- (e) Plant where the asphalt mix will be produced.
- (f) Plant target mixing temperature based on viscosity of 0.22 Pa·s.
- (g) Ratio of dust to binder material on effective asphalt.
- (h) Maximum specific gravity at the target binder content.
- (i) Mix design grading plotted on 0.45 power gradation chart.



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- (j) Tensile strength ratio and worksheets.
- (k) The bulk specific gravity and gyratory weight at Ndesign gyrations.
- (l) The air void content (percent Va) at N Design gyrations.
- (m) The voids in the mineral aggregate (percent VMA) and the voids filled with asphalt (percent VFA) at N Design gyrations (T 312).
- (n) All consensus and source properties.
 - (1) Coarse aggregate angularity.
 - (2) Flat and elongated.
 - (3) Sand equivalent.
 - (4) Uncompacted void content of fine aggregate.
 - (5) Bulk and apparent specific gravity of coarse and fine aggregate.
 - (6) Absorption of coarse and fine aggregate.

Include the quantity of job mix formula aggregate and appropriate amount of required PG binder for ignition oven calibration with each mix design submitted for approval.

When previous construction or performance experience has shown the proposed mix design to be unsatisfactory, OMT may require submission of a more suitable design.

- (a) When a change to the source of aggregate used in the mix is proposed, submit a revised mix design as specified.
- (b) Notify OMT two working days in advance if a change in the PG binder source becomes necessary.
- (c) Conduct a stripping test per MSMT 410 and submit an initial PG binder sample for testing and approval. OMT may require an anti-stripping additive test per D4867 before approval.

904.04.04 WMA Mix Design Approval. 904.04.03 and the following:

- (a) Warm Mix technology and/or additive information.

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- (b) WMA manufacturer's established target rate for water and additives and the acceptable variation for production.
- (c) Producer's compaction temperature of gyratory specimens.
- (d) The producer shall follow the manufacturer's recommendation for incorporating additives and WMA technologies into the mix per the manufacturer's recommendations.

When a foaming, chemical or organic additive is used, submit the appropriate job mix formula (JMF) per R35 for approval.

- (a) All WMA technology methods shall require a mix design/field placement demonstration on a non-Administration project once the JMF is approved and before verification, or as approved. Notify OMT two working days prior to shipment.
- (b) A technical representative from the product supplier must be present during the initial shipment and placement of the WMA when a chemical or organic additive is used.
- (c) If all specification requirements are met, this is a one-time demonstration per product, per plant, or with a combination of products.
- (d) The demonstration may be waived if the asphalt producer has successfully placed WMA on other projects with the same aggregates and can provide testing data and contact information.

904.04.05 Verification of Mix Design. Conduct a verification of the mix at the beginning of production in each plant after receiving tentative approval for the design.

- (a) Notify the Engineer and OMT at least two working days in advance of the scheduled verification. Verification shall be performed by certified personnel per 504.03.
- (b) Prepare the verification samples per R35. All verification samples will be split with the OMT laboratory.
- (c) Compare and evaluate the verification test results per MSMT 735.

904.04.06 Verification Evaluation. MSMT 735.

- (a) Initial verification consists of four split samples tested as specified. Begin random sampling with the first day's production, with at least one split sample witnessed by an OMT representative.

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- (b) If the first day of production is less than 2 000 tons, verification testing may be spread over no more than five working days with production of 200 tons or more. Complete verification testing no later than the fifth working day with production in excess of 200 tons or on the day when production has reached 2 000 tons, whichever occurs first.
- (c) Production may proceed without any changes when the Contractor’s and Administration’s test results conform to a Percent within Specification Limit (PWSL) of at least 85. If the mixes submitted have identical aggregate combinations and differing asphalt contents associated with changes in ESAL loads, verification may be limited to volumetric analysis, as determined.
- (d) If all test results do not conform to the parameters with a PWSL of at least 85, then an adjustment to the asphalt content or gradation may be made to bring the mix design requirements within acceptable levels. Permissible adjustment limitations between the approved Mix Design and Adjusted Mix Design are as follows:

TEST PROPERTY	PERMISSIBLE ADJUSTMENT % (*)
Larger than 1/2 in. (12.5 mm) sieve	± 5
1/2 in. (12.5 mm) thru No. 4 (4.75 mm) sieves	± 4
No. 8 (2.36 mm) thru No. 100 (1.50 μm) sieves	± 3
No. 200 (75 μm) sieve	± 1.0
Binder Content	± 0.20

*The permissible adjustment for all mixes shall be within control points

- (e) Perform a second verification to ensure that the modified mix conforms to all design requirements when an adjustment outside the permissible adjustment percentage is made to the mix design. Conform to the time and tonnage limitations as specified. Production may proceed when the adjusted mix is within control points and meets the PWSL. Suspend mix production and submit a new mix design for approval if the mix does not meet specifications. Design the new mix as specified.
- (f) Suspend mix production if subsequent designs submitted due to nonconformance do not meet specifications during the initial verification until corrective action is taken, as approved.

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If an adjustment to a verified mix is necessary due to aggregate changes, the mix design must meet all specification requirements before a new mix design number is issued. Verification will be based on the last 4 QA and QC production samples.

904.04.07 Thin Lifts. As specified in 504.03.12. Lift thicknesses shall be designated as thin lifts when the lift thickness specified does not meet 3-times nominal maximum aggregate size for fine graded mix designs or 4-times nominal maximum aggregate size for coarse graded mix designs.

Determine fine and coarse graded thin lift mix designs per M 323 and in accordance with the table below.

Thin Lift Mix Design Identification Table

Mix Designation	Gradation Classification	
	Control Sieve Mix Design Target (%Passing)	
	Fine Graded	Coarse Graded
4.75mm	A thin lift is a specified pavement thickness < 1 inch.	A thin lift is a specified pavement thickness < 1 inch.
9.5mm	When the 2.36mm (#8) is $\geq 47\%$, a thin lift is a specified pavement thickness < 1 1/8 inches	When the 2.36mm (#8) is < 47%, a thin lift is a specified pavement thickness < 1 1/2 inches
12.5mm	When the 2.36mm (#8) is $\geq 39\%$, a thin lift is a specified pavement thickness < 1 1/2 inches	When the 2.36mm (#8) is < 39%, a thin lift is a specified pavement thickness < 2 inches
19.0mm	When the 4.75mm (#4) is $\geq 47\%$, a thin lift is a specified pavement thickness < 2 1/4 inches	When the 4.75mm (#4) is < 47%, a thin lift is a specified pavement thickness < 3 inches
25.0mm	When the 4.75mm (#4) $\geq 40\%$, a thin lift is a specified pavement thickness < 3 inches	When the 4.75mm (#4) < 40%, a thin lift is a specified pavement thickness < 4 inches
37.5mm	When the 9.50mm (3/8) $\geq 47\%$, a thin lift is a specified pavement thickness < 4 1/2 inches	When the 9.50mm (3/8) < 47%, a thin lift is a specified pavement thickness < 6 inches

904.04.08 Anti-stripping Additives. D4867. Asphalt mixes shall have a Tensile Strength Ratio (TSR) of at least 0.85.

- (a) The freeze-thaw conditioning cycle is required. OMT testing of TSR's will be performed randomly.



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- (b) Asphalt mixes not meeting the minimum TSR require the use of an approved anti-stripping additive.
- (c) The producer shall determine the exact quantity of anti-stripping additive required per D4867 based on a minimum TSR of 0.85.
- (d) The dosage rate when a heat stable anti-stripping additive is used shall be at least 0.20 percent of the total weight of asphalt. The additive shall be introduced by the PG binder supplier or at the plant by line blending, metering, or otherwise measuring to ensure accurate proportioning and thorough mixing.
- (e) Hydrated lime (when used) shall conform to C 1097. Add hydrated lime in slurry form at the rate of 1.0 to 1.5 percent by weight of total aggregate. The lime slurry shall be sprayed uniformly on the aggregate on the feed belt prior to entry into the asphalt plant dryer.
- (f) Plant control and acceptance of the mix will be based on MSMT 410 per its stripping potential.

904.04.09 Plant Control. The following tolerances shall apply:

TABLE 904 A – DENSE-GRADED MIX TOLERANCES

PHYSICAL PROPERTIES	PLANT	PROJECT SITE
	Site or Hauling Unit Samples	Behind the Paver Samples
Passing No. 4 (4.75 mm) sieve and larger, %	± 7	± 7
Passing No. 8 (2.36 mm) thru No. 100 (150 µm) sieve, %	± 4	± 5
Passing No. 200 (75 µm) sieve, %	± 2	± 2
Asphalt content, %	± 0.4	± 0.5
Ratio of dust to binder material	0.6 to 1.6 (a)	0.6 to 1.6 (a)
Mix temperature leaving plant vs. mix design temperature, F	± 25	NA
Deviation of maximum specific gravity per lot versus design maximum specific gravity	± 0.030	± 0.040
Voids, total mix, (VTM), %	4.0 ± 1.2	4.0 ± 1.2
Voids, total mix, 4.75 mm mix (VTM), %	3 ± 2	3 ± 2
Voids in mineral aggregate, (VMA), %	± 1.2 from design target	± 1.2 from design target
Voids filled asphalt (VFA), %	Within spec	Within spec
Bulk specific gravity, Gmb, %	± 0.022	± 0.022

(a) Not applicable to 4.75 mm.

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904.04.10 PWSL Computations. As specified in 504.04.02. Perform PWSL computations for maximum specific gravity, voids in the total mix, voids in the mineral aggregate, and voids filled with asphalt. Use the moving average of the last three consecutive test values for each parameter.

- (a) If the PWSL for the three test values falls below 85, take corrective action to bring the PWSL to at least 85.
- (b) If the PWSL drops below 68, production shall be suspended until corrective action is taken as approved.



**CATEGORY 900
MATERIALS**

SECTION 905 – PIPE

694 **DELETE:** Sections 905.01 and 905.02 in their entirety.

INSERT: The following.

905.01 CERTIFICATION. Furnish certification for pipe as specified in TC-1.03.

MATERIAL	SPECIFICATION	REMARKS
Nonreinforced Concrete Pipe	M 86, Class 3	–
Reinforced Concrete Pipe	M 170, Class 4 and 5	60 in. and smaller diameter, Load bearing option. Larger than 60 in. diameter, Material option.
Reinforced Concrete Elliptical Pipe	M 207, Class 4, Horizontal installation only	60 in. and smaller equivalent diameter, Load bearing option. Larger than 60 in. equivalent diameter, Material option.
Concrete End Sections	M 170	Class 3 pipe reinforcement required
Reinforced Concrete Arch Culvert	M 206	–
Concrete Drain Tile	M 178	–
Non-Asbestos Fiber-Cement Storm Drain Pipe	C 1450	–
Reinforced Concrete Low-Head Pressure Pipe	C 361	–
Corrugated Polyethylene Pipe	M 294	–
Corrugated Polyethylene Drainage Pipe	M 252	Perforated underdrain and underdrain outlet pipe.
Corrugated Polypropylene Drainage Pipe	MP 21	–
Polyvinyl Chloride (PVC) Profile Wall Pipe	M 304	–
Polyvinyl Chloride (PVC) Pipe	M 278	Underdrain outlet pipe
	M 278 (a)	Perforated underdrain
Joints for Concrete Pipe and Manholes Using Rubber Gaskets	C 443	–
Joints for Concrete Pipe, Manholes and Precast Box Sections Using Preformed Flexible Joint Sealants	C 990	Not for use with circular pipe
Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals	D 3212	–
Corrugated Steel Pipe, Pipe Arches and Underdrain	M 36 (b), (c)	End finish shall be annular corrugations
Corrugated Aluminum Alloy Pipe	M 196 (b)	End finish shall be annular corrugations
Structural Plate for Pipe, Pipe Arches and Arches	M 167	–
Copper Pipe	Fed Spec WW – T-799, Type K	–
Polyethylene (PE) Precoated Corrugated Steel Pipe	M 245 and M 246	Minimum thickness 10 mil on each of the surfaces.

- (a) Perforations shall conform to the requirements of F 758.
- (b) Bands with dimples are prohibited.



(c) All Corrugated Steel Pipe shall be aluminum-coated Type 2 conforming to M 274 unless otherwise specified.

905.02 CERTIFIED REINFORCED CONCRETE PIPE PLANTS. Reinforced concrete pipe (RCP) will be accepted on certification based on TC-1.03 and the requirements outlined below. This includes the sampling, testing, documentation, and certification of the product by the manufacturer in combination with an Administration monitoring program.

Annual Inspections. Plants producing material for SHA, or an SHA inspected contract, for the first time or after a break in production longer than one calendar year will be subject to a comprehensive inspection of its production, testing, storage facilities, materials used and applicable documentation prior to production. Each plant will be subject to another comprehensive inspection at the beginning of each calendar year thereafter. The Administration will determine whether plant equipment and personnel conform to all applicable specifications and that suitable testing facilities are available. Submit a Quality Control Plan (QCP) for review and approval prior to inspection. The producer is responsible for ensuring timely delivery of the QCP. The QCP shall include the following:

- (a) The manner in which the materials will be handled including.
 - (1) Locations of stockpiles.
 - (2) Methods of weighing and batching material into mixers.
 - (3) Sources of materials and certifications that those materials meet these Specifications.
 - (4) Methods to be used to heat or cool materials during periods of extreme temperature.
- (b) The following Quality Control (QC) procedures.
 - (1) The names, qualifications, responsibilities and a unique identification number for each of the QC personnel and the designation of a QC manager.
 - (2) Sampling and testing methods and frequencies.
 - (3) Method used for inspecting reinforcement cages prior to and during production.
 - (4) Method of curing.
 - (5) Method of maintaining accurate QC records.
 - (6) Samples of forms approved by the Administration.
 - (7) Patching procedure.



(8) Method of preparation of units for shipping.

(9) Method of identification of each unit as tested and approved.

Certification by a Professional Engineer registered in the State of Maryland attesting the plant's facilities conform to all applicable specifications will be accepted in lieu of Administration inspection. However, final determination of conformance will be as determined.

905.02.01 Responsibilities of the Concrete Pipe Producer. Perform Quality Control operations at the plant to ensure that the material conforms to specifications. The QC process will be subject to unannounced periodic Quality Assurance (QA) verification and the plant's QC personnel shall fully participate in the verification process. Submit any change in personnel, production, testing facility and policy as a supplement to the QCP in writing within 10 days.

905.02.02 Lot Size. A pipe lot is defined as a maximum 14-day production run of concrete pipe of like size, material, strength designation, and manufacturing process. The 14 days need not be consecutive, as long as they occur within a period of 30 consecutive days and the manufacturing process is not altered in any way between production days. Lot size may include up to 1000 pieces for 12 to 36 in. pipe and 18 to 36 in. equivalent elliptical diameter pipe, or 500 pieces for 42 in. and larger pipe and 42 in. and larger equivalent elliptical diameter pipe.

905.02.03 Acceptance Testing. Perform a three-edge bearing test to produce a 0.01 in. crack for each lot in conformance with M 170, section 5.1.1 except as modified for pipe diameter per Table 905. Pipe that have been tested only to the formation of a 0.01 in. crack and that meet the 0.01 in. or lesser load requirement will be considered acceptable for use.

905.02.03 Quality Control Testing. Perform one three-edge bearing test to ultimate load at least once very twelve months in conformance with M 170, Section 5.1.1 for each size and class of pipe shipped to SHA inspected contracts. Also, perform an absorption test on each size and class of pipe manufactured and shipped to Administration projects at least once every twelve months. Specify in the QCP the method selected to test the lots for ultimate load and absorption.

905.02.04 Test Facilities. The producer's facilities, equipment, and quality control personnel shall be capable of conducting the tests specified in T 280 and will be approved as part of the Annual Inspection. Identify all QC personnel in accordance with 905.02 (b) (1) with a unique number used for testing and stamping or stenciling pipe for shipping. Record that number in the QCP and include the individual's printed name and signature. Maintain yearly calibration certificates on all equipment used for testing. The



producer may elect to use the services of an independent commercial testing laboratory as approved in lieu of conducting their own tests.

905.02.05 Shipment. Pipe may be shipped to Administration projects only after the required testing for all pipe in the lot have been completed with acceptable results and all pipe to be shipped is at least the age of the test specimens at testing. Visual inspection of the pipe and the accompanying documentation will be made when pipe is received on the project to verify compliance with certification requirements.

Prior to shipping, mark the following information on the inside of each pipe.

- (a) Plant name.
- (b) Plant location.
- (c) Size of pipe.
- (d) Class of pipe.
- (e) Date of manufacture.
- (f) Quality control stamp.
- (g) Quality control personnel number.

905.02.06 Certification. Manufacturer's certification shall accompany each shipment of pipe. Deliver a copy of the certification to the Engineer, the Administration's laboratory, the Contractor, and maintain a copy at the plant. Certification shall include the following:

- (a) The plant name, address, and location.
- (b) Size and class of the pipe.
- (c) Date of manufacture and shipment.
- (d) Number of pieces.
- (e) Administration Contract number.
- (f) Statement of Specification compliance.
- (g) Signature and number of the quality control personnel that inspected the shipment.



905.02.07 Records. Maintain all testing and inspection documents at the production plant for at least three years from the manufacture date and make available upon request. Collect and maintain conformance certificates and mill test reports for aggregates, cement, fly ash, joint material, reinforcing steel, and other materials intended for use in products used on Administration projects.

905.02.08 Quality Control Forms. Maintain an Administration approved quality control form for all pipe produced for use on Administration projects. Include the following on the forms for each lot:

GENERAL INFORMATION	PIPE DIMENSIONS	REINFORCEMENT	TESTS
Plant Name	Diameter	Size Spacing Area: Specification and Test Results	Visual Inspection
Lot Identification	Length		Absorption: Specification and Test Results: Once per year
Production Dates	Wall Thickness	Adequacy and Quality of Welds and Splices	THREE EDGE BEARING
Pipe Class	Joint Style		0.01 in. Crack Strength: Specification and Test Results
Units Per Lot			Ultimate Strength: Specification and Test Results: Once per year
Technician Signature			
<u>Material Sources</u>			
Cement			
Fine Aggregate			
Reinforcement			

905.02.09 Responsibilities of the Administration. The Administration will notify each plant when to present its Quality Control Plan. Thirty days will be provided to make arrangements for delivery after the Administration is notified of the plan's completion. Verification of certification by Quality Assurance Audit will be performed a minimum of once per year, as determined.

The Administration reserves the right to discontinue acceptance of RCP if the verification process indicates that materials, test procedures, or finished pipe do not conform to the specifications, Contract Documents or QCP. Producers will be notified of any type of non-compliance revealed during Quality Assurance Audits and provided with a resolution procedure to resolve any deficiencies.



CATEGORY 900
MATERIALS
SECTION 908 — REINFORCEMENT STEEL

703 **DELETE**: SECTION 908 — REINFORCEMENT STEEL in its entirety.

INSERT: The following.

SECTION 908 — REINFORCING STEEL

908.01 DEFORMED REINFORCEMENT. A615, Grade 60 or A 706, Grade 60. Use A706 Grade 60 when welding of the reinforcement is required. Deformed bars shall be epoxy powder coated per 917.02 when specified.

908.02 PLAIN REINFORCEMENT. A36 or A615, Grade 60. Bars used as ties in portland cement concrete pavement expansion and contraction joints shall be plain round steel bars unless otherwise specified. Bars shall be epoxy powder coated per 917.02. Bars used for traverse joints shall not exceed the maximum pullout strength per M 254.

908.03 STAINLESS STEEL BARS. A276, Type SM-29. Stainless steel bars may be used in lieu of epoxy powder coated plain bars. Deformed stainless steel bars shall meet A615 for cross sectional area and deformations.

908.04 SLEEVES FOR DOWEL BARS IN PAVEMENT EXPANSION JOINTS. Sleeves for dowel bars shall be sheet metal and capable of fitting over $2 \pm 1/4$ in. of the bar. Sleeves shall have a closed end with a stop to hold the end of the sleeve a minimum distance of 1 in. from the end of the dowel bar.

908.05 WELDED STEEL WIRE REINFORCEMENT, PLAIN. A185. Reinforcement shall be furnished in flat sheets.

908.06 WELDED STEEL WIRE REINFORCEMENT, DEFORMED. A497.

908.07 WELDED DEFORMED STEEL BAR MATS. A184.

908.08 STEEL WELDED WIRE REINFORCEMENT FOR PNEUMATICALLY APPLIED MORTAR AND CONCRETE ENCASMENT. A185, galvanized per A123. The reinforcement shall be fabricated from size W1.4 wire on 3 in. centers in each direction or from W0.9 wire on 2 in. centers in each direction.

908.09 COLD DRAWN STEEL WIRE. M32 for concrete reinforcement.



SPECIAL PROVISIONS INSERT
908 — REINFORCEMENT STEEL

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2 of 2

908.10 TIE DEVICES FOR CONCRETE PAVEMENT. Tie device sizes shall be as specified and made from deformed bar meeting 908.01 with a threaded connection. Tie devices shall have a minimum tensile strength of 48000 psi.

908.11 STEEL STRAND. M203, Grade 70, Low Relaxation Strand.

908.12 CERTIFICATION. TC1.03. The steel manufacturer shall furnish certification for each heat of steel supplied.



**CATEGORY 900
MATERIALS**

SECTION 909 — METALS

703 **DELETE**: SECTION 909 — METALS in its entirety.

INSERT: The following.

SECTION 909 — METALS

909.01 STRUCTURAL STEEL. Structural steel shall meet all specified requirements.

- (a) All primary load carrying members shall meet the supplementary toughness requirements per. M270, Zone 2.
- (b) Primary load carrying members are as follows or as specified.
 - (1) Finger joint steel from which saw tooth configurations have been cut, all stringers, cover plates, bearing stiffeners, splice plates, pins and pin links for straight rolled steel beam bridges; all flanges, webs, bearing stiffeners, splice plates, pins and pin links for straight steel girder bridges.
 - (2) Additionally, on curved rolled steel beam and steel girder bridges; all diaphragms, cross frames, lateral bracing, including connection plates to main stringers.

909.02 STEEL FOR MISCELLANEOUS USE. A36, A72 or A709, Grade 36 or 50. Steel for bearings on structures shall conform to A709, Grade 50.

909.03 WELDING MATERIALS. AWS D1.5 or D1.1 per design criteria.

909.04 GRAY IRON CASTINGS. A48, Class 30B.

909.05 STEEL STUD SHEAR DEVELOPERS. AWS D1.5 or D1.1 per design criteria

909.06 BOLTS, NUTS, AND WASHERS FOR GENERAL USE.

- (a) Bolts, A307.
- (b) Bridge anchor bolts A709, Grade 36.
- (c) Washers, F436.



- (d) Nuts, A563, Grade A. Galvanize per F2329 when required. High temperature galvanizing is not allowed.

909.07 HIGH STRENGTH FASTENERS, BOLTS, NUTS, AND WASHERS.

- (a) Bolts, A325.
- (b) Washers, F436.
- (c) Nuts, heavy hex A194, Grade 2H or A563, Grade DH. Galvanize per F2329. High temperature galvanizing is not allowed.
- (d) Use A490, Type 3 fasteners on unpainted weathering steel.

Rotational capacity testing shall be performed on all high strength fasteners. Provide test results per 909.01.

909.08 ANCHOR BOLTS, NUTS, WASHERS FOR TRAFFIC SIGNALS, HIGHWAY LIGHTING, AND SIGNS. F1554, Grade 55 S1.

- (a) Anchor bolts, galvanized for the full length of the threads and 3 in. below the threads.
- (b) Nuts, heavy hex, A194, Grade 2H or A563, Grade DH.
- (c) Flat washers, heavy washers, F436.
- (d) Galvanize all hardware per F2329. High temperature galvanizing is not allowed.

909.09 CAST WASHERS. Cast washers, ogee washers, and special cast washers per A47. Hot dip galvanize per A153.

909.10 HARDWARE. F1667. Spikes, wood screws, staples, brads, lag screws, carriage bolts, and other parts under general hardware shall be composed of carbon steel.

909.11 STEEL FORMS. A653, Designation SS, Grades 33 through 80S. Steel bridge deck forms and deck form supports that remain in place shall be fabricated as specified. Steel forms shall be coated per Coating Designation G 165. The minimum thickness of uncoated steel shall be 0.0359 in.

909.12 CERTIFICATION. TC-1.03. The metal producer shall furnish certification as specified. Certification shall include actual mill test results and the chemical and physical properties of the finished metal products.



**CATEGORY 900
MATERIALS**

740 **DELETE:** SECTION 916 — SOIL AND SOIL-AGGREGATE BORROW in its entirety.

INSERT: The following.

**SECTION 916 — SOIL AND SOIL-AGGREGATE
BORROW**

916.01 BORROW EXCAVATION. A soil or soil aggregate mixture meeting the following:

Maximum dry density and optimum moisture content of the material per T 180, Method C unless the material has more than 35 percent retained on the No. 4 sieve, in which case Method D shall be used. Material with a maximum dry density of less than 100 lb/ft³ is unsatisfactory and shall not be used in embankments. Potentially expansive materials, such as steel slag, are prohibited.

Refer to the Recycled Materials Special Provisions located elsewhere in the Contract Documents.

BORROW REQUIREMENTS						
Class Borrow	Max Dry Density Minimum P.C.F. T 180	LL Maximum T 89	PI Maximum T 90	Gradation Requirements T 88	Reference MSMT Soil Classification	Reference AASHTO Classification
Select Borrow	105	34	7	30% max passing No. 200 sieve	A-2,A-3, A-2-4	A-1-a, A-1-b, A-3, A-2-4
Capping Borrow	105	34	7	30% max passing No. 200 sieve*	A-2,A-3, A-2-4	A-1-a, A-1-b, A-3, A-2-4
Modified Borrow	125	30	9	50% min. retained on No. 4 sieve	Any material except A-5	A-2-4, A-4**
Common Borrow	100	N/A	N/A	N/A	N/A	N/A
<p>* When material has no liquid and plastic limit, and the amount of material that passes the No. 4 sieve and retained on the No. 10 sieve is less than 10 percent of the total sample mass, the material shall have at least 15 percent passing the No. 200 sieve.</p> <p>** When A-4, the material has to be a manufactured product.</p>						



**CATEGORY 900
MATERIALS**

SECTION 920 — LANDSCAPING MATERIALS

748 **DELETE:** Section 920 — Landscaping Materials, in its entirety.

INSERT: The following:

SECTION 920 — LANDSCAPING MATERIALS

920.01 SOILS. Topsoil, Subsoil, and Bioretention Soil Mix shall conform to requirements of this section. Soils shall be sampled, tested and approved per specifications of MSMT 356 by the Soils and Aggregates Technology Division of the Office of Materials Technology, or by other approved tests or laboratories. Soils shall be amended as specified by the Nutrient Management Plan (NMP).

920.01.01 Existing Topsoil and Salvaged Topsoil.

- (a) **Existing Topsoil.** Existing topsoil is the surface material of existing landscaped areas on SHA property that will be used for seeding or other landscape construction without excavation or significant grading.
- (b) **Salvaged Topsoil.** Salvaged topsoil is the surface material of existing landscaped areas on SHA property that will be used for seeding or other landscape construction after being excavated, stockpiled, and placed in designated areas.
- (c) **Composition.** Existing topsoil and salvaged topsoil shall conform to the following:



COMPOSITION - EXISTING TOPSOIL & SALVAGED TOPSOIL					
TEST PROPERTY	TEST ¹ METHOD	TEST VALUE AND AMENDMENT			
Prohibited Weeds	—	Free of live stems or roots of Shattercane, Johnsongrass, Canada Thistle, Bull Thistle, Plumeless Thistle, Musk Thistle, and Common Reed when inspected before transportation.			
Debris	—	1.0 % or less by weight of cement, concrete, asphalt, crushed gravel or construction debris when inspected.			
Grading Analysis	MSMT 356	Sieve Size		Passing by Weight Minimum %	
		2 in.		100	
		No. 4		90	
		No. 10		80	
Textural Analysis	MSMT 356	Particle		% Passing by Weight	
		Size	mm	Minimum	Maximum
		Sand	2.0 – 0.050	15	77
		Silt	0.050 – 0.002	Combined Silt and Clay 23	80
		Clay	less than 0.002		30
Soil pH	MSMT 356	pH of 4.8 to 7.6. Apply limestone to topsoil with pH 4.8 to 6.1 per NMP. Apply sulfur to topsoil with pH 7.1 to 7.6 per NMP.			
Organic Matter	MSMT 356	1.0 to 8.0 % OM by weight. Apply compost to topsoil with 1.0 to 1.7% OM per NMP.			
Nutrient Content	MSMT 356	Administration will assess. Apply fertilizer per NMP for nitrogen requirement and optimum fertility index values (FIV) for phosphorus and potassium.			
Soluble Salts	MSMT 356	800 ppm (1.25 mmhos/cm) or less. Apply gypsum to topsoil with 500 to 800 ppm (0.78 to 1.25 mhos/cm) per NMP.			
Harmful Materials	—	Topsoil shall not contain substances in concentrations that are harmful to human health, water quality, or plant growth. Industrial waste such as ash, slag, raw sludge, dredge spoil, or similar materials shall not be soil components.			
Note:					
¹ Materials Standards and Materials Testing 356 (MSMT 356) published by the Administration defines the approved test methods; other materials shall be approved by visual inspection or methods defined by the Landscape Operations Division.					

920.01.02 Furnished Topsoil. A natural, friable, surface soil that is uniform in color and texture, and not derived from the project. Producers shall be included in the Qualified Products List maintained by the Administration for Furnished Topsoil.



(a) **Composition.** Furnished topsoil shall conform to the following.

COMPOSITION - FURNISHED TOPSOIL					
TEST PROPERTY	TEST ¹ METHOD	TEST VALUE AND AMENDMENT			
Prohibited Weeds	—	Free of live stems and roots of species in 920.01.01 as well as live stems and roots of Bermudagrass, Quackgrass, and Yellow Nutsedge.			
Debris	—	920.01.01			
Grading Analysis	MSMT 356	920.01.01			
Textural Analysis	MSMT 356	Particle		% Passing by Weight	
		Size	mm	Minimum	Maximum
		Sand	2.0 – 0.050	20	75
		Silt	0.050 – 0.002	Combined Silt and Clay 25	75
Clay	less than 0.002	20			
Soil pH	MSMT 356	pH of 5.2 to 7.6 Apply limestone to topsoil with pH 5.2 to 6.1 per NMP. Apply sulfur to topsoil with pH 7.1 to 7.6 per NMP.			
Organic Matter	MSMT 356	920.01.01			
Nutrient Content	MSMT 356	920.01.01			
Soluble Salts	MSMT 356	500 ppm (1.25 mmhos/cm) or less.			
Harmful Materials	—	920.01.01			
Note:					
¹ Materials Standards and Materials Testing 356 (MSMT) published by the Administration defines the approved test methods; other materials shall be approved by visual inspection or methods defined by the Landscape Operations Division.					

(b) **Storage.** Furnished topsoil shall be a homogenous mixture stored at a specific, identifiable site in a stockpile constructed as specified in 308.03.28 and 701.03.02(c).

(c) **Approval.** Tests shall be completed and approval will be granted before furnished topsoil is delivered. Ensure that Form 27B has been completed and that a source of supply letter for the furnished topsoil soil has been submitted and approved.

(d) **Delivery.** Certification shall be submitted that the furnished topsoil is delivered from an approved stockpile. A bill of lading or other acceptable documentation that identifies the approved source of supply shall be submitted when furnished topsoil is delivered.

920.01.03 Salvaged Subsoil. Salvaged subsoil is the subsurface material of existing areas that will be used for landscape construction after being excavated, stockpiled, and placed in designated areas.



(a) Composition. Salvaged topsoil shall conform to the following:

COMPOSITION - SALVAGED SUBSOIL					
TEST PROPERTY	TEST¹ METHOD	TEST VALUE AND AMENDMENT			
Prohibited Weeds	—	920.01.01			
Debris	—	5.0 % or less by weight of any combination of cement, concrete, asphalt, or other construction debris when inspected.			
Grading Analysis	MSMT 356	Sieve Size		Passing by Weight Minimum %	
		2 in.		90	
		No. 4		85	
		No. 10		60	
Textural Analysis	MSMT 356	Particle		% Passing by Weight	
		Size	mm	Minimum	Maximum
		Sand	2.0 – 0.050	10	85
		Silt	0.050 – 0.002	10	85
Clay	less than 0.002	5	40		
Soil pH	MSMT 356	pH of 4.5 to 7.8.			
Organic Matter	MSMT 356	0.1 to 5.0 % by weight.			
Soluble Salts	MSMT 356	1000 ppm (1.56 mmhos/cm) or less.			
Harmful Materials	—	920.01.01			
Note: ¹ Materials Standards and Materials Testing 356 (MSMT) published by the Administration defines the approved test methods; other materials shall be approved by visual inspection or methods defined by the Landscape Operations Division.					

920.01.04 Furnished Subsoil. A natural subsurface soil that is uniform in texture and not derived from the project. Furnished subsoil shall conform to the following:



(a) **Composition.** Furnished subsoil shall conform to the following:

COMPOSITION - FURNISHED SUBSOIL		
TEST PROPERTY	TEST ¹ METHOD	TEST VALUE AND AMENDMENT
Prohibited Weeds	—	920.01.01
Debris	—	920.01.03
Grading Analysis	MSMT 356	920.01.03
Textural Analysis	MSMT 356	920.01.03
Soil pH	MSMT 356	920.01.03
Organic Matter	MSMT 356	920.01.03
Soluble Salts	MSMT 356	700 ppm (1.09 mmhos/cm) or less
Harmful Materials	—	920.01.01
Note:		
¹ Materials Standards and Materials Testing 356 (MSMT) published by the Administration defines the approved test methods; other materials shall be approved by visual inspection or methods defined by the Landscape Operations Division.		

(b) **Storage.** Refer to 920.01.02(b).

(c) **Approval.** Refer to 20.01.02(c).

(d) **Certification and Delivery.** Refer to 920.01.02(d).

920.01.05 Bioretention Soil Mix (BSM). BSM shall be a homogenous mixture as follows:

(a) **Components.** BSM shall be composed of Sand, Furnished Topsoil, and Hardwood Mulch. BSM may include approved soil amendments. No other components shall be used.

(1) **Sand.** Sand shall be washed silica sand that conforms to ASTM C-33 or ASTM M-6 with less than 1 percent by weight of any combination of diabase, greystone, calcareous, or dolomitic sand.

(2) **Furnished Topsoil.** Refer to 920.01.02.

(3) **Hardwood Mulch.** Hardwood Mulch shall be the bark and wood of hardwood trees that is milled and screened to a uniform particle size of 2 in. or less. Hardwood Mulch



shall be composted and aged for 6 months or longer, with negligible quantity of sawdust and no foreign materials.

(4) Amendments. Refer to 920.02. Limestone, Sulfur, and Iron Sulfate may be used to adjust pH of BSM. No other amendments shall be used.

(b) Composition. BSM shall conform to the following:

COMPOSITION- BIORETENTION SOIL MIX (BSM)					
TEST PROPERTY		TEST VALUE			
Weeds		Free of seed and viable plant parts of species in 920.06.02(a)(b)(c) when inspected.			
Debris		No observable content of cement, concrete, asphalt, crushed gravel or construction debris.			
Hardwood Mulch		20% of the loose volume of BSM when inspected.			
Textural Analysis		Particle		% Passing by Weight	
		Size	mm	Minimum	Maximum
		Sand	2.0 – 0.050	55	85
		Silt	0.050 – 0.002	1	20
		Clay	less than 0.002	1	8
Soil pH		pH of 5.7 to 7.4.			
Organic Matter		Minimum 1.5 % by weight.			
Soluble Salts		500 ppm (1.25 mmhos/cm) or less.			
Harmful Materials		920.01.01(a).			

(c) Storage. Refer to 920.01.02(b).

(d) Approval. Refer to 920.01.02(c).

(e) Certification and Delivery. Refer to 920.01.02(d).

920.02 SOIL AMENDMENTS.

920.02.01 Limestone. Limestone shall be an agricultural product manufactured and labeled for sale in Maryland for increasing soil pH. Limestone shall contain at least 85 percent calcium and magnesium carbonates. Dolomitic limestone shall contain at least 10 percent magnesium as magnesium oxide and 85 percent calcium and magnesium carbonates.

Limestone shall be supplied as a fine powder, or as pellets produced from fine powder, that conforms to the following:



LIMESTONE GRADING ANALYSIS	
SIEVE Size Number	PASSING BY WEIGHT Minimum %
10	100
20	98
100	50

920.02.02 Sulfur. Sulfur shall be an agricultural product manufactured and labeled for sale in Maryland for reducing soil pH. Sulfur labeled as a fertilizer may also be used to supply sulfur as a plant nutrient. Sulfur shall be supplied as a fine powder or pelletized powder with a minimum purity of 90 percent elemental sulfur.

920.02.03 Iron Sulfate. Iron sulfate shall be an agricultural product manufactured and labeled for sale in Maryland for reducing soil pH. Iron sulfate labeled as a fertilizer may also be used to supply sulfur or iron as a plant nutrient. Iron sulfate shall be supplied as a fine powder or pelletized powder with a minimum purity of 15 percent water soluble iron derived from ferrous sulfate.

920.02.04 Gypsum. Gypsum shall be an agricultural product manufactured and labeled for sale in Maryland as an aid for improving soil structure and removing soil soluble salts, or as a fertilizer to supply calcium and sulfate. Gypsum shall be supplied as a fine powder or pelletized powder with a minimum purity of 68 percent calcium sulfate dihydrate.

920.02.05 Compost.

- (a) **Compost Types.** Compost shall be an agricultural product of biosolids or source-separated materials manufactured and labeled for sale in Maryland.
- (b) **Stability.** Compost shall be biologically mature and no longer able to reheat to thermophilic temperatures.
- (c) **pH.** Compost shall have a pH of 6.0 to 7.5.
- (d) **Soluble Salts.** Compost shall have a soluble salt concentration less than 10.0 mmhos/cm.
- (e) **Moisture.** Compost shall have a moisture content of 30 to 55 percent. When delivered, compost shall have a weight of 1,400 lb per cubic yard or less.
- (f) **Particle Size and Grading.** Compost shall be screened so that it has a uniform particle size of 0.5 in. or less, with grading analysis as follows.



COMPOST GRADING ANALYSIS	
SIEVE SIZE mm	PASSING BY VOLUME Maximum %
4.75	90
0.425	25
0.75	2.2

920.02.06 Peat Moss. A milled sphagnum peat moss with negligible woody substances.

920.02.07 Aged Pine Bark Fines. Derived from the bark of pine trees that have been composted and milled to a fineness approved for use by the Landscape Operations Division.

920.02.08 Water Absorbent Gel. A cross linked polyacrylamide agricultural product used to maintain moisture around bare root plants and as a soil conditioner. Formulas used shall conform to the manufacturer's recommendations.

920.03 FERTILIZERS.

920.03.01 Composition. Standard Fertilizers and Special Fertilizers shall be commercial grade products labeled for sale and use as agricultural fertilizer, and shall conform to Federal and Maryland State regulations and the Standards of the Association of Official Analytical Chemists. All analyses are subject to approval by the Landscape Operations Division prior to application.

(a) Standard Fertilizer. Standard fertilizers shall be produced of ingredients, analysis, and composition as follows:

(1) Ingredients. Standard fertilizers shall include one or more of the following:

FERTILIZER INGREDIENTS	
ammonium nitrate	polymer coated urea
ammonium sulfate	potassium chloride
biosolids	potassium nitrate
calcium nitrate	potassium sulfate (SOP)
diammonium phosphate (DAP)	sulfur coated urea
isobutylidene diurea	triple super phosphate
methylene urea	urea
monoammonium phosphate (MAP)	ureaform (UF)

(2) Analysis and Composition. Standard fertilizers shall contain nitrogen (N), phosphorus (P), potassium (K), and sulfate (SO₄) derived from ingredients above.



STANDARD FERTILIZER ANALYSIS AND COMPOSITION	
FERTILIZER	USE
0-0-50 SOP ^a	Source of phosphorus (P) and sulfate (SO ₄) fertilizer
11-52-0 MAP ^a	Source of nitrogen (N) and phosphorus (P) fertilizer
38-0-0 UF ^a	Source of slow-release nitrogen (N) fertilizer
20-16-12 (83% UF with MAP & SOP)	Turfgrass Establishment and other seeding and refertilizing
15-30-15 ^b	Temporary Seed
Notes:	
^a Purity shall be at least 98% UF, MAP, or SOP as indicated.	
^b Mixture of ingredients in 920.03.01(a)(1) with no more than 2% of any combination of other materials.	
^c Mixture of UF, MAP, and SOP with no more than 2% of any combination of other materials.	

(b) Special Fertilizers. Special fertilizers shall be of ingredients, analysis, and composition as follows:

(1) Ingredients. Special fertilizers shall provide label analysis guaranteeing nitrogen, phosphorus, and potassium from ingredients in 920.03.01(a) and also include plant micronutrients, coatings, or materials to augment their performance.

(2) Analysis and Composition. As follows:

SPECIAL FERTILIZER ANALYSIS AND COMPOSITION	
FERTILIZER ^a	USE
14-14-14 Polymer-coated fertilizer with minor nutrients	Slow-release fertilizer used to install trees, shrubs, perennials and other plant materials.
14-14-14 Granular fertilizer with minor nutrients	Slow-release fertilizer used to install trees, shrubs, perennials and other plant materials.
20-10-5 21 to 23 grams per fertilizer tablet. 13% water insoluble and 7% water soluble N, with minor nutrients	Slow release fertilizer tablet used to install trees, shrubs, perennials and other plant materials.
20-20-20 Water soluble powder fertilizer with minor nutrients	Fertilizer solution used to refertilize trees, shrubs, perennials and other plant materials
Note:	
^a Shall be a mixture of any ingredients listed in 920.03.01(a)(1) and (b)(1) with no more than 5% by weight of any combination of other materials.	

920.04 MULCHES. Materials used as mulch shall have a uniform texture and be free from foreign materials or concentrations of metals, chemicals, or other substances that are harmful to human health, water quality, or plant growth.

920.04.01 Straw Mulch. Shall consist of thoroughly threshed stems and leaves of barley, oats, rye, and wheat. Straw mulch shall be in an air-dry condition suitable for application with a mulch blower or other equipment. Straw mulch shall be visually inspected to ensure it is free of objectionable quantities of mold, foreign substances, and weed seeds.



920.04.02 Wood Cellulose Fiber Mulch. A uniformly processed wood product that is able to form a homogenous slurry with seed, fertilizer, and other materials under agitation with water.

The fiber shall perform satisfactorily in hydraulic seeding equipment without clogging or damaging the system. The slurry shall contain a green dye to provide easy visual inspection for uniformity of application.

The manufacturer shall furnish certification as specified in TC-1.03 of the Technical Association of Pulp and Paper Industry (TAPPI) in conformance with the following:

WOOD CELLULOSE FIBER	
TEST PROPERTY	TEST VALUE
Particle Length	Approx. 0.5 in.
Particle Thickness	Approx. 0.063 in.
Net Dry Weight Content	Minimum as stated on bag
pH, TAPPI Standard T 509	4.0 – 8.5
Ash Content, TAPPI Standard T 413	7.0% maximum
Water Holding Capacity	90% minimum

The material shall be delivered in packages of uniform weight, which shall not exceed 75 lb net weight and shall bear the name of the manufacturer, the net weight, and a supplemental statement of the net weight content.

920.04.03 Shredded Hardwood Bark (SHB) Mulch. Shall consist of natural bark derived from hardwood trees that has been milled and screened to a maximum 4 in. particle size. SHB mulch shall contain negligible quantities of sawdust or other non-bark woody materials.

920.04.04 Composted Wood Chip (CWC) Mulch. Shall consist of natural wood mechanically reduced to a maximum size of 2 x 2 x 0.5 in. by a chipping machine before being composted. Grading analysis of CWC mulch shall be as follows:

COMPOSTED WOOD CHIP MULCH	
SIEVE SIZE in.	PASSING BY VOLUME Maximum %
2	100
1	30
0.5	10



920.05 SOIL STABILIZATION MATTING.

920.05.01 Soil Stabilization Matting (SSM). SSM products shall be selected from the Office of Materials Technology’s Qualified Products List (QPL) for Soil Stabilization Matting Manufacturers.

SSM shall consist of machine-produced matting of uniform thickness, weave, or distribution of fibers, supplied in rolls at least 40 in. wide. SSM shall be smolder resistant.

The chemical components shall be nonleaching, nontoxic to vegetation and germinating seed, and noninjurious to the skin.

- (a) **Type A.** Degradable; excelsior or nonwoven coconut fibers with degradable, synthetic netting on top and bottom; netting shall not be permanent or quick break down. Type A soil stabilization matting products shall be listed in the current AASHTO National Transportation Product Evaluation Program (NTPEP) Report for Erosion Control Products. Large scale results shall be obtained by a Geosynthetic Institute Accredited or other approved laboratory for Criteria marked *.

COMPOSITION - TYPE A SSM		
CRITERIA	METHOD	MEASUREMENT
Thickness	D 6525	At least 0.25 in.
Weight	D 6475	At least 7.9 oz per yd ²
Tensile Strength – MD	D 6818	At least 6.25 lb per in.
Tensile Strength – TD	D 6818	At least 4.7 lb per in.
Light Penetration	D 6567	At least 5%
Slope Erosion – C Factor*	D 6459	No more than 0.2
Shear for 0.5 in Soil Loss*	D 6460	At least 1.75 lb per ft ²
Netting Opening	<input type="checkbox"/>	No more than 2.0 x 1.0 in.
Thread	<input type="checkbox"/>	Degradable
Stitching and Spacing	<input type="checkbox"/>	No more than 4.0 in apart

- (b) **Type B.** Permanent; non-woven, nondegradable, UV stabilized, synthetic fibers; with non-degradable, UV stabilized, synthetic netting on top and bottom. Type B soil stabilization matting products shall be listed in the current AASHTO National Transportation Product Evaluation Program (NTPEP) Report for Erosion Control Products. Large scale results shall be obtained by a Geosynthetic Institute Accredited or other approved laboratory for Criteria marked *.



COMPOSITION - TYPE B SSM		
CRITERIA	METHOD	MEASUREMENT
Thickness	D 6525	At least 0.3 in.
Weight	D 6655	At least 10.0 oz per yd ²
Tensile Strength – MD	D 6818	At least 12.5 lb per in.
Tensile Strength – TD	D 6818	At least 12.5 lb per in.
Tensile Strength > 500 hr. exp.	D 4355	At least 80 % of original
Light Penetration	D 6567	At least 10 %
Slope Erosion – C Factor*	D 6459	No more than 0.2
Shear for 0.5 in Soil Loss*	D 6460	At least 2.25 lb per ft ²
Netting Opening	□	No more than 1.0 x 0.75 in.
Thread	□	Nondegradable, UV stabilized, synthetic
Stitching and Spacing	□	No more than 4.0 in. apart

(c) **Type C.** Permanent; nondegradable, synthetic lattice; and easily filled with soil.

COMPOSITION - TYPE C SSM		
CRITERIA	METHOD	MEASUREMENT
Thickness	D 6525	At least 0.4 in.
Weight	D 6655	At least 7.0 oz per yd ²
Tensile Strength – MD	D 6818	At least 12.5 lb per in.
Tensile Strength – TD	D 6818	At least 9.5 lb per in.
Tensile Strength > 500 hr. exp.	D 4355	At least 80 % of original
Porosity or Open Area	□	At least 80 %

(d) **Type D.** Degradable; woven coir.

COMPOSITION - TYPE D SSM		
CRITERIA	METHOD	MEASUREMENT
Thickness	D 6525	At least 0.30 in.
Weight	D 6475	At least 19.0 oz per yd ²
Porosity or Open Area	□	At least 35 %

(e) **Type E.** Degradable; excelsior, straw, or straw/coconut blend fibers; with degradable, synthetic netting on top and bottom; netting shall not be permanent or quick break down. Type E soil stabilization matting products shall be listed in the current AASHTO National Transportation Product Evaluation Program (NTPEP) Report for Erosion Control Products. Large scale results shall be obtained by a Geosynthetic Institute Accredited or other approved laboratory for Criteria marked *.



COMPOSITION - TYPE E SSM		
CRITERIA	METHOD	MEASUREMENT
Thickness	D 6525	At least 0.25 in.
Weight	D 6475	Excelsior: 6.0 to 7.9 oz per yd ²
		Straw; Straw & Coconut: At least 6.0 oz per yd ²
Tensile Strength – MD	D 6818	At least 6.25 lb per in.
Tensile Strength – TD	D 6818	At least 2.5 lb per in.
Light Penetration	D 6567	At least 5 %
Slope Erosion – C Factor*	D 6459	No more than 0.2
Shear for 0.5 in Soil Loss*	D 6460	At least 1.5 lb per ft ²
Netting Opening	☐	Excelsior: 2.0 x 1.0 in. or less
		Straw; Straw & Coconut: 0.75 x 0.75 in. or less
Thread	☐	Degradable
Stitching and Spacing	☐	Excelsior: 4.0 in. apart or less
		Straw, or Straw & Coconut: 2.0 in apart or less

920.05.02 Fasteners for Soil Stabilization Matting and Turfgrass Sod. Fasteners shall selected as specified in Section 709.03.06 and conform to the following:

(a) **Wood Peg.** Wood, biodegradable, Untreated; single leg is driven into the soil so that wider top is flush with turfgrass sod and SSM.

6 Inch. Approx. 6 in. long, 3/8 in. thick; top 1 in. wide, tapered to base.

(b) **T-Head Pin.** Molded plastic; biodegradable. Single leg with barbs is driven into the soil so that molded T-Head top is flush with turfgrass sod and SSM.

6 Inch. Approx. 6 in. long, 3/8 in. thick; head 1 in. wide.

8 Inch. Approx. 8 in. long, 3/8 in. thick; head 1 in. wide.

(c) **Circle-Top Pin.** Steel wire; single leg is driven into the soil so that coil or loop top is flush with turfgrass sod and SSM.

6 Inch. 11 gauge; leg 6 in long.

8 Inch. 11 gauge; leg 8 in. long.

(d) **Round-Head Pin.** Molded plastic; biodegradable. Single leg with barbs is driven into the soil so that molded disk top is flush with turfgrass sod and SSM.

6 Inch. Approx. 6 in long; head 1 in. diameter.

8 Inch. Approx. 8 in long; head 1 in. diameter.



- (e) **U-Shape Staple.** Steel wire; two main legs are driven into the soil so that top of staple is flush with turfgrass sod and SSM.

6 Inch. 11 gauge bent into U shape; legs 6 in. long; top 1 to 1-1/2 in. wide.

8 Inch. 8 gauge bent into U shape; legs 8 in. long; top 1 to 1-1/2 in. wide.

12 Inch. 8 gauge bent into U shape.; legs 12 in. long; top 1 to 1-1/2 in. wide.

- (f) **Fabric Pin.** Steel nail; single leg is driven into the soil so that steel washer top is flush with SSM.

12 Inch. 11 gauge approx. 12 in. long.

18 Inch. 3/16 in. approx 18 in. long.

920.06 SEED AND TURFGRASS SOD STANDARDS.

920.06.01 Names and Naming. The authority for common and scientific names shall be the USDA NRCS The Plants Database website at <http://plants.usda.gov>. Cultivar names shall be those of the registered cultivar.

Plant and seed identification, tags, and labels shall correspond to the common name and scientific name of the species in The Plants Database. Any conflict in names or naming shall be resolved by the Engineer in consultation with the Landscape Operations Division.

920.06.02 Prohibited Weeds.

- (a) **Weeds Prohibited in Turfgrass Sod and SHA Seed Mixtures.** Turfgrass Sod, SHA Turfgrass Seed Mix, SHA Temporary Seed Mix, and Additive Seed shall be free from seed or viable parts of the following species:



WEEDS PROHIBITED IN TURFGRASS SOD & SHA SEED MIXTURES	
COMMON NAME	SCIENTIFIC NAME
Annual Bluegrass	<i>Poa annua</i> L.
Balloonvine	<i>Cardiospermum halicacabum</i> L.
Bermudagrass	<i>Cynodon dactylon</i> (L.) Pers. (approved for Bermudagrass sod)
Canada Thistle	<i>Cirsium arvense</i> (L.) Scop.
Carolina Horsenettle	<i>Solanum carolinense</i> L.
Common Corncockle	<i>Agrostemma githago</i> L.
Common Reed = Phragmites	<i>Phragmites australis</i> (Cav.) Trin. ex Steud.
Crested Anoda = Spurred Anoda	<i>Anoda cristata</i> (L.) Schldt.
Dodder	<i>Cuscuta spp.</i> L.
Field Bindweed	<i>Convolvulus arvensis</i> L.
Japanese Bristlegrass = Giant Foxtail	<i>Setaria faberi</i> Herrm.
Java-Bean = Sicklepod	<i>Senna obtusifolia</i> (L.) Irwin and Barneby
Johnsongrass	<i>Sorghum halepense</i> (L.) Pers. and hybrids
Meadow Garlic = Wild Onion	<i>Allium canadense</i> L.
Plumeless Thistle, Musk Thistle	<i>Carduus</i> L.
Quackgrass	<i>Elytrigia repens</i> (L.) Gould
Rough Cocklebur	<i>Xanthium strumarium</i> L.
Serrated Tussock	<i>Nassella trichotoma</i> (Nees) Hack.
Wild Garlic	<i>Allium vineale</i> L.
Yellow Nutsedge	<i>Cyperus esculentus</i> L.

(b) Weeds Prohibited in Meadow and Wildflower Seed. Meadow and Wildflower Seed shall be free of species listed in (a) and the following species:



WEEDS PROHIBITED IN MEADOW & WILDFLOWER SEED	
COMMON NAME	SCIENTIFIC NAME
Asiatic Tearthumb = Mile-a-Minute	<i>Polygonum perfoliatum</i> L.
Burdock and related species	<i>Arctium</i> L.
Canarygrass = Reed Canarygrass and related spp.	<i>Phalaris</i> L.
Common Wormwood = Mugwort	<i>Artemisia vulgaris</i> L. var. <i>vulgaris</i>
Dogbane and related spp.	<i>Apocynum</i> L.
Eastern Poison Ivy	<i>Toxicodendron radicans</i> (L.) Kuntze
Fig Buttercup = Lesser Celandine	<i>Ranunculus ficaria</i> L. var. <i>bulbifera</i> Marsden-Jones
Garlic Mustard	<i>Alliaria petiolata</i> (M. Bieb.) Cavara and Grande
Giant Hogweed	<i>Heracleum mantegazzianum</i> Sommier and Levier
Japanese Honeysuckle, Tatarian Honeysuckle, related spp.	<i>Lonicera</i> L.
Japanese Knotweed	<i>Polygonum cuspidatum</i> Siebold and Zucc.
Lesser Knapweed = Spotted Knapweed	<i>Centaurea nigra</i> L.
Multiflora Rose	<i>Rosa multiflora</i> Thunb.
Nepalese Browntop = Japanese Stiltgrass	<i>Microstegium vimineum</i> (Trin.) A. Camus
Poison Hemlock	<i>Conium maculatum</i> L.
Purple Loosestrife and related spp.	<i>Lythrum</i> L.
Silvergrass and related spp.	<i>Miscanthus</i> Andersson
Thistle and related spp.	<i>Cirsium</i> Mill., <i>Onopordum</i> L.

(c) **Weeds Prohibited in Shrub Seed.** Shrub Seed shall be free of species listed in (a) and (b) and the following species:

WEEDS PROHIBITED IN SHRUB SEED	
COMMON NAME	SCIENTIFIC NAME
Burningbush	<i>Euonymus alatus</i> (Thunb.) Siebold
Common Buckthorn	<i>Rhamnus cathartica</i> L.
Japanese Barberry	<i>Berberis thunbergii</i> DC.
Oriental Bittersweet	<i>Celastrus orbiculatus</i> Thunb.
Oleaster; Russian Olive, Autumn Olive, and related spp.	<i>Elaeagnus</i> L.
Privet, and related species	<i>Ligustrum</i> L.
Tree of Heaven	<i>Ailanthus altissima</i> (Mill.) Swingle



920.06.03 Turfgrass Sod. Turfgrass sod shall be Maryland Certified Tall Fescue Sod unless Bermudagrass Sod or Zoysiagrass Sod is specified.

Sod shall be field grown in the State of Maryland in compliance with the Maryland Turfgrass Law and Regulations of the State of Maryland. Each load of tall fescue sod shall bear a Maryland State Certified Label.

Sod shall be sufficiently knitted when harvested to resist breakage under normal handling and be in good health at the time of delivery. Sod shall be machine cut in strips at least 14 in. wide. Tall Fescue Sod shall be uniform thickness of 0.75 to 1.25 in., excluding top growth, with thatch thickness less than 3/8 in.

Prior to harvest, Tall Fescue Sod shall be mowed to a height of 2.0 to 3.5 in. Bermudagrass Sod and Zosiagrass Sod shall be mowed to a height of 0.75 to 3.0 in.

920.06.04 Approved Cultivars. Refer to ‘University of Maryland Turfgrass Technical Update TT-77 Recommended Turfgrass Cultivars for Certified Sod Production and Seed Mixtures in Maryland’. Only cultivars included in TT-77 may be used. When no cultivar is specified, any common type cultivar of the species may be used.

920.06.05 Seed Testing and Sampling. Seed shall comply with the Maryland Seed Law and Regulations of the State of Maryland. Seed suppliers shall assume charges for seed inspections and testing.

(a) **Certified Seed.** Component cultivars of SHA Turfgrass Seed Mix, SHA Special Purpose Seed Mix, SHA Temporary Seed Mix, and any seed used as additives for these mixes, shall be certified and carry the tags of their state of origin that show the percent purity, percent germination, percent weed seed, and types and content of noxious weed seed.

(b) **SHA Seed Mixtures.** Turfgrass Seed Mix, SHA Special Purpose Seed Mix, and SHA Temporary Seed Mix shall be sampled and tested by an inspector of the Maryland Department of Agriculture, Turf and Seed Section (MDA) for percent purity, percent germination, percent weed seed, and types and content of noxious weed seed. These seed mixtures shall conform to MDA Standards for Maryland Certified Seed and carry the certified tag of the State of Maryland.

(c) **Unmixed Seed.** Seed supplied for use as Meadow Seed, Wildflower Seed, and Shrub Seed shall be supplied in containers of a single species, unmixed. Each species shall be tested by the producer or supplier and carry a tag that shows the percent purity, percent germination, percent weed seed; and types and content of noxious weed seed.

920.06.06 Standards for Seed Species. Seed supplied in lots of individual species or used to produce mixes shall conform to the requirements of this section for minimum percent germination, minimum purity, and maximum percent of weed seed.



Meadow seed, wildflower seed, and shrub seed that does not conform to these standards may be used after review and approval by the Engineer in consultation with the Landscape Operations Division. The seed will be subject to use at increased seeding rates or measures to compensate for substandard seed purity, germination, weed content.

- (a) SHA Turfgrass Seed Mix and SHA Special Purpose Seed Mix.** Species included in SHA Turfgrass Seed Mix and SHA Special Purpose Seed Mix shall be MDA Certified Seed of approved cultivars and conform to the following requirements for minimum percent purity, maximum percent weed seed, and minimum percent germination:

TURFGRASS SEED SPECIES			
COMMON NAME, and SCIENTIFIC NAME	PURITY Min %	WEED Max %	GERM Min %
Chewings Fescue <i>Festuca rubra</i> L. ssp. <i>fallax</i> (Thuill.) Nyman	98	0.5	85
Red Fescue <i>Festuca rubra</i> L. ssp. <i>rubra</i>	98	0.5	85
Hard Fescue <i>Festuca brevipila</i> Tracey	98	0.5	85
Kentucky Bluegrass <i>Poa pratensis</i> L. ssp. <i>pratensis</i>	95	0.4	80
Sheep Fescue <i>Festuca ovina</i> L.	98	0.5	85
Tall Fescue <i>Schedonorus phoenix</i> (Scop.) Holub = <i>Festuca elatior</i> L.	98	0.5	85

- (b) Temporary and Grass Additive Seed.** Species included in SHA Temporary Seed Mix, or used as Additive Seed with SHA Turfgrass Seed Mix or SHA Special Purpose Seed Mix shall conform to the following requirements for minimum percent purity, maximum percent weed seed, and minimum percent germination:



TEMPORARY AND GRASS ADDITIVE SEED SPECIES			
COMMON NAME, and SCIENTIFIC NAME	PURITY Min %	WEED Max %	GERM Min %
Cereal Rye <i>Secale cereale</i> L.	98	0.1	85
Common Barley, winter type <i>Hordeum vulgare</i> L.	98	0.3	85
Common Oat, winter type <i>Avena sativa</i> L.	98	0.5	85
Common Wheat, winter type <i>Triticum aestivum</i> L.	98	0.1	85
Foxtail Bristlegrass = Foxtail Millet <i>Setaria italica</i> (L.) P. Beauv.	99	0.1	80
Perennial Ryegrass <i>Lolium perenne</i> L. ssp. <i>perenne</i>	97	0.5	85

(c) **Meadow Forb Seed.** Seed shall be supplied in lots of individual species, unmixed, labeled with common name and scientific name in conformance with the following:

- (1) **Purity.** Weed and/or other crop seed content shall be 2.5 percent or less by weight. Seed that does not conform to this specification may be used after approval by the Engineer in consultation with the Landscape Operations Division at increased seeding rates, or with measures to compensate for increased weed or crop seed content.
- (2) **Origin.** Seed shall either be collected from native sources in USDA Hardiness Zone 5b, 6a, 6b and 7a in the States of Maryland, Pennsylvania, New York, New Jersey, Delaware, Virginia, West Virginia, or North Carolina, or shall be grown and produced from seed certified to have been collected from sites in the USDA Hardiness Zones of those States.

Seed that does not conform to origin requirements may be used after review and approval by the Engineer in consultation with the Landscape Operations Division.

- (3) **Species.** Seed shall conform to the following species, subspecies and varieties:



MEADOW FORB SEED SPECIES	
COMMON NAME	SCIENTIFIC NAME
Allegheny Monkeyflower = Square Stem Monkeyflower	<i>Mimulus ringens</i> L. var. <i>ringens</i>
Bearded Beggarticks = Showy Tickseed	<i>Bidens aristosa</i> (Michx.) Britton
Blackeyed Susan	<i>Rudbeckia hirta</i> L. var. <i>hirta</i> <i>Rudbeckia hirta</i> L. var. <i>pulcherrima</i> Farw.
Browneyed Susan	<i>Rudbeckia triloba</i> L. var. <i>triloba</i> <i>Rudbeckia triloba</i> L. var. <i>pinnatifida</i> Torr. and A. Gray
Common Boneset	<i>Eupatorium perfoliatum</i> L. var. <i>perfoliatum</i>
Common Evening Primrose	<i>Oenothera biennis</i> L.
Crimson-eyed Rose Mallow	<i>Hibiscus moscheutos</i> L.
Eastern Purple Coneflower	<i>Echinacea purpurea</i> (L.) Moench
Flat-top Goldenrod = Grass-Leaved Goldenrod	<i>Euthamia graminifolia</i> (L.) Nutt. <i>Euthamia graminifolia</i> (L.) Nutt. var. <i>graminifolia</i> <i>Euthamia graminifolia</i> (L.) Nutt. var. <i>hirtipes</i> (Fernald) C.E.S. Taylor and R.J. Taylor
Gray Goldenrod	<i>Solidago nemoralis</i> Aiton var. <i>nemoralis</i>
King of the Meadow = Tall Meadow Rue	<i>Thalictrum pubescens</i> Pursh
Lanceleaf Tickseed = Lanceleaf Coreopsis	<i>Coreopsis lanceolata</i> L.
Maryland Senna	<i>Senna marilandica</i> (L.) Link
Maximilian Sunflower	<i>Helianthus maximiliani</i> Schrad.
New England Aster	<i>Symphyotrichum novae-angliae</i> (L.) G.L. Nesom
New York Aster	<i>Symphyotrichum novi-belgii</i> (L.) G.L. Nesom var. <i>elodes</i> (Torr. and A. Gray) G.L. Nesom <i>Symphyotrichum novi-belgii</i> (L.) G.L. Nesom var. <i>novi-belgii</i> <i>Symphyotrichum novi-belgii</i> (L.) G.L. Nesom var. <i>villicaule</i> (A. Gray) J. Labrecque and L. Brouillet
New York Ironweed	<i>Vernonia noveboracensis</i> (L.) Michx.
Partridge Pea	<i>Chamaecrista fasciculata</i> (Michx.) Greene <i>Chamaecrista fasciculata</i> (Michx.) Greene var. <i>fasciculata</i> <i>Chamaecrista fasciculata</i> (Michx.) Greene var. <i>macrosperma</i> (Fernald) C.F. Reed
Seedbox	<i>Ludwigia alternifolia</i> L.
Smooth Blue Aster	<i>Symphyotrichum laeve</i> (L.) A. Löve and D. Löve var. <i>laeve</i> <i>Symphyotrichum laeve</i> (L.) A. Löve and D. Löve var. <i>concinnum</i> (Willd.) G.L. Nesom
Smooth Oxeye = Ox-eye Sunflower	<i>Heliopsis helianthoides</i> (L.) Sweet var. <i>helianthoides</i> <i>Heliopsis helianthoides</i> (L.) Sweet var. <i>scabra</i> (Dunal) Fernald
Spotted Trumpetweed = Spotted Joe Pye Weed	<i>Eupatoriadelphus maculatus</i> (L.) King and H. Rob.



	var. <i>maculatus</i>
Stiff Goldenrod	<i>Oligoneuron rigidum</i> (L.) Small var. <i>rigidum</i>
Sundial Lupine = Wild Blue Lupine	<i>Lupinus perennis</i> L. ssp. <i>perennis</i> <i>Lupinus perennis</i> L. ssp. <i>perennis</i> var. <i>perennis</i> <i>Lupinus perennis</i> L. ssp. <i>perennis</i> var. <i>occidentalis</i> S. Watson
Swamp Milkweed	<i>Asclepias incarnata</i> L. <i>Asclepias incarnata</i> L. ssp. <i>incarnata</i> <i>Asclepias incarnata</i> L. ssp. <i>pulchra</i> (Ehrh. ex Willd.) Woodson
Swamp Sunflower = Narrow-Leaved Sunflower	<i>Helianthus angustifolius</i> L.
Swamp Verbena = Blue Vervain	<i>Verbena hastata</i> L. var. <i>hastata</i>
Talus Slope Penstemon = Tall White Beardtongue	<i>Penstemon digitalis</i> Nutt. ex Sims
Trumpetweed = Joe Pye Weed	<i>Eupatoriadelphus fistulosus</i> (Barratt) King and H. Rob.
Wild Bergamot	<i>Monarda fistulosa</i> L. ssp. <i>fistulosa</i> <i>Monarda fistulosa</i> L. ssp. <i>fistulosa</i> var. <i>mollis</i> (L.) Benth. <i>Monarda fistulosa</i> L. ssp. <i>fistulosa</i> var. <i>rubra</i> A. Gray <i>Monarda fistulosa</i> L. ssp. <i>brevis</i> (Fosberg and Artz) Scora, ined.

(d) **Meadow Grass, Sedge, and Rush Seed.** Seed shall be supplied in lots of individual species, unmixed, labeled with common name, scientific name, and cultivar in conformance with the following:

- (1) **Purity.** Refer to 920.06.06(c)(1). Grasses with awns shall be debarbed or deawned.
- (2) **Origin.** Refer to 920.06.06(c)(2). Cultivars may be produced in any state east of the Mississippi River.
- (3) **Species.** Seed shall conform to the following species, subspecies, varieties, and cultivars:



MEADOW GRASS, SEDGE AND RUSH SEED SPECIES	
COMMON NAME and CULTIVARS	SCIENTIFIC NAME
Big Bluestem cv. Niagara	<i>Andropogon gerardii</i> Vitman
Broomsedge Bluestem = Broomsedge	<i>Andropogon virginicus</i> L. <i>Andropogon virginicus</i> L. var. <i>virginicus</i> <i>Andropogon virginicus</i> L. var. <i>decipiens</i> C.S. Campbell
Common Rush = Soft Rush = Lamp Rush	<i>Juncus effusus</i> L. var. <i>conglomeratus</i> (L.) Engelm. <i>Juncus effusus</i> L. var. <i>decipiens</i> Buchenau <i>Juncus effusus</i> L. var. <i>pylaei</i> (Laharpe) Fernald and Wiegand <i>Juncus effusus</i> L. var. <i>solutus</i> Fernald and Wiegand
Deertongue cv. 'Tioga'	<i>Dichanthelium clandestinum</i> (L.) Gould
Fowl Bluegrass	<i>Poa palustris</i> L.
Fox Sedge	<i>Carex vulpinoidea</i> Michx. var. <i>vulpinoidea</i>
Gamagrass cv. 'Meadowcrest', 'Pete'	<i>Tripsacum dactyloides</i> (L.) L.
Indiangrass cv. 'Rumsey'	<i>Sorghastrum nutans</i> (L.) Nash
Little Bluestem cv. 'Aldous'	<i>Schizachyrium scoparium</i> (Michx.) Nash var. <i>scoparium</i> <i>Schizachyrium scoparium</i> (Michx.) Nash var. <i>divergens</i> (Hack.) Gould
Longhair Sedge = Bristly Sedge	<i>Carex comosa</i> Boott
Rattlesnake Mannagrass	<i>Glyceria canadensis</i> (Michx.) Trin.
Shallow Sedge = Lurid Sedge	<i>Carex lurida</i> Wahlenb.
Switchgrass cv. 'Blackwell', 'Shelter'	<i>Panicum virgatum</i> L. var. <i>virgatum</i> <i>Panicum virgatum</i> L. var. <i>spissum</i> Linder
Virginia Wildrye	<i>Elymus virginicus</i> L., <i>Elymus virginicus</i> L. var. <i>halophilus</i> (E.P. Bicknell) Wiegand
Woolgrass	<i>Scirpus cyperinus</i> (L.) Kunth

(e) **Wildflower Seed.** Seed shall be supplied in lots of individual species, unmixed, labeled with common name, scientific name, and cultivar in conformance with the following:

(1) **Purity.** Species shall be 98 percent purity or greater, with 75 percent germination or greater, and with weed and/or other crop seed content of 2.5 percent or less by weight. Seed that does not conform to purity requirements may be used after approval by the Engineer in consultation with the Landscape Operation Division at increased seeding rates, or with measures to compensate for increased weed or crop seed content.

(2) **Origin.** Any State of the United States.

(3) **Species.** Seed shall conform to the following species, subspecies, varieties, and cultivars:



WILDFLOWER SEED SPECIES	
COMMON NAME and CULTIVARS	SCIENTIFIC NAME
Blackeyed Susan	<i>Rudbeckia hirta</i> L. var. <i>hirta</i> <i>Rudbeckia hirta</i> L. var. <i>pulcherrima</i> Farw.
Calendula	<i>Calendula officinalis</i> L.
Common Sunflower cv. 'Autumn Beauty'	<i>Helianthus annuus</i> L.
Doubtful Knight's-spur = Rocket Larkspur	<i>Consolida ajacis</i> (L.) Schur
Firewheel = Annual Gaillardia	<i>Gaillardia pulchella</i> Foug. <i>Gaillardia pulchella</i> Foug. var. <i>pulchella</i>
Garden Cornflower = Bachelors Button	<i>Centaurea cyanus</i> L.
Garden Cosmos = Pink Cosmos, cv. 'Sensation'	<i>Cosmos bipinnatus</i> Cav.
Lemon Beebalm	<i>Monarda citriodora</i> Cerv. ex Lag.
Moroccan Toadflax = Spurred Snapdragon	<i>Linaria maroccana</i> Hook. f.
Siberian Wallflower	<i>Erysimum</i> × <i>marshallii</i> (Henfr.) Bois
Sulphur Cosmos = Yellow Cosmos, cv. 'Bright Lights'	<i>Cosmos sulphureus</i> Cav.

(f) **Shrub Seed.** Seed shall be supplied in lots of individual species, unmixed, labeled with common name and scientific name in conformance with the following:

- (1) **Purity.** Weed and/or other crop seed content shall be 0.5 percent or less by weight. Minimum purity and minimum germination shall conform to the requirements of (3), below.
- (2) **Origin.** Refer to 920.06.06(c)(2).
- (3) **Species.** Seed shall conform to the following species, subspecies, and varieties:

SHRUB SEED SPECIES		
SPECIES Including Subspecies and Variety	PURITY Min %	GERM Min %
American Black Elderberry <i>Sambucus nigra</i> L. ssp. <i>canadensis</i> (L.) R. Bolli	98	60
American Cranberrybush <i>Viburnum opulus</i> L. var. <i>americanum</i> Aiton	99	70
Black Chokeberry <i>Photinia melanocarpa</i> (Michx.) K.R. Robertson and Phipps	99	70
Bristly Locust <i>Robinia hispida</i> L. var. <i>fertilis</i> (Ashe) R.T. Clausen <i>Robinia hispida</i> L. var. <i>hispida</i>	99	90
Chokecherry <i>Prunus virginiana</i> L. var. <i>viginiana</i>	99	70
Common Buttonbush <i>Cephalanthus occidentalis</i>	98	60
Common Ninebark <i>Physocarpus opulifolius</i> (L.) Maxim., orth. cons.	99	75
Common Winterberry	99	60



SPECIAL PROVISIONS INSERT
920 — LANDSCAPING MATERIALS

<i>Ilex verticillata</i> (L.) A. Gray		
Desert False Indigo <i>Amorpha fruticosa</i> L.	98	70
Fragrant Sumac <i>Rhus aromatica</i> var. <i>aromatica</i>	99	85
Gray Dogwood <i>Cornus racemosa</i> Lam.	99	70
Inkberry <i>Ilex glabra</i> (L.) A. Gray	98	60
Mapleleaf Viburnum <i>Viburnum acerifolium</i> L.	99	70
Maryland Senna <i>Senna marilandica</i> (L.) Link	99	70
Nannyberry <i>Viburnum lentago</i> L.	99	75
Red Chokeberry <i>Photinia pyrifolia</i> (Lam.) K.R. Robertson and Phipps	85	60
Red Elderberry <i>Sambucus racemosa</i> L. var. <i>racemosa</i>	95	70
Redosier Dogwood <i>Cornus sericea</i> L. ssp. <i>sericea</i>	99	70
Silky Dogwood <i>Cornus amomum</i> Mill.	98	70
Smooth Sumac <i>Rhus glabra</i> L.	99	80
Southern Arrowwood <i>Viburnum dentatum</i> L. var. <i>dentatum</i> <i>Viburnum dentatum</i> L. var. <i>venosum</i> (Britton) Gleason <i>Viburnum recognitum</i> Fernald	99	70
Spicebush <i>Lindera benzoin</i> (L.) Blume var. <i>benzoin</i>	95	60
Staghorn Sumac <i>Rhus typhina</i> L.	99	85
Steeplebush <i>Spiraea tomentosa</i> L.	85	70
Swamp Rose <i>Rosa palustris</i> Marsh.	99	65
Witch Hazel <i>Hamamelis virginiana</i> L.	99	70

920.06.07 Seed Mixes. Refer to 920.06.01 thru .06 and the document ‘Specifications for Seed and Seed Mixes’ maintained by the Landscape Operations Division, which includes lists of approved cultivars.

(a) SHA Turfgrass Seed Mix.

SHA TURFGRASS SEED MIX		
MIX %	SPECIES	
	Common Name	Scientific Name
95	Tall Fescue	<i>Schedonorus phoenix</i> (Scop.) Holub
5	Kentucky Bluegrass	<i>Poa pratensis</i> L. ssp. <i>pratensis</i>



(b) SHA Special Purpose Seed Mix.

SHA SPECIAL PURPOSE SEED MIX		
MIX %	SPECIES	
	Common Name	Scientific Name
75	Hard Fescue	<i>Festuca brevipila</i> Tracey
25	Chewings Fescue	<i>Festuca rubra</i> L. ssp. <i>fallax</i> (Thuill.) Nyman

Note: When pre-mixed seed is not available, a small quantity exception will allow the mix to be performed at the seeding location using Certified seed of the required species.

(c) SHA Temporary Seed Mix.

SHA TEMPORARY SEED MIX		
MIX %	SPECIES	
	Common Name	Scientific Name
95	One or more of the following: Common Wheat, winter type Common Barley, winter type Common Oat, winter type Cereal Rye, winter type	<i>Triticum aestivum</i> L. <i>Hordeum vulgare</i> L. <i>Avena sativa</i> L. <i>Secale cereale</i> L.
5	Foxtail Bristlegrass = Foxtail Millet	<i>Setaria italica</i> (L.) P. Beauv.

920.07 PLANT MATERIALS.

920.07.01 Certificate and Licenses. Sellers, distributors, installers or producers of nursery stock shall possess the Plant Dealer License, Plant Broker License, or Nursery Inspection Certificate of the Maryland Department of Agriculture, or substitute a similar certificate or licenses from another State where they do business.

920.07.02 Plant Material Inspection. Plant material will be inspected for conformance with 920.07.03 thru .05, and tagged with Administration Plant Material Inspection Seals (Seals) as follows:

- (a) Inspection.** The Plant Material Inspection will be conducted in Maryland at the nursery where the plant material is grown, or at the brokerage where the plant material is sold. When plant material is produced by a nursery outside Maryland, the Inspection will be conducted at the Contractor’s holding area, or at the project site before planting, unless otherwise specified in the Contract Documents.

The Contractor shall ensure that the plant material is present for inspection on the scheduled date, and that it meets the requirements of 920.07. The condition and identity of plant material will be subject to re-inspection for the duration of the Contract.



- (b) **Scheduling.** The Inspection will be scheduled by the Engineer in consultation with the Landscape Operations Division. At least 14 days notice to schedule an Inspection within Maryland, and at least 45 days notice to schedule an Inspection outside Maryland.
- (c) **Seals.** The Administration will determine which plants, if any, will be tagged with Seals. When Seals are placed upon representative plants within a block of plant material, the plant material delivered for installation shall be similar in size, shape and character to the plant material that received Seals. Plant material that is delivered with broken or missing Seals, or that is not similar to the plant material within the block that was tagged with Seals will be rejected.
- (d) **Rejected Plants.** Plant materials which do not meet these requirements will be rejected. Plant material rejected at the nursery or holding area shall not be delivered to the project; if delivered, it shall immediately be removed. Plants shall not be installed until the Plant Material Inspection has been completed and satisfactory identification has been provided.

920.07.03 Plant Material Standards. Plant material shall be grown, identified, graded, and delivered in good condition as specified in this section.

- (a) **Hardiness Zones and Origin.** Trees, shrubs, perennials and ornamental grasses shall be nursery grown within plant hardiness zones 5, 6, or 7 according to the ‘USDA Plant Hardiness Zone Map’ in the following states, unless specified otherwise: Maryland, Ohio, Pennsylvania, New York, New Jersey, Delaware, Virginia, West Virginia, North Carolina, Tennessee, Kentucky, Georgia. Annuals and bulbs shall be nursery grown.
- (b) **Names and Identification.** Refer to 920.06.01. Plant material shall be clearly and correctly identified by the grower or distributor. Plant materials that are misidentified, or not satisfactorily tagged or labeled, or do not conform to the accepted characteristics of the species or cultivar, will be rejected.
- (c) **ANSI Standards.** Plant material shall conform to ‘American Standard for Nursery Stock (ANSI Z60.1) of the American Nursery and Landscape Association. Plant grades shall be those established in ANSI Z60.1, and shall include plants from that size up to but not including the next larger grade size. When specimen plants are specified by the Contract documents, the specimen requirement shall also be met. Plant material which does not meet the standards of this section shall be rejected.
- (d) **Health and Sanitation.** Plant material shall be dug and transported in conformance ANSI Z60.1. Bare root deciduous plants shall be delivered in a dormant condition. Roots shall be adequately protected and kept moist.

Plant material shall be in good health and be declared and certified free from disease and insects as required by law for transportation, and shall be free from pest-related stress and pest damage.



Plants shall be healthy, free from physical defects and stresses, and have well-developed branches and a vigorous root system. Plants that exhibit wilt, shriveling, insufficient root mass, broken or loose root balls, or inadequate protection will be rejected.

Container grown plants shall be well rooted, vigorous and established in the size pot specified, shall have well balanced tops for their pot size, and shall not be root bound. Plants grown in fields or containers which include Ailanthus, Canada Thistle, Johnsongrass, or Yellow Nutsedge will be rejected.

- (e) **Shade and Flowering Trees.** Shade and flowering trees shall be symmetrically balanced. Major branch unions shall not have ‘V’ shaped crotches, bark inclusion or unions derived from water sprouts (epicormic growth) capable of causing structural weakness.

Trees shall be free of unhealed branch removal wounds greater than 1 in. diameter, or wounds or scars caused by staking, wire or ties, or any other defect which could cause structural failure or disfigurement.

Shade trees and central leader flowering trees shall have a single main trunk. Trunk height to the lowest branch shall conform to the following:

HEIGHT TO LOWEST BRANCH	
CALIPER in.	HEIGHT ft
1-1/2 and 1-3/4	4
2 to 2-1/2	5
3	6

- (f) **Unacceptable Plants.** Plant material that becomes unacceptable after installation shall be rejected as specified in 710.03.18.

920.07.04 American Holly (*Ilex opaca* Aiton). Unless other cultivars or ratios are specified in the Contract document, each lot of plants shall include 90 percent female plants and 10 percent male plants of cultivars selected from the following list, unless specified otherwise.

AMERICAN HOLLY CULTIVARS		
FEMALE		MALE
Angelica	Miss Helen	David
Arlene Leach	Old Heavy Berry	Jersey Knight
B and O	Patterson	Leather Leaf
Dan Fenton	Satyr Hill	Nelson West
Jersey Princess	Wyetta	North Wind



920.07.05 Plant Storage and Handling. Adequate facilities shall be provided for plant storage. Plants shall be handled with care to avoid damage.

- (a) **Bulbs.** Bulbs shall be stored under appropriate climate control.
- (b) **Perennials, Ornamental Grasses, Plug Plants and Annuals.** Perennials, ornamental grasses, plug plants and annuals shall be kept moist.
- (c) **Bare Root Plants and Live Stakes.** Bare root plants and live stakes shall be kept moist and heeled into moist soil or other suitable material until installed. During transport, the roots shall be covered with canvas, burlap or straw.
- (d) **Balled and Burlapped and Container Grown Plants.** Balled and burlapped plants and container grown plants shall be kept moist and installed within seven days of delivery, or the root balls or containers shall be covered with mulch or straw until removed for installation.

920.08 MARKING AND STAKING MATERIALS.

920.08.01 Outline Stakes. Outline stakes shall be full cut 1.75 x 1.75 in. sound hardwood, 48 in. long, as approved.

920.08.02 Stakes. Stakes for supporting trees shall be rough sawn, straight grain hardwood reasonably free from bark, knot holes, excessive warping, or other imperfections. Stakes shall be full cut 2.0 x 2.0 in. thickness.

920.08.03 Wire. Wire shall be No. 12 and 14 gauge new annealed galvanized wire.

920.08.04 Wire Rope. Wire rope shall be 0.25 in. zinc coated steel wire seven strand as commonly used for guying large trees.

920.08.05 Cable Clamps. Cable clamps shall be zinc galvanized steel.

920.08.06 Hose. Hose shall be 5/8 in. inside diameter corded synthetic rubber hose.

920.08.07 Turnbuckles. Turnbuckles shall be zinc galvanized with 4.5 in. openings and 5/16 in. threaded ends with screw eyes.

920.08.08 Anchors. Tree anchors shall be earth anchors of a type commonly used for anchoring large trees.

920.09 WATER, PESTICIDES, AND ADJUVANTS.



920.09.01 Water. Water used for the installation and establishment of vegetation shall not contain concentrations of substances that are harmful to plant growth. Water derived from public and municipal water systems in Maryland shall be acceptable for irrigation, fertilization, or mixing with pesticides. Water derived from wells or other sources may be used when it has soluble salts concentration less than 500 ppm, sodium less than 50 percent of total salts, and pH between 5.0 to 7.8.

920.09.02 Seed Carrier. Seed carrier shall be one or more inert, horticultural-grade materials used to improve seed mixing and distribution through a spreader or drill. Seed carriers shall be free flowing, easily mixable with seed, and nontoxic to seed, plants, humans, and wildlife. Seed carrier shall include one or more of the following:

- (a) **Calcined Clay.** Calcined clay shall be a furnace-baked clay product.
- (b) **Cocoa Shell.** Cocoa shell shall be processed cocoa seeds.
- (c) **Oyster Shell.** Oyster shell shall be crushed shells of oyster or other mollusk.
- (d) **Vermiculite.** Vermiculite shall be heat-expanded mineral mica.
- (e) **Perlite.** Perlite shall be heat-expanded mineral perlite.

920.09.03 Pesticides. Pesticides shall be EPA-approved and registered for use in Maryland to control plants, fungi, insects or other pests. Pesticides shall be approved for use, and acceptable application rates established by the Landscape Operations Division as follows:

- (a) **Herbicide.** Herbicide shall control or prevent regrowth of plants or vegetation.
- (b) **Insecticide.** Insecticide shall control or protect against insect or other arthropod pests.
- (c) **Fungicide.** Fungicide shall control or protect against fungal or bacterial pests.
- (d) **Other Pesticides.** Other pesticides shall control or protect against other pests such as deer, beaver, etc.

920.09.04 Marking Dye. Marking dyes shall be used to color spray solutions, be nonphytotoxic, oil or water soluble, and compatible with the pesticide products they are applied with. Marking dye products and application rates shall be approved by the Landscape Operations Division.

920.09.05 Spray Adjuvant and Wetting Agent. Spray adjuvant and wetting agents shall be compatible with the pesticides or other products they are applied with.



920.09.06 Antidesiccant. Antidesiccant and antitranspirant products shall be materials that provide a film over plant surfaces to limit water loss. These products and application rates shall be approved by the Landscape Operations Division.

**CATEGORY 900
MATERIALS**

SECTION 920 — LANDSCAPING MATERIALS

DELETE: 920.01.05 Bioretention Soil Mix (BSM) In its entirety.

INSERT:

920.01.05 Rain Garden Soil Mix (RGSM). Rain Garden Soil Mix (RGSM) shall be a homogenous mixture as follows:

- (a) **Components.** RGSM shall be composed of sand, mulch, planting soil, and compost. RGSM may include other approved soil amendments per 920.02. No other components shall be used.
- (1) **Sand.** MSMT 356. Coarse Sand shall be washed silica sand or crushed glass that conforms to ASTM Fine Aggregate C-33. Coarse Sand shall include less than 1% by weight of clay or silt size particles, and less than 5% by weight of any combination of diabase, greystone, calcereous or dolomitic sand.
- (2) **Mulch.** 920.05
- (3) **Compost.** Compost shall be agricultural product of bio-solids or source-separated materials manufactured and labeled for sale in Maryland.
1. Compost shall be biologically mature and no longer able to reheat to thermophilic temperatures.
 2. Compost shall have a pH of 6.0 to 7.5.
 3. Soluble salts concentration shall be less than 10.0 mmhos/cm.
 4. Moisture content shall be 30-55 percent.
 5. When delivered, compost shall have a weight of 1,400 lb per cubic yard or less.
 6. Compost shall be screened so that it has a uniform particle size of 0.5 in. or less.
- (4) **Planting Soil.** The planting soil shall be a friable soil uniform in color and texture and not supplied from the project but must be furnished. The USDA Textural classification of the planting soil shall be Sandy Loam and shall conform to the following:

COMPOSITION – PLANTING SOIL					
TEST PROPERTY	TEST¹ METHOD	TEST VALUE AND AMENDMENT			
Prohibited Weeds	—	Free of live stems and roots of species in 920.01.01 as well as live stems and roots of Bermudagrass, Quackgrass, and Yellow Nutsedge.			
Debris	—	920.01.01			
Grading Analysis	MSMT 356	920.01.01			
Textural Analysis	MSMT 356	Particle		% Passing by Weight	
		Size	mm	Minimum	Maximum
		Sand	2.0 – 0.050	50	60
		Silt	0.050 – 0.002	30	40
		Clay	less than 0.002	5	15
Soil pH	MSMT 356	pH of 6.0 to 7.5 Apply limestone to topsoil with pH 5.2 to 6.1 per NMP. Apply sulfur to topsoil with pH 7.1 to 7.6 per NMP.			
Organic Matter	MSMT 356	920.01.01			
Nutrient Content	MSMT 356	920.01.01			
Soluble Salts	MSMT 356	500 ppm (1.25 mmhos/cm) or less.			
Harmful Materials	—	920.01.01			
Note:					
¹ Materials Standards and Materials Testing 356 (MSMT) published by the Administration defines the approved test methods; other materials shall be approved by visual inspection or methods defined by the Landscape Operations Division.					

(5) Rain Garden Soil Mix (RGSM). The composition for the RGSM shall be as follows:

ITEM	POSITION BY VOLUME	REFERENCE
Planting Soil	30%	(Classified as Sandy Loam)
Compost	40%	920.05.01
Sand	30%	ASTM C33 Fine Aggregate

The RGSM shall meet the following nutrient criteria:

ITEM	CRITERIA	TEST METHOD
Corrected pH	5.5-7.5	04972
Magnesium	Minimum 35 ppm	*
Phosphorus (Phosphate-	Minimum 75 ppm	*
Potassium (K20)	Minimum 85 ppm	*
Soluble Salts	Not to exceed 500 ppm	*

* University of Maryland, Cooperative Extension Service, Department of Agronomy Test Method.

- (5) **Amendments.** Refer to 920.02. Limestone, Sulfur, and Iron Sulfate may be used to adjust pH of RGSM. No other amendments shall be used.

- (b) At least forty-five (45) days prior to the start of construction of microbioretention facilities, the Contractor shall submit the source of the planting soil to the Engineer for approval. No time extensions will be granted should the proposed planting soil fail to meet the minimum requirements stated above. Once a stockpile of the planting soil has been sampled, no material shall be added to the stockpile.

- (c) Planting soil that fails to meet the minimum requirements shall be replaced at no additional cost to the City.

- (d) **Amendment or Failure.** RGSM that does not conform to composition requirements will not be accepted, and shall not be delivered or used as RGSM.

- (e) **Storage:** 920.01.02(b). RGSM shall be stored in a stockpile that is protected from weather under tarp or shed. RGSM stored for 6 months or longer shall be resampled, retested and reapproved before use.

- (f) **Approval.** 920.01.02(c).

- (g) **Certification and Delivery.** 920.01.02(d).

ADD: The following:

920.01.06 High Flow Treatment Media (HFTM). High Flow Treatment Media (HFTM) shall conform to the following:

- (a) **Components.** Components of HFTM shall be sampled, tested and approved before mixing as follows:
 - (1) **Coarse Sand:** MSMT 356. Coarse Sand shall be washed silica sand or crushed glass that conforms to ASTM Fine Aggregate C-33. Coarse Sand shall include less than 1% by weight of clay or silt size particles, and less than 5% by weight of any combination of diabase, greystone, calcerous or dolomitic sand.
 - (2) **Fine Sand:** MSMT 356. Fine Sand shall be washed silica sand or crushed glass that conforms to ASTM Fine Aggregate C-33. Fine Sand shall include less than 1% by weight of clay or silt size particles, and less than 5% by weight of any combination of diabase, greystone, calcerous or dolomitic sand.
 - (3) **Medium Sand:** MSMT 356. Medium Sand shall be washed silica sand or crushed glass that conforms to ASTM Fine Aggregate C-33. Medium Sand shall include less than 1% by weight of clay or silt size particles, and less than 5% by weight of any combination of diabase, greystone, calcerous or dolomitic sand.
 - (4) **Very Coarse Sand:** MSMT 356. Very Coarse Sand shall be washed silica sand or crushed glass that conforms to ASTM Fine Aggregate C-33. Very

Coarse Sand shall include less than 1% by weight of clay or silt size particles, and less than 5% by weight of any combination of diabase, greystone, calcerous or dolomitic sand.

- (5) Peat Moss:** Peat Moss shall be 100% natural peat (no composted, sludge, yard or leaf waste) listed by Organic Materials Review Institute and meet the following criteria:

Total Carbon	> 85%
Carbon to Nitrogen Ratio	15:1 to 23:1
Lignin Content	49% to 52%
Humic Acid	> 18%
pH range	6.0 to 7.0
Moisture Content	30% to 50%

- (b) Composition.** HFTM shall be sampled and tested according to the requirements of MSMT 356 and conform to the following:

< 5% Fine Sand (0.125-0.25 mm)
10% - 15% Medium Sand (0.25-0.50 mm)
15% - 25% Coarse Sand (0.50-1.0 mm)
40% - 45% Very Coarse Sand (1.0-2.0 mm)
10%-20% Gravel (2.0-10 mm)
5% - 15% Peat Moss

- (c) Amendment or Failure.** HFTM that does not conform to composition requirements will not be accepted, and shall not be delivered or used as HFTM.
- (d) Storage:** 920.01.02(b). HFTM shall be stored in a stockpile that is protected from weather under tarp or shed. HFTM stored for 6 months or longer shall be resampled, retested and reapproved before use.
- (e) Approval.** 920.01.02(c).
- (f) Certification and Delivery.** 920.01.02(d).



**CATEGORY 900
MATERIALS**

SECTION 921 — MISCELLANEOUS

784 **DELETE:** SECTION 921.09.01 — GEOTEXTILES in its entirety.

INSERT: The following.

921.09.01 Geotextile Requirements. Geotextiles used on Administration projects shall participate in the National Transportation Product Evaluation Program (NTPEP) and conform to the Contract Documents and MSMT 732. Geotextiles shall be manufactured from fibers consisting of long chain synthetic polymers, composed of a minimum 95 percent by weight of polyolefins or polyesters, and formed into a stable network so the filaments or yarns retain their dimensional stability relative to each other, including selvages. Geotextiles used on Administration projects shall conform to the following:

MARYLAND APPLICATION CLASS		TYPE OF GEOTEXTILE	GRAB STRENGTH lb	PUNCTURE STRENGTH lb	PERMITTIVITY sec ⁻¹	APPARENT OPENING SIZE, MAX mm	TRAPEZOID TEAR STRENGTH (MD ^{***}) lb
			D 4632	D 6241	D4491	D 4751	D 4533
SD	TYPE I	NONWOVEN	160	310	0.50	0.43	55
		WOVEN, MONOFILAMENT	250	495	0.50	0.43	90
	TYPE II	NONWOVEN	160	310	0.20	0.25	55
		WOVEN, MONOFILAMENT	250	495	0.20	0.25	90
PE	TYPE I	NONWOVEN	200	430	0.70	0.43	80
		WOVEN, MONOFILAMENT	250	620	0.70	0.43	90
	TYPE II	NONWOVEN	200	310	0.20	0.25	55
		WOVEN, MONOFILAMENT	250	495	0.20	0.25	90
	TYPE III	NONWOVEN	200	220	0.10	0.22	40
		WOVEN, MONOFILAMENT	250	370	0.10	0.22	70
SE	NONWOVEN	160	310	0.20	0.30	80	
	WOVEN	250	495	0.20	0.30	90	
ST	WOVEN	300*	600	0.05	0.15**	110	
F	WOVEN	200	450	0.05	0.60	75	
E	NONWOVEN	200	450	1.1	0.21	80	
	WOVEN, MONOFILAMENT	370	900	0.28	0.21	100	



Note 1: All property values in the above table are based on minimum average roll values in the weakest principal direction except for apparent opening size.

Note 2: The ultraviolet stability shall be 50 percent after 500 hrs of exposure for all classes, except Class F, which shall be 70 percent (D 4355).

* 15% elongation for silt fence and monofilament woven geotextile in Machine Direction

** This is a MINIMUM apparent opening size, not a maximum.

***Machine Direction

Contact the Office of Materials Technology's Soils and Aggregate Technology Division for approval of geotextiles used for reinforcement applications.

921.09.02 Seam and Overlap. D 4884. Geotextiles joined by sewing shall conform to the following:

- (a) Either "J" or "Butterfly" type seams joined with a lock stitch.
- (b) Tensile strength requirements when tested across the seam.
- (c) Thread used for seaming shall be of equal or greater durability than the geotextile itself.

921.09.03 Securing Pins or Staples. Minimum 10 in. length and designed to securely hold the geotextile in place during construction.



786 **ADD:** The following after 921.11.

921.12 CONCRETE STAIN.

The material shall conform to the following requirements:

TEST PROPERTY	TEST METHOD	SPECIFICATION LIMITS
Accelerated Weathering	G7	Passing results
Mildew Resistance/fungus growth	Fed. Test Method STD.141, Method 6271	Resistance
Weatherometer, 1000 hours minimum	ASTM G26	No crazing, cracking, chipping, or flaking. Light chalk and color change. No other deterioration.
Total Non Volatile Vehicle, %	D2369	Mfr. Stated Value +/- 2%
Viscosity, Krebs Units, 77 deg. F	D562	Mfr. Stated value +/- 10 KU
Drying time (to touch)	D1640	1 hour minimum
Recoat dry time	D1640	Able to recoat within 24 hours
Infrared Spectrogram	D2621	n/a
Color	Fed. Std. 595	As specified in contract documents
Weight/gallon, lb.gal	D1475	Mfr. State value +/- 0.3 lb/gal
Shelf life		6 months minimum

Material more than six months old shall be retested. Material must be VOC compliant for Maryland.



CATEGORY 900
MATERIALS

789 **DELETE:** SECTION 925 — DETECTABLE WARNING SURFACES in its entirety.

INSERT: The following.

SECTION 925 — DETECTABLE WARNING SURFACES

925.01 GENERAL. Detectable warning surfaces shall conform to the current accessibility guidelines of the Americans with Disabilities Act (ADA). The Office of Materials Technology (OMT) maintains a Qualified Products List (QPL). Manufacturers seeking inclusion of their product on the QPL shall submit certified test results showing conformance to the properties in 925.07, as well as installation instructions and the types of adhesives and sealants required.

925.02 COMPOSITION. Warning surfaces shall be either flexible or rigid. If there is a change in the composition of a qualified product, the manufacturer shall notify OMT and submit new test results showing conformance with 925.07.

925.02.01 Pavers. Type III Brick Pavers shall conform to the requirements of C 902, Class SX, Type 1, and Application PX. The pavers shall be 2-1/4 x 4 x 8 in. with square edges and a surface meeting 925.03.

925.03 CONFIGURATION AND DIMENSIONS. The warning surface shall consist of a system of truncated domes having a base diameter of 0.9 in. to 1.4 in., a top diameter 50 to 65 percent of the base diameter, and a height of 0.2 in. The domes shall be arranged in a square grid with center-to-center spacing of 1.66 to 2.35 in.

925.04 COLOR. The color shall be homogeneous across the surface of the material and contrast with adjoining surfaces.

925.05 IDENTIFICATION. The top surface shall have an identifier that uniquely distinguishes the manufacturer. Brick pavers are excluded.

925.06 REQUIREMENTS.

TYPE	DESCRIPTION	PHYSICAL TEST REQUIREMENTS
Type I	Cast in Place	A, B, C, D, E, G
Type IIa	Surface Mount, Rigid	A, B, C, D, E, G
Type IIb	Surface Mount, Flexible	A, B, C, D, F, G
Type III	Brick Pavers	925.02.01
Type IV	Prefilled Pavers	A, B, C, D, G



SPECIAL PROVISIONS INSERT
925 — DETECTABLE WARNING SURFACES

925.07 PHYSICAL PROPERTIES.

	PROPERTY	TEST METHOD	SPECIFICATION LIMIT
A	Slip Resistance Coefficient	C 1028 (dry method)	0.80 minimum
B	Abrasive Wear, index	C 501	150 minimum
C	Fade (UV) Resistance/Color Retention	D 4587	Fade or Change in color after 2000 hours less than $\Delta E = 5^*$
D	Freeze/Thaw Resistance	C 1026	No disintegration
E	Adhesion/Bond Strength, pull off	C 482/C 882(as appropriate)	No adhesion failure
F	Adhesion/Bond Strength, peel	D 903/D 429 (modified as appropriate)	No adhesion failure
G	Contrast	Contrast percentage formula** using E 1349 to determine cap Y brightness/light reflectance values (LRV)	Current ADA requirement***

* Chromaticity coordinates (L*a*b* system) checked in conformance with D 2244, before and after test.

** Contrast % = $[(B_1 - B_2)/B_1] \times 100$,

where B_1 = (LRV) of the lighter area, and B_2 = (LRV) of the darker area.

*** For the purpose of determining whether a material meets acceptable contrast criteria, use actual cap Y brightness of detectable warning surface, and assume a value of 15 for the cap Y brightness of cured concrete, or a value of 3 for asphalt wearing surfaces to determine percentage difference. Detectable warning surfaces to be installed on other materials are required to undergo additional testing.



**CATEGORY 900
MATERIALS**

SECTION 950 — TRAFFIC MATERIALS

792 **DELETE**: 950.03 REFLECTORIZATION OF SIGNS AND CHANNELIZING DEVICES in its entirety.

INSERT: The following.

950.03 REFLECTORIZATION OF SIGNS AND CHANNELIZING DEVICES.

Provide retroreflective sheeting that meets the requirements of the latest version of ASTM D 4956 and is selected from the Administration's QPL. The type of sheeting to be used for different classifications of signs shall be as specified in the QPL and as described below.

Provide fluorescent colors, when yellow, orange or pink sheeting is specified. Color coordinates and values shall be as described in the MDMUTCD and 23 CFR Part 655, Subpart F, Appendix.

Provide non-reflective sheeting, when black sheeting is specified.

All sheeting for legend and backgrounds shall be from the same manufacturer and be a matched component system intended to be used together.

Use ASTM Type IV or VIII construction sheeting with a Class 1 backing for drums for maintenance of traffic. The sheeting must be reboundable as defined in the supplementary requirements of ASTM D 4956, latest version.

Use ASTM Type IV, V or VIII for delineators, and lane separator systems. Use ASTM Type IV, VI or VIII sheeting for cones for maintenance of traffic. The sheeting must be reboundable as defined in the supplementary requirements of ASTM D 4956, latest version.

Use ASTM Type VI sheeting with a Class 5 backing for Roll up signs for Maintenance of Traffic.

Use ASTM Type VIII, IX or XI sheeting for rigid temporary traffic signs.

Use ASTM Type IX or XI sheeting for Guide Signs, Exit Gore Signs, General Information Signs, School Signs, Warning Signs and Red Regulatory Signs.

Use ASTM Type IV, VIII, IX or XI sheeting for all other Regulatory Signs and for Route Markers.



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950.03— REFLECTORIZATION OF SIGNS AND CHANNELIZING DEVICES

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Use ASTM Type I or higher sheeting for No Trespassing Signs, signs directed at Pedestrian Traffic, signs directed at Bicycle Traffic, R7 series Parking signs, R8 series Parking signs and supplemental panels for R7 and R8 series signs.

CATEGORY 900
TRAFFIC MATERIALS

SECTION 950.15 — TRAFFIC SIGNAL HEADS

804 **DELETE:** The table and section titled Hardware in its entirety.

INSERT: The following.

ITEM	DESCRIPTION	A	B	C	D
1	Aluminum Alloy - Casting	A 319	A 380	A 713	6063 T6
2	Yield Strength, ksi	18	23	25	25
3	Tensile Strength, ksi	27	47	35	30
4	Brinell Hardness	70	80	75	73
5	Elongation (% in 2 in.)	1.5	4	3	12
6	Stainless Steel	A 316	-	-	-
7	Galvanized Steel	A 157	A 153	G 60	-
8	Steel-Flat Sheet	16 gauge	-	-	-
9	Coating	*	Anodized Finish	-	-
10	Brass	CZ120	-	-	-

*The signal head housing shall be yellow in conformance with Federal Standards 595, Color Chip No. 13538. The signal head door and visor shall be optical flat (dull) black Federal Standards 595, Color Chip No. 37038. Aluminum signal heads shall be painted using fusion bonded polyester coating method.

Hardware.

- (a) Hub plate shall conform to A, 1 through 5 and 9B.
- (b) Span wire hanger clamp shall conform to C, 1 thru 5.
- (c) Balance adjuster body shall conform to 10A.
- (d) Balance adjuster eyebolt and hardware shall conform to 6A, 7A, and 7B.
- (e) 2-way lower arm shall conform to 7C and 8A.
- (f) 2-way tri-stud arm shall conform to A, 1 thru 5.

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950.15 — TRAFFIC SIGNAL HEADS

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- (g) Span wire entrance fitting shall conform to C, 1 thru 5.
- (h) Mast arm mount signal bracket (1-way, 2-way, and 5-section) shall conform to 1A and 1D.
- (i) Side pole upper and lower arm assembly shall conform to 1B thru 5B or 1D thru 5D.

The maximum allowable play or space between the sides of the eyebolt and span wire clamp shall be 0.062 in.

808 **ADD:** The following under Electrical.

- (f) Terminal blocks screws shall be of the captive type secured by fasteners on the reverse side of the terminal block. Terminal block screws shall be a # 10 size.
- (g) Male spade terminal ends shall be furnished for each position on the terminal block angled at 45 degrees and perpendicular to the terminal block face.

**CATEGORY 900
MATERIALS****SECTION 951 — PAVEMENT MARKING MATERIALS****951.01 NONTOXIC LEAD FREE WATERBORNE PAVEMENT MARKINGS**

All nontoxic lead free waterborne pavement marking materials shall be ready-mixed, pigmented binder, emulsified in water, and capable of anchoring reflective beads that are applied separately.

The pavement marking material shall not contain any hazardous material listed in the Environmental Protection Agency Code of Federal Regulations (CFR) 40, Section 261.24, Table 1.

951.01.01 Waterborne Physical Requirements. The nontoxic lead free waterborne pavement marking material shall conform to the manufacturer's formulations as initially approved for use by the Administration and shall be controlled from batch to batch. All paint shall be evaluated in conformance to the requirements listed below.

Production batch samples will be subject to random tests, such as but not limited to, X-ray spectroscopy, infrared spectroscopy, ultraviolet spectral analysis, and atomic absorption spectroscopy.

The combined total of lead, cadmium, mercury, and hexavalent chromium shall not exceed 100 ppm, when tested by X-ray fluorescence spectroscopy, or other method capable of detection at this level.

For each production batch, the Contractor shall provide the Administration with the manufacturer's certified analysis conforming to TC-1.03 of the Standard Specifications.

- (a) **Viscosity.** The viscosity shall be 85 ± 10 KU when tested in conformance with D 562.
- (b) **Pigment For Yellow Pavement Marking Material.** The colorants used to attain the color of the yellow product shall be one or more of the following, along with titanium dioxide: Pigment Yellow 65, Pigment Yellow 75, and opaque Pigment Yellow 74.
- (c) **Color and Appearance.** Color and appearance shall be evaluated using the following: CIE 1976 $L^*a^*b^*$, illuminant D 65, and standard observer angle 1931 CIE 2 degrees. The geometry shall be 45/0 or 0/45, or d/8, excluding specular gloss. Measurements shall be taken from samples applied to an opacity chart, e.g., Leneta Form 2A, at a wet film thickness of 15 mils \pm 1 mil. The applied sample shall have been allowed to dry for at least 12 hours before measurements are taken. The evaluation shall be as follows:
 - (1) **Production:** The color of the dry paint film of the production sample shall match the $L^*a^*b^*$ values provided, under the specified conditions. For white material the values are: $L^* = 94.80$, $a^* = -2.35$, $b^* = 3.20$. For yellow material the values are: $L^* = 80.70$, $a^* = 19.40$, $b^* = 88.65$. The colors shall match when compared instrumentally.
 - (2) **Control.** The maximum permissible variation from the specified $L^*a^*b^*$ values shall be $2.0 \Delta E_{cmc}$. The measurements shall be taken from a sample applied over the black portion of an opacity chart.

The Administration will approve or disapprove any batch based on a laboratory visual evaluation for blemishes and irregularities in the test specimen (i.e. cracks, flaking, surface depressions, pooling, etc.) that would interfere with the measurement of color and appearance on the opacity chart. The Administration will make the final decision.

- (3) **Reflectance.** The reflectance, without beads, and using CIE XYZ Y_{xy} , shall be a minimum Y of 80 percent for white production batches; and a minimum of 50 percent for yellow production batches with a maximum of 60 percent. The measurement shall be taken from a sample applied over the black portion of an opacity chart.
 - (4) **Color Difference over Black and White.** For any production batch the measured color difference between readings taken over the black portion of the opacity chart from those taken over the white portion shall be a maximum value of $1.0 \Delta E_{cmc}$ for white products and $1.3 \Delta E_{cmc}$ for yellow products.
 - (5) **Yellowness Index.** The yellowness index of the white material, when determined according to E 313, Using Equation 1 and the coefficients for CIE D 65 illumination, 1931 from Table 1 in that standard, shall not exceed 8.0.
- (d) **Flexibility.** The pigmented binder shall not display cracking or flaking when subjected to the flexibility test of Federal Test Method TT-P 1952D, with the exception that the panels shall be 35 to 31 gauge (0.0078 to 0.0112 in.) tin plate approximately 3 x 6 in. The tin plates shall be lightly buffed with steel wool and thoroughly cleaned with solvent and dried before being used for the test.
- (e) **Weight per Gallon.** The weight per gallon for a production batch, when determined according to D 1475, shall be within ± 0.3 lb/gal of the value obtained by The National Transportation Product Evaluation Program (NTPEP), and reported on a NTPEP deck designated "north". When the Administration waives the NTPEP requirements, another target value will be stipulated.

951.01.03 Glass Bead Physical Requirements. Each lot of glass beads shall be sampled in conformance with the Administration's Frequency Guide and shall be submitted to the Administration's Office of Materials and Technology for testing and approval prior to use.

Glass beads shall be colorless, clean, transparent, and free of milkiness and excessive air bubbles.

Reflective glass beads shall conform to M 247, except that the gradation shall conform to the following:

SPECIAL PROVISIONS

951.01 — NONTOXIC WATERBORNE PAVEMENT MARKINGS

PERCENT PASSING			
SIEVE SIZE	Standard Beads	Large Beads	Maryland Blend
12 (1.70 mm)	—	100	100
14 (1.40 mm)	—	95 – 100	98 – 100
16 (1.18 mm)	—	80 – 95	88 – 97
18 (1.00 mm)	—	10 – 40	48 – 70
20 (0.85 mm)	100	0 – 5	28 – 50
30 (0.60 mm)	75 – 95	—	—
50 (0.30 mm)	15 – 35	—	5 – 25
80 (0.18 mm)	—	—	0 – 5
100 (0.15 mm)	0 – 5	—	—

Moisture resistance and flotation test are not required.

- (a) **Refractive Index.** The refractive index shall be 1.50 minimum, when tested in conformance with MSMT 211.
- (b) **Roundness.** Glass beads shall be smooth, spherical in shape, free of sharp angular scars, scratches, or pits, and shall contain a minimum of 60 percent silica. Beads shall have a minimum average roundness of 75 percent when tested in conformance with D 1155.

951.01.04 Qualification. Pavement marking material manufacturers desiring to have their material formulations approved under this Special Provision shall have their formulations evaluated on a NTPEP North Test Deck unless waived by the Administration. Only NTPEP evaluated formulations will be considered candidates for selection, unless the requirement is waived.

951.01.05 Field testing. Materials conforming to this specification shall be field evaluated for performance on a NTPEP North Test Deck. Materials performing satisfactorily throughout the test period will be placed on the Administration's Qualified Products List. All marking materials supplied under the Contract Documents shall be identical in composition to the materials submitted for initial NTPEP testing. The Office of Materials and Technology will determine conformity with these requirements.

951.01.06 Material Acceptance. Only Administration approved and stamped materials conforming to these Specifications shall be used.

Prior to the shipment of any pavement marking material batch, the manufacturer shall provide access for the Administration's representative to collect samples of the material from each production batch. The samples shall be sent to the Administration laboratory for QA testing. Each sample shall be accompanied by a certified analysis conforming to TC 1.03, showing compliance with the physical and chemical requirements of this Specification, and a statement certifying that any marking material supplied under the Contract Documents is identical in composition to the material submitted for initial NTPEP testing. The Administration will determine conformity with these requirements. Administration authorization shall be required before a batch or a portion of a batch is shipped.

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951.01 — NONTOXIC WATERBORNE PAVEMENT MARKINGS

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Paints shall be compatible with cleaning solvents used in equipment cleaning.

Nontoxic waterborne pavement markings shall not skin, curdle, settle or be unusable or difficult to apply within 12 months of the date of manufacture. The supplier, at the Administration's request, shall replace containers of marking material exhibiting an unacceptable level of settling, skinning, or curdling, as determined by the Administration. Marking material from a production batch shall not be used beyond 12 months after the date of manufacture.

951.01.07 Certification. The manufacturer shall explicitly certify in writing that any marking material supplied under the Contract Documents conforms to the formulation identified by the same product code or name placed on the NTPEP test deck from which it was approved. The same code or name as used in the published report from that test deck must identify the product. Failure to certify will be considered grounds for product batch rejection.

The manufacturer shall, in accordance with TC-1.03, explicitly certify, in writing, of any paint batch supplied under the Contract Documents that it complies with all applicable specifications. Failure to so certify will be considered grounds for product batch rejection. Certification for yellow nontoxic lead free waterborne pavement markings shall include, for the purpose of showing compliance with this specification, the name or the type of colorant used to achieve the yellow color. The Administration will keep the paint composition and chemical analysis information confidential.

The Certification shall also, contain the following:

- (a) Manufacturer's name.
- (b) Place (address) of manufacture.
- (c) Color of material.
- (d) Date of manufacture (month-day-year).
- (e) Lot or batch identification.
- (f) Size of lot/batch.
- (g) The recommended paint temperature at the spray gun.
- (h) Material Safety Data Sheets for all materials submitted for testing and application.

The Contractor shall furnish a copy of this certification to the Administration's representative before applying the paint batch it represents.

951.01.08 Production Facility.

- (a) The producer shall have a facility, presently in operation, capable of producing the traffic paint in the quantity and quality required by the Administration. This facility will be subject to the Administration's approval.
- (b) The producer shall have a laboratory, subject to the Administration's approval, that is capable of performing the required tests.

**CATEGORY 900
MATERIALS**

SECTION 951 — PAVEMENT MARKING MATERIALS

951.04 REMOVABLE PAVEMENT MARKING TAPE. Removable pavement marking tape shall remain in place on the pavement surface without being displaced by traffic, or affected by weather conditions. The material shall be capable of being removed without the use of heat, solvents, grinding, or sand blasting and shall not leave an objectionable residue.

The material shall be of good appearance and free from cracks. Edges shall be true, straight and unbroken. Line marking material shall be in rolls having no more than three splices per 150 ft of length. All marking materials shall be packaged in conformance with accepted commercial standards and shall have a minimum shelf life of one year.

Performance Requirements. When applied in conformance with the manufacturer's recommendations, the material shall provide a neat, durable marking that will not flow or distort due to temperature if the pavement surface or underlying markings remain stable. The material shall be weather resistant and, through normal traffic wear, shall show no lifting or shrinkage that will significantly impair the intended usage of the tape throughout its useful life, and shall show no significant tearing while in place, or other signs of poor adhesion. The material shall be capable of easy removal without tearing into small pieces.

951.04.01 White and Yellow. Removable preformed pavement marking materials shall conform to the requirements of the MdmUTCD and the following:

- (a) **Composition.** The marking material shall consist of a mixture of polymeric materials, pigment, and glass beads distributed uniformly throughout the surface.
- (b) **Color.** The color of the marking materials shall match Federal Test Standard No. 595 for the following color numbers:

White - 37925
Yellow - 38907

- (c) **Glass Beads.** Glass beads shall conform to the General Requirements of M 247 and have a minimum refractive index of 1.90 when tested as specified in MSMT 211.
- (d) **Frictional Resistance.** The British Pendulum Number shall be a minimum of 50 when tested as specified in E 303.
- (e) **Certification.** Samples submitted to the Office of Materials Technology (OMT) for testing shall be accompanied by the manufacturer's certified analysis in conformance with TC-1.03.

Any material supplied for a Contract shall be identical in composition to the material originally submitted for testing. Conformity will be determined by OMT.

- (f) **Field Testing.** Line marking materials conforming to the Contract Documents will be field tested by The National Transportation Product Evaluation Program (NTPEP) and over 180 day period as specified in MSMT 723 for conformance with the following:

- (1) Ease of Application - satisfactory.
- (2) Removability - a minimum rating of 2.
- (3) Residue Remaining at Time of Removal (day and night) - minimum rating of 2.
- (4) Durability, Appearance, and Night Visibility - minimum weighted rating of 4.
- (5) Loss or Movement - minimum rating of 2.

Upon satisfactory completion of the field testing, the marking materials will be placed on OMT's Qualified Products List. The material shall conform to all criteria for a minimum period of 120 days to be considered satisfactory.

951.04.02 Black. Removable preformed pavement marking materials shall conform to the requirements of the MdMUTCD and the following:

- (a) **Composition.** The non-reflective blackout tape shall not contain metallic foil and shall consist of a mixture of high quality polymeric materials, pigments, and inorganic fillers distributed throughout its cross-sectional area, with a matte black non-reflective surface. The film shall be pre-coated with a pressure sensitive adhesive. A nonmetallic medium shall be incorporated to facilitate removal.

For patterned materials, a minimum of 20 percent of the total surface area shall be raised and coated with nonskid particles. The channels between the raised areas shall be substantially free of particles.

- (b) **Color.** The color of the blackout material shall match Federal Test Standard No. 595 for the following color numbers:

Black - 37038 (or as approved by the Engineer)

- (c) **Frictional Resistance.** The British Pendulum Number shall be a minimum of 50 when tested as specified in E 303.
- (d) **Certification.** Samples submitted to OMT for testing shall be accompanied by the manufacturer's certified analysis in conformance with TC-1.03.

Any material supplied for a Contract shall be identical in composition to the material originally submitted for testing. Conformity will be determined by OMT.

- (e) **Field Testing.** Line marking materials conforming to the Contract Documents will be field tested by The National Transportation Product Evaluation Program (NTPEP) and over a 180 day period as specified in MSMT 723 for conformance with the following:

- (1) Ease of Application - satisfactory.
- (2) Removability - a minimum rating of 2. The manufacturer shall show that the blackout tape can be manually removed after its intended use, intact or in large pieces, at temperatures above 40 F without the use of heat, solvents, grinding, or sand or water blasting. The blackout tape shall remove cleanly from existing markings that are adequately adhered to the pavement surface.

SPECIAL PROVISIONS

951.04 — REMOVABLE PAVEMENT MARKING TAPE

- (3) Residue Remaining at Time of Removal (day and night) - minimum rating of 2.
- (4) Durability, Adhesion, Appearance, and Night Visibility - minimum weighted rating of 4. The manufacturer shall demonstrate that the properly applied blackout tape adheres to the roadway and existing stable roadway markings under climatic and traffic conditions normally encountered in the construction work zone.
- (5) Loss or Movement - minimum rating of 2.

Upon satisfactory completion of the field testing, the marking materials will be placed on OMT's Qualified Products List. The material shall conform to all criteria for a minimum period of 180 days to be considered satisfactory.

951.04.03 Packaging. Preformed pavement markings shipping package shall conform to the manufacturer's shipping requirements to prevent damage during delivery and unloading of all shipments. The shipping package shall be marked with the following information placed on each container:

- (a) Description of item.
- (b) Date of manufacture.
- (c) Successful Bidder's Name.
- (d) Purchase Order Number.
- (e) Lot Number.
- (f) Color.
- (g) Installation instructions.

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**951.05 — SNOWPLOWABLE RAISED PAVEMENT MARKERS and
RECESSED PAVEMENT MARKERS**

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**CATEGORY 900
MATERIALS**

SECTION 951 — PAVEMENT MARKING MATERIALS

**951.05 SNOWPLOWABLE RAISED PAVEMENT MARKERS (SPRPM) AND
RECESSED PAVEMENT MARKERS (RPM).**

Pavement Marker Reflector Lenses. Pavement marker reflector lenses shall conform to the requirements of D 4383 and shall be comprised of materials with adequate chemical, water and UV resistance for the intended use. The reflector lens shall contain one or two prismatic reflective faces to reflect incident light from opposite directions. The reflector lens shall be in the shape of a shallow frustum of a pyramid. The bottom of the reflector lens shall be equipped with an elastomeric pad to permit its attachment to the surface of the casting using the manufacturer's recommended adhesive. The lens faces shall provide extremely hard and durable abrasion resistant surfaces.

Pavement marker reflector lenses shall be 4.00 x 2.00 x 0.46 in. The slope of the reflecting surface shall be 30 degrees and the area of each reflecting surface shall be 1.7in.². The outer surface of the shell shall be smooth except in identification areas.

The pavement marker reflector lens shall be imprinted with the model number and the manufacturer's name.

SPRPM Casting. Both ends of the casting shall be shaped to deflect a snow plow blade. The bottom of the casting shall incorporate two parallel keels and an arcuately shaped web designed to fit into a grooved surface. Casting dimensions shall be a minimum of 9.25 x 5.86 x 1.69 in. and shall not exceed 10.5 x 7.25 x 1.69 in. The installed height shall not exceed 0.25 in. above the road surface.

The casting shall be nodular iron conforming to A 536, Grade 80-55-06, hardened to 51 to 55 R_C. The surface of the keel and web shall be free of scale, dirt, oil, grease or any other contaminant, which may reduce its bond to the epoxy adhesive.

The casting shall be imprinted with the model number and the manufacturer's name.

Recessed Pavement Marker Adhesive. The adhesive used to fasten the pavement marker lens to the pavement surface shall conform to D 4383-05 Table X1.4.2.3 M 237 Type II. Rapid Set Type adhesives shall not be used.

Casting Adhesive. The epoxy adhesive used to fasten the castings to the pavement surface shall conform to D 4383-05 Table X1.1.

Reflector Lens Adhesive in Casting. The adhesive used to fasten the reflector lens to the casting shall conform to the manufacturers' recommendations.

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951.05 — SNOWPLOWABLE RAISED PAVEMENT MARKERS and
RECESSED PAVEMENT MARKERS

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951.05.01 Field Testing. Materials conforming to SPRPM Specification shall be field evaluated at the National Transportation Product Evaluation Program (NTPEP) Northeast test deck for performance. Materials conforming to recessed pavement marker specification shall be field evaluated at any (NTPEP) test deck for performance. Materials performing satisfactorily throughout the test period will be placed on the Administrations Prequalified Materials List. All marking materials supplied during the Contract shall be identical in composition to the materials submitted for initial testing. Random sampling will be performed on projects sites. Conformity with these requirements will be determined by the Office of Materials Technology (OMT).

951.05.02 Facility Sampling. Random testing of samples will be performed by the Administration as Quality Assurance and certification verification. Materials will be periodically sampled at the manufacturer’s facility by the Administration. Each sample shall be accompanied by a certification showing compliance with the physical requirements of this Specification. Materials supplied during the Contract shall be identical in composition to the materials submitted for initial testing. Conformity with these requirements will be determined by OMT.

Sources supplying materials shall be submitted by the Contractor to the Engineer for approval in conformance with the Contract Documents.

The material manufacturer shall reimburse the Administration for the cost of sampling and shipment of the samples when sampled by the Administration.

Material Shipment. The components shall be shipped in containers sealed by the manufacturer. The label on each container shall include the following information:

- (a) Manufacturer’s Name.
- (b) Place of Manufacture.
- (c) Color of Material and Component Type.
- (d) Date of Manufacture (month-year).
- (e) Batch and Lot Identification Number.
- (f) Size/quantity of lot represented.

951.05.03 Certification. The Contractor shall furnish notarized certification as specified in TC-1.03.

The manufacturer shall certify that any SPRPM materials supplied during the Contract conforms to the identical composition of the samples submitted for evaluation on the NTPEP Northeast Test Deck, and identify the SPRPM materials by referring to the code used on the deck. PRPM materials which fail to conform will be rejected.

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951.05 — SNOWPLOWABLE RAISED PAVEMENT MARKERS and
RECESSED PAVEMENT MARKERS

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The manufacturer shall certify that any recessed pavement marker materials supplied during the Contract conforms to the identical composition of the samples submitted for evaluation on any NTPEP Test Deck, and identify the recessed pavement marker materials by referring to the code used on the deck. Recessed pavement marker materials which fail to conform will be rejected.

The manufacturer shall also provide the following:

- (a) Material Safety Data Sheets for all materials submitted for testing and use.
- (b) A facility, in operation, capable of producing the materials in the quantity and quality required by the Administration.
- (c) A laboratory capable of performing the required tests. This laboratory will be subject to the Administration's approval.

**CATEGORY 900
MATERIALS****SECTION 951 — PAVEMENT MARKING MATERIALS**

951.06 HEAT APPLIED PERMANENT PREFORMED THERMOPLASTIC PAVEMENT MARKING MATERIAL. The material shall be highly durable retroreflective polymeric materials designed for use as transverse lines, numbers, legends, symbols and arrow markings subjected to high traffic volumes and severe wear conditions such as shear action from crossover or encroachment.

The applied material shall adhere to hot mix asphalt (HMA), open-grade friction courses (OGFC), stone matrix asphalt (SMA), portland cement concrete (PCC), and any existing pavement markings when applied using normal heat from a propane fueled heat gun in conformance with manufacturer's recommendations.

The applied material shall be capable of conforming to pavement contours, breaks and faults, shall not be affected by weather conditions, and shall remain in place on pavement surfaces without being displaced by traffic.

The material shall have a minimum shelf life of one year.

The material shall conform to the requirements of the MdMUTCD and the following:

(a) Composition. The material shall consist of polymeric materials, pigments, binders and glass beads distributed throughout the entire cross-sectional area. The thermoplastic material shall conform to M 249 with the exception of the relevant differences for the material being supplied in the preformed state.

Restrictions. The combined total of lead, cadmium, mercury and hexavalent chromium shall not exceed 100 ppm when tested by X-ray diffraction, ICP, or comparable method capable of this level of detection. Nonleachable lead based pigments will not be permitted. Diarylide type pigments shall only be used when the manufacture or pavement marking material application temperature does not exceed 392 F.

(b) Color. Preformed markings shall consist of film with pigments selected and blended to match Federal Standard 595 color chip Nos. 17886 and 13538 for white and yellow respectively.

(c) Frictional Resistance. The surface of the applied material shall provide a minimum average skid resistance value of 50 BPN when tested in conformance with E 303.

SPECIAL PROVISIONS

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951.06 — HEAT APPLIED THERMOPLASTIC MATERIALS

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- (d) **Patchability.** The material shall be capable of use for patching worn areas of the same type in conformance with manufacturer's recommendations.
- (e) **Thickness.** The minimum thickness, without adhesive, shall be 120 mils.
- (f) **Adhesion.** The material shall retain a minimum of 65 percent adhesive bond after 100 cycles of freeze-thaw when tested in conformance with C 666, Method B.
- (g) **Beads.**
- (1) **Index of Refraction.** All beads shall meet the general requirements of M 247, Type I, and shall have a minimum index of refraction of 1.50 when tested using the liquid oil immersion method specified in MSMT 211.
 - (2) **Acid Resistance.** A maximum of 15 percent of the beads shall show a formation of a distinct opaque white layer on the entire surface after exposure to a 1 percent solution (by weight) of sulfuric acid in conformance with MSMT 211.

Field Testing. Materials conforming to this Specification shall be field tested at AASHTO regional test facilities, such as National Transportation Product Evaluation Program (NTPEP), for performance.

Materials performing satisfactorily throughout the test period, including exhibiting a minimum retained reflectance of 100 mcd/m²/lux at the completion of the testing, will be placed on the Prequalified Materials List maintained by the Office of Materials and Technology.

Certification. Any marking material supplied during the Contract shall be identical in composition to the material submitted for initial testing. Samples submitted for testing shall be accompanied by the manufacturer's certified analysis in conformance with TC-1.03.

**CATEGORY 900
MATERIALS****SECTION 951 — PAVEMENT MARKING MATERIALS**

951.07 PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT (PPRP) MARKING MATERIAL. The material shall be capable of adhering to hot mix asphalt and portland cement concrete surfaces, and to any existing pavement markings in accordance with manufacturer's recommendations by a pre-coated pressure sensitive adhesive. A primer shall be used to precondition the surface if recommended by the manufacturer. The markings shall be capable of being inlaid in new hot mix asphalt surfaces during the paving operation.

The material shall be highly durable and retroreflective and shall be fabricated of a polymeric material designed for longitudinal and legend/symbol markings subjected to high traffic volumes and severe wear conditions, such as shear action from crossover or encroachment on typical longitudinal configurations, and where high levels of reflectivity are required to ensure the safety of the motoring public.

The material shall be of good appearance and free from cracks. Edges shall be true, straight and unbroken. Line marking material shall be in rolls having no more than three splices per 150 ft of length. All marking materials shall be packaged in conformance with accepted commercial standards and shall have a minimum shelf life of one year.

The material shall remain in place on the pavement surface without being displaced by traffic, and shall not be affected by weather conditions.

951.07.01 Permanent Preformed Patterned Reflective Pavement Marking Material Components.

Composition. The material shall consist of a mixture of polymeric materials, pigments and reflective spheres distributed throughout the base cross-sectional area and reflective spheres bonded to the topcoat surface to provide immediate and continuing retroreflection.

Restrictions. The combined total of lead, cadmium, mercury and hexavalent chromium shall not exceed 100 ppm. Diarylide based pigments and non-leachable lead pigmentation are not acceptable. The presence of these compounds shall be tested for compliance to the specification by X-ray diffraction, ICP, or another comparable method, capable of this level of detection.

951.07.02 Permanent Preformed Patterned Reflective Pavement Marking Material Physical Requirements.

- (a) **Reflectance.** The manufacturer shall certify that the white and yellow materials shall have the minimum initial retroreflectance values of 350 mcd/L/m² for white and 250 mcd/L/m² for yellow markings in any 528 ft section. Reflectance shall be measured using a reflectometer with CEN 30-meter geometry (88.76 degree entrance angle and 1.05 degree observation angle).

SPECIAL PROVISIONS

- (b) **Color.** The color of preformed markings shall essentially match the 37886, 33538 or 37038 color chips for white, yellow or black respectively as shown in Federal Standard 595A.
- (c) **Frictional Resistance.** The surface of the retroreflective pliant polymer shall provide a minimum initial average skid resistance value of 45 BPN when tested according to ASTM E 303.

951.07.03 Field Testing. Materials conforming to this specification shall be field evaluated at the National Transportation Product Evaluation Program (NTPEP) Northeast test deck for performance. Materials performing satisfactorily throughout the test period will be placed on the Administration's Prequalified Materials List. All marking materials supplied during the Contract shall be identical in composition to the materials submitted for initial testing. Conformity with these requirements will be determined by the Office of Materials and Technology.

951.07.04 Prequalification. Samples shall be taken by Administration for testing. The manufacturer shall submit any data from AASHTO NTPEP Northeast Test Deck which support material performance. Materials conforming to this Specification will be placed on the Administration's Prequalified List of Patterned Tapes.

951.07.05 Certification. The Contractor shall furnish notarized certification as specified in TC-1.03. The manufacturer shall certify that any reflective thermoplastic materials supplied during the Contract conforms to the identical formulation as the samples submitted for evaluation on the NTPEP Northeast test deck, and identify the formulas by referring to the code used on the deck. Reflective thermoplastic materials which fail to conform will be rejected.

The manufacturer shall also provide the following:

- (a) Material Safety Data Sheets for all materials submitted for testing and use.
- (b) A facility, presently in operation, capable of producing the reflective thermoplastic materials in the quantity and quality required by the Administration.
- (c) A laboratory subject to the Administration's approval which is capable of performing the required tests.

Bidders are advised that the following:

ADDENDUM RECEIPT
VERIFICATION FORM

and the

PROPOSAL FORM PACKET

shall be completed,

and submitted in a sealed envelope

clearly marked

“SEALED BID”

and the

CONTRACT NUMBER

on the outside of the envelope

ADDENDUM RECEIPT VERIFICATION FORM

COMAR 21.05.02.08 requires that all addenda issued be acknowledged, therefore before bids may be considered responsive, the *City of Takoma Park* must receive verification that all bids considered the contents of all Contract Documents and all Addenda issued, as applicable, for this project.

I do solemnly declare and affirm under the penalties of perjury that this bid was prepared by this firm, including all subcontractors and suppliers, with consideration of all the information contained in the as advertised Contract Documents and all Addenda issued, as applicable.

NO ADDENDA WERE ISSUED

ADDENDUM NO. 1 to _____

(Must be filled in by the bidder – if only one Addendum enter 1 in the blank space provided)

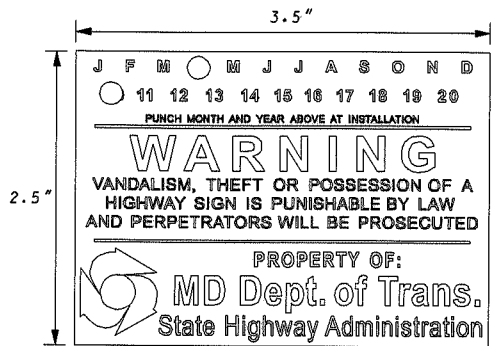
Date: _____

By: _____

(print name of Authorized Representative)

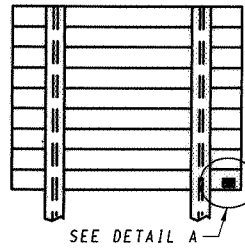
(signature of Authorized Representative)

**SIGN VANDALISM & INSTALLATION
DATE STICKER (VID) DETAIL**

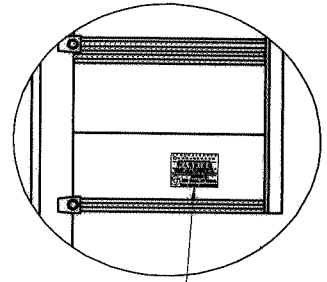


**VID STICKER INSTALLATION ON
EXTRUDED SIGNS**

INSTALL STICKER IN BOTTOM RIGHT CORNER OF SIGN AS SHOWN BELOW



SEE DETAIL A



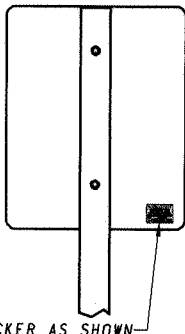
INSTALL VID STICKER TO FIRST EXTRUDED SIGN PANEL JUST BELOW CENTER STIFFENER RIB APPROXIMATELY 2 TO 3 INCHES FROM RIGHT EDGE OF SIGN PANEL

**EXTRUDED SIGN
REAR VIEW**

DETAIL A

**VID STICKER INSTALLATION ON
FLAT SHEET SIGNS**

INSTALL STICKER IN BOTTOM RIGHT CORNER OF SIGN AS SHOWN BELOW

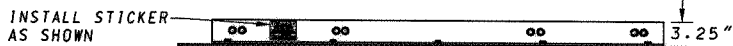


INSTALL STICKER AS SHOWN

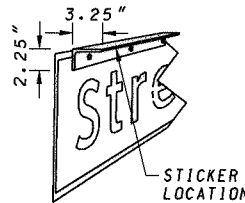
**FLAT SHEET SIGN
REAR VIEW**

**VID STICKER INSTALLATION ON
OVERHEAD STREET NAME SIGNS - MAST ARM MOUNTED**

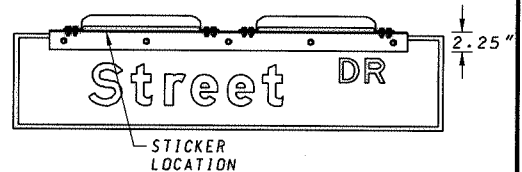
INSTALL STICKER TO UNDERSIDE OF SUPPORT ANGLE



UNDERSIDE OF SUPPORT ANGLE VIEW



ELEVATION VIEW



FRONT VIEW

NOTES

1. ALL VID STICKERS SHALL BE MANUFACTURED USING THE OFFSET SILK SCREEN METHOD. NO INKJET, PHOTO-PRINT, OR LARGE FORMAT PRINTING FORMATS WILL BE ACCEPTED IN ANY KIND.
2. ALL BACKGROUND SHEETING SHALL BE YELLOW - TYPE I, II OR IV RETRO-REFLECTIVE SIGN SHEETING APPROVED FOR THE USE ON MARYLAND STATE HIGHWAY ADMINISTRATION HIGHWAY SIGNING.
3. THE PROPER HANDLING AND MANUFACTURING OF THESE MATERIALS SHALL MEET THE SHEETING MANUFACTURER'S SPECIFICATIONS.
4. ALL SILK SCREENING PROCESSES AND INKS SHALL MEET THE SHEETING MANUFACTURER'S APPROVAL AND BE APPLIED TO THE SHEETING FOLLOWING ALL SHEETING MANUFACTURER'S PROCEDURES.
5. VID STICKERS, PRIOR TO INSTALLATION ON SIGNS, SHALL BE PROTECTED FROM EXPOSURE TO WEATHER, EXTREMES IN TEMPERATURE AND ANY CONDITIONS THAT COULD DAMAGE THEM.
6. ALL VID STICKERS SHALL BE INSTALLED ON SIGNS AS SHOWN IN THE ABOVE DETAILS.
7. AT THE TIME OF INSTALLATION THE AREA FOR WHICH THE STICKER IS TO BE APPLIED SHALL BE CLEAN AND FREE OF GREASE, DIRT, CONTAMINATES, ETC. ONLY ORDINARY WINDOW CLEANER, RUBBING ALCOHOL, DENATURED ALCOHOL OR MILD SOAP AND WATER SHOULD BE USED TO CLEAN THE BACK OF THE SIGN. NO ACETONE, ZYLENE OR OTHER HARSH CHEMICALS SHALL BE USED TO CLEAN ANY PORTION OF ANY MARYLAND STATE HIGHWAY ADMINISTRATION SIGN.
8. BE SURE THAT THE AREA IS COMPLETELY DRY PRIOR TO APPLICATION OF THE VID STICKER.
9. TO OBTAIN AN ELECTRONIC COPY OF THE VID STICKER FOR MANUFACTURING PURPOSES CONTACT:
MARYLAND STATE HIGHWAY ADMINISTRATION - OFFICE OF TRAFFIC AND SAFETY - TRAFFIC ENGINEERING DESIGN DIVISION
7491 CONNELLEY DR. HANOVER, MARYLAND 21076
AVAILABLE IN THE FOLLOWING FORMATS: .PDF, .JPG, .BMP AND .FS (FLEXISIGN).

SPECIFICATION CATEGORY CODE ITEMS

APPROVED

DIRECTOR - OFFICE OF TRAFFIC AND SAFETY



TYPICAL

**Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY**

**SIGN VANDALISM & INSTALLATION DATE
STICKER (VID)**

TYPICAL NO.

MD 813.99-05

BORING LOGS

Findling, Inc.

BORING LOG

PROJECT Ethan Allen Gateway Streetscape			PROJECT NO. 13-1050	BORING NO. SWM-01
LOCATION See Boring Location Plan	BEGUN 11/22/13	COMPLETED 11/22/13	HOLE SIZE	GROUND ELEVATION
COORDINATES	DEPTH WATER ENC. Dry	AT END DRILL Dry	AT 24 HRS	CAVED DEPTH 7.5'
DRILLER D. Fincham	WEIGHT OF HAMMER 140 lbs	HEIGHT OF FALL 30"	TYPE OF CORE	BORING DEPTH (FT) 11
TYPE OF DRILL RIG & METHOD CME 75, Truck	DEPTH TO ROCK	LOGGED BY: A. Workie	PAGE NO. 1	

DEPTH (ft)	STRATA ELE./ DEPTH	GRAPHIC LOG	DESCRIPTION	SAMPLE DATA					REMARKS:
				SAMPLE NO.	SAMPLE LENGTH (in)	N-VALUE/ RQD (%)	SAMPLE TYPE AND DIAMETER	SAMPLE RECOVERY (in)	
0	0		Asphaltic Concrete = 9 1/2"						Obtained Bulk Bag sample from 3' to 7'
	-1		Aggregate Base = 2 1/2"						
	-3		Brown moist Silty CLAY, little fine to medium Sand (CL) FILL	S-1	24"	2-3-4-5	DS	20"	
5	-5		Brown & Red moist Silty fine to medium SAND (SM) FILL	S-2	24"	4-5-5-5	DS	24"	
			Red & Brown moist Silty SAND, trace Clay (SM)	S-3	24"	3-4-4-6	DS	24"	
				S-4	24"	4-5-6-6	DS	20"	
10	-11			S-5	24"	4-5-5-6	DS	24"	
			Bottom of Boring @ 11'						Borehole Backfilled and patched with cold asphalt upon completion. Approximate Station @ 302+85, 45' Left
15									
20									
25									
30									

Findling, Inc.

BORING LOG

PROJECT Ethan Allen Gateway Streetscape			PROJECT NO. 13-1050	BORING NO. SWM-01A
LOCATION See Boring Location Plan	BEGUN 11/22/13	COMPLETED 11/22/13	HOLE SIZE	GROUND ELEVATION
COORDINATES	DEPTH WATER ENC. Dry	AT END DRILL Dry	AT 24 HRS	CAVED DEPTH 7.0'
DRILLER D. Fincham	WEIGHT OF HAMMER 140 lbs	HEIGHT OF FALL 30"	TYPE OF CORE	BORING DEPTH (FT) 11
TYPE OF DRILL RIG & METHOD CME 75, Truck	DEPTH TO ROCK	LOGGED BY: A. Workie		PAGE NO. 1

DEPTH (ft)	STRATA ELE./ DEPTH	GRAPHIC LOG	DESCRIPTION	SAMPLE DATA					REMARKS:
				SAMPLE NO.	SAMPLE LENGTH (in)	N-VALUE/ RQD (%)	SAMPLE TYPE AND DIAMETER	SAMPLE RECOVERY (in)	
0	0		Asphaltic Concrete = 5"						Obtained Bulk Bag Sample from 1' to 5'
	-1.2		Aggregate Base = 8"						
			Red & Brown moist Silty CLAY, trace cemented Sand fragments (CL) FILL	S-1	24"	1-3-3-4	DS	18"	
	-3.5			S-2	24"	3-3-3-2	DS	24"	
5	-6		Brown moist Silty fine to medium SAND, trace Clay (SM) FILL	S-3	24"	1-2-2-3	DS	20"	
			Reddish Brwon moist Silty CLAY, little fine to medium Sand (CL)	S-4	24"	3-5-7-8	DS	24"	
	-9								
10	-11		Reddish Brown moist Silty fine to medium SAND, trace Clay (SM)	S-5	24"	4-6-7-8	DS	24"	
			Bottom of Boring @ 11'						Borehole Backfilled and patched with cold asphalt upon completion. Approximate Station @ 303+45, 25' left Installed 5" diameter PVC pipe in an offset borehole to 5' for Infiltration test.
15									
20									
25									
30									

Findling, Inc.

BORING LOG

PROJECT Ethan Allen Gateway Streetscape			PROJECT NO. 13-1050	BORING NO. SWM-02A
LOCATION See Boring Location Plan	BEGUN 11/21/13	COMPLETED 11/21/13	HOLE SIZE	GROUND ELEVATION
COORDINATES	DEPTH WATER ENC. Dry	AT END DRILL Dry	AT 24 HRS	CAVED DEPTH 7.3'
DRILLER D. Fincham	WEIGHT OF HAMMER 140 lbs	HEIGHT OF FALL 30"	TYPE OF CORE	BORING DEPTH (FT) 11
TYPE OF DRILL RIG & METHOD CME 75, Truck	DEPTH TO ROCK	LOGGED BY: A. Workie	PAGE NO. 1	

DEPTH (ft)	STRATA ELE./ DEPTH	GRAPHIC LOG	DESCRIPTION	SAMPLE DATA					REMARKS:
				SAMPLE NO.	SAMPLE LENGTH (in)	N-VALUE/ RQD (%)	SAMPLE TYPE AND DIAMETER	SAMPLE RECOVERY (in)	
0	0		Asphaltic Concrete = 2 1/2"						Obtained Bulk Bag sample from 1.5' to 5.0' Obtained Bulk Bag sample from 1.5' to 5.0'
	-1.3		Cement Concrete = 8"	S-1	24"	1-2-4-6	DS	20"	
			Aggregate Base = 5"	S-2	24"	5-7-8-8	DS	20"	
5	-5		Brown and Grey moist Silty CLAY, trace fine to medium Sand (CL) FILL	S-3	24"	3-4-7-7	DS	24"	
			Brown moist Silty CLAY, trace fine to medium Sand (CL)	S-4	24"	5-8-11-13	DS	24"	
	-8.8			S-5	24"	3-5-4-5	DS	24"	
10	-11		Brown and Red moist Silty fine to medium SAND (SM)						Borehole Backfilled and patched with cold asphalt upon completion. Approximate Station @ 310+00, 50' right
			Bottom of Boring @ 11'						
15									
20									
25									
30									

Findling, Inc.

BORING LOG

PROJECT Ethan Allen Gateway Streetscape			PROJECT NO. 13-1050	BORING NO. SWM-02
LOCATION See Boring Location Plan	BEGUN 11/21/13	COMPLETED 11/21/13	HOLE SIZE	GROUND ELEVATION
COORDINATES	DEPTH WATER ENC. Dry	AT END DRILL Dry	AT 24 HRS	CAVED DEPTH 7.2'
DRILLER D. Fincham	WEIGHT OF HAMMER 140 lbs	HEIGHT OF FALL 30"	TYPE OF CORE	BORING DEPTH (FT) 11
TYPE OF DRILL RIG & METHOD CME 75, Truck	DEPTH TO ROCK	LOGGED BY: A. Workie	PAGE NO. 1	

DEPTH (ft)	STRATA ELE./ DEPTH	GRAPHIC LOG	DESCRIPTION	SAMPLE DATA					REMARKS:
				SAMPLE NO.	SAMPLE LENGTH (in)	N-VALUE/ RQD (%)	SAMPLE TYPE AND DIAMETER	SAMPLE RECOVERY (in)	
0	0		Asphaltic Concrete = 2 1/2"						Obtained Bulk Bag sample from 1.5' to 5.0'
	-1.3		Cement Concrete = 9 1/2"	S-1	24"	2-3-6-7	DS	20"	
			Aggregate Base = 4"						
			Brown moist Silty fine to medium SAND, trace Clay (SM)	S-2	24"	5-8-10-11	DS	20"	
5	-4.7		FILL						
			Brown, Red moist Clayey SILT, trace to some Silty fine Sand, trace cemented Sand fragments (ML)	S-3	24"	6-6-8-8	DS	24"	
				S-4	24"	6-8-7-8	DS	24"	
10	-11			S-5	24"	4-3-5-7	DS	24"	
			Bottom of Boring @ 11'						Borehole Backfilled and patched with cold asphalt upon completion. Approximate Station @ 309+40, 40' right Installed 5" diameter PVC pipe in an offset borehole to 5' for Infiltration test.
15									
20									
25									
30									

Findling, Inc.

BORING LOG

PROJECT Ethan Allen Gateway Streetscape			PROJECT NO. 13-1050	BORING NO. SWM-03
LOCATION See Boring Location Plan	BEGUN 11/21/13	COMPLETED 11/21/13	HOLE SIZE	GROUND ELEVATION
COORDINATES	DEPTH WATER ENC. Dry	AT END DRILL Dry	AT 24 HRS	CAVED DEPTH 5.0'
DRILLER D. Fincham	WEIGHT OF HAMMER 140 lbs	HEIGHT OF FALL 30"	TYPE OF CORE	BORING DEPTH (FT) 11
TYPE OF DRILL RIG & METHOD CME 75, Truck	DEPTH TO ROCK	LOGGED BY: A. Workie	PAGE NO. 1	

DEPTH (ft)	STRATA ELE./ DEPTH	GRAPHIC LOG	DESCRIPTION	SAMPLE DATA					REMARKS:
				SAMPLE NO.	SAMPLE LENGTH (in)	N-VALUE/ RQD (%)	SAMPLE TYPE AND DIAMETER	SAMPLE RECOVERY (in)	
0	0		Asphaltic Concrete = 2 1/2"						Obtained Bulk Bag sample from 2' to 5'
	-1.7		Cement Concrete = 7 1/2"						
	-3		Aggregate Base = 10"	S-1	24"	5-5-5-4	DS	15"	
	-5		Brown moist Silty CLAY, trace fine to medium Sand (CL) FILL	S-2	24"	4-5-7-9	DS	22"	
5	-5		Brown moist Silty SAND, trace Clay (SM) FILL	S-3	24"	3-4-4-4	DS	24"	
			Brown moist Silty fine to coarse SAND, trace Clay, trace Gravel (SM)	S-4	24"	3-4-3-4	DS	24"	Borehole Backfilled and patched with cold asphalt upon completion. Approximate Station @ 313+65, 40' right Installed 5" diameter PVC pipe in an offset borehole to 5' for Infiltration test.
10	-11			S-5	24"	3-4-5-6	DS	24"	
			Bottom of Boring @ 11"						
15									
20									
25									
30									

Findling, Inc.

BORING LOG



PROJECT Ethan Allen Gateway Streetscape			PROJECT NO. 13-1050	BORING NO. C-1
LOCATION See Boring Location Plan	BEGUN 11/21/13	COMPLETED 11/21/13	HOLE SIZE	GROUND ELEVATION
COORDINATES	DEPTH WATER ENC. Dry	AT END DRILL Dry	AT 24 HRS	CAVED DEPTH 4.0'
DRILLER D. Fincham	WEIGHT OF HAMMER 140 lbs	HEIGHT OF FALL 30"	TYPE OF CORE	BORING DEPTH (FT) 5
TYPE OF DRILL RIG & METHOD CME 75, Truck	DEPTH TO ROCK	LOGGED BY: A. Workie	PAGE NO. 1	

DEPTH (ft)	STRATA ELE./ DEPTH	GRAPHIC LOG	DESCRIPTION	SAMPLE DATA					REMARKS:
				SAMPLE NO.	SAMPLE LENGTH (in)	N-VALUE/ RQD (%)	SAMPLE TYPE AND DIAMETER	SAMPLE RECOVERY (in)	
0	0		Asphaltic Concrete = 2"						Obtained Bulk Bag sample from 1' to 5'
	-0.8		Cement Concrete = 8"	S-1	24"	3-3-4-6	DS	22"	
			Brown & Orange moist Silty fine to medium SAND, trace Clay, cemented Sand fragments (SM) FILL	S-2	24"	5-6-6-7	DS	24"	
5	-5		Bottom of Boring @ 5.0'						Borehole Backfilled and patched with cold asphalt upon completion. Approximate Station @ 311+95, 40' right
10									
15									
20									
25									
30									

Findling, Inc.

BORING LOG

PROJECT Ethan Allen Gateway Streetscape			PROJECT NO. 13-1050	BORING NO. C-2
LOCATION See Boring Location Plan	BEGUN 11/22/13	COMPLETED 11/22/13	HOLE SIZE	GROUND ELEVATION
COORDINATES	DEPTH WATER ENC. Dry	AT END DRILL Dry	AT 24 HRS	CAVED DEPTH 3.9'
DRILLER D. Fincham	WEIGHT OF HAMMER 140 lbs	HEIGHT OF FALL 30"	TYPE OF CORE	BORING DEPTH (FT) 5
TYPE OF DRILL RIG & METHOD CME 75, Truck	DEPTH TO ROCK	LOGGED BY: A. Workie	PAGE NO. 1	

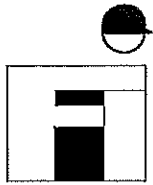
DEPTH (ft)	STRATA ELE./ DEPTH	GRAPHIC LOG	DESCRIPTION	SAMPLE DATA					REMARKS:
				SAMPLE NO.	SAMPLE LENGTH (in)	N-VALUE/ RQD (%)	SAMPLE TYPE AND DIAMETER	SAMPLE RECOVERY (in)	
0	0		Asphaltic Concrete = 6"						
	-0.9		Aggregate Base = 5"						
	-2		Light Grey moist fine to medium Sandy SILT, trace roots (ML) FILL	S-1	24"	3-4-3-5	DS	20"	Obtained Bulk Bag sample from 1' to 5'
	-3		Brown & Red moist Silty CLAY, trace Sand (CL) FILL	S-2	24"	5-9-10-13	DS	24"	
5			Brown moist Silty fine to medium SAND (SM) FILL						Borehole Backfilled and patched with cold asphalt upon completion. Approximate Station @ 314+00, 45' left
			Bottom of Boring @ 5.0'						
10									
15									
20									
25									
30									

Findling, Inc.

BORING LOG

PROJECT Ethan Allen Gateway Streetscape			PROJECT NO. 13-1050	BORING NO. C-3
LOCATION See Boring Location Plan	BEGUN 11/22/13	COMPLETED 11/22/13	HOLE SIZE	GROUND ELEVATION
COORDINATES	DEPTH WATER ENC. Dry	AT END DRILL Dry	AT 24 HRS	CAVED DEPTH 4.0'
DRILLER D. Fincham	WEIGHT OF HAMMER 140 lbs	HEIGHT OF FALL 30"	TYPE OF CORE	BORING DEPTH (FT) 5
TYPE OF DRILL RIG & METHOD CME 75, Truck	DEPTH TO ROCK	LOGGED BY: A. Workie	PAGE NO. 1	

DEPTH (ft)	STRATA ELE./ DEPTH	GRAPHIC LOG	DESCRIPTION	SAMPLE DATA					REMARKS:
				SAMPLE NO.	SAMPLE LENGTH (in)	N-VALUE/ RQD (%)	SAMPLE TYPE AND DIAMETER	SAMPLE RECOVERY (in)	
0	0		Asphaltic Concrete = 3"						Obtained Bulk Bag sample from 2' to 5'
	-1.5		Cement Concrete = 9"	S-1	24"	2-3-3-3	DS	18"	
			Aggregate Base = 6"						
			Brown & Orange moist Silty fine to medium SILT, trace Clay (SM)	S-2	24"	4-6-8-8	DS	24"	Borehole Backfilled and patched with cold asphalt upon completion. Approximate Station @ 305+80, 125' left
5	-5		FILL						
			Bottom of Boring @ 5.0'						
10									
15									
20									
25									
30									



FIELD CLASSIFICATION SYSTEM

NON COHESIVE SOILS

(Silt, Sand, Gravel and Combinations)

<u>Density</u>		<u>Particle Size Identification</u>	
Very Loose	- 5 blows/ft. or less	Boulders	-8 inch diameter or more
Loose	- 6 to 10 blows/ft.	Cobbles	-3 to 8 inch diameter
Medium Dense	-11 to 30 blows/ft.	Gravel	-Coarse -1 to 3 inch
Dense	-31 to 50 blows/ft.		Medium -½ to 1 inch
Very Dense	-51 blows/ft. or more		Fine -¼ to ½ inch
 <u>Relative Proportions</u>		Sand	-Coarse -0.6mm to ¼ inch (dia. of pencil lead)
<u>Descriptive Term</u>	<u>Percent</u>		Medium -0.2mm to 0.6mm (dia. of broom straw)
Trace	1 -10		Fine -0.05mm to 0.2mm (Dia. of human hair)
Little	11-20	Silt	-0.6mm to 0.002mm (Cannot see particles)
Some	21-35		
And	36-50		

COHESIVE SOILS

(Clay, Silt and Combinations)

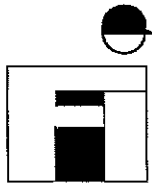
<u>Consistency</u>		<u>Plasticity</u>	
Very Soft	- 3 blows/ft. or less	<u>Degree of</u>	<u>Plasticity</u>
Soft	- 4 to 5 blows/ft.	Plasticity	Index
Medium Stiff	- 6 to 10 blows/ft.	None to slight	0- 4
Stiff	-11 to 15 blows/ft.	Slight	5- 7
Very Stiff	-16 top 30 blows/ft.	Medium	8-22
Hard	-31 blows/ft. or more	High to Very High	over 22

Classification on logs are made by visual inspection of samples.

Standard Penetration Test — Driving a 2.0" O.D., 1-3/8" I.D., sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30.0 inches. It is customary to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the test are recorded for each 6.0 inches of penetration on the drill log (Example — 6/8/9). The standard penetration test result can be obtained by adding the last two figures (i.e. 8+ 9 = 17 blows/ft.). (ASTM D1586 - 08a)

Strata Changes — In the column "Soil Descriptions" on the drill log the horizontal lines represent strata changes.

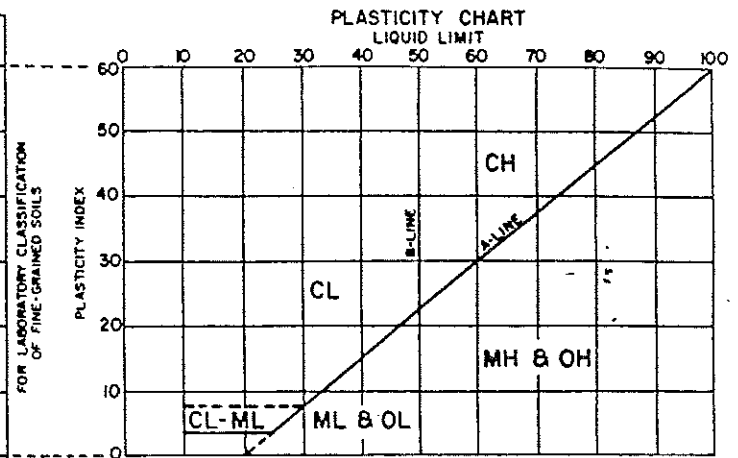
Ground Water observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc., may cause changes in the water levels indicated on the logs.



UNIFIED SOIL CLASSIFICATION SYSTEM

SOIL CLASSIFICATION CHART

MAJOR GROUPS		LETTER SYMBOL	TYPICAL DESCRIPTIONS
FINE-GRAINED SOILS 50% OR MORE PASSES No. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50%	ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY
PT		PEAT, MUCK AND OTHER HIGHLY ORGANIC SOILS	
COARSE-GRAINED SOILS MORE THAN 50% RETAINED ON No. 200 SIEVE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON No. 4 SIEVE	GW	CLEAN GRAVELS LITTLE OR NO FINES
		GP	GRAVELS WITH FINES LITTLE OR NO FINES
		GM	GRAVELS WITH FINES APPRECIABLE AMOUNT OF FINES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING No. 4 SIEVE	GC	CLEAN SANDS LITTLE OR NO FINES
		SW	SANDS WITH FINES LITTLE OR NO FINES
		SP	SANDS WITH FINES APPRECIABLE AMOUNT OF FINES
		SM	WELL-GRADED SANDS AND GRAVELLY SANDS, LITTLE OR NO FINES
		SC	POORLY GRADED SANDS AND GRAVELLY SANDS, LITTLE OR NO FINES
		SC	SILTY SANDS, SAND-SILT MIXTURES CLAYEY SANDS, SAND-CLAY MIXTURES



GRADATION CHART

MATERIAL SIZE	PARTICLE SIZE				
	LOWER LIMIT		UPPER LIMIT		
	MILLIMETERS	SIEVE SIZE	MILLIMETERS	SIEVE SIZE	
SAND	FINE	.074	200	0.42	40
	MEDIUM	0.42	40	2.00	10
	COARSE	2.00	10	4.75	4
GRAVEL	FINE	4.75	4	19	3/4"
	COARSE	19	3/4"	76	3"
COBBLES		76	3"	305	12"
BOULDERS		305	12"	914	36"

16.04.210 Inspection schedule and reports.

- A. Prior to issuance of a final stormwater management permit, the owner/developer shall submit to the City a proposed schedule for maintenance inspection and construction control as provided for in Section 16.04.260.
- B. The owner/developer shall notify the City at least 48 hours before commencing any work in conjunction with site development, the stormwater management permit and upon completion of the project.
- C. Regular inspections shall be made and documented for each ESD planning technique and practice at the stages of construction specified in the Design Manual by the City, its authorized representative, or certified by a professional engineer licensed in the State of Maryland. At a minimum, all ESD and other nonstructural practices shall be inspected upon completion of final grading, the establishment of permanent stabilization, and before issuance of use and occupancy approval.
- D. Written inspection reports shall include:
1. The date and location of the inspection;
 2. Whether construction was in compliance with the approved stormwater management plan;
 3. Any variations from the approved construction specifications; and
 4. Any violations that exist.
- E. The owner/developer and on-site personnel shall be notified in writing when violations are observed. Written notification shall describe the nature of the violation and the required corrective action.
- F. No work shall proceed on the next phase of development until the City inspects and approves the work previously completed and furnishes the developer with the results of the inspection as soon as possible after completion of each required inspection. (Ord. 2010-20 § 1 (part), 2010/Ord. 2010-15 § 1 (part), 2010/Ord. 2002-6 § 1 (part), 2002: Ord. 2001-29 § 1 (part), 2001: prior code § 10C-20)

16.04.220 Inspection requirement during construction.

- A. At a minimum, regular inspections shall be made and documented at the following specified stages of construction:
1. For ponds:
 - a. Upon completion of excavation to subfoundation and when required, installation of structural supports or reinforcement for structures, including but not limited to:

- i. Core trenches for structural embankments;
 - ii. Inlet and outlet structures, anti-seep collar or diaphragms, and watertight connectors on pipes; and
 - iii. Trenches for enclosed storm drainage facilities;
 - b. During placement of structural fill, concrete, and installation of piping and catch basins;
 - c. During backfill of foundation and trenches;
 - d. During embankment construction; and
 - e. Upon completion of final grading and establishment of permanent stabilization.
2. Wetlands: at the stage specified for pond construction in this section, during and after wetland reservoir area planting, and during the second growing season to verify a vegetation survival rate of at least 50 percent.
3. For infiltration trenches:
 - a. During excavation to subgrade;
 - b. During placement and backfill of underdrain systems and observation wells;
 - c. During placement of geotextiles and all filter media;
 - d. During construction of appurtenant conveyance systems such as diversion structures, pre-filters and filters, inlets, outlets, and flow distribution structures; and
 - e. Upon completion of final grading and establishment of permanent stabilization.
4. For infiltration basins: at the stages specified for pond construction in Section A.1 of this section and during placement and backfill of underdrain systems.
5. For filtering systems:
 - a. During excavation to subgrade;
 - b. During placement of and backfill of underdrain systems;
 - c. During placement of geotextiles and all filter media;

- d. During construction of appurtenant conveyance systems such as flow diversion structures, pre-filters and filters, inlets, outlets, orifices, and flow distribution structures; and
 - e. Upon completion of final grading and establishment of permanent stabilization.
6. For open channel systems:
- a. During excavation to subgrade;
 - b. During placement and backfill of underdrain systems for dry swales;
 - c. During installation of diaphragms, check dams, or weirs; and
 - d. Upon completion of final grading and establishment of permanent stabilization.
- B. The City may, for enforcement purposes, use any one or a combination of the following actions:
1. A notice of violation shall be issued specifying the need for corrective action if stormwater management plan noncompliance is identified;
 2. A stop work order shall be issued for the site by the City if a violation persists;
 3. Bonds or securities shall be withheld or the case may be referred for legal action if reasonable efforts to correct the violation have not been undertaken; or
 4. In addition to any other sanctions, a civil action or criminal prosecution may be brought against any person or citations issued for violation of the Stormwater Management Subtitle, the Design Manual or this Chapter.
- C. Any step in the enforcement process may be taken at any time, depending on the severity of the violation.
- D. Once construction is complete, as-built plan certification shall be submitted by either a professional engineer or professional land surveyor licensed in the State of Maryland to ensure that ESD planning techniques, treatment practices, and structural stormwater management measures and conveyance systems comply with the specifications contained in the approved plans. At a minimum, as-built certification shall include a set of drawings comparing the approved stormwater management plan with what was constructed. The City may require additional information.
- E. The City shall submit notice of construction completion to the Administration on a form supplied by the Administration for each structural stormwater management practice within 45 days of construction completion. The type, number, total drainage area, and total impervious area treated by all ESD techniques and practices shall be reported to the Administration on a site by site basis. If BMPs requiring Soil Conservation District (SCD) approval are constructed, notice of construction completion shall also be submitted to the appropriate SCD. (Ord. 2010-20 § 1 (part), 2010/Ord. 2010-15 § 1 (part), 2010)

16.04.230 Acceptance of certification in lieu of inspections.

The City Manager, in his or her sole discretion, may accept the certification of a registered professional engineer licensed in Maryland in lieu of any inspection during construction required by this chapter. (Ord. 2010-20 § 1 (part), 2010/Ord. 2010-15 § 1 (part), 2010/Ord. 2002-6 § 1 (part), 2002: Ord. 2001-29 § 1 (part), 2001: prior code § 10C-22)

16.04.240 Maintenance agreement.

A. An inspection and maintenance agreement shall be executed between the owner and the City for all privately owned ESD treatment practices and structural stormwater management measures prior to the issuance of a final stormwater management permit. Such agreement shall be binding on all subsequent owners of land served by a private stormwater management facility and shall provide for access to the facility at reasonable times for regular inspections by the City or its authorized representative to ensure that the facility is maintained in proper working condition to meet design standards.

B. The agreement shall be recorded by the applicant in the land records of the County prior to the issuance of a stormwater management permit.

C. The agreement shall also provide that upon a failure to correct violations requiring maintenance work within 10 days after notice thereof, the City may provide for all necessary work to place the facility in proper working condition. The owner(s) of the facility shall be assessed the costs of the work and any penalties. This may be accomplished by placing a lien on the property, which may be placed on the tax bill and collected as property taxes by the City. (Ord. 2010-20 § 1 (part), 2010/Ord. 2010-15 § 1 (part), 2010/Ord. 2002-6 § 1 (part), 2002: Ord. 2001-29 § 1 (part), 2001: prior code § 10C-23)

16.04.250 Ownership and maintenance of stormwater management facilities.

A. Any stormwater management measure which serves a single lot or facility shall be privately owned and maintained. The owner or any other person or agent in control of such property shall maintain in good condition and promptly repair and restore all ESD practices, grade surfaces, walls, drains, dams and structures, vegetation, erosion and sediment control measures, and other protective devices in perpetuity. Such repairs or restoration and maintenance shall be in accordance with previously approved plans or newly submitted plans.

B. All stormwater management measures relying on vegetated areas or site features shall be privately owned and maintained.

C. All stormwater management facilities serving the general City stormwater management system which are constructed by the City or other public or governmental body or which are conveyed or dedicated to the City shall be publicly owned and maintained.

D. A maintenance schedule shall be developed for the life of any stormwater management facility or system of ESD practices, and shall state the maintenance to be completed, the time period for completion, and who shall perform the maintenance. This maintenance schedule shall be printed on or attached to the approved stormwater management plan. (Ord. 2010-20 § 1 (part), 2010/Ord. 2010-15 § 1 (part), 2010/Ord. 2002-6 § 1 (part), 2002: Ord. 2001-29 § 1 (part), 2001: prior code § 10C-24)

16.04.260 Maintenance inspection.

- A. Preventive maintenance inspections of all ESD treatment practices and structural stormwater management measures shall be made by the City. The inspection schedule shall include an inspection during the first year of operation and at least once every 3 years thereafter.
- B. The City shall maintain a file of all maintenance inspection reports for all ESD treatment practices and structural stormwater management measures.
- C. Inspection reports for ESD treatment practices and structural stormwater management systems shall include the following:
1. The date of inspection;
 2. The name of the inspector;
 3. An assessment of the quality of the stormwater management system related to ESD treatment practice efficiency and the control of runoff to the MEP;
 4. The condition of vegetation or filter media, fences or other safety devices, spillways, valves, or other control structures, embankments, slopes, and safety benches; reservoir or treatment areas; outlet or inlet channels or structures, underground drainage, sediment load and debris accumulation in storage and forebay areas, any nonstructural practices to the extent practicable, or any other item that could affect the proper function of the stormwater management system; and
 5. A description of needed maintenance.
- D. If, after an inspection, the condition of a stormwater management facility presents an immediate danger to the public health or safety because of an unsafe condition or improper construction or poor maintenance, the City shall take such action as may be necessary to protect the public and make the facility safe. The owner(s) of the facility shall be assessed any costs of such action, and the cost shall be a lien on the property, which may be placed on the tax bill and collected as property taxes by the City.
- E. After notification is provided to the owner of any deficiencies discovered from an inspection of a stormwater management system, the owner shall have 30 days or such other time frame mutually agreed to between the City and the owner, to correct the deficiencies. The City shall then conduct a subsequent inspection to ensure completion of the repairs.
- F. If repairs are not properly undertaken and completed, enforcement procedures as set forth in this chapter shall be followed by the City. (Ord. 2010-20 § 1 (part), 2010/Ord. 2010-15 § 1 (part), 2010/Ord. 2002-6 § 1 (part), 2002: Ord. 2001-29 § 1 (part), 2001: prior code § 10C-25)

**WSSC GENERAL CONDITIONS
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NOTES:

1. *These WSSC General Conditions for Construction shall apply only to the WSSC water main relocation and associated work.*
2. *All salvaged items and material becomes the property of the contractor by virtue of the contract provisions. Please refer to the Notice to Contractor special provision for requirements for all other work not pertaining to the water main relocation.*
3. *Regarding named manufactured articles, materials and equipment, the provisions of Section 01630 (Substitution Requirements) included herein shall apply.*

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WSSC GENERAL CONDITIONS FOR CONSTRUCTION

ARTICLE 1 DEFINITIONS

Wherever used in these General Conditions, the following terms shall have the meanings indicated, which shall be applicable to both the singular and plural thereof.

- 1.1 Addenda - Written or graphic instruments issued prior to the Bid Opening, which modify or interpret the Contract Documents.
- 1.2 Amendments - Written or graphic instruments executed after Bid Opening, which modify or interpret the Contract Documents.
- 1.3 Approval - Written approval from the Engineer.
- 1.4 Bid - The offer or proposal of the Bidder submitted in the prescribed manner on the prescribed form setting forth the prices for the Work to be performed as described in the Contract Documents.
- 1.5 Bidder - Any person, firm or corporation submitting a Bid for the Work.
- 1.6 Bonds - Bid Bond, Performance Bonds, Labor and Material Payment Bonds, Maintenance Bonds, and other instruments of security furnished by the Contractor and his surety in accordance with the Contract Documents.
- 1.7 Claim – A demand which seeks the payment of money, an adjustment of time, an adjustment or interpretation of any provision of the Contract Documents, or other relief arising under or relating to this Contract, including without limitation, controversies based upon breach of contract, mistake, misrepresentation, or other cause for contract modification or rescission.
- 1.8 Commission - The Washington Suburban Sanitary Commission (WSSC), the Owner.
- 1.9 Construction Easement - The right, acquired through formally executed permission of the property owner, permitting the Commission to use a clearly defined strip or parcel of land across the property of others temporarily during the period of initial construction of a specified utility or facility.
- 1.10 Contract Documents - The Contract, including WSSC's Procurement Regulations, the Solicitation, Invitation for Bids, Bonds, Notice of Award, Notice to Proceed, Change Orders, Field Orders, Drawings, Certificate of Substantial Completion, Certificate of Final Acceptance, Specifications, these General Conditions, Special Conditions, Standard Details, Amendments, Addenda, Contract Execution Page, Appendix A from the Solicitation, Appendix B from the Solicitation, Appendix C Submissions, and Federal Contract Provisions when required.

WSSC GENERAL CONDITIONS FOR CONSTRUCTION

- 1.11 Contract Price - The total monies payable to the Contractor under the terms and conditions of the Contract Documents.
- 1.12 Contract Time - The specific date or the number of calendar days stated in the Contract Documents for the substantial completion of the Work.
- 1.13 Contractor - The person, firm or corporation with whom the Commission has executed the Contract
- 1.14 Contractor's Submittals - Shall include but not be limited to all shop, layout and working drawings, diagrams, illustrations, catalog data, brochures, calculations, and other data which are prepared by the Contractor, a Subcontractor, manufacturer, supplier or distributor, which illustrate how specific portions of the Work shall be fabricated or installed.
- 1.15 Day - A calendar day of 24 hours lasting from midnight one day to midnight the next day.
- 1.16 Drawings - The part of the Contract Documents which show the characteristics and scope of the Work to be performed and which have been prepared by or for the Commission. The term is used interchangeably with the word "Plans" and includes Standard Details, and Specifications.
- 1.17 Engineer - The authorized agent of the Commission, acting within the scope of their authority or delegated authority and the particular duties assigned.
- 1.18 Environmental Pollution - Presence and action of physical, chemical, biological, and human agents that adversely affect individual and community health and welfare; unfavorably alter or destroy ecosystems of importance to man; or degrade significant aesthetic and recreational values.
- 1.19 Federal Contract Provisions – Are federal contract provisions which are required to be included in the Contract by the federal government.
- 1.20 Field Order - A written order to the Contractor issued during construction by the Engineer for interpretations, clarifications, directives and other instructions as to the intent of the Contract Documents.
- 1.21 Final Completion - That date as certified by the Engineer when all Work contained in the Contract Documents has been completed, including outstanding items of Work that were not required by the Engineer for the Certificate of Substantial Completion.
- 1.22 General Conditions - The Articles included in this document.

WSSC GENERAL CONDITIONS FOR CONSTRUCTION

- 1.23 Inspector - The authorized representative of the Commission assigned to make detailed inspection of any or all portions of the Work or materials.
- 1.24 Invitation for Bids - Has the same definition as WSSC Procurement Regulation § 1-201.41.
- 1.25 Latent Defect – A hidden defect in the Work that reasonably careful inspection could not reveal prior to the expiration of the maintenance bond.
- 1.26 Manufacturer - Any person or organization who changes the form of a commodity or creates a new commodity and supplies it for the Work at any tier, but who does not perform labor at the site.
- 1.27 Notice to Proceed - Written communication issued by the Commission to the Contractor authorizing him to proceed with the Work and establishing the dates of commencement and substantial completion of the Work.
- 1.28 Or Equal - A material, article or method is specified or described by using the name of a proprietary product or name of a particular manufacturer or vendor in the Contract Documents and gives the Contractor an opportunity to provide an equal substitution. Materials, articles or methods deemed equal by the Contractor which he proposes to incorporate into the Work shall be submitted with his bid in accordance with requirements set forth in the Contract Documents.
- 1.29 Pollutant - Any chemical or physical substance that when introduced into a natural aquatic, atmospheric or soil system will cause adverse impact on that system. Includes grease, oil, bitumens, sewage, salts, adhesives, fuels and, when considering aquatic or atmospheric systems, soil.
- 1.30 Project - The undertaking to be performed as provided in the Contract Documents.
- 1.31 Proper Invoice – A payment estimate which has been approved as correct by the Engineer with respect to quantity, price, delivery, lawfully deducted sums, and supporting documentation which may be required by the Contract Documents.
- 1.32 Provide - Means furnish and install, complete in place.
- 1.33 Public Utilities Easement (PUE) - An easement established, by document and dedication by recordation of a plat of subdivision, to permit the construction, maintenance, and operation of the utilities for gas, electric, telephone and cable companies. Commission facilities are not included.
- 1.34 Right of Way - The right, acquired by a legally executed and recorded document, permitting the Commission to use a clearly defined strip or parcel across the land of others for the installation, construction, reconstruction, maintenance, repair, operation, and inspection, with the right of ingress and egress for a specified utility or facility, in perpetuity.

WSSC GENERAL CONDITIONS FOR CONSTRUCTION

- 1.35 Rock - Any indurated material that requires drilling, wedging, blasting, or other methods of brute force to excavate.
- 1.36 Sensitive Documents: Documents and information that could reasonably be used to aid in or plan for contaminating or damaging the Commission system or Commission customers. Examples of such documents include, but are not limited to:
1. Plans/blueprints, as-built drawings, or contract documents of Commission facilities.
 2. Plans/blueprints, as-built drawings, contract documents, or 200-foot sheets of the water distribution system or the wastewater collection system.

Where there is uncertainty as to whether a document or information is “sensitive,” the Commission shall have sole discretion to make such a determination.

- 1.37 Solicitation – Has the same definition as WSSC Procurement Regulation § 1-201.65.
- 1.38 Special Conditions – A document which supplements, modifies, changes, deletes, removes, adds, or strikes any language to the General Conditions.
- 1.39 Specifications – Sections containing Scope of Work and technical requirements which are unique to a particular contract.
- 1.40 Standard Details - Commission details showing standard elements of construction, methods, and materials for use on Commission Contracts.
- 1.41 Structure - Structural entity including but not limited to building, manhole, duct bank, tank, foundation, road, pavement, pipe conductor, substation, pumping station.
- 1.42 Subcontractor - An individual, firm or corporation having a direct contract with the Contractor or with any other Subcontractor at any tier for the performance of a part of the Work at the site. Subcontractor shall not mean supplier.
- 1.43 Substantial Completion - That date as certified by the Engineer when the construction of the Project or a specified part thereof is sufficiently completed in accordance with the Contract Documents so that the Project or specified part can be utilized for the purposes for which it is intended.
- 1.44 Supplier - Any person or organization who supplies materials or equipment for the Work at any tier, including that fabricated to a special design, but who does not perform labor at the site.

WSSC GENERAL CONDITIONS FOR CONSTRUCTION

- 1.45 Work - Any and all obligations, duties, and responsibilities necessary to the successful completion of the Project assigned to or undertaken by the Contractor under the Contract Documents, labor, materials, equipment, and other incidentals and the furnishing thereof.
- 1.46 Written Notice - Any notice to any party of the Contract relative to any part of the Contract in writing and considered delivered and the service thereof completed when posted by mail to the said party at his last given address, or delivered in person to said party or his authorized representative of the Project.
- 1.47 WSSC's Procurement Regulations – The regulations adopted by the Commission, which became effective August 1, 2012, and any subsequent amendments.

ARTICLE 2 FIELD ORDERS

- 2.1 At the request of the Contractor, the Engineer may issue Field Orders that contain interpretations, clarifications, and other instructions as to the intent of the Contract Documents. In addition, the Engineer may at any time issue additional instruction, explain details of the Work and issue detail drawings in the form of Field Orders, as necessary to perform the Work required by the Contract Documents. Upon receipt of a Field Order, the Contractor shall proceed with the performance of the Work in accordance with all instructions contained therein.
- 2.2 There shall be no additional Contract Cost or Time to the Commission resulting from a Field Order unless the Contractor believes that the Field Order entitles him to a change in the Contract Price or Time or both, and so notifies the Engineer, in writing, within 7 days after receipt of the Field Order. Request for a Change Order arising out of a Field Order will not be considered without the attachment thereto of a copy of the referenced Field Order. Thereafter the Contractor shall document his position in accordance with Article 32.1 for change in the Contract Price and Time within 30 days. Failure to notify the Engineer within 7 days after receipt of the Field Order or to document the Contractor's position within prescribed time shall constitute an abandonment of all entitlement.
- 2.3 The Contractor shall proceed with the performance of the Work in accordance with the Field Order. Failure to proceed shall constitute a breach of Contract and shall be cause for termination of the Contract.

ARTICLE 3 SCHEDULES, REPORTS AND RECORDS

- 3.1 The Contractor shall submit to the Engineer such schedule of quantities and costs, construction progress schedules, payrolls, breakdown of lump sum items, reports, estimates, records, and

WSSC GENERAL CONDITIONS FOR CONSTRUCTION

other data where applicable, as are required by the Contract Documents.

ARTICLE 4 CONTRACT DOCUMENTS

4.1 The intent of the Contract Documents is that the Contractor shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the Work in accordance with the Contract Documents and all incidental Work necessary to complete the Project in an acceptable manner, ready for use, occupancy or operation by the Commission.

4.2 In resolving conflicts, errors, and discrepancies within the Contract Documents, the Documents shall be given precedence in the following order:

Federal Contract Provisions (only if identified and incorporated in the Contract Documents)

WSSC Procurement Regulations

Change Orders

Field Orders

Amendments

Addenda

Special Conditions

General Conditions

Contract Execution Page

Notice to Proceed

Notice of Award

Special Provisions

Specifications

Drawings

Standard Details

Appendix B to the Solicitation (Insurance & Bonding Requirements)

Appendix A to the Solicitation (MBE and/or SLBE requirements)

Appendix C to the Solicitation (Commission Forms completed by Contractor)

Division 1, General Requirements governs the execution of all Sections of the Specifications from Division 2 through Division 16. Anything mentioned in the Specifications and not shown on the Drawings or shown on the Drawings and not mentioned in the Specifications shall be of like effect as if shown or mentioned in both. Figure dimensions on Drawings shall govern over scale dimensions and detailed Drawings shall govern over general Drawings.

4.3 Any discrepancies found between the Drawings and Specifications or any inconsistencies or ambiguities in the Drawings or Specifications shall be immediately reported to the Engineer, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. Work done by the Contractor after his discovery of such discrepancies, inconsistencies or ambiguities prior to corrections directed by the Engineer shall be done at the Contractor's risk.

**WSSC GENERAL CONDITIONS
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ARTICLE 5 CONTRACTOR'S SUBMITTALS

- 5.1 The Contractor shall provide all submittals as may be necessary for the prosecution of the Work as required by the Contract Documents.

ARTICLE 6 MATERIALS, SERVICES AND FACILITIES

- 6.1 It is understood that except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the Work within the specified time.
- 6.2 Manufactured articles, materials, and equipment shall be new, and shall be stored, applied, installed, connected, erected, used, cleaned, and conditioned as directed by the manufacturer, and as approved by the Engineer. Manufactured articles, materials, and equipment shall meet all specified requirements, and their manufacturers and suppliers shall be approved by the Engineer before delivery to the Contract site. When manufactured articles, materials, and equipment, and their manufacturers and suppliers are named in the Specifications, only those named will be considered and accepted. When the named manufactured articles, materials and equipment are followed by the phrase "or equal", "*or equivalent*", "*or approved equal*", *etc.* the provisions of Section 01630 *included herein* shall apply.
- 6.3 Deliveries of material, equipment, and supplies to the Contractor or Subcontractors at the contract site shall be specifically addressed to the Contractor or Subcontractor and not to the Commission. Commission personnel will not accept deliveries for the Contractor or Subcontractors.
- 6.4 Materials and equipment shall be stored to ensure the preservation of their quality and fitness for the Work. Stored materials and equipment to be incorporated in the Work shall be located and stored to facilitate prompt and safe inspection. Temporary fence shall be provided, when required. All written instructions and recommendations of the manufacturer and requirements of the Engineer for lubrication, protection, and maintenance of equipment shall be performed during storage, installation, and until it is accepted as substantially complete by the Engineer. Materials and equipment damaged including those damaged internally from moisture, improper storage or otherwise shall be replaced or repaired as directed by the Engineer at no additional cost to the Commission.
- 6.5 Materials, supplies, and equipment shall be in accordance with samples, drawings, and catalog cuts submitted by the Contractor and approved by the Engineer and shall not be delivered to the Work site prior to the Engineer's approval of samples and Contractor's submittals.
- 6.6 Materials, supplies or equipment to be incorporated into the Work shall be new and shall not be purchased by the Contractor or the Subcontractor subject to a chattel mortgage or under a

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conditional sale contract or other agreement by which an interest is retained by the seller.

- 6.7 The Contractor shall submit to the Engineer an invoice for each movable item furnished, including tools, office furniture and equipment and laboratory equipment.
- 6.8 All Work included in this Contract shall be performed in a skillful and workmanlike manner. The Contractor shall employ no plant, equipment, materials, methods or persons to which the Engineer objects, and shall remove no plant, equipment or other facilities from the site of the Work without permission of the Engineer.

ARTICLE 7 INSPECTION AND TESTING

- 7.1 All materials and equipment used in the construction of the Project shall be subject to inspection and testing as required and defined in the Contract Documents.
- 7.2 If the Contract Documents, laws, ordinances, rules, regulations or order of any public authority having jurisdiction require any Work to specifically be inspected, tested or approved by someone other than the Contractor, the Contractor shall give the Engineer 10 Day notice of readiness. The Contractor shall then furnish the Engineer the required certificates of inspection, testing or approval.
- 7.3 Inspection, tests or approvals by the Engineer or others are for the sole benefit of the Commission and will not relieve the Contractor from his obligations to perform the Work in accordance with the requirements of the Contract Documents.
- 7.4 The Engineer and his representatives shall have access to the Work at all times. In addition, authorized representatives of the Commission or agents of any participating Federal, State or local agency shall be permitted from time to time, as in their sole discretion they may deem necessary, to inspect all Work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. All such records shall remain available and accessible during performance of the Contract and until 3 years from the date of Final Payment, or, in case of dispute, for a period of 3 years after resolution of said dispute, whichever is later. The Contractor shall provide proper facilities for such access, observation of the Work, and any inspection or testing thereof.
- 7.5 If any Work is covered without the approval of the Engineer or contrary to requirements elsewhere in the Contract Documents, it shall, if requested by the Engineer, be uncovered for his observation and recovered at the Contractor's expense.
- 7.6 If the Engineer considers it necessary or advisable that approved covered Work be inspected or tested, the Contractor, at the Engineer's request, shall uncover, expose or otherwise make that portion of the Work available for observation, inspection or testing as the Engineer may require by furnishing all necessary labor, materials, tools, and equipment. If it is found that

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such Work is defective, the Contractor shall bear all the expenses of such uncovering, exposure, observation, inspection, and testing and of satisfactory reconstruction. If, however, such Work is not found to be defective, the Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time or both, directly attributable to such uncovering, exposure, observation, inspection, testing, and reconstruction and an appropriate Change Order will be issued. Any additional compensation or extension of time shall be determined as provided in Article 14.

ARTICLE 8 SUBSTITUTIONS

8.1 Substitutions for named and specified materials, articles, and methods followed by the phrase "or equal" will only be allowed within the parameters set forth elsewhere in the Contract Documents.

ARTICLE 9 PATENTS

9.1 The Contractor shall pay all applicable royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and hold the Commission harmless from loss on account thereof, except that the Commission will be responsible for any such loss when a particular process, design or the product of a particular manufacturer or manufacturers as specified is an infringement of a patent, provided, however, that the Contractor shall be responsible for such loss unless he gives such information to the Engineer within 7 days of its receipt.

ARTICLE 10 SURVEYS, PERMITS, REGULATIONS

10.1 Unless otherwise specified, the Engineer will furnish all boundary surveys and establish all baselines for locating the principal component parts of the Work together with suitable number of bench marks adjacent to the Work as shown in the Contract Documents.

10.2 Unless otherwise specified, permits, licenses, and easements for permanent structures and permanent modifications to existing facilities will be secured and paid for by the Commission.

10.2.1 For electrical Work, permits for permanent structures, and permanent modifications to existing facilities are not required. Permits for electrical Work of a temporary nature necessary for the prosecution of the Work shall be secured and paid for by the Contractor.

10.2.2 Plumbing or gasfitting of a temporary or permanent nature on a structure or modifications to a structure shall be performed in accordance with The Plumbing and Gasfitting Regulations of the Washington Suburban Sanitary District. The plumbing permit shall be secured by the Contractor, and will be issued by the Commission for no fee.

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- 10.3 The Contractor shall give all notices and comply with all permits, laws, ordinances, rules, and regulations bearing on the conduct of the Work as shown and specified. If there is a conflict between requirements specified in the Contract Documents and the permits, laws, ordinances, rules and regulations, the requirements of the permits, laws, ordinances, rules, and regulations shall govern.
- 10.4 Should any permit, license or certificate, expire, be revoked, terminated or suspended as a result of any action on the part of the Contractor, he shall not be entitled to any additional compensation, neither will he be entitled to an extension of the Contract Time.
- 10.5 Permits obtained by the Commission for this Project are listed on the Drawings and specific requirements contained in these permits that are not covered elsewhere in the Standard Specifications and on the Drawings but are the responsibility of the Contractor will be included in the Contract Documents. A copy of the permits will be available for inspection from the Engineer.

ARTICLE 11 PROTECTION OF WORK, PROPERTY AND PERSONS

- 11.1 The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. He shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to all employees on the Work and other persons who may be affected thereby, all the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation or replacement in the course of construction.
- 11.2 In case of suspension of Work for any cause, the Contractor shall be responsible for the Project and shall take such precautions as may be necessary to prevent damage to the Work, all material or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, provide for proper drainage, provide temporary heat, light, and other required utilities and services, and shall erect any necessary temporary structures, signs, or other facilities at his expense. In addition, the Contractor shall properly and continuously maintain in acceptable growing condition all living material in newly established plantings, seedings, and sodding furnished under this Contract, and shall take adequate precautions to protect new and existing growth against injury.
- 11.3 The Contractor shall comply with all applicable laws, ordinances, rules, regulations, and orders of any public body having jurisdiction. He shall erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection. He shall notify owners of adjacent utilities when prosecution of the Work may affect them.

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- 11.4 In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, shall act, at his discretion, to prevent threatened damage, injury or loss.
- 11.5 When the Commission has been notified of emergency situations requiring in the Engineer's opinion, immediate attention and rectification, the Engineer will so notify the Contractor. Should the Contractor not commence Work to rectify the situation within 1 hour after notification, the Commission may perform the required Work and deduct the costs thereof from monies owed the Contractor.

ARTICLE 12 SUPERVISION BY CONTRACTOR

- 12.1 The Contractor shall supervise and direct the Work. He shall be solely responsible for the means, methods, techniques, sequences, safety, and procedures of construction. The Contractor shall employ and maintain on the Work a qualified supervisor or superintendent who shall have been designated in writing by the Contractor as the Contractor's representative at the site. The supervisor shall be able to communicate in fluent English. The supervisor shall have full authority to act on behalf of the Contractor and all communications given to the supervisor shall be as binding as if given to the Contractor. The supervisor shall be present on the site at all times when the Work is in progress as required to perform adequate supervision and coordination of the Work as determined by the Engineer. The supervisor shall have a thorough understanding of the Contract Documents and shall have previous experience in the type of Work being performed.

ARTICLE 13 CHANGE ORDERS

- 13.1 Without invalidating the Contract, the Engineer, if acting within the scope of his authority or delegated authority, may at any time or from time to time by written order and without notice to the sureties, order additions, deletions or revisions in the Work when ordered by the Engineer. These will be authorized by Change Orders. Upon receipt of the Change Order, the Contractor shall promptly and diligently proceed with the Work involved. If any Change Order causes an increase or decrease in the Contract Price, or an extension or shortening of the Contract Time, an equitable adjustment will be made as provided in Article 14, subject to the conditions hereinafter stated.
- 13.2 The Contractor shall proceed with the performance of any changes in the Work so ordered by the Engineer. Failure to proceed shall constitute a breach of Contract and shall be cause for termination of the Contract. Should the Contractor believe that a Change Order entitles him to a change in Contract Price or Time or both, he shall give the Engineer Written Notice within 7 days after receipt of the Change Order. Thereafter the Contractor shall document his position in accordance with Article 32.1 for a change in the Contract Price or Time or both within 30 days. Failure to notify the Engineer within 7 days after receipt of the Change Order or to document the Contractor's position within prescribed time shall constitute an abandonment of any and all entitlement to a change in Contract Price and/or Time.

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ARTICLE 14 CHANGES IN CONTRACT PRICE AND TIME

14.1 The Contract Price may be changed only by a Change Order. The value of Work covered by a Change Order for increase or decrease in the Contract Price shall be determined in the manner provided herein, in the following order of precedence.

14.1.1 Mutually agreed upon unit prices.

14.1.2 An agreed lump sum, if supported by written cost documentation acceptable to the Engineer. If an agreed lump sum is not reached prior to initiation of the Change Order Work, the value of Work covered by the Change Order shall be determined in accordance with 14.1.3 below, unless otherwise determined by the Engineer.

14.1.3 On the basis of the Cost of the Work determined as provided below.

14.1.3.1 The Cost of the Work shall be determined as follows:

- .1 For all labor and for foremen in direct charge of the specific operations, the Contractor shall receive the actual rate of wage in effect at the time the Work is performed for each and every hour that said worker and foreman are actually engaged in such Work. Said agreed rate shall be no higher than that regularly paid the employee. A foreman shall not be used where there are fewer than 2 workers employed except with the written consent of the Engineer.

The Contractor shall receive the actual costs paid to or on behalf of workers by reason of fringe benefits including but not limited to social security contributions, unemployment, excise and payroll taxes, workers' compensation, health and retirement benefits, sick leave, vacation, and holiday pay.

Expenses of working after hours, on holidays or on Saturdays and Sundays shall be included to the extent authorized by the Engineer.

Subsistence and travel allowance where required by collective bargaining agreements shall be included.

- .2 For cost of materials accepted by the Engineer and used as an integral part of the finished Work, the Contractor shall receive the actual cost of such materials delivered to the Work, including transportation charges paid by him, exclusive of equipment rentals as hereinafter set forth.

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For other materials used in the construction which are not an integral part of the finished Work, such as but not limited to sheeting, false Work, and form lumber, the Contractor shall be reimbursed in the amount agreed upon by the Engineer before such Work is begun. The salvage value of such material will be taken into consideration in determining the amount of reimbursement.

- .3 Cost of construction equipment shall be based on the actual time the equipment is required to perform the Work and shall not exceed 8 hours per day unless equipment is in operation for a longer time. Moving time, loading, unloading, and hauling will not be paid for if the equipment is used at the site for other Work.

For the use of equipment moved in on the Work and used exclusively for the Work covered by the Change Order, the Contractor will be paid the rates herein specified including moving time, loading, unloading, and hauling. The time period shall begin at the time the equipment is unloaded at the site of the Work, shall include each day or fraction thereof that the equipment is at the site of the Work, excluding Saturdays, Sundays, and other legal holidays unless the Work is performed on such days, and shall terminate at the end of the day on which the Engineer directs the Contractor to discontinue the use of such equipment.

The rates of payment for equipment used, regardless if owned or rented, including fuel and lubricants but excluding operators, shall be established using cost documentation acceptable to the Engineer.

No payment will be made for the small tools defined as individual pieces of equipment or tools having a new value of \$1,000 or less.

When the Commission is obligated to pay for idle equipment, the allowance will be 50 percent of the rate determined herein.

- .4 For cost of premiums for additional bonds and insurance required because of changes in the Work, the Contractor shall receive the actual cost. The Contractor shall furnish satisfactory evidence of the rate or rates paid for such bond and insurance.
- .5 The Cost of the Work shall not include any of the following.

Payroll costs and other compensation of the Contractor's Officers,

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executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, superintendents, foremen not engaged in the Work, timekeepers, clerks, and other personnel employed by the Contractor whether at the site or in the Contractor's principal or branch office, all of which are to be considered overhead costs covered by the Contractor's Fee.

Costs due to the negligence of the Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Article 14.1.3.1.1 thru 14.1.3.1.4.

- .6 Cost of Subcontractors used on the Work shall be computed in the manner set forth hereinabove in Article 14.1.3.1.1 thru 14.1.3.1.5. Subcontractor's Fee shall be as provided in Article 14.1.3.2.1 and 14.1.3.2.3.
- .7 No payment will be made until the Contractor furnishes the Engineer itemized statements of the Cost of the Work detailed as to the following:

Name, classification, date, daily hours, total hours, rate, and extension for each worker, foreman.

Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment.

Quantities of materials, prices including transportation cost and extensions.

Cost of bonds and insurance premiums.

Requests for payment shall be accompanied by original receipted invoices for materials used and transportation charges. If, however, the materials used in the Work are not specifically purchased for such Work but are taken from the Contractor's stock, then in lieu of the original invoices the statements shall contain or be accompanied by an affidavit of the Contractor which shall certify that such materials were

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taken from his stock, that the quantity claimed was actually used and that the price and transportation of the material as claimed represent actual cost.

- .8 Labor, material, and equipment usage reports shall be furnished daily to the Engineer, signed by both parties.
- 14.1.3.2 The Contractor's Fee allowed to the Contract for overhead and profit shall be determined as follows:
- .1 For costs incurred under Article 14.1.3.1.1 and 14.1.3.1.2, the Contractor's Fee shall be 15 percent.
 - .2 For cost incurred under Article 14.1.3.1.6, the Contractor's Fee shall be a single allowance of 5 percent regardless of the tier of the Subcontractor.
 - .3 No fee shall be payable on the basis of costs itemized under Article 14.1.3.1.3 and 14.1.3.1.4.
 - .4 The Contractor's Fee shall be calculated in the same manner for both additive and deductive changes in the contract.
- 14.1.3.3 If directed, the Contractor shall submit to the Engineer 3 qualified bids for extra or changed Work and materials, if similar Work is not being performed at the Project site.
- 14.1.4 The Contract Time may be changed only by a Change Order. Extensions of time, when granted, will be based upon the effect of delays to the Work as a whole. Extensions of time will not be granted for noncontrolling delays to portions of the Work unless it can be shown that such delays did in fact delay the progress of the Work as a whole. Request for time extension shall be accompanied by a revised construction schedule or portion thereof demonstrating the delay to the progress of the Work as a whole. Extensions of time will not be granted until the Engineer is satisfied that the time extension is appropriate and justified. Said extension of time shall be the Contractor's sole and exclusive remedy.
- 14.1.5 No Damages For Delay: The Contractor shall not be entitled to any costs for delay, disruption, suspension, or extension of time, or resulting labor productivity losses, constructive acceleration, ripple effects, cumulative impacts, overheads, profits, indirect costs, or other alleged damages of any nature or kind, even if not in the contemplation of the parties at the time the Contract Documents were executed, the Contractor acknowledges that the Contract Price is full consideration for all such

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damages, costs, or losses.

ARTICLE 15 TIME FOR SUBSTANTIAL COMPLETION AND LIQUIDATED DAMAGES

- 15.1 The date of beginning and the time for substantial completion of the Work are essential conditions of the Contract Documents and the Work embraced shall be commenced on the date specified in the Notice to Proceed. Time is of the essence for all periods of time specified in the Contract Documents.
- 15.2 The Contractor shall proceed with the Work at such rate of progress to ensure substantial completion within the Contract Time. It is expressly understood and agreed by and between the Contractor and Commission that the Contract Time for the substantial completion of the Work described herein is a reasonable time, taking into consideration the average climate and economic conditions and other factors prevailing in the locality of the Work.
- 15.3 If the Contractor shall fail to substantially complete the Work within the Contract Time, or extension of time granted by the Engineer, then the Contractor shall pay to the Commission the amount for liquidated damages as specified in the Contract Documents for each calendar day that the Contractor shall be in default after the time or date stipulated thereon; and the Commission may deduct the same from monies due from current progress payments or to become due to the Contractor otherwise.
- 15.3.1 Should the Contractor abandon performance of the Work, the Commission shall have the right to complete the Work with its own or other forces, and the liquidated damages provisions set forth herein as well as other provisions of the Contract shall remain in effect; and such liquidated damages provisions shall not be construed to be a substitute for damages caused by increased cost of the Work but shall be compensatory only for delay in substantial completion of the Contract.
- 15.4 This Article does not exclude the recovery of damages by either party under other provisions of the Contract Documents.
- 15.5 The Contractor will not be charged with liquidated damages or any excess cost when the delay in substantial completion of the Work as a whole is a controlling delay due to the following unforeseeable causes, and the Contractor has given Written Notice of such delay including reasons therefore to the Engineer within 7 days of the occurrence. Thereafter, the Contractor shall document his position in accordance with Article 32.1 for unforeseeable cause in delay within 30 days. Failure to notify the Engineer within 7 days or to document the Contractor's position within prescribed time shall constitute abandonment to a change in Contract Time pursuant to Article 14.1.4.
- 15.5.1 To unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include acts of God or of the public enemy, acts

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of the Commission, acts of another Contractor in the performance of a contract with the Commission, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather, or delays of Subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and such Subcontractors or suppliers.

15.5.2 An extension of Contract Time pursuant to Article 14.1.4 shall be the Contractor's sole and exclusive remedy if he can establish an unforeseeable cause beyond the control and without the fault or negligence of the Contractor occurred.

15.5.3 No Damages For Delay: The Contractor shall not be entitled to any costs for delay, disruption, suspension, or extension of time, or resulting labor productivity losses, constructive acceleration, ripple effects, cumulative impacts, overheads, profits, indirect costs, or other alleged damages of any nature or kind, relating to or arising from the unforeseeable cause. The Contractor acknowledges that the Contract Price is full consideration for all such damages, costs, or losses, even though such damages, costs, and losses may not have been contemplated by the parties at the time the its Bid was submitted or the Contract was executed.

ARTICLE 16 CORRECTION OF WORK

16.1 The Contractor shall promptly remove from the premises all Work rejected by the Engineer for failure to comply with the Contract Documents whether incorporated in the construction or not, and the Contractor shall promptly replace and re-execute the Work in accordance with the Contract Documents and without expense to the Commission and shall bear the expense of making good all Work of other Contractors destroyed or damaged by such removal or replacement.

16.2 All removal and replacement Work shall be done at the Contractor's expense. If the Contractor does not take action to remove such rejected Work within 10 days after receipt of Written Notice, the Engineer may remove such Work, store the materials, and replace the rejected Work at the expense of the Contractor.

16.3 Any Work which may be done or materials ordered by the Contractor prior to receipt of the Notice to Proceed, incorporation of previously rejected Work, Work done contrary to or regardless of the instructions of the Engineer, Work done beyond the limits shown on the Plans, except as herein specified, or any extra Work done without written authority from the Engineer, will be considered as unauthorized and may not be paid for. Work so done may be ordered removed or replaced at the Contractor's expense.

ARTICLE 17 CHANGED CONDITIONS

17.1 The Contractor shall within 7 days, and before such conditions are disturbed, except in the

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event of an emergency, notify the Engineer by Written Notice of:

- 17.1.1 Subsurface or latent physical conditions at the site differing materially from those indicated in the Contract Documents; or
 - 17.1.2 Unknown physical conditions at the site of an unusual nature, differing materially from those ordinarily encountered, and generally recognized as inherent in Work of the character provided for in the Contract Documents.
 - 17.1.3 The provisions of 17.1.1 and 17.1.2 shall not apply to rock and/or water conditions that may be encountered during the construction of this Project. The provisions set forth in General Conditions, Article 18, "Physical Data," or the appropriate sections of the Contract Documents, including Drawings and/or Specifications shall be applicable.
- 17.2 The Contractor shall document his position in accordance with Article 32.1 for changed conditions within 30 days of Written Notice. Failure to notify the Engineer within 7 days or to document the Contractor's position within prescribed time shall constitute an abandonment of all entitlement. The Engineer will promptly investigate the conditions, and if he finds that such conditions do materially so differ and cause an increase or decrease in the cost of, or in the time required for performance of the Work, an equitable adjustment will be made and the Contract Documents will be modified by a Change Order as provided in Article 14.

ARTICLE 18 PHYSICAL DATA

- 18.1 Each Bidder shall determine to their own satisfaction the actual subsurface conditions including the character and type of soil and other material he will encounter in the Work to be done under the Contract.

Information and data referred to herein is available for the Contractor's information and for whatever use the Contractor may find therefore. The information is made available in order that the Contractor may have the same information as is available to the Commission for design purposes. The subsurface and other physical data such as those mentioned herein and contained in the Contract Documents or otherwise made available to the Contractor by the Commission are not intended as representations or warranties, nor guaranteed to be more than a general indication of the material to be found at the individual boring locations. It is expressly understood that the Commission will not be responsible for the completeness thereof, nor for any deductions, interpretations or conclusions drawn therefrom, including specifically the physical conditions between boring locations. The provisions of Article 17.1.1 and 17.1.2 shall not apply to rock and/or water conditions that may be encountered during construction of this Project.

- 18.1.1 The Commission has conducted subsurface test borings in the area where the Work will

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be performed. Resultant data obtained from these borings and a geotechnical report are in the Contract Documents. It shall be understood that this information was obtained during the preparation of the Contract Documents and is not guaranteed to be more than a general indication of the material likely to be found adjacent to the boring holes, and that the Commission or its consultant do not warrant that material encountered beneath the ground surface is homogeneous or uniform. Bidders are advised to independently evaluate or to have the data and interpretations independently evaluated by someone qualified in this technical field before using for bidding purposes because the bidder is solely responsible for this evaluation. Conclusions and recommendations included in the geotechnical report are not intended to restrict the Contractor from selecting the method of dewatering, excavating, or sheeting and shoring he will utilize. The report is included herein as information available to the Contractor for evaluation when selecting his method of dewatering, excavating, sheeting and shoring because the Contractor is solely responsible for the method of dewatering, excavating, and sheeting and shoring he elects to use unless otherwise indicated in the Contract Documents.

ARTICLE 19 SUSPENSION OF WORK AND TERMINATION

- 19.1 The Engineer may order the Contractor in writing to suspend or interrupt all or any part of the Work for such period of time as it may determine to be appropriate for the Commission's convenience.
- 19.1.1 If the performance of all or any part of the Work is, for an unreasonable period of time, suspended or interrupted by a written order of the Engineer in administration of this Contract, an equitable adjustment will be made in accordance with Article 14, and the Contract modified by Change Order accordingly. However, no adjustment shall be made under this clause for any suspension or interruption to the extent: (1) that performance would have been so suspended or interrupted by any other cause, including the fault or negligence of the Contractor, or (2) for which an equitable adjustment is provided for or excluded under any other provision of these Contract Documents.
- 19.2 The Contract may be terminated for default in accordance with WSSC Procurement Regulation § 6-105.03. A material breach of the Contract shall include but not be limited to the following events: the Contractor is adjudged bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the Contractor or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he repeatedly fails to make prompt payments to Subcontractors for labor, materials or equipment, or if he refuses or fails to prosecute the Work or any separable part thereof with such diligence as will ensure its substantial completion within the Contract Time, or if he fails to complete said Work within said time, or if he disregards laws, ordinances, rules, regulations, directions or

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orders of any public body having jurisdiction over the Work, or if he disregards the authority of the Engineer, or if he otherwise violates any provision of the Contract Documents.

- 19.3 The Contract may be terminated for convenience in accordance with WSSC Procurement Regulation § 6-105.04.
- 19.4 The Contract may be terminated by mutual consent in accordance with WSSC Procurement Regulation § 6-105.05.
- 19.5 Where the Contractor's services have been terminated by the Commission, said termination shall not affect any right of the Commission against the Contractor then existing or which may thereafter accrue. Any retainage or payment of monies by the Commission due the Contractor will not release the Contractor from compliance with the Contract Documents.
- 19.6 If through no act or fault of the Contractor, the Work is suspended for a period of more than 90 days by a written order of the Engineer or under an order of court or other public authority, then the Contractor may, after 10 days from delivery of Written Notice to the Engineer, terminate the Contract and recover from the Commission payment for all Work performed and accepted and all allowable expenses incurred up until the time of the delivery of Written Notice to the Engineer.

ARTICLE 20 USE OF THE PREMISES

- 20.1 The Commission will have the right to enter the premises for the purpose of doing Work not covered by the Contract Documents. This provision shall not be construed as relieving the Contractor of the sole responsibility for the care and protection of the Work or the restoration of any damaged Work, except such as may be caused by agents or employees of the Commission.
- 20.2 Unless otherwise specified, with the concurrence of the Contractor the Commission may use any completed or substantially completed portion of the Work. Such use shall not constitute an acceptance of such portions of the Work.

ARTICLE 21 SUBSTANTIAL COMPLETION

- 21.1 The Contractor shall not be entitled to a certificate of Substantial Completion for a piece of equipment, a portion of the Work, or the Work unless and/or until the Engineer in his sole discretion determines a piece of equipment, a portion of the Work, or the Work is ready for service. That piece of equipment, portion of the Work, or the Work shall be inspected and tested in accordance with the Contract Documents and when accepted, a Certificate of Substantial Completion will be issued. Upon issuance of the Certificate of Substantial Completion by the Engineer, it shall be placed into beneficial operation unless otherwise directed by the Engineer. The date of Substantial Completion shall be the effective

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commencement date for any guarantee applicable to the specific equipment, portion of Work, or the Work. The Contractor shall be advised of operation and maintenance responsibility for specific equipment, portion of the Work, or the Work commencing with the date of Substantial Completion.

- 21.2 All written conditions of the Certificate of Substantial Completion are binding to the Contractor. Failure to comply with such conditions within the time stated therein will be cause for rescission of the Certificate of Substantial Completion and rescission of commencement of the guarantee, or performance of the remaining Work by the Commission or others at the Contractor's expense 10 days after receipt of Written Notice by the Contractor. Substantial Completion and commencement of the guarantee may be reinstated upon reissuance of the Certificate of Substantial Completion by the Engineer as set forth above.
- 21.3 A Certificate of Substantial Completion does not relieve the Contractor of his responsibility under any of the provisions of these Contract Documents unless explicitly noted herein and/or in the written Certificate of Substantial Completion.
- 21.4 Written consent of Surety and endorsement from the insurance carrier or carriers permitting prior occupancy or use of any completed or partially completed portions of the Work by the Commission shall be secured and submitted to the Engineer prior to issuance of Certificate of Substantial Completion.
- 21.5 Until approval of the final estimate for the entire Contract by the Commission, it shall be the Contractor's responsibility to protect and insure all portions of the Work in beneficial operation against damages resulting from vandalism, theft, floods, fires, and malfunction due to other equipment or Work not yet placed into beneficial operation, unless such damage is the direct result of negligence on the part of Commission personnel or fair wear and tear. Should repairs be required due to any reasons other than the exceptions stated above, they shall be performed at no expense to the Commission, and the guarantee commencement date shall be modified to coincide with the date of re-acceptance in accordance with the provisions set forth herein. Should the Contractor be unable to perform repairs, the Engineer may direct that the necessary repairs be performed by others, and the cost therefor be deducted from monies owed the Contractor. In such a case, the guarantee commencement date shall be modified to coincide with the date of completion of repairs by others.

ARTICLE 22 PAYMENTS TO THE CONTRACTOR

- 22.1 At least 10 days before each progress payment falls due, but not more often than once a month, the Contractor shall submit to the Engineer a partial payment estimate form provided by the Commission, filled out in ink or typewritten and signed by the Contractor, covering Work performed during the period of the partial payment estimate and supported by such data as the Engineer may reasonably require, less sums as may be lawfully deducted by the Commission. If payment is requested on the basis of materials and equipment not incorporated in the Work,

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the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the Engineer, as will protect the Commission's interests therein, including applicable insurance. The Engineer will, within 10 days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate for processing, or return the partial payment estimate to the Contractor indicating in writing his reasons for not approving payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate. The Commission will, within 10 days of an Engineer approved partial payment estimate, pay the Contractor a progress payment on the basis of the approved partial payment estimate.

- 22.2 If payment is requested on the basis of materials and equipment not incorporated in the Work, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the Engineer, as will protect the Commission's interests therein, including applicable insurance. The Engineer will, within 10 days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate for processing, or return the partial payment estimate to the Contractor indicating in writing his reasons for not approving payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate. Payments to the Contractor pursuant to this Contract shall be made no later than 30 days after the Commission's receipt of a Proper Invoice from the Contractor.
- 22.3 In accordance with the Maryland Little Miller Act, Maryland Annotated Code, State Finance and Procurement, § 17-110(b)(1)-(2), the Commission shall retain 5 percent of the amount of each payment. In addition to retainage, the Commission may withhold from payments otherwise due to the Contractor any amount that the Commission reasonably believes necessary to protect its interests.
- 22.4 In accordance with the Maryland Little Miller Act, Maryland Annotated Code, State Finance and Procurement, § 17-106, with each payment estimate, the Contractor, when signing the payment estimate form, certifies that he has made payment from proceeds of prior payments and that he will make timely payments from the proceeds of progress and final payment then due him to his Subcontractors and suppliers in accordance with his contractual arrangement with them. In addition, the Contractor shall enter and certify payments to all minority and or small local Subcontractor(s)/supplier(s) in accordance with any applicable Commission policies. Failure to meet this condition may result in halting the processing of subsequent estimates until this condition is met.
- 22.5 No payments for installation of equipment requiring Operation and Maintenance Manuals will be made prior to receipt of final approved copies of the Operation and Maintenance Manuals. Failure to maintain Contractor required record drawings current will be cause to delay progress payments.
- 22.6 If the Engineer fails to respond to any payment estimate within 30 days after it is submitted, or

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the Commission fails to pay the Contractor substantially the sum approved by the Engineer within 30 days of its approval and presentation, the Contractor may upon 10 days Written Notice to the Engineer stop the Work until he has been paid all amounts then due, in which event Change Orders will be issued for adjusting the Contract Price, extending the Contract Time, or both to compensate for the costs and delays attributable to the stoppage of the Work.

22.7 No payments shall be made for material or equipment not yet incorporated in the Work.

22.8 Prior to making a request for final payment, the Contractor shall have completed all Work as defined under the Contract.

The Engineer will issue a Certificate of Final Acceptance attached to the final payment request with a copy sent to the Contractor that the Work has been accepted by him under the conditions of the Contract Documents. The entire balance found to be due the Contractor, including the retained percentages but except such sums as may be lawfully deducted by the Commission, will be paid to the Contractor within 30 days of final completion and acceptance of the Work. In accordance with the Maryland Little Miller Act, Maryland Annotated Code, State Finance and Procurement, § 17-110(b)(5), if there is a dispute or Claim between the Contractor and the Commission concerning the satisfactory completion of this Contract, the Commission shall release the retainage to the Contractor within 120 days after the resolution of the dispute or Claim.

22.9 The Contractor shall furnish to the Engineer, a Maintenance Bond as described in Article 25, to be in effect for the guarantee period(s) set forth in Article 31.

22.10 The Contractor shall indemnify and hold the Commission and its agents harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, tools, and all supplies incurred in the furtherance of the performance of the Work. The Contractor shall, at the Engineer's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged or waived. If the Contractor fails to do so the Commission may, after having notified the Contractor, either pay unpaid bills or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor will be resumed in accordance with the terms of the Contract Documents, but in no event shall the provisions of this sentence be construed to impose any obligations upon the Commission to either the Contractor, his Surety, or any third party. In paying any unpaid bills of the Contractor, any payment so made by the Commission will be considered as a payment made under the Contract Documents by the Commission to the Contractor and the Commission will not be liable to the Contractor for any such payments made in good faith.

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ARTICLE 23 ACCEPTANCE OF FINAL PAYMENT AS RELEASE

- 23.1 The acceptance by the Contractor of final payment shall be and shall operate as a release to the Commission from any and all claims of any nature and all liability to the Contractor, for all things done or furnished in connection with the Work, and for every act and neglect of the Commission and others relating to or arising out of this Work.
- 23.2 The Commission shall not be precluded or estopped by any measurement, estimate, or certificate made either before or after the final completion and acceptance of the Work and payment therefor, from showing the true amount and character of the Work performed and materials furnished by the Contractor, nor from showing that any such measurement, estimate or certificate is untrue or is incorrectly made, nor from showing that the Work or materials do not in fact conform to the Contract. The Commission shall not be precluded or estopped, notwithstanding any such measurement, estimate or certificate, and payment in accordance therewith, from recovering from the Contractor or his Sureties, or both, such damage as it may sustain by reason of his failure to comply with the terms of the Contract.
- 23.3 Neither the acceptance by the Commission or any representative of the Commission nor any payment for or acceptance of the whole or any part of the Work, nor any extension of time, nor any possession taken by the Commission, shall operate as a waiver of any portion of the Contract or of any power herein reserved, or of any right to recover damages. The waiver of any breach of the Contract shall not be held to be waiver of any other or subsequent breach.

ARTICLE 24 INSURANCE

- 24.1 The Contractor shall within the time specified in the Contract Documents purchase and maintain insurance as specified in the Contract Documents. The Contractor shall submit proof of insurance as required by the Contract Documents.

ARTICLE 25 CONTRACT SECURITY

- 25.1 The Contractor shall within the time specified in the Contract Documents provide the Commission with a Performance Bond, a Labor and Material Payment Bond, and Letter of Intent to Issue Maintenance Bond in penal sum equal to 100 percent of the Contract Price. Bonds shall be conditioned upon the performance by the Contractor of all undertakings, covenants, terms, conditions, and agreements of the Contract Documents, and upon the prompt payment by the Contractor to all persons supplying labor, materials, and services in the prosecution of the Work provided by the Contract Documents. Such Bonds shall be executed by the Contractor and a corporate bonding company licensed to transact such business in the State of Maryland. The expense of these Bonds shall be borne by the Contractor. If at any time a Surety on any such Bond is declared bankrupt or loses its right to do business in the State of Maryland or is removed from the Listing of Approved Sureties, the Contractor shall within 10 days after notice from the Surety Company, substitute an acceptable Bond (or

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Bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Commission. The premiums on such Bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable Bond to the Commission.

- 25.2 Should the Contract Price be increased by 25 percent or more before Final Acceptance, the amount of the Maintenance Bond shall be increased accordingly.

ARTICLE 26 ASSIGNMENTS

- 26.1 Neither the Contractor nor the Commission shall sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of his right, title or interest therein, or his obligations thereunder, without written consent of both parties.

ARTICLE 27 INDEMNIFICATION

- 27.1 The Contractor shall defend, indemnify, and hold harmless the Commission, its agents, and employees from and against any and all claims, suits in law or equity, actions, damages, losses and expenses of every name and description, including attorneys' fees to which the Commission, its agents, and employees may be subject or put by reason of injury to persons (including bodily injury, death or any other form of personal injury) or property damage arising out of or resulting from the performance of the Work whether caused or alleged to be caused in whole or in part by any negligent act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by the Commission, its agent or employees, the party indemnified hereunder, or other cause.
- 27.2 Monies due or to become due the Contractor under the Contract as may be considered necessary by the Commission shall be retained by the Commission until such suits or claims for damages shall have been settled or otherwise disposed of or satisfactory evidence to that effect has been furnished to the Commission.

ARTICLE 28 SEPARATE CONTRACTS

- 28.1 The Commission reserves the right to let other contracts in connection with this Project. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials, the execution of their Work, and shall properly connect and coordinate his Work with theirs. If the proper execution or results of any part of the Contractor's Work depends upon the Work of any other Contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such Work that render it unsuitable for such proper execution and results.
- 28.2 The Commission may perform additional Work related to the Project by itself, or it may let

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other contracts containing provisions similar to these. The Contractor shall afford the other Contractors who are parties to such contracts, and the Commission, if it is performing the additional Work itself, reasonable opportunity for the introduction and storage of materials and equipment, the execution of work, and shall properly connect and coordinate his Work with theirs.

ARTICLE 29 SUBCONTRACTING

- 29.1 The services of specialty Subcontractors may be utilized on those parts of the Work which, under normal contracting practices, are performed by specialty Subcontractors within the parameters set forth herein and in the Contract Documents.
- 29.1.1 Before entering into any subcontracts, the Contractor shall submit a written statement to the Engineer giving name and address of the proposed Subcontractor, manufacturer or supplier, the Work and material that he is to perform and furnish, and shall further certify that the proposed Subcontractor, manufacturer or supplier has the necessary facilities, skill, integrity, past experience and financial resources to perform the portion of the Work stated in accordance with requirements of the Contract.
- 29.1.2 No substitution for any Subcontractor, manufacturer or supplier, person or entity previously selected by the Contractor shall be made without written notification to the Engineer.
- 29.2 The Contractor shall not award Work to Subcontractors in excess of 49 percent of the Contract Price.
- 29.3 The Commission will require all Contractors to report Subcontractor/supplier payments on a monthly basis utilizing the WSSC's Web-Based Compliance System. The Contractor shall enter all payment information within 30 days of receipt of payment from WSSC until final payment, and the Subcontractor(s)/supplier(s) shall validate payment received within 30 days of receipt of payment from the Contractor until final payment. Instructions on entering data are located on WSSC's website at: <http://www.wsscwater.com/home/jsp/content/slmbe-program.faces>
- 29.4 Failure to report payments on WSSC's Web-Based Compliance System, as described above, will result in delay in payment(s). Final payment may not be made until all Subcontractor payment(s) are reported and verified.
- 29.5 Failure to comply with the requirements herein will be considered in the evaluation of the Contractor's responsibility in performing future contracts.
- 29.6 No additional compensation will be allowed for a company not meeting the requirements of this section.

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- 29.7 Questions concerning WSSC's Web-Based Compliance System shall be directed to the SLMBE Office at 301-206-8800 or email at wsscwebcompliance@wsscwater.com.
- 29.8 The Contractor shall report the use of Subcontractors, manufacturers, and suppliers during the course of the Contract as set forth in the Contract Documents.
- 29.9 The Contractor shall be fully responsible to the Commission for the acts and omissions of his Subcontractors, manufacturers, suppliers, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

The Contractor shall be fully responsible for the coordination of the Work of the trades, Subcontractors, manufacturers and suppliers, and their officers, agents, and employees.

- 29.10 The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind Subcontractors to the Contractor by the terms of the Contract Documents insofar as applicable to the Work of Subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Commission may exercise over the Contractor under any provision of the Contract Documents.

29.10.1 All Subcontractors shall be specifically bound by the terms of Article 7.4.

- 29.11 Nothing contained in the Contract Documents shall create any contractual arrangement between any Subcontractor and the Commission.

ARTICLE 30 ENGINEER'S AND INSPECTOR'S AUTHORITY

- 30.1 The Engineer will act as the Commission's representative during the construction period and decide questions which may arise as to quality and acceptability of materials furnished and Work performed. The Engineer will within a reasonable time, make decisions relative to interpretation of the Contract Documents in a fair and unbiased manner, and will make visits to the site and determine if the Work is proceeding in accordance with the Contract Documents.
- 30.2 The Contractor shall be held strictly to the intent of the Contract Documents in regard to the quality of materials, workmanship, and execution of the Work. Inspections may be made at the factory or fabrication plant of the source of material supply.
- 30.3 The Engineer will not be responsible for construction means, controls, techniques, sequences, procedures or construction safety.
- 30.4 Authority and Duties of Inspectors

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- 30.4.1 Inspectors are authorized agents of the Engineer and shall be authorized to inspect all Work done and all material furnished. Such inspection may extend to any part or all of the Work, including the preparation, fabrication or manufacture of the materials to be used. The presence or absence of an Inspector does not relieve the Contractor from any requirements of the Contract Documents. The Inspector is not authorized to revoke, alter or waive any requirements of the Contract, nor is he authorized to approve or accept any portion of the complete Project. He is authorized to call the attention of the Contractor to any failure of the Work or materials to conform to the Contract. He will have the authority to reject materials or suspend the Work until any questions at issue can be referred to and decided by the Engineer. Inspectors will perform their duties at such times and in such manner as will not unnecessarily impede progress of the Contract.
- 30.4.2 The Inspector will not act as foreman or perform other duties for the Contractor, nor interfere with the management of the Work by the latter. Any advice which the Inspector may give the Contractor shall not be construed as binding the Engineer in any way, or releasing the Contractor from fulfilling all of the terms of the Contract.
- 30.4.3 Where there is disagreement between the Contractor and the Inspector, such as refusal by the Contractor to use properly approved materials, for performing Work not in compliance with the Contract Documents, or refusing to suspend Work until problems at issue can be referred to a decision by the Engineer, the Inspector will immediately direct the Engineer's attention to the issues of disagreement, and if the Contractor still refuses to make corrections, comply or suspend Work, the Engineer will prepare and deliver in writing to the Contractor, by mail or otherwise, a written order stopping the Work and explaining the reason for such shutdown. As soon as the Inspector is advised of the delivery of the shutdown order, the Inspector will immediately leave the site of the Work. Work performed after the issuance of the shutdown order will not be accepted or paid for and may be required to be removed and disposed of at the Contractor's expense.

ARTICLE 31 GUARANTEE

- 31.1 The Contractor shall furnish a Maintenance Bond in accordance with Article 25 to guarantee all materials and equipment furnished and Work performed for a period of 1 year from the date(s) of substantial completion, except that (1) those items listed as exceptions on the certificate(s) of substantial completion shall be so guaranteed for a period of 1 year from the date of Final Completion and (2) those items where longer guarantee provisions are required. The Contractor warrants and guarantees that the completed Work is free from all defects due to faulty materials, equipment, and workmanship. This shall include but not necessarily be limited to the following.

- 31.1.1 Against all faulty or imperfect materials and equipment, subsidence of backfills, fills

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and embankments, vegetation stabilization, and against all imperfect, careless and/or unskilled workmanship.

- 31.1.2 That the Work performed under this Contract, including all mechanical and electrical equipment, and appurtenances, and each and every part thereof, shall operate, with proper care and maintenance, in a satisfactory and efficient manner in accordance with the requirements of these Contract Documents. Where manufacturer's equipment warranty(s) are required elsewhere herein, said equipment warranty shall name the Commission as a beneficiary, and the Contractor shall furnish the Commission with a copy of the manufacturer's equipment warranty.
- 31.1.3 That the structures shall be watertight and leak-proof at every point and in every joint.
- 31.1.4 No use or acceptance by the Commission of the Work or any part thereof, nor any failure to use same, nor any repairs, adjustments, replacements, or corrections made by the Commission due to the Contractor's failure to comply with any of his obligations under the Contract Documents, or other corrections made by the Commission shall impair in any way the guarantee obligations assumed by the Contractor under these Contract Documents.

The Contractor shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the Work resulting from such defects and agrees to replace with proper workmanship, materials, equipment, and re-execute, correct or repair without cost to the Commission, any Work which may be found to be improper or imperfect and/or which does not operate in a satisfactory manner and fails to perform as specified, or in any other way does not conform to the Contract Documents, unless such damage is the direct result of negligence on the part of Commission personnel, or fair wear and tear. The Commission will give notice of observed defects with reasonable promptness. In the event that the Contractor fails to make such repairs, adjustments or other Work that may be made necessary by such defects, the Commission may do so and charge the Contractor the cost thereby incurred.

- 31.2 Latent defects will not be considered to be included in the Work covered by the one-year maintenance bond. The guarantee provisions specified herein shall not limit the Commission's right to recover damages for the Contractor's refusal to repair defective Work after the expiration of the Maintenance Bond and the guarantee provisions specified herein.

ARTICLE 32 CLAIMS AND DISPUTES

- 32.1 Any Claim by the Contractor against the Commission arising under or relating to this Contract shall be filed and adjudicated in accordance with the requirements and procedures set forth in WSSC Procurement Regulation § 6-104.01.

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- 32.2 Any Claim by the Commission against the Contractor arising under or relating to this Contract shall be filed in the federal or state courts located in Prince George's County, Maryland or Montgomery County, Maryland. However, the Commission may assert any set-off amount in any matter filed pursuant to Article 32.1.
- 32.3 This Contract and any Claim arising under or relating to it shall be governed in accordance with the law of the State of Maryland.
- 32.4 The Contractor shall diligently carry on the Work and maintain the progress schedule during any dispute, appeal, or court proceeding arising from or related to a Claim.
- 32.5 With regard to any Claim submitted in accordance with Article 32, the Contractor shall (1) allow the Engineer, or his representatives, including but not limited to attorneys, third parties hired by the Engineer, such as outside auditors, the right to interview employees and witnesses, examine and audit all books, records, documents, and supporting materials, including computations and projections, in order to evaluate the accuracy, completeness and currency of the costs being claimed and the facts asserted, (2) make available at his office at reasonable times, material and persons described above for interview, examination, audit or reproduction, and (3) shall obtain from all subcontractors and suppliers, and file with its initial claim, authorization for the Engineer to examine and audit all subcontractor costs and facts included in the claim. In addition, the amounts included in the claim shall be limited to the actual direct costs incurred and paid by the Contractor and supported by such accounting records as job cost reports, payroll journals, paid invoices, cancelled checks and ledgers.

ARTICLE 33 TAXES

- 33.1 The Contractor shall pay all sales, consumer, use, and other similar taxes required by the law of the place where the Work is performed. Pursuant to MD Code, Tax-General, § 11-210(b)(3), sales and uses taxes may not apply to certain purchases made by the Contractor. The Contractor is solely responsible for determining whether or not a sales or use tax exemption is applicable. The Commission is prohibited by Maryland law from providing any sales tax exemption certificate to the Contractor.

ARTICLE 34 ETHICS

- 34.1 Personnel of the Commission and the Contractor and its personnel and agents shall be guided in their actions by the WSSC Code of Ethics; Resolution No. 2003-1669 adopted June 11, 2003, and any subsequent revisions and amendments thereto. Additionally, standards for ethical, professional procurement behavior such as established by the Institute for Supply Management (formerly NAPM) entitled "Principles and Standards of Ethical Supply Management Conduct" are to be followed. Both documents are available for review in the Office of Chief Procurement Officer. See abstract in the attachment section entitled "Ethics in

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Public Contracting.”

- 34.2 In accordance with Section 3-3 of WSSC’s Code of Ethics, a former Commissioner or employee may not act as an agent or representative of any person or entity involved in a business transaction with WSSC for a period of 12 months from the date of the former employee’s separation from the Commission. In addition, a former Commission employee is barred from assisting or representing a party in a business transaction with WSSC if the former employee participated significantly in the matter as an employee.

ARTICLE 35 BRIBES

- 35.1 A bribe or attempt to bribe any employee or officer of the Commission by the Contractor shall be considered a fraudulent and bad faith act, and shall thus empower the Commission to invoke its rights pursuant to WSSC Procurement Regulation § 6.103.02.

ARTICLE 36 ABUSE, USE, SALE OR POSSESSION OF DRUGS OR INTOXICANTS

- 36.1 The use, possession, sale or distribution of drugs or intoxicants by the Contractor, a Subcontractor, or any of their employees while on Commission premises or while actively representing or performing Work for the Commission is prohibited. It shall be the responsibility of the Contractor to prevent such activities and to remove any employee or Subcontractor employee whose ability to perform appears to be affected by the use of drugs or intoxicants. Failure of the Contractor to comply with this provision may result in Termination of the Contract.

ARTICLE 37 SEXUAL HARASSMENT

- 37.1 Sexual harassment by the Contractor, a Subcontractor, or any of their employees while on Commission premises or while actively representing or performing Work for the Commission is prohibited. It shall be the responsibility of the Contractor to prevent any such acts and to remove any employee who conducts such acts. Failure of the Contractor to comply with this provision may result in Termination of the Contract. Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment. Basic criteria for determining unlawful behavior includes conduct that has the purpose or effect of unreasonably interfering with an individual's Work performance or creating an intimidating, hostile, or offensive working environment.

ARTICLE 38 DEBARMENT AND SUSPENSION

- 38.1 Debarment and suspension actions taken against a contractor will be done in accordance with WSSC Procurement Regulation § 6-102.

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ARTICLE 39 NONDISCRIMINATION POLICY

- 39.1 Discrimination in any manner against any employee or applicant for employment by the Contractor or a Subcontractor on the basis of sex, race, creed, color, age, mental or physical handicap, sexual orientation, or national origin is prohibited.
- 39.2 The Contractor shall include a similar nondiscrimination clause in all subcontracts.
- 39.3 If the Contractor fails to include a nondiscrimination clause in a subcontract, the Commission shall provide a reasonable opportunity to cure the defect. If the Contractor fails to cure the defect within the time period granted, the Commission may declare the contract void and the Contractor shall be entitled to the reasonable value of Work that has been performed and materials that have been provided to date. If the Contractor cures the defect, the Contract remains in force according to its revised terms.
- 39.4 If the Contractor willfully fails to comply with the requirements of the nondiscrimination clause, the Commission may compel the Contractor to continue to perform under the Contract as provided in Maryland Annotated Code, Public Utilities, § 20-106(b).

ARTICLE 40 ACCESS TO WSSC FACILITIES AND INFRASTRUCTURE

- 40.1 Prior to beginning Work on any Commission project, the Contractor must complete and submit background investigation applications for all participants in the project, regardless of whether subjects will be participating in the project at Commission facilities or off-site. Background investigations shall be completed by the Commission's investigative agency. Investigative results will be reviewed by the Commission to determine the suitability to Work on Commission property or projects. Like investigations must be submitted for all replacement participants prior to beginning Work. The Commission reserves the right to reject any employee, Subcontractor or the Contractor as a result of the findings of background investigations.
- 40.2 Commission will additionally be provided with the name, address, home phone number, and date of birth for all the Contractor's project participants prior to the project's commencement. The list shall be updated regularly to accurately reflect the current complement.
- 40.3 The Contractor's project participants shall be issued photo identification cards. Identification cards must be worn at all times while on any Commission property. Contractor employees found on-site without proper identification will be immediately removed from Commission property. The design of identification cards shall be reviewed and approved by the Commission prior to issuance. Identification cards for employees who are no longer associated with the project, for any reason, will be immediately recovered by the Contractor. The Contractor is responsible to control and inventory all identification cards issued so that cards are not obtained or used by unauthorized individuals.

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- 40.4 All project participants needing either electronic or hardcopy Sensitive Documents or information will be required to make application with, and receive approval from the Commission prior to receiving this information. Permission to receive Sensitive Documents or information will pertain only to the individual approved. Sensitive Documents or information received from the Commission must be handled consistent with the terms of non-disclosure required for application. Contractor is responsible to restrict use of Sensitive Documents or information to project participants only and shall take appropriate measures to prevent distribution of sensitive documents to anyone inside or outside of the Contractor's company except Contractor's project participants. After completion of project, all Sensitive Documents or information remaining in the Contractor's possession shall continue to be governed under the terms of non-disclosure and must continue to be stored in a secure manner. After such records are no longer needed for record purposes, the records shall be destroyed or returned to the Commission.
- 40.5 All Contractor and Subcontractor employees that will Work on the job site or who have access to Sensitive Documents or information are to have initial background checks performed by the Commission to assure the Commission information used and generated by this project will not end up in unauthorized hands. The initial background checks are valid for one year and subject to annual renewal for employees continuing to Work on the project. The Office of the Chief Procurement Officer will provide further instructions for submission procedures upon inquiry.

ARTICLE 41 CONTRACTOR PERFORMANCE EVALUATION

- 41.1 The purpose of the Contractor Performance Evaluation is to:
- 41.1.1 Identify and document the Contractor's ability to meet all contract compliance requirements.
 - 41.1.2 Communicate contract compliance problems to the Contractor in a timely manner.
 - 41.1.3 Provide corrective action as early as possible during the contract Work, so that the Work may be successfully completed in accordance to all contract requirements.
- 41.2 Contractor Performance Evaluation Schedule
- 41.2.1 Contracts equal to or greater than \$25,000 shall be evaluated, at a minimum, at the conclusion of the Work.
 - 41.2.2 Contracts equal to or greater than \$250,000, or more than ninety (90) days in duration shall be evaluated at a minimum at the contract mid-point (approx. 50%) and at the contract completion (approx. 100%) based on the contract duration in calendar days.

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41.2.3 Contracts equal to or greater than \$1,000,000 or greater than one (1) year in duration shall be evaluated at a minimum before the midpoint (approx. 25%); at the contract mid-point (approx. 50%); after the midpoint but before completion (approx. 75%); and at contract completion (approx. 100%) based on the contract duration in calendar days.

41.3 Contract Startup

41.3.1 Prior to the start of the Contract, the Engineer shall review the Evaluation Factors with the Contractor.

41.3.2 Documentation of the meeting shall be provided to the Contractor and to the Procurement Office, and shall be incorporated into the contract file.

41.4 Contractor Performance Evaluation

41.4.1 The Engineer shall complete a Contractor Performance Evaluation in accordance to the Contractor Performance Evaluation Schedule using the Contractor Performance Evaluation (CPE) form.

41.4.2 The Engineer shall attach documentation that supports the results of the Contractor Performance Evaluation and which at a minimum includes:

41.4.2.1 Prior CPE documents

41.4.2.2 The most recent SLMBE subcontracting report

41.4.2.3 Cure Letters and/or Show Cause Letters

41.4.2.4 Field Orders

41.4.2.5 Test Results and/or Inspection Results

41.4.2.6 Correspondence between WSSC and the Contractor

41.4.2.7 Minutes of any meetings relevant to contract compliance.

41.4.3 The Engineer shall provide a copy of the CPE form and supporting documents to the Contractor for review and acknowledgement.

41.4.4 The Contractor shall review the CPE form, indicate agreement or disagreement with the evaluation results, and acknowledge receipt of the CPE form by signing and returning the signed form to the Engineer no later than ten (10) days after receipt.

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41.5 Contractor Performance Evaluation Meeting

41.5.1 Contractor Performance Evaluation Meetings shall be conducted if:

41.5.1.1 The Contractor receives a Marginal or Unsatisfactory evaluation;

41.5.1.2 The Contractor requests a meeting within ten (10) days after receipt of the CPE form; or

41.5.1.3 The Engineer determines that a meeting is required to improve Contractor's performance.

41.5.2 Prior to the meeting the Engineer shall provide a copy of the CPE and all supporting documents to the Contractor for review.

41.5.3 Additional WSSC stakeholders may attend the meeting, including but not limited to SLMBE, Procurement, or other departments impacted by the Contract.

41.5.4 Contractor's key personnel and, if requested by WSSC, company owners or executive officers, shall attend Contractor Performance Evaluation Meetings.

41.5.5 During the meeting, the Engineer:

41.5.5.1 Shall provide a sign-in sheet for all meeting attendants, including the date, time and location of the meeting.

41.5.5.2 Shall review all performance issues with the Contractor including CPE and all supporting documentation.

41.5.5.3 Shall document discussion with meeting notes that include corrective action, person(s) responsible for completing corrective action, and date by which corrective action will be completed.

41.5.6 After the meeting

41.5.6.1 The Engineer shall revise the CPE form with any additional information and/or updates to the evaluation results.

41.5.6.2 The Contractor shall review and acknowledge receipt of the CPE form by signing and returning to the Engineer no later than ten (10) days after receipt of the form.

**WSSC GENERAL CONDITIONS
FOR CONSTRUCTION**

41.5.7 CPE forms that document Contractor Performance Evaluations will be stored by the Procurement Office for a period of not less five (5) years.

STANDARD SPECIFICATIONS
SECTION 01330
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 DESCRIPTION

- A. Section includes general requirements and procedures related to preparation and transmittal of Submittals to include Schedules, Contractor's Drawings, Samples, Manuals, Methods of Construction, and Record Drawings to Engineer demonstrating performance of Work.
 - 1. Other requirements for submittals are specified under applicable sections of Standard Specifications and Special Provisions.

1.2 SUBMITTAL REQUIREMENTS

- A. General.
 - 1. Submit each under separate cover or transmittal.
 - 2. Furnish neat, legible, and sufficiently explicit detail to enable proper review for Contract compliance.
 - 3. Show complete and detailed fabrication; assembly and installation details; wiring and control diagrams; catalog data; pamphlets; descriptive literature; and performance and test data.
 - 4. Include calculations or other information sufficient to show comprehensive description of structure, machine, or system provided and its intended manner of use.
 - a. With each submission, furnish Engineer specific written notation and justification of each variation in Contractor's Submittals from requirements of Contract Documents.
 - b. Fabrication, purchase or delivery of materials to the site, and installation of materials or Work performed before approval, or not conforming to approved submittals, shall be at Contractor's risk.
 - 5. Engineer's review and approval of submittals shall not relieve Contractor from responsibility for fulfillment of terms of Contract, unless Engineer has received specific written notice of each variation and has given specific written approval.
 - 6. Contractor assumes all risks of error and omission.
 - 7. Contract Work, Materials, Fabrication, and Installation: Following approved submittals.
- B. Process and Requirements.
 - 1. Not later than 3 days after preconstruction conference (see Information for Bidders), submit written list of materials and equipment to be purchased, giving name, address, and telephone number of Supplier, Manufacturer, or processor.
 - a. Submit updated material and equipment list when changes are made.

2. Coordinate and schedule submittals with construction schedule and Engineer.
3. With the first submittal, but not later than 30 days after Notice to Proceed, submit a complete submittal schedule, listing as near as practicable and by Specification Section number, submittals required and approximate date submittal will be forwarded.
 - a. Arrange submittals schedule so that related equipment items are submitted concurrently.
 - b. Engineer may require changes to submittal schedule to permit concurrent review of related equipment.
4. To each submittal affix the following signed Certification Statement.
 - a. "Certification Statement: By this submittal, we hereby represent that we have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and pertinent data and we have checked and coordinated each item with other applicable approved drawings and all Contract requirements."
5. Identification.
 - a. Submit identification data, as applicable, contained thereon or permanently adhered thereto:
 - 1) The Commission Contract Number.
 - 2) Project name and location.
 - 3) Submittal Numbers:
 - a) Number sequentially as submitted.
 - b) Resubmittals shall bear original submittal number and be sequentially lettered.
 - 4) Product identification.
 - 5) Drawing title, drawing number, revision number, and date of drawing and revision.
 - 6) Applicable Contract Drawing Numbers and Specification Section and Paragraph Numbers.
 - 7) Subcontractor's, Vendor's and/or Manufacturer's name, address and phone number.
 - 8) Contractor's Certification Statement.
 - b. Identify on exterior, catalog product data or brochures submitted in packages of multiple items. Include page and catalog item numbers for items submitted.
 - 1) Highlight catalog, product data, or brochures containing various products, sizes, and materials to show particular item submitted.
 - 2) Mark items not applicable to Contract "not applicable" or cross out.
 - 3) If one or more items in catalog submittal are not approved, resubmit only unapproved items.
6. Stamp Space: Blank space of approximately 2-1/2 inches high by 4 inches wide adjacent to the identification data to receive Engineer's status stamp.
7. Number of Copies: See requirements in Submittals specified herein.
8. Approval Process.
 - a. Follow submittal schedule provided to Engineer. Engineer will return submittal within 30 days.
 - b. Submittals will be returned, marked with one of following classifications:

- 1) APPROVED: Requires no corrections, no marks.
- 2) APPROVED AS NOTED: Requires minor corrections. Items may be fabricated as marked without further resubmission. Resubmit 2 corrected copies to the Engineer.
- 3) APPROVED AS NOTED - RESUBMIT: Requires corrections. Items not marked may be fabricated. Resubmit entire submittal following original submission with corrections noted. Allow 30 days for checking and Engineer's appropriate action.
- 4) REJECTED: Requires major corrections or is otherwise not following Contract Documents. No items shall be fabricated. Resubmit entire submittal following original submission with corrections noted. Allow 30 days for checking and Engineer's appropriate action.
- 5) INFORMATION ONLY: Items specified by Contract Documents.

C. Electronic Submittals: PDF Format, as approved by Engineer.

1.3 SUBMITTALS

A. Schedules. (Excluding Area service connection contracts AC, LC)

1. Construction Schedule – Bar Chart Form.

- a. Within 15 days after construction start date in Notice to Proceed, prepare and submit to Engineer for review, feasible and reasonable schedule showing Order of Work and start and finish dates of salient milestones, referencing work by street name. Submit in Microsoft Project 2003 compatible format by digital delivery (email or CD) and 2 copies of printed format to Contract Manager. Show usage of entire Contract Time and include dates for submittals, approval of samples and submittals, and procurement of materials, plant, and equipment. Using sufficient detail, subdivide Work into activities on Construction Schedule, coordinate with breakdowns for lump sum items herein, to serve as basis for progress payments during construction.
- b. Furnish such additional information and data required by Engineer to justify basis of schedule precedent to mutual acceptance. Engineer's review and mutual acceptance of Contractor's schedule is for conformance to requirements of the Contract Document. Review and mutual acceptance by Engineer of Contractor's schedule does not relieve Contractor of any of its Contract Document responsibilities for accuracy or feasibility of schedule, or of Contractor's responsibility to meet interim project milestone dates and Contract completion date.
- c. Submit with each request for payment, in same format specified above, actual performance against scheduled performance on the mutually accepted construction schedule, including work added by change order. If Contractor fails to submit required updated schedule within time prescribed, Engineer may withhold approval of progress payment estimates until Contractor submits required current updated schedule.
- d. Use mutually accepted schedule for planning, organizing, directing, and executing Work and for reporting progress. Engineer may order and authorize

2. Construction Schedule - Critical Path Method.
 - a. When required and specified in Special Conditions, substitute CPM Construction Schedule that is feasible and reasonable, instead of chart form.
 - b. Within 15 days after construction start date in Notice to Proceed, prepare and submit a preliminary schedule in time-scale format, indicating planned operations during first 60 days. Include cost of activities expected to be completed or partially completed before submission and mutual acceptance of entire schedule.
 - c. Within 45 days after construction start date in Notice to Proceed, submit 5 copies of a complete network analysis system, showing usage of entire Contract Time, consisting of detailed network, mathematical analysis, and network diagram. Present schedule in the form of an Arrow Diagramming Method (ADM) CPM Network Diagram.
 - 1) Show order and interdependence of activities and sequence in which Work will be accomplished. Show how the start of a given activity is dependent on completion of preceding activities and how its completion restricts start of following activities.
 - 2) Show following detailed network activities on network diagram, in addition to construction activities;
 - a) Submittal and approval of samples and submittals.
 - b) Procurement of critical materials and equipment.
 - c) Fabrication of materials and equipment, their installation and testing.
 - d) Specified intermediate milestone or completion dates.
 - e) Show duration of each activity in working days, with minimum of 1 working day and maximum of 20 working days for any on site activity. Material and equipment related delivery activities are exempt from the maximum duration requirement.
 - 3) Group related activities on network and highlight activities on critical path. Time-scale network using units of approximately 1/2 inch equals 1 week or other suitable scale approved by Engineer. Indicate weekends and holidays. Where slack exists, show activities at earliest time they are scheduled to be accomplished. Use sheet size 22 inch by 34 inch minimum, or per Engineer's approval. Place title and revision block in lower right-hand corner. Give dummies duration of zero.
 - 4) Include tabulation of each activity shown on detailed network diagram in the mathematical analysis. Furnish following information as minimum for each activity:
 - a) Activity node numbers (I/J).
 - b) Activity description.
 - c) Duration of activity in units of working days.
 - d) Earliest start date (by calendar date).
 - e) Earliest finish date (by calendar date).
 - f) Scheduled or actual start date (by calendar date).
 - g) Scheduled or actual finish date (by calendar date).

- h) Latest start date (by calendar date).
 - i) Latest finish date (by calendar date).
 - j) Slack or Float (working days).
 - k) Activity percent complete and remaining duration.
 - l) Monetary value of activity.
 - m) Responsibility code for each activity (Prime Contractor, subcontractors, suppliers, the Commission).
 - n) Manpower required by trade and by total.
 - o) Equipment required.
- 5) List activities in sorts or groups in mathematical analysis:
- a) Ascending activity node number (I/J).
 - b) Amount of total float, then in order of activity number.
 - c) Latest start date, then in order of activity number.
 - d) Responsibility in order of earliest start date.
- 6) To facilitate review of payment requests, submit separate sort consisting of activities to which monetary values are assigned. Organize by node number from lowest to highest and then in order of following node number. As minimum for each monetary activity furnish:
- a) Activity node numbers (I/J).
 - b) Activity description.
 - c) Monetary value of activity.
 - d) Previous amount.
 - e) Current amount.
- 7) Furnish initial submittal and revisions in 3 copies.
- d. Review of system:
- 1) Participate in Engineer's review and evaluation of proposed network diagrams and analysis. Resubmit revisions necessary as a result of this review to Engineer within 10 days after conference. Allow 20 days for Engineer's checking and further action.
 - 2) Progress payments will be withheld pending attainment of mutually acceptable schedule. Engineer's review and mutual acceptance of Contractor's schedule is for conformance to requirements of the Contract Document. Review and mutual acceptance by Engineer of Contractor's schedule does not relieve Contractor of any of its Contract Document responsibilities for accuracy or feasibility of schedule, or of Contractor's ability to meet interim project milestone dates and Contract completion date, nor does such review and mutual acceptance expressly or impliedly warrant, acknowledge or admit the reasonableness of the logic, durations, manpower, or equipment loading of Contractor's schedule.
 - 3) Contractor shall use mutually accepted schedule for planning, organizing, directing, and executing Work and for reporting progress.
 - 4) To make subsequent changes to method of operating and scheduling, submit written request separately to Engineer for review, stating reasons for change(s). For major changes, Engineer may require Contractor to revise and submit, without additional cost to the Commission, all affected portions of network diagram and mathematical analysis to show effect on entire

- e. Furnish to Engineer scheduling software approved by and compatible to the current Commission operating system within 15 days after date in Notice to Proceed. Submit to Engineer CPM schedule data on disk, CD, or acceptable product with each schedule submittal and update.
 - f. Submit at 30-day intervals a report of actual construction progress by updating mathematical analysis sorts and graphically generating and reproducing a copy of current network diagram. Include issued change orders in updated schedule. Revise network diagram as described above and as necessary for clarity.
 - g. Show activities or portions of activities completed during reporting period and their total value as basis for Contractor's periodic request for payment. Coordinate these activities or portions of activities with breakdown for lump sum items herein. State percentage of Work actually completed and scheduled as of report date and progress along critical path in terms of days ahead or behind mutually accepted schedule dates.
 - 1) If project is behind schedule, report progress along other paths with negative slack. Engineer will review percentage of work actually completed following procedures set forth in General Conditions Article 22.
 - 2) If Contractor fails to submit required monthly reports and updates within time prescribed, Engineer may withhold approval of progress payment estimates until Contractor submits acceptable required reports and updates. Submit 3 copies of report for each update.
 - h. Simultaneously submit a narrative report with updated analysis, which shall include but not be limited to description of problem areas, current and anticipated delaying factors, their impact, and an explanation of corrective actions taken or proposed.
 - i. Float or slack is defined as difference in working days between earliest start date and latest start date, or difference between earliest finish date and latest finish date of any activity of mathematical analysis of 2., c., 4) herein. Float or slack is not for exclusive use of Contractor or the Commission.
 - j. Requests for Contract Time extension:
 - 1) Accompanied by revised schedule, or portion thereof, and mathematical analysis.
 - 2) Based on affect of controlling delays to the Work as a whole.
3. Schedule of Breakdown for Each or Lump Sum Items:
- a. Before first application for payment, submit to Engineer schedule of breakdown for lump sum items, aggregating total amount bid for each. Include with each breakdown its proper share of overhead, profit, and applied General Conditions. Subdivide Work into activities on Construction Schedule in sufficient detail.

- b. Prepare schedule of breakdown in form acceptable to Engineer and furnish with data to substantiate its correctness as Engineer may require.

B. Shop Drawings.

1. For original submittal and each subsequent resubmittal required, submit 1 each reproducible transparency and 6 legible prints. Engineer will return 3 copies of shop drawing prints.
2. Show types, sizes, accessories, and layouts, including plans, elevations, and sectional views; component, assembly, and installation details; and all other information required to illustrate how applicable portions of Contract requirements will be fabricated and/or installed.
3. In case of fixed mechanical and electrical equipment, submit layout drawings drawn to scale, to show required clearances for operation, maintenance, and replacement of parts. Include manufacturer's certified performance curves, catalog cuts, pamphlets, descriptive literature, installation, and application recommendations, as required. Submit together shop drawings for closely related items such as a pump and its motor. Additional shop drawings and information required for electrical and mechanical equipment are listed in appropriate Specification Sections.
4. Shop drawings for continually furnished items such as pipe, fittings, valves, precast structures and metal work will be waived provided Contractor submits letter naming manufacturer who will furnish these items. Manufacturer shall have on file certified drawing(s) containing above information approved by the Commission, and items furnished shall be as described on certified drawing(s). If Standard Details or Specifications change after certified drawings are approved, new submittals are required.

C. Catalog Data.

1. For original submittal and each subsequent resubmittal required, submit 12 copies of catalog data. Engineer will return 3 copies.
2. Manufacturer's Catalog, Product, and Equipment Data: Certified and include material type, performance characteristics, voltage, phase, capacity, and similar data.
 - a. Furnish wiring diagrams when applicable.
 - b. Indicate catalog, model, and serial numbers representing specified equipment.
 - c. Submit complete component information to verify specified required items.

D. Working Drawings.

1. For original submittal and each subsequent resubmittal required, submit 1 each reproducible transparency and 6 legible prints. Engineer will return 3 copies.
2. Submit working drawings as required for changes, substitutions, Contractor design items, and Contractor designed methods of construction. Requirements for working drawings are listed in appropriate Specification Sections or in Special Provisions.
3. Include with drawings calculations or other information to completely explain structure, machine, or system described and its intended use. Review or approval of drawings by Engineer shall not relieve Contractor from responsibility for fulfillment

4. Submit working drawings and calculations sealed, dated, and signed by Professional Engineer registered in State of Maryland and experienced in the work or discipline involved.

E. Method of Construction.

1. For original submittal and each subsequent resubmittal required, submit 12 copies of data detailing method of construction. Engineer will return 3 copies.
2. When Engineer specifies or directs, submit proposed method of construction for specific portions of Work.
 - a. Include detailed written description of phases of construction operation to fully explain to Engineer proposed method of construction.
 - b. If required by Specifications, submit working drawings to supplement description.
3. Engineer review will follow the process herein and shall not relieve Contractor from responsibility for fulfillment of terms of Contract. Contractor assumes risks associated with proposed method.
4. After review, submit requests for modifications in detail, including justification for them. Do not implement modifications prior to Engineer's review.

F. Manufacturer's Installation Recommendations.

1. For original submittal and each subsequent resubmittal required, submit 12 copies of manufacturer's installation recommendations. Engineer will return 3 copies.
2. Furnish written detail for step by step preparation and installation of the materials and products, including recommended tolerances and space for maintenance and operation.

G. Samples.

1. General: As soon as practicable after Notice to Proceed, submit samples required by Specifications or at Engineer's request. Unless otherwise specified, submit 3 samples of each item as original submittal.
2. Obtain approval before delivery of material to Contract site.
3. Samples: Representative of actual material proposed for use in project and of sufficient size to demonstrate design, color, texture, and finish when these attributes will be exposed to view.
 - a. If samples deviate from Contract Documents, advise Engineer in writing with submittal and state reason.
4. Identification.
 - a. Permanently attach to each sample:
 - 1) The Commission Contract Number.
 - 2) Project Name and Location.
 - 3) Product Identification.
 - 4) Applicable Contract Drawing and Specification Section Number.
 - 5) Subcontractor's, Vendor's and/or Manufacturer's Name, Address and Phone Number.

- b. Mail under separate cover a letter submitting each shipment of samples containing identification information listed herein. Enclose copy of this letter with shipment.
- 5. Approval Process.
 - a. Allow 30 days for Engineer's checking and appropriate action. Certain samples may be tested for specified requirements by the Commission before approval. Failure of sample to pass tests will be sufficient cause for refusal to consider further samples of same brand and make of that material.
 - b. Rejected samples will be returned upon request, and resubmittals required shall consist of 3 new samples and an additional 30 days for review. Only 1 test of each sample proposed for use will be made at expense of the Commission. When originally submitted sample fails, retesting of additional samples will be made by the Commission at expense of Contractor. Upon approval, 1 sample so noted will be returned, and remainder will be retained by Engineer until completion of Work.
 - c. Samples of various material or equipment delivered to site or during placement may be taken by Engineer for testing. Samples failing to meet Contract requirements will automatically void previous approvals, and resubmittal of samples will be required.

H. Record Drawings (As-builts).

- 1. Unless otherwise indicated, Engineer will be responsible for preparation and maintenance of record drawings. Coordinate and cooperate with Commission personnel in preparation. Do not permanently seal or bolt manhole covers until after as-built surveys have been made. Assist Commission personnel as required in ascertaining necessary location information.
- 2. When so specified in Special Conditions or as specified in these Contract Documents, maintain 1 record copy of Contract Documents at site in good order and annotated to show revisions made during construction. Keep annotations current for possible monthly inspection.
 - a. Make record drawings available to Engineer at all times during life of Contract. Upon request, the Commission will furnish 1 set of reproducible of original Contract Drawings and sample record drawing, showing required style and quality, for this purpose.
 - b. Drawings: Made part of record drawings and to include:
 - 1) Contract Drawings: Annotate or redraft, as required, to show revisions, substitutions, variations, omissions, and discrepancies made or discovered during construction concerning location and depth of utilities, piping, ductbanks, conduits, manholes, pumps, valves, vaults, and other equipment. Make revisions and show on all drawing views with actual dimensions established to permanent points.
 - 2) Working/Layout Drawings: When required as submittals, record actual layouts of conduit runs between various items of electrical equipment for power, control, and instrumentation; wire sizes, numbers, and functions; configuration of conduits; piping layouts; and duct layouts. Add sections

- c. Before preliminary inspection, furnish reproducible of record drawings. At completion of Contract and before final payment is made, furnish Engineer 1 set of reproducible of finally approved record drawings reflecting revisions herein described. Furnish Engineer record drawing data on disk or CD, in format compatible with the Commission's software.

I. Operation and Maintenance Manuals.

1. Furnish Operation and Maintenance Manuals for various types of equipment and systems, as required by Contract Documents. Unless otherwise indicated, furnish separate manual for each piece of equipment and system. If manual contains other items or equipment, indicate where specified items are located in manual. Include in manual complete information necessary to operate, maintain, and repair specific equipment and system furnished under this Contract, and include the following specific requirements;
 - a. Contents.
 - 1) Table of Contents and Index.
 - 2) Brief description of equipment/system and principal components.
 - 3) Starting and stopping procedures, both normal and emergency.
 - 4) Installation, maintenance, and overhaul instructions including detailed assembly drawings with parts list and numbers, and recommended spare parts list with recommended quantity, manufacturer's price, supplier's address, and telephone number.
 - 5) Recommended schedule for servicing, including technical data sheets that indicate weights and types of oil, grease, or other lubricants recommended for use and their application procedures.
 - 6) One copy of each component wiring diagram and system wiring diagram showing wire size and identification.
 - 7) One approved copy of each submittal with changes made during construction properly noted, including test certificates, characteristic curves, factory and field test results.
 - 8) For electrical systems, include dimensioned installation drawings, single line diagrams, control diagrams, wiring and connection diagrams, list of material for contactors, relays and controls, outline drawings showing relays, meters, controls and indication equipment mounted on equipment or inside cubicles, control and protective schematics, and recommended relay settings.
 - b. Material:
 - 1) Covers: Oil, moisture, and wear resistant 9 inches by 11-1/2 inches size.
 - 2) Pages: 60 pound paper 8-1/2 inches by 11 inches size with minimum of 2 punched holes 8-1/2 inches apart reinforced with plastic, cloth, or metal.
 - 3) Fasteners: Metal screw post or Acco metal strap type.
 - 4) Diagrams and Illustrations: Attach foldouts, as required.
 - 5) Legible Original Quality: Reproduced by dry copy method.
2. Copies:

- a. Submit 6 preliminary copies of manuals for review and approval no later than date of shipment of equipment. Installation shall not begin until manuals are accepted by Engineer. Include in preliminary copies all items required under "Contents" above. Three copies will be marked and returned to Contractor.
- b. Deliver 7 copies of finally approved manuals to Engineer before Engineer's inspections and tests required in Section 01450.

J. Substitutions: See Section 01630.

PART 2 PRODUCTS
NOT USED

PART 3 EXECUTION
NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.1 Providing for and complying with requirements in this Section will not be measured for payment, but cost will be considered incidental to Contract.

WSSC

STANDARD SPECIFICATIONS
SECTION 01450
QUALITY CONTROL

PART 1 GENERAL

1.1 DESCRIPTION

- A. Section includes general requirements relating to responsibility for quality control involving inspections, tests, certificates, and reports.

1.2 INSPECTIONS

- A. Commission will provide 24 hours notice and may inspect materials and equipment at all stages of development or fabrication, and is allowed access to Contractor's and Supplier's shops.
 - 1. Notify Contract Manager of shift and production schedules and changes by manufacturer.
 - 2. On-site work may be subject to continual inspection.
 - 3. Inspection by Commission will not release Contractor from responsibility or liability for material or equipment.
- B. When local codes or laws require approval and inspection of work by other agencies or organizations before installation or operation, give Contract Manager 3 working days notice of readiness.
 - 1. Obtain required certificates of inspection, testing or approval and submit 1 signed original and 3 copies to Contract Manager.
- C. Contract Manager will inspect, before installation, Contractor furnished materials delivered directly to work sites and mark;
 - 1. Materials without inconsistencies or discrepancies with the Commission's logo.
 - 2. Materials not accepted "Rejected".
 - 3. At plant, Commission witnessed and inspected Contractor-furnished materials with in plant testing following above procedures.
- D. Contract Manager will not mark or remove previously marked logo on material with noncorrectable damages or deficiencies and deemed not suitable for work.
 - 1. Remove or repair non-accepted and damaged materials at Contract Manager's direction.

1.3 TESTING

- A. Shop or Factory Test: When material or equipment testing is required of manufacturer before shipment to Project site, give Contract Manager minimum of 10 days written notice of appropriate time for required test.

1. Ensure test site is safe, accessible, dry, ventilated and well lighted.
2. Do not proceed with installation of equipment until Contract Manager approves required test results.

B. Field and Laboratory:

1. Provide field and laboratory testing facilities and personnel to perform required testing, including the following periodic inspections, Engineering, and associated services:
 - a. Soils.
 - 1) Inspect and test for excavation suitability, placement, and compaction.
 - 2) Inspect subgrades and foundations.
 - b. Masonry.
 - 1) Sample and test mortar, bricks, and grout.
 - 2) Inspect brick and block samples.
 - 3) Sample wall panels.
 - 4) Inspect placement of reinforcement and grouting.
 - c. Concrete: Following Section 03300 to make cylinder samples and perform test on specimen cylinders.
2. Provide 24 hours notice before specified testing.
3. Engage laboratory testing facilities, where specified in Contract Documents, which have performed previous satisfactory work for the Commission, or are certified by the following, and are approved by Contract Manager before their use:
 - a. NIST National Voluntary Laboratory Accreditation Program (telephone: 301-975-4016).
 - b. Washington Area Council of Engineering Laboratories, Inc. (telephone: 301-652-7925).

C. Equipment: Coordinated and demonstrated following procedures specified in Contract Documents.

D. Pipeline and Other Testing: Following test procedures and requirements specified in appropriate Specification Sections.

1.4 REPORTS

A. Certified Test Reports: Where Contract Documents require transcripts or certified test reports, meet the following requirements.

1. Submit and obtain Contract Manager's approval, before delivery of materials, required transcripts, certified test reports, certified copies of reports of tests required in referenced specifications or specified in Contract Documents.
 - a. Testing: Performed in approved independent or manufacturer's laboratory, within 1 year of submittal for approval.
 - b. Transcripts or test reports: Supplied with notarized letter signed by officer or authorized representative of manufacturer or supplier certifying that tested

2. Reference to supplier's certification is limited to its fabricated materials.

B. Certificate of Compliance:

1. At Contract Manager's option or where specified, Contractor may submit for approval notarized (notarization date to be within 12 months of submittal date) Certificate of Compliance from manufacturer or supplier, instead of specified tests and other tests required in reference documents.
 - a. Manufacturer or supplier has performed all required tests.
 - b. Materials to be supplied meet all test requirements.
 - c. Tests have been performed within 1 year of Certificate submittal.
 - d. Tested materials are of same type, quality, manufacture, and make as those specified in Contract Documents.
 - e. Identification of materials tested.
2. Certificate signed by officer or authorized representative of manufacturer or supplier.
 - a. Reference to supplier's certification is limited to its fabricated materials.
 - b. Do not deliver materials until receipt of Certificate approval.

C. Manufacturer's Certificates: Submitted for installation of items of equipment listed in Special Conditions.

1. It has been installed under either continuous or periodic supervision of manufacturer's authorized representative.
2. It has been adjusted and initially operated in presence of manufacturer's authorized representative.
3. It is operating following specified requirements.

D. Materials List Furnished by Commission:

1. Submit completed Materials List for items to be used.

1.5 MANUFACTURER SERVICES

- A. Manufacturer services, when required, are specified in appropriate Specification Sections.

PART 2 PRODUCTS
NOT USED

PART 3 EXECUTION
NOT USED

WSSC

STANDARD SPECIFICATIONS
SECTION 01630
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 DESCRIPTION

- A. Section includes Substitution Bid and Submittal Process.

1.2 SUBSTITUTION REQUIREMENTS

- A. When material, article, or method is specified using name of proprietary product manufacturer, vendor, or method followed by phrase "or equal", "*or equivalent*", "*or approved equal*", *etc.* the specific item mentioned establishes basis upon which bids are to be prepared.
1. Other manufacturers' materials, articles, and methods not named will be considered as substitutions provided required information is submitted on "FORM FOR SUBSTITUTIONS FOR SPECIFIED ITEMS" and will not require substantial revisions of Contract Documents.
 2. This applies to specific construction methods when required by Contract Documents.
- B. Whenever material, article, or method is specified or described without phrase "or equal," "*or equivalent*", "*or approved equal*", *etc.* no substitutions will be allowed. *For these instances, a certification letter demonstrating synchronization requirements was submitted by the City and approved to comply with FHWA guidelines.*
- C. Cost for redesigns due to substituted items are responsibility of Contractor.
- D. Bidder represents the following in making their request for substitution(s).
1. Has personally investigated proposed product or method and determined it is equal in all respects to that specified.
 2. Will furnish same guarantee for substitution as for product or method specified.
 3. Will coordinate installation of accepted substitution into Work, making design and construction changes to complete Work in all respects following Contract requirements without additional cost to the Commission, *the Administration or to the City of Takoma Park.*
- E. Request for substitutions received after bids are open will not be considered except as stated herein.

1.3 SUBMITTAL OF DATA FOR PROPOSED SUBSTITUTIONS

- A. In order for substitutions that do not change design intent to be considered, submit no later than 30 days after date of Notice to Proceed, 3 copies of complete data set forth herein to permit complete analysis of proposed substitutions listed on submitted "FORM FOR SUBSTITUTIONS FOR SPECIFIED ITEMS".
1. For Products.

- a. Identification including manufacturer's name and address.
 - b. Manufacturer's literature, including but not necessarily limited to:
 - 1) Product description, performance, and test data.
 - 2) Reference standards.
 - c. Samples where appropriate.
 - d. Name and address of similar projects on which product was used and dates of installation with contact name and telephone number.
2. For Construction Methods.
- a. Detailed description of proposed method.
 - b. Drawings illustrating methods.
 - c. Name and address of similar projects on which method was used and dates of use with contact name and telephone number.
3. Comparison of proposed substitution with product or method specified.
4. Data relating to impact on construction schedule by proposed substitution.
5. Impact on other contracts.

1.4 SUBSTITUTIONS RECEIVED AFTER BID OPENING

- A. No request for substitutions submitted after Bid Opening will be considered unless following evidence is submitted to Engineer.
 - 1. Specified material or method is unavailable, due to cause(s) stated in General Conditions, Article 15.5.1.
 - a. Submit data to permit complete analysis of the proposed substitution.

1.5 APPROVAL OF SUBSTITUTION

- A. Engineer's decision regarding evaluation of substitutions will be final and binding.
- B. Request for time extensions and additional costs based on submission, acceptance, or rejection of substitutions will be evaluated following Contract Documents.
- C. All approved substitutions will be incorporated into Contract by Change Order.

PART 2 PRODUCTS
NOT USED

PART 3 EXECUTION
NOT USED

PART 4 MEASUREMENT AND PAYMENT

- 4.1 Providing for and complying with requirements in this Section will not be measured for payment, but cost will be considered incidental to Contract.

WSSC

STANDARD SPECIFICATIONS
SECTION 01770
PROJECT CLEANUP

PART 1 GENERAL

1.1 DESCRIPTION

- A. Section includes requirements for cleanup, restabilization restoration and disposal to maintain a safe and well-kept job site and properly repair disturbed areas.

1.2 CLEANUP

- A. Proceed with construction cleanup as construction progresses.
 - 1. Remove mud, oil, grease, soil, gravel, trash, scrap, debris, and excess materials that are unsightly or may cause accidents to persons or properties.
 - 2. Remove water from floor areas where electrical power tools are to be used, and prevent stains on concrete that will be exposed in finish work.
 - 3. Select and employ cleaning materials and equipment with care to avoid scratching, marring, defacing, staining, or discoloring surfaces cleaned.
- B. Final Cleanup: Perform immediately before written request for final inspection of Contract Work or any portion thereof.
- C. Besides normal "Broom Clean" requirements, clean exposed surfaces as listed.
 - 1. Glass: Wash and polish.
 - 2. Painted Surfaces: Remove marks, stains, fingerprints, and dirt.
 - 3. Exposed Slabs: Wash, scrape, and scrub, using detergent to remove bond breaker, dirt, and discolorations.
 - 4. Asphalt Paving: Remove mud, oil, grease, dirt, and trash and hose down.
 - 5. Aluminum: Clean following manufacturer's recommendations.
 - 6. Other Surfaces: Remove blemishes, leave clean, uniform, and dust-free.
 - 7. Premises and Site: Remove trash, debris, and surplus excavated material.
- D. Leave premises orderly and "Broom Clean."

1.3 RESTORATION AND RESTABILIZATION

- A. Restore and restablize disturbed areas including, but not limited to staging and stockpiling areas, construction strips, access roads, stream crossings, and areas within acquired right of way.

- B. Proceed with final restoration and restabilization following Restoration Schedule on Drawings and requirements in Sections 02315 and the special provisions.
- C. Disassemble and remove all temporary construction facilities, and leave site in orderly and restored condition following Contract Documents.
- D. Preserve public and private signs, markers, guardrails, and fences, and maintain in existing locations and condition unless written permission is obtained for removal and restoration or replacement.
 - 1. Remove conflicting facilities when grading operations begin and store in manner to keep them clean and in existing condition.
 - 2. Restore to original or new locations at Engineer's direction.
 - 3. Repair or replace damaged items when directed, at no cost to the Commission.
- E. Perform restoration of turf areas following the special provisions.
- F. Perform tree protection, repair, and replacement following the special provisions.
- G. Restore gravel surfaces and roadway shoulders to their condition before being disturbed.
 - 1. Do not reuse shoulder material if contaminated by foreign material.
 - a. Replace with new material of same quality and gradation.
 - 2. Materials and Methods of Construction: Follow jurisdictional requirements and applicable permits secured for this Contract.
 - 3. Surface areas adjacent to shoulders, if left unstable by construction, with stabilized gravel or other acceptable stabilizing material.
- H. Restore pavement, curbs, other paved areas, and sidewalks following requirements elsewhere in Contract Documents.

1.4 DISPOSAL OF WASTE AND EXCESS MATERIALS

- A. Dispose of construction waste and excess materials in authorized County disposal area or in area covered by current grading or sediment control permit.
 - 1. See the special provisions.
 - 2. Furnish 3 copies of grading permits to Engineer before use of disposal site.
- B. Remove waste and excess material disposed of in unauthorized area, and restore area to its condition before disturbance, at no cost to the Commission, the Administration, or to the City.
- C. Dispose of human waste in special sites designated therefor.

1.5 REMOVAL OF REJECTED MATERIAL

- A. Remove material delivered to Contract site, which has been determined by Engineer to be unsuitable or not following Contract Documents, and dispose of in approved area.

PART 2 PRODUCTS
NOT USED

PART 3 EXECUTION
NOT USED

PART 4 MEASUREMENT AND PAYMENT

- 4.1 Providing for and complying with requirements in this Section will not be measured for payment, but cost will be considered incidental to Contract.

****WSSC****

STANDARD SPECIFICATIONS
SECTION 02315
EARTHWORK FOR PIPELINE CONSTRUCTION

PART 1 GENERAL

1.1 DESCRIPTION

- A. Section includes requirements for excavation, backfill, grading, and related items for pipeline construction.

1.2 DEFINITIONS

A. Trench Zones.

1. Pipe Embedment Zone: Area surrounding pipe in trench, consisting of Bedding Zone, Haunching Zone, and Initial Backfill Zone defined herein.
 - a. Bedding Zone: Area from pipe bottom to firm subgrade, extending full width of trench and providing support for pipe shown in Standard Details.
 - b. Haunching Zone: Area from pipe bottom up to as far as springline and extending full width of trench shown in Standard Details.
 - c. Initial Backfill Zone: Area from top of Haunching Zone up to as far as 1 foot above top of pipe and extending to full width of trench shown in Standard Details or specified herein.
2. Final Backfill Zone: Area from top of Pipe Embedment Zone to finished grade, extending full width of trench shown in Standard Details.
3. Additional Excavation: Excavation below trench bottom to remove unsuitable material such as rock, cobble, soft or organic soil, when Engineer determines that material is unsuitable to support pipe.

B. Backfill Material.

1. Trench Backfill: Native or Borrow Material placed in trench excavation and meeting specifications herein.
2. Borrow Material: Suitable material used for Trench Backfill provided from locations outside limits of trench excavation and meeting specification requirements herein.
3. Structural Fill: Compacted Trench Backfill meeting specification requirements herein, to minimize future settlement and provide support or bearing for structures to be constructed upon or within fill.

C. Pipe.

1. Rigid Pipe: Reinforced Concrete Pipe (RCP), Cast Iron Soil Pipe, Cast Iron Pipe, Prestressed Concrete Cylinder Pipe (PCCP), Asbestos Cement Pipe, Vitrified Clay Pipe, and Concrete Sewer Pipe.
 - a. Pipes relying primarily on inherent strength to support external vertical load.

2. Flexible Pipe: Ductile Iron Pipe (DIP), Polyvinyl Chloride (PVC) Pipe, and Type K Copper Pipe, Steel Pipe, and High Density Polyethylene (HDPE) Pipe.
 - a. Pipe deriving its supporting strength primarily from passive pressures induced as pipe flexes outward against material in Pipe Embedment Zone.
- D. Controlled Blasting: Method used to fracture and excavate rock to required limits for trench while minimizing overbreak and fracturing.
- E. Paved Areas: Over which paving exists, or is to be placed under this Contract, or areas designated on Drawings to receive future paving: See plans and special provisions
- F. Wetland Areas: Non-tidal Wetlands and Non-tidal Wetlands Buffer Zones.

1.3 QUALITY ASSURANCE

(Service Connection Contracts (AC, LC and SC) only)

A. Inspection and Testing.

1. Placing trench backfill and earthwork is subject to continuous inspection.
 - a. Engineer may perform field density tests of compaction of each layer of fill following ASTM D1556, ASTM D2922, or ASTM D2937
2. Allow time for Engineer to perform tests after completion of each layer of fill in designated area.
3. Provide safe access and equipment to cut out smooth-surfaced spot locations designated by Engineer for testing.
4. Engineer may perform gradation and other tests on trench backfill.

(All other contracts)

A. Inspection and Testing.

1. Field Density Compaction Tests: Performed by a licensed Geotechnical Engineer following ASTM D1556, ASTM D6938, or ASTM D2937 at minimum rate of 1 test for every 100 feet of fill along main trench and at every lateral trench, structure and valve box in Type I areas.
 - a. Test each lift to a minimum depth of 5.0 feet from the surface on sewer main and sewer service connections. Test each lift of fill on water main, water service connections, pressure sewer and pressure sewer service connections to a minimum depth of 3.0 feet from the surface or 1.5 feet above the top of the pipe, whichever is greater.
 - b. When field-testing indicates differences in soil types, reference and/or verify test results using one-step field proctors or laboratory proctors following AASHTO T99.
 - c. Perform field density compaction test as new mains are installed.
 - d. Re-excavate and recompact failed test areas, at 25 foot intervals, the entire trench depth and length until retests meet above referenced standards.
2. Placing Trench Backfill and earthwork is subject to continuous inspection by WSSC.

- a. Allow time for WSSC to perform spot tests after completion of each layer of fill in designated area.
- b. Provide safe access and equipment to cut out smooth-surfaced spot locations designated by Contract Manager for testing.
- c. WSSC may perform gradation and other tests on Trench Backfill.

B. Finished Grade Settlement Limitations.

- 1. Guarantee backfilled trench excavation areas designated on Drawings will not pond or settle in excess of following limitations.

<u>Designations</u>	<u>Settlement Limitations</u>	<u>Locations</u>
Type I	0.05 foot	Paved areas and public rights of way
Type II	with positive drainage	Unimproved areas
Type III	0.10 foot	Nonpaved improved areas
Type IV	0.00 foot	Wetlands or wetlands buffer

- 2. Remove and replace Trench Backfill which settles in excess of above limitations with suitable material at no cost to the Commission.
- 3. Remove and replace piping, structures, paving, landscaping, and other site improvements damaged by settlement or repair following Contract Documents, at no cost to the Commission.

1.4 SUBMITTALS

A. Submit following Section 01330.

- 1. Working drawings and data to show blasting design and monitoring, for information only.
 - a. Submit request and obtain written permission from Engineer before using explosives.
- 2. Working drawings showing sheeting and shoring, and method of dewatering, for structure excavations deeper than 8 feet and larger than 400 square feet.
- 3. Samples of Borrow Material, except for Borrow Aggregate.
 - a. Size: Minimum of 30 pounds in sturdy cloth or plastic bags.
 - b. In addition to sample identification required in Section 01330, clearly label each sample showing type and material designation, intended use, name and address of supplier, and location where material is mined or manufactured.

B. Delivery of Borrow Material.

- 1. Submit prior notification of source, designation, quantity, and intended use for all Borrow Material.
- 2. Submit delivery tickets with each load of Borrow Material.
 - a. Name and location of supplier.
 - b. Type and amount of material delivered, including ASTM's and the Commission's material designations.

- C. Submit following Section 01450.
 - 1. Certificate of Compliance: When recycled concrete is used, submit letter from governing jurisdiction approving its use.
 - 2. Certified Test Reports: Borrow Aggregate.
 - a. In addition to requirements of Section 01450, include information showing type and material designation, intended use, name and address of supplier, and location where material is mined or manufactured.

- D. For Flowable Fill see Section 03300.

- E. Submit Soil's Compaction Reports (except Service Connection Contracts (AC, LC and SC) as follows:
 - 1. Certified by Professional Engineer registered in State of Maryland.
 - 2. Field Density Compaction Test Results.
 - 3. Contract Number.
 - 4. Soils Technician's Name and Employer.
 - 5. Test Number.
 - 6. Date of Test.
 - 7. Location of Test (sewer and/or water station, lot number and street name).
 - 8. Retest results of previous tests (and number), if required.
 - 9. Depth of Test.
 - 10. Dry Density.
 - 11. Moisture Content.
 - 12. Maximum Density/Optimum Moisture Curve Relationship Chart following ASTM D698.
 - 13. Test Results.
 - 14. One Step Proctor Determination (when taken).
 - 15. Additional Comments.
 - 16. Submit test results to the Engineer within 2 weeks of test and 3 business days prior to testing mains and service connections and/or performing tie ins.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Detectable Warning Tape Furnished by the Commission.
 - 1. Description.
 - a. Size: Six inch width, minimum 5 mils thickness.
 - b. Printing: Two lines, minimum 3/4 inch high lettering on each line, repeated continuously along length of tape at intervals no greater than 3 feet.
 - 1) Water: CAUTION - WATER LINE BURIED BELOW
CALL WSSC 301-206-4002
 - 2) Sewer: CAUTION - SEWER LINE BURIED BELOW
CALL WSSC 301-206-4002
 - 3) Cathodic Protection: CAUTION – CATHODIC PROTECTION

CALL WSSC 301-206-4002

4) Restrained joint pipe: CAUTION – RESTRAINED JOINT PIPE
CALL WSSC 301-206-4002

- c. Colors.
 - 1) Tape:
 - a) Blue for water.
 - b) Green for sewer.
 - c) Yellow for cathodic protection.
 - d) APWA Red for restrained joint pipe.
 - 2) Lettering: Black.
 - 2. Approved Manufacturers:
 - a. Lineguard, Inc, Type III Detectable Tape.
 - b. Pro-Line Safety Products, No. 5012 (Type A Double Safe).
 - c. Reef Industries, Terra Tape D.
 - d. Empire Level Manufacturing Corporation, MagnaTec.
 - e. Or approved equal
- B. Trench Backfill.
- 1. General Trench Backfill Requirements.
 - a. Outside Wetland Areas: Free of organic or frozen material, waste metal products, unsightly debris, toxic material, or other deleterious materials and at moisture content permitting compaction to density specified.
 - b. Within Wetlands Areas: Previously excavated native material which can include organic matter, but free of frozen material, waste metal products, unsightly debris, toxic material, or other deleterious materials.
 - c. Material Excavated from Trench and meeting these requirements: Use when approved by Engineer; otherwise excavate, haul, and place Borrow Material.
 - 2. General Borrow Material Requirements.
 - a. Outside Wetland Areas: Meet General Trench Backfill Requirements for Outside Wetland Areas, stated herein.
 - b. Within Wetland Areas: Soil material meeting requirements of ASTM D2488, material classification types SM, SC, ML, CL, OL and PT, which can include organic matter, but be free of frozen material, waste metal products, unsightly debris, toxic material, or other deleterious materials.
 - c. Acceptance of Borrow Material from any location outside limits of trench excavation, shall not be construed as approval of entire Borrow Material site, but only insofar as material continues to meet specified requirements, herein.
 - 3. Borrow Aggregate.
 - a. Standard Sizes of Aggregate: ASTM C33, coarse aggregate.
 - b. Dry Concrete Sand: ASTM C33, fine aggregate.
 - c. Surge Stone: 3 inch to 7 inch stones.
 - d. Crushed stone, crusher run (CR-6), or bank run gravel.
 - 1) Aggregate Test Requirements:
 - a) Maximum Sodium Sulfate Soundness (ASTM C88): 12 percent.
 - b) Maximum Los Angeles Abrasion (ASTM C131): 50 percent.

- c) Maximum Flat and Elongated (ASTM D4791) for crushed stone only:
15 percent.
- 2) Gradations: Conform to Table of Borrow Aggregate Gradations.

Borrow Aggregate Gradations

(Based on Table "901-A", January 2001 MSHA Standard Specifications for Construction and Materials)

Sieve Size	Percent Passing Each Sieve by Weight				
	¹ Bank Run Gravel Number 1	² Bank Run Gravel Number 2	³ Crushed Stone Number 3		⁴ Crusher Run Number 4 (CR-6)
			Design Value	Tolerance	
2-1/2 inch	100	100			
2 inch			100	-2	100
1-1/2 inch			95-100	±5	90-100
1 inch	85-100	90-100			
3/4 inch			70-92	±8	60-90
1/2 inch	60-100	60-100			
3/8 inch			50-70	±8	
Number 4			35-55	±8	30-60
Number 10	35-75	35-90			
Number 30			12-25	±5	
Number 40	20-50	20-55			
Number 200	3-20	5-25	0-8	±3	0-15

¹MSHA - Base Bank Run Gravel

³MSHA - Base Graded Aggregate

²MSHA - Subbase Bank Run Gravel

⁴MSHA - Crusher Run Aggregate

4. Flowable Fill: Section 03300.

5. Recycled Concrete: Free of waste metal products, unsightly debris, toxic material or other deleterious materials and meeting Gradation and Aggregate Test Requirements for Borrow Aggregate, as stated herein.
6. Bentonite: 100 percent high-swelling granular sodium Bentonite, with maximum moisture content of 12 percent.
 - a. Approved Manufacturers:
 - 1) American Colloid Company.
 - 2) Wyo-ben Inc.
 - 3) Bentonite Corporation.;
 - 4) Or approved equal
7. Structural Fill: Meet material requirements of Trench Backfill and compaction requirements stated herein.
8. Backfill Requirements for Different Types of Pipes.
 - a. Additional Excavation Area Below Pipe Embedment Zone for Outside and Within Wetland Areas:
 - 1) Borrow Aggregate meeting requirements of ASTM C33, coarse aggregate size number 3 or 4 and/or surge stone.
 - 2) Use geotextile to separate pipe embedment zone material and aggregate in additional excavation area when migration of fines is a concern.
 - b. Pipe Embedment Zone Backfill Requirements for Outside and Within Wetland Areas Specified below for each pipe material:
 - 1) Type K copper pipe and standard asphaltic coated, external coating system or polyethylene encased DIP 24 inch and smaller, following Standard Detail M/8.1a:
 - a) Specified in General Trench Backfill Requirements for Outside Wetland Areas.
 - b) Containing no rock or gravel larger than 1-1/2 inches in greatest dimension.
 - c) Liquid limit: Not to exceed 30.
 - d) Plasticity index: Not to exceed 6.
 - e) Dry density: Not less than 105 pounds for each cubic foot as determined by ASTM D698.
 - 2) Standard Asphaltic Coated, external coating system or Polyethylene Encased DIP, Larger than 24 inch:
 - a) Pipe embedment zone: Following Standard Detail M/8.1b:
 - (1) Borrow Aggregate:
 - (a) Gradation number 1, bank run gravel or
 - (b) Gradation number 3, crushed stone as specified herein, containing no rock or gravel larger than 1-1/2 inches in greatest dimension.
 - 3) PVC Gravity Sewer Pipe, following Standard Detail M/8.1c:
 - a) Borrow Aggregate ASTM C33, coarse aggregate size number 67 as specified herein.
 - 4) RCP, following Standard Detail M/8.0:
 - a) Borrow Aggregate for Bedding Zone and Haunching Zone.

- (1) Circular RCP: ASTM C33, coarse aggregate size number 4 and containing no rock or gravel larger than 1-1/2 inches in greatest dimension or coarse aggregate size number 57.
 - b) Initial Backfill Zone: Specified in General Trench Backfill Requirements for Outside Wetland Areas.
 - (1) Containing no rock or gravel larger than 1-1/2 inches.
 - (2) Liquid limit: Not to exceed 30.
 - (3) Plasticity index: Not to exceed 6.
 - (4) Maximum dry density: Not less than 105 pounds for each cubic foot as determined by ASTM D698.
 - 5) PVC and HDPE Pipe for Pressure Sewer System: Standard Detail PS/1.0.
 - a) Borrow Aggregate ASTM C33, coarse aggregate size number 8 as specified herein.
 - 6) PVC AWWA C900/C905 Pipe: Standard Detail.
 - a) Pipe with 10 feet or less cover:
 - (1) Specified in General Trench Backfill Requirements for Outside Wetland Areas.
 - (a) Containing no rock or gravel larger than 3/4 inch in greatest dimension.
 - (b) Liquid limit: Not to exceed 30.
 - (c) Plasticity index: Not to exceed 6.
 - (d) Maximum dry density: Not less than 105 pounds for each cubic foot as determined by ASTM D698.
 - (2) Bedding Zone: May use Borrow Aggregate meeting ASTM C33, coarse aggregate size number 67.
 - b) Pipe with greater than 10 feet cover:
 - (1) Borrow Aggregate ASTM C33, coarse aggregate size number 67 specified herein.
- c. Final Backfill Zone Materials Outside Wetland Areas:
- 1) Specified in General Trench Backfill Requirements.
 - 2) Containing no rock or gravel larger than 3 inches from top of Pipe Embedment Zone to 2 feet above.
 - 3) From 2 feet above Pipe Embedment Zone to finished grade, no rocks larger than 8 inches in greatest dimension, unless contained in sufficient matrix of soil to avoid point to point contact, except:
 - a) Service Connection Contracts (AC, LC, and SC), Type I areas, under existing paving:
 - (1) State and county arterial roads and shoulders: Crushed stone.
 - (2) Other roads: Same as for all other Contracts specified below.
- Or,
- a) All other Contracts, Type I areas, under existing paving, top 30 inches below pavement base course, unless indicated otherwise in Trench Detail for Paved Areas located under ATTACHMENTS: Borrow Aggregate, gradation number 3 or 4 crushed stone. Flowable fill and

recycled concrete may be used instead of Borrow Aggregate, as specified below:

- (1) Flowable fill, unless otherwise shown on Drawings, from top of Pipe Embedment Zone to below pavement base course, if approved by roadway governing jurisdictions.
- (2) Recycled concrete for PVC pipe only, as specified below.
 - (a) Allow at least 12 inch separation between top of PVC pipe and recycled concrete.
 - (b) Do not use recycled concrete if PVC pipe crosses or is within 10 feet or 5 pipe outside diameters horizontally, whichever is greater, to existing Non-PVC pipe.
- b) Type I areas, under future paving and within 5 feet of structure, and Type III areas: Top 12 inches below proposed pavement base course or finished grade containing no rocks or gravel larger than 3 inches.
- d. Final Backfill Zone Materials within Wetland Areas: Specified in General Trench Backfill Requirements, herein.

C. Backfill Requirements for Structures.

1. Granular Bedding for Precast or Cast-in-place Structures:
 - a. Granular Bedding Borrow Aggregate: ASTM C33, coarse aggregate size number 4.
 - b. Borrow Aggregate for Additional Excavation Area below Granular Bedding: ASTM C33, coarse aggregate size number 3 or 4 and/or surge stone.
2. Granular Bedding for On-Grade Slabs: Borrow Aggregate meeting ASTM C33, coarse aggregate size number 4.
3. Backfill for Precast or Cast-in-place Structures: Trench Backfill in Final Backfill Zone, unless otherwise shown on Drawings.
 - a. Flowable fill may be used instead of Trench Backfill material for circular shape precast and cast-in-place concrete manholes.

D. Trench Erosion Checks.

1. Wood: Follow Standard Details.

E. Sheeting, Shoring, and Bracing Materials.

1. Timber, steel, or combination thereof, designed as required to retain earth around structure, prevent cave-in and settlements, and to fulfill MOSH safety requirements.
 - a. Timber: Structural grade with minimum working stress of 1,100 psi.
 - b. Steel Sheet Piling: ASTM A328, continuous interlocking type.
 - c. Struts, Bracing, and other Accessories Required for Sheet Piling System: ASTM A36.

PART 3 EXECUTION

3.1 EXCAVATION

- A. General: Excavate to lines and grades indicated on Drawings.
 - 1. On-grade Slabs and Pavements: Sufficient to allow for fills, base, and waterproofing materials.
 - 2. Planting Areas: Sufficient to allow for topsoil.
 - 3. Formed Concrete: Sufficient to allow for convenient construction and removal of forms, and for application of waterproofing and curing materials.

- B. Test Pit Excavation: Perform with caution and to prevent damage to facility.
 - 1. Special Requirements: Section 02510.

- C. Material Storage and Disposal of Unsuitable Material.
 - 1. Separate and protect excavated material which is suitable Trench Backfill from contamination by unsuitable excavated material or by other sources.
 - 2. Stockpile suitable materials in location approved by Engineer to avoid contamination and prevent erosion.
 - 3. See special provisions for off-site disposal of excess excavated material and unsuitable material.
 - 4. See special provisions for site clearing

- D. Unauthorized Excavation: Where excavations are made below indicated elevations under slabs, footings, pipes, structures, or outside maximum trench pay widths, restore to proper elevations with materials specified herein at Engineer's direction, at no cost to the Commission.

- E. Trench Excavation.
 - 1. Excavate trenches to width and depth following Standard Details, Drawings, or specified herein.
 - a. Sides of trenches within Pipe Embedment Zones: Practically plumb.
 - b. Trench widths within Pipe Embedment Zone for Rigid Pipe shown on Standard Details are maximum widths.
 - 2. Remove rock, when encountered, to minimum depth of 6 inches below pipe barrel and pipe bell and structures.
 - a. Excavate trench bottom to conform to shape and dimensions of proposed pipe or structure.
 - b. Excavate bell holes in trench bottom to permit proper assembling of joints.
 - c. Support pipe or structure uniformly and continuously, upon specified material.
 - 3. Where material not meeting requirements of Trench Backfill and deemed unsuitable by Engineer is encountered either contiguous to or within proposed limits of excavation, Engineer may direct additional excavation and removal of unsuitable material.
 - a. Depth and extent of additional excavation at Engineer's determination.
 - 4. Perform excavation in immediate vicinity of adjacent and crossing facilities by means that will not damage facility.
 - a. Excavate within 1 foot of existing pipelines or conduits by hand.

- b. Repair or replace damage caused to existing facilities, pipelines, or conduits at no cost to the Commission.
- 5. Unless otherwise authorized by Engineer, proceed with trench excavation no more than 40 feet in advance of placing of Trench Backfill.
 - a. Engineer may require backfilling and subsequent re-excavation on trenches left open in advance of pipe installation, at no expense to the Commission.
 - b. Protect or enclose trenches left open overnight, or during periods when Contractor's personnel are not present and mark to prevent danger to public or others.
- 6. Excavate sides of trenches in improved public areas and adjacent to other utilities or structures practically plumb.
 - a. When crossing under existing pipes or conduits, plumb sides of trench from 1 foot above top of existing pipes or conduits to bottom of trench.
 - b. With Engineer's permission, sides of trenches in other areas may be sloped from 1 foot above top of pipe to finished grade, at no additional cost to the Commission.
- 7. Trench Sheet piling, Shoring, and Bracing: Place so as not to interfere with construction work and be entirely independent of footings and structures.
 - a. Method, design and adequacy of sheet piling, shoring and bracing: Meet requirements of MOSH.
 - 1) Repair damage related or caused by excavation at no cost to the Commission.
 - 2) Sheet piling, shoring, and bracing: Before placement, use means acceptable to Engineer for its removal as backfill progresses.
 - b. Sheet and shore as required to assure safe working conditions, maintain required excavation dimensions for proper construction, and to prevent accidents, cave-ins, and damage to adjacent structures, facilities, and surfaces.
 - 1) In excavations over 4 feet in depth, where Commission personnel are required to enter, sheet piling and shoring shall meet requirements of MOSH for Type "C" soil conditions.
 - c. Remove sheet piling, shoring, bracing and wood forms concurrently with backfilling operations, except in Pipe Embedment Zone and where sheet piling is used as 1 side of form for concrete.
 - 1) Accomplish removal in manner that precludes settlement of backfill, cave-in of excavation sides, and prevents damage to adjacent surfaces.
 - 2) Promptly fill voids left or caused by removal.
 - 3) Compact contiguous areas concurrent with removal of trench sheet piling.
 - d. Follow Standard Details where sheet piling is used for trench width between interior faces of sheet piling.
 - e. Sheet piling may be left in place, provided that following are met:
 - 1) Positive verification that no voids exist between sheet piling and trench wall.
 - 2) Upper wales and horizontal braces are removed or excavation is backfilled with sand.
 - 3) Existing voids are filled following Trench Backfill requirements.

- a) Sheeting left in place: Cut off minimum of 1-1/2 feet below finished grade or at Engineer's direction.
- 8. Trench Boxes or Mules: Use of trench boxes: Permitted in areas where excavation sidewalls are suitable and where sheeting, shoring, and bracing are not required to maintain excavation dimensions.
 - a. Structural box design: To withstand pressures imposed thereon.
 - 1) Trench boxes and steel plates and their use: Meet requirements of MOSH.
 - b. Location:
 - 1) Do not extend trench box below top of Pipe Embedment Zone during or after placement of Pipe Embedment Zone material.
 - 2) Remove steel plates used below trench box in Pipe Embedment Zone simultaneously with placement of Pipe Embedment Zone material and before its compaction.
 - c. Box size:
 - 1) Height: Sufficient to assure safe working conditions.
 - 2) Length: To accommodate size and lengths of pipe being installed.
 - 3) Width: For trench opening not more than maximum permitted in Standard Details.

F. Rock Excavation.

- 1. Investigate to determine if rock is present, whether or not it is indicated within Contract Documents.
 - a. Presence or absence of rock will not entitle Contractor to additional compensation.
- 2. When blasting, control fly rock and material to prevent injury or damage to persons or properties.
 - a. Use blasting mats in areas where overburden has been removed before blasting, or as required to control fly rock.
 - b. Equipment used for drilling holes shall have positive means of dust control and meet OSHA and other applicable regulations and agencies requirements in asbestos-bearing rock area.
- 3. Blasting unless otherwise directed by Engineer:
 - a. No closer than 10 feet to existing water, gas, sewer or conduit utilities unless such facilities have been completely exposed, definitely located, and then backfilled before blasting.
 - b. No closer than 2 feet from definitely located existing utilities, 10 inch or smaller diameter.
 - c. No closer than 5 feet from utilities larger than 10 inch diameter.
- 4. Use controlled blasting techniques.
 - a. Modify blasting round as necessary to achieve best obtainable results and to keep air blast over pressure, vibrations, and noise within limits herein specified.
 - 1) Exercise care in drilling and blasting operations to minimize over break and blast damage of adjacent unexcavated ground.
 - 2) Produce satisfactory excavated surface by determining proper relationships of burden, spacing, depth of charge, amount and type of explosive, hole size

and delay pattern, and other necessary considerations to achieve required results.

5. Vibration and Air Blast Control.
 - a. Control operations to ensure:
 - 1) Peak particle velocity will not exceed 2 inches per second measured adjacent to any structure in vicinity of blasting operations or following limits for concrete:

<u>Inches per Second</u>	<u>Age of Concrete</u>
0.25	12 - 24 hours
0.5	24 - 48 hours
1.0	48 hours - 5 days
2.0	5 plus days
 - 2) Impact or impulsive noise from blasting operations will not exceed 140 db peak sound pressure level measured at nearest structure or property line.
 - b. Peak particle velocity definition: Maximum of 3 velocity components of a vibration measured at any point in 3 mutually perpendicular directions by Engineer approved seismograph, capable of producing permanent record and capable of internal dynamic calibration.
 - c. Furnish seismograph instruments, qualified personnel to operate instruments, interpret results for all blasting operations, and submit copy of results to Engineer.
 - d. Record air blast over pressure with peak impact recording instrument having linear frequency response, and submit copy of results to Engineer.
6. Repair or replace facilities damaged by blasting operations at no cost to the Commission.
7. Replace rock which is not broken to meet backfill requirements with suitable Trench Backfill, as specified herein.

G. Dewatering and Drainage.

1. Investigate to determine if water is present, whether or not it is indicated within Contract Documents.
 - a. Presence or absence of water will not entitle Contractor to additional compensation.
2. If water is encountered in excavation, install and maintain dewatering system of sufficient capacity to remove it during excavation, pipe placement, and backfill.
 - a. For structures:
 - 1) Until concrete footings have been poured and cured,
 - 2) Walls or other portions of structure are erected to grade,
 - 3) Or until excavation has been backfilled.
 - b. Do not allow sediment-laden water to flow into watercourses, drainageways, or over land without first filtering it through approved desilting device. See special provisions and sediment control plans.
3. Choose methods of dewatering excavations including, but not limited to, sump pumps, wellpoints, deep wells, drainage blankets, and tight sheeting.
 - a. Continuously inspect dewatering system to ensure it is functioning properly.

- b. Ensure system does not disturb or degrade final subgrade for new pipe or structure and does not cause damage or settlement to adjacent surfaces or structures.
 - c. Modify system as required, and repair or restore damage or disturbance caused by system at no cost to the Commission.
 - d. Install necessary temporary surface drainage and keep it operating to Engineer's satisfaction, until permanent drainage or finish grading has been completed.
 - e. Do not allow damming or ponding of water in gutters or storm drains.
4. Remove dewatering devices upon completion of work at Engineer's direction.

3.2 BACKFILL OPERATIONS

A. Placing Trench Backfill.

- 1. Backfill trench excavations with soils material excavated therefrom, provided this material meets requirements of Trench Backfill herein and at Engineer's approval.
- 2. Do not place, spread, or compact frozen or thawing material or place specified materials upon frozen or thawing ground or during unfavorable weather conditions.
 - a. When work is interrupted by rain, do not resume backfill operations until field tests indicate moisture content and density of materials are within specified limits.
 - b. Rework and recompact after thawing compacted layers which have been frozen before next layer is placed.
 - c. Interruptions in backfill operations due to weather: At no cost to the Commission.
- 3. Mix each lift before compaction to ensure uniform distribution of water content and distribute rocks of permissible sizes through material.
- 4. Place Trench Backfill and utilize compaction equipment that will not damage structures, pipe, and appurtenances.
 - a. Place and compact Trench Backfill around pipe and structures evenly to preclude unbalanced pressure.
 - b. Compaction with large rollers or heavy equipment will not be permitted within 5 feet of structures.
 - c. Repair damage done during backfill operations or replace at Engineer's direction, at no cost to the Commission.
- 5. Place Trench Backfill in uniform lifts of 8 inches maximum in uncompacted thickness, unless otherwise specified herein.
 - a. Spread each layer uniformly and evenly.
 - b. Perform compaction using compacting rollers, pneumatic or vibratory compactors, or other equipment and methods with Engineer's approval.
- 6. When Borrow Material is utilized, place in uniform lifts of 8 inches maximum in uncompacted thickness, or at Engineer's direction.
 - a. Any change in lift thickness is based on test sections and tests under Engineer's direction and observation, and dependent upon type of compaction equipment used.
 - b. Backhoe buckets permitted for gravel compaction.

7. Backfill Structural Fill areas in uniform lifts of 8 inches maximum in uncompacted thickness and compact to not less than 95 percent of maximum dry density, following ASTM D698, at moisture content within 2 percent optimum for material.
8. Meet following conditions when flowable fill is used instead of Trench Backfill material when specified herein for Type I areas under existing paved areas and for circular precast or cast-in-place concrete manholes.
 - a. Prevent floatation during placement of flowable fill.
 - b. Install 12 inches minimum of Trench Backfill material around valves, valve boxes, and fire hydrants.
 - c. Place flowable fill at maximum of 10 foot lifts.
 - 1) Cure flowable fill at least 4 hours before placing additional lift of flowable fill.
 - 2) Cure final lift at least 24 hours before placing additional compacted Trench Backfill material or paving.
 - d. For circular precast or cast-in-place concrete manholes, when specified herein, place flowable fill equally around entire manhole from 1 foot above uppermost pipe entering manhole.
 - 1) Backfill trench with flowable fill from top of Pipe Embedment Zone to below pavement base course.
 - 2) Outside Type I areas backfill minimum 12 inches Trench Backfill material above flowable fill.

B. Placing Trench Backfill for Pipes.

1. Do not backfill around pipe, connections, or fittings until Engineer completes measurements and locations.
2. In new subdivision work where water and sewer service connections are to be placed in same trench at different times, backfill and compact above sewer service connection as specified up to proposed finished grade.
 - a. When installing water service connection, re-excavate as required, install water pipe, backfill, and compact as specified.
3. Detectable Warning Tape
 - a. Use blue detectable warning tape for water mainline and water service connections.
 - b. When water and sewer are installed in same trench use only blue detectable tape.
 - c. Use green detectable warning tape for gravity sewer mainline, gravity sewer service connections, and pressure sewer piping for both grinder pump systems and force mains.
 - 1) Detectable warning tape will not be required when both manholes in gravity sewer mainline reach are within limits of existing or proposed paved areas.
 - d. Use yellow detectable warning tape for externally coated ductile iron pipelines and test station lead wires.
 - e. Place tape directly over centerline of pipe the full length of trench, 18 to 30 inches below finished surface and with minimal number of splices.
 - 1) Overlap tape minimum 6 inches at splices and intersections.

4. On steep slopes, place trench erosion checks following Standard Details, at locations shown on Drawings or at Engineer's direction.
5. When pipelines cross under existing utilities, place and compact Trench Backfill around and between existing pipelines or conduits, using manual tampers to ensure proper compaction and to avoid damage to pipes or conduits.
 - a. When indicated on Drawings, place and compact Borrow Aggregate to limits following Standard Detail.
 - b. Flowable fill may be used instead of Borrow Aggregate specified herein.
6. When connecting to existing pipelines, backfill under and around excavated and undermined existing pipes with Trench Backfill compacted as structural fill:
 - a. Backfill existing Rigid Pipe to pipe springline with Borrow Aggregate ASTM C33, coarse aggregate size number 67, or same Borrow Aggregate as used at connecting or adjacent pipe.
 - b. Backfill existing Flexible Pipe to 1 foot above top of pipe.
 - 1) DIP 24 inch and smaller and Type K Copper Pipe: Trench Backfill.
 - 2) DIP larger than 24 inch: Borrow Aggregate.
 - a) Bank run gravel, gradation number 1,
 - b) Or crushed stone, gradation number 3.
 - 3) PVC Gravity Sewer Pipe:
 - a) Borrow aggregate, ASTM C33.
 - b) Coarse aggregate, size number 67 or size number 8.
 - 4) PVC AWWA C900/905 PVC Pipe.
 - a) Pipe with 10 feet or less cover:
 - (1) Trench Backfill containing no rock or gravel larger than 3/4 inch.
 - (2) Or Borrow Aggregate meeting ASTM C33, coarse aggregate size number 67 for Bedding Zone.
 - b) Pipe with greater than 10 feet cover:
 - (1) Borrow Aggregate meeting ASTM C33, coarse aggregate size number 67 for Bedding Zone.
7. Place and compact specified Trench Backfill in following Zones to width and depth following Standard Details and Drawings, unless otherwise specified.
 - a. Additional excavation area below Pipe Embedment Zone: Place as Trench Backfill and compact as Structural Fill.
 - b. Pipe Embedment Zone: Place and compact Trench Backfill as Structural Fill.
 - 1) DIP, 24 inch and smaller and PVC AWWA C900/905: If additional excavation below trench bottom is required to remove unsuitable material, install minimum 6 inches of compacted Trench Backfill between pipe and additional excavation material.
 - 2) PVC Pipe: Compact using manual tampers.
 - 3) All sizes of DIP with external coating system or polyethylene encasement: Place Trench Backfill around pipe without damaging pipe coating and polyethylene encasement.
 - a) Do not drop Trench Backfill directly on pipe; use deflecting boards or other temporary protection.
 - b) Do not permit workers to walk on or place tools on pipe.

- 4) Sewer pipe connections to manholes or structures: Bentonite when required, following special provisions, Details or Drawings.
 - 5) Pipe Embedment Zone within Wetland Areas: Extend from trench bottom to 6 inches above pipe, full width of trench.
 - 6) Pipe to have concrete encasement: Place around pipe within Pipe Embedment Zone, to limits shown on Standard Details.
- c. Final Backfill Zone: Place Trench Backfill and compact following these designation types. Trench Backfill not meeting requirements herein: Re-compact at no cost to Commission.
- 1) Service Connection Contracts (AC, LC, and SC) in Type 1 areas under existing paving:
 - a) State and county arterial roads and shoulders.
 - (1) Place crushed stone in horizontal layers not to exceed 6 inches in depth.
 - (2) Uniformly tamp each layer and compact by means of mechanical or vibratory compacting device.
 - b) Other roads: Same as for "All other Contracts" specified below.

Or,

- 1) All other Contracts in Type I areas under existing paving:
 - a) Compact to not less than following percents of maximum dry densities at moisture content within 2 percent of optimum for material, as determined by listed ASTM method.
 - (1) MSHA highways: 92 percent except for top foot, and this will be 95 percent following ASTM D1557.
 - (2) All other paved areas: 95 percent except for top foot, which will be 100 percent following ASTM D698.
 - 2) In Type I areas under future paved areas and within public rights of way: Compact to not less than 95 percent of maximum dry density following ASTM D698 at moisture content within range where density can be obtained based on moisture density curves taken on existing soil.
 - 3) In Type II: Compact in layers to form thoroughly dense refill free of voids and to preclude settlement within limits specified herein.
 - 4) In Type III areas: Place in 12 inch maximum lifts and compact to not less than 90 percent of maximum dry density, following ASTM D698, at moisture content within range where density can be obtained.
 - 5) In Type IV areas: Place in 12 inch lifts.

C. Placing Trench Backfill for Structures.

1. Place and compact specified backfill material to width and depth following Standard Details, Drawings, and specified herein.
 - a. Additional excavation area, below Granular Bedding: Place and compact Trench Backfill as Structural Fill.
 - b. Granular Bedding, under structure: Place and compact specified herein.
 - c. Place and compact Trench Backfill as Structural Fill to top of structure or to finished grade, following Drawings or Standard Details.

D. Finished Grade.

1. Grade areas disturbed during Work to existing grade before disturbance, unless otherwise noted on Drawings, Standard Details, or with Engineer's approval.
2. Slope surface to drain, to provide positive drainage in Type I, II, and III areas.

3.3 RESTORATION

- A. Restore and restabilize surface features and facilities damaged or destroyed during construction at least to condition existing before construction, following Section 01770, and other applicable Specification Sections.

PART 4 MEASUREMENT AND PAYMENT

4.1 EXCAVATION AND BACKFILL FOR TRENCHES AND STRUCTURES

- A. Excavation listed will not be measured separately for payment, but cost will be included in unit prices bid for particular item.
1. Pipelines and structures, and backfill with approved Trench Backfill material excavated from trench, including required Pipe Embedment Zone material for pipes and Granular Bedding for structures.
 2. Original existing pavement excavation and disposal, 30 inch cap, and temporary pavement.
- B. No payment will be made for excavation and backfill for pipelines and structures in excess of limits described herein.

4.2 BORROW MATERIAL ABOVE PIPE EMBEDMENT ZONE

- A. Measurement: By compacted volume in cubic yards actually placed for type required when listed in Bid Schedule.
1. Borrow Material will be computed using depth to top of pipe of embedment zone and width as shown on Standard Details and Drawings and specified herein.
 2. No allowance will be made for any material deposited beyond these limits.
- B. Payment: At unit price for each cubic yard listed in Bid Schedule.
1. When required in Special Provisions, and no item is listed in Bid Schedule, no measurement for payment will be made and cost thereof will be considered incidental.
 2. When required under Engineer's direction, at fixed contingent price listed in Bid Schedule.
 3. Payment includes disposal off-site of unsuitable material.

4.3 PIPE EMBEDMENT ZONE FOR PIPES

- A. Pipe Embedment Zone material for pipes will not be measured for payment, but cost shall be included in unit price for each linear foot in Bid Schedule.

4.4 GRANULAR BEDDING FOR STRUCTURES

- A. Granular Bedding for structures will not be measured for payment, but cost shall be included in Bid Schedule lump sum item for structures.

4.5 ADDITIONAL EXCAVATION

- A. Measurement: Excavation of unsuitable material and replacement with Borrow Material below Pipe Embedment Zone or below Granular bedding or structures, at Engineer's direction, measured by cubic yard actually replaced.
- B. Payment: At fixed contingent unit price for each cubic yard listed in Bid Schedule.
 - 1. Payment includes excavation and disposal off-site of unsuitable material, and provision of Borrow Material.

4.6 TEST PITS

- A. Measurement: Test pits in numbers, at locations, and to limits directed by Engineer measured by cubic yard of excavated material removed.
 - 1. Those portions of test pits not backfilled but utilized as trench excavation, and test pits required by Contract Documents, are not measured for payment as test pits, but their cost are included in unit prices bid.
- B. Payment: At fixed contingent unit prices for each cubic yard listed in Bid Schedule.
 - 1. Payment includes labor, equipment, and material required to excavate, maintain, and backfill test pits following requirements specified herein.

WSSC

SPECIAL PROVISIONS
SECTION 02510
WATER DISTRIBUTION SYSTEM

DELETE Standard Specification Section 02510 in its entirety and SUBSTITUTE;

PART 1 GENERAL

1.1 DESCRIPTION

- A. Section includes requirements to furnish, construct, and test piping for water supply and distribution system, including fire protection.

1.2 REQUIREMENTS FOR MANUFACTURERS AND SUPPLIERS AND CONTRACTORS BEFORE DELIVERY

- A. Commission supplied material: Inspected by the Contractor.
 - 1. Damage of exterior coated pipe and fittings; Contractor shall repair following Pipe Manufacturer's recommendations.
- B. Contractor shall provide with his Bid Package for 30-inch and larger pipe and fittings, the following:
 - 1. Project Schedule showing the pipe laying by stations and locations.
 - 2. Identify delivery sequence with specific locations, pipe sizes and quantities required per the lay schedule. See Section 01110.
- C. The Commission will provide in bid documents the following for all exterior coated pipe and fittings and all 30-inch and larger pipe and fittings:
 - 1. Recommended coating thickness in cutback area on spigot end of pipe in area receiving rubber sealing gasket in jointing process.
 - 2. Recommended guidelines for environmental conditions to protect pipe, fittings and valves from moisture, humidity, and temperature in area where cleaning, coating application, curing, and repair of coating is performed.
 - 3. Recommended repair methods and procedures for repair of defects and damage to coating, including limits for defects or damage considered repairable.
 - a. Include repair methods and procedures for use on Contract site and at coating applicator's site.
 - b. Include cure times and consider all weather conditions in location of installation.
 - 4. Handling and loading procedures for coated pipe, fittings, and valves.
 - 5. Recommended voltage for testing coated pipe, fittings, and valves for holidays.
 - 6. Pipe and fittings lay schedule for 30-inch and larger pipe and fittings
- D. Conduct quality assurance for furnished pipe, fittings, and valves following standards specified herein.

- E. Commission may inspect materials, including in-plant testing of valves, following Section 01450.
- F. Quality assurance for precast concrete utility structures is specified in Section 03400.
- G. Tapping Contractor: Performed successful pressure taps on cast iron, ductile iron pipe (DIP), or polyvinyl chloride (PVC) water mains.
- H. PVC pipe manufactured more than 12 months prior to installation will not be accepted.
- I. Qualifications for linestop tapping equipment installer:
 - 1. Experience: Actively engaged in linestop installation for minimum of 3 years, with at least 5 projects in the last 3 years of similar size and type.
 - 2. Field supervisory personnel: Experienced in performance of work and tasks stated herein for minimum of 3 years.
- J. Qualifications for insertion valve equipment installer:
 - 1. Experience: Actively engaged in insertion valve installation for minimum of 3 years, with at least 5 projects in the last 3 years of similar size and type.
 - 2. Field supervisory personnel: Experienced in performance of work and tasks stated herein for minimum of 3 years.

1.3 SUBMITTALS

- A. Submit following Section 01330.
 - 1. Manufacturer's shop drawings showing valves, operators, gear ratios, design flows, and pressure differential, performance charts, and parts list for all valves 16 inch and larger.
 - 2. Working drawings and calculations for pipes with welded on thrust rings.
 - 3. Proposed temporary bypass piping system.
 - a. Catalog data for pipe material.
 - b. Working drawings and description of sizes and locations.
 - 4. Product data and coating procedure for surface preparation, prime coat and finish coat application for PCCP adapters.
 - 5. Manufacturer's shop drawings for linestop installation, including but not limited to; pipe taps, drilling apparatus, linestops, tapping valves and all other equipment and materials necessary to complete the work.
 - 6. Manufacturer's shop drawings for insertion valve installation, including but not limited to; pipe taps, drilling apparatus, insertion valves, tapping valves and all other equipment and materials necessary to complete the work.
 - 7. Waiver for pipe and fittings, valves, precast concrete structures, fire hydrants, and welded on thrust rings: Submit letter naming the manufacturer who has on file with the Commission a certified standard drawing containing required Commission approved information. Provide new submittals if specifications change.

- B. Submit following Section 01450 on Contractor provided materials.
 - 1. Certificates of Compliance or Materials Checklist Furnished by the Commission, for all applicable materials specified herein.
 - 2. Manufacturer's Certified Test Reports:
 - a. Valves 16 inches and larger:
 - 1) Tests specified in the referenced standards.
 - 2) Tests performed on valves and valve operators.
- C. Tapping Sleeve and Valve or Tapping Assembly and Valve: Submit before main is tapped.
 - 1. Installation and testing instructions.
 - 2. Recommended maximum test pressure and length of time for testing assembly using water as test medium.
- D. Submit manufacturers' installation instruction for PVC pipe and fittings, joint restraint devices, and manufacturer's instructions for tapping pipe.
- E. Submit for information only:
 - 1. Contractors Experience and Supervisory Field Personnel for Linestop Tapping Equipments/Installer.
 - a. Presentation of similar experience in the last 3 years.
 - 1) Include, but not limited to, owner name, address, telephone number, contact person, date and duration of work, location, pipe information, and contents handled by the pipeline.
 - b. Supervisory field personnel and historical information of linestop experience.
 - c. At least one of the field supervisors listed must be at site when linestop operations are in progress.
 - 2. Submit copies of WSSC approved tapping card, MDE Sediment and Erosion Control Certification and American Traffic Safety Services Association (ATSSA) flagger certification.

1.4 STORAGE AND HANDLING

- A. Engineer will inspect materials on site before installation following Section 01450.
- B. Loading, unloading, handling, inspection, and storage of pipe, fittings, valves, joint accessories, and appurtenances: Follow AWWA C600 and AWWA C605 as well as AWWA C900 and C905, and as specified herein.
- C. Storage: Store pipe, fittings, valves, and appurtenances off ground using sound wood blocks placed on stable foundation or using other appropriate means. Allow space between rows, individual pieces and bundles with clearance below and above to allow full view for inspection purposes.
 - 1. Store in well-drained area away from brush and accessible for inspection.
 - 2. Do not stack pipe higher than 54 inches high.

3. Keep spigot ends of pipe clean and clear for dimensioning purposes.
 4. Do not place excavated or other material over or against stored material.
 5. PVC pipe:
 - a. Store so it does not deform or bend.
 - b. Pipe stored outdoors or otherwise exposed to direct sunlight: Cover with canvas or other opaque material with provision for adequate air circulation.
- D. Handling: Unload and handle materials with crane, backhoe, or equipment of adequate capacity, equipped with appropriate slings or padding to protect materials from damage. Use of chains for handling pipe is not permitted.
- E. Repair or Replacement:
1. Repair damages or defects following approved manufacturer's recommendations.
 2. Remove and replace at no cost to the Commission materials deemed not repairable.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Pipe and Fittings.
1. General:
 - a. Provide pipe and fittings of same size and material by same manufacturer, marked with manufacturer's name or trademark.
 - b. Bolts and nuts: Marked, cast, or forged with identification of material and producer. Painted markings are not acceptable.
 - c. The Commission will furnish:
 - 1) Meters.
 - d. To obtain material furnished by the Commission, the Contractor shall notify and make arrangements with the Commission's warehouse as specified in Section 01110.
 - 1) The Commission will arrange for Contract site delivery when the quantity of pipe comprises a truckload lot or more. When material is delivered directly to the job site, the Commission will so notify the Contractor at least 24 hours before delivery. The Contractor shall unload and store the material to the satisfaction of the Engineer.
 - 2) Pipe and fittings delivered direct to work site will be inspected prior to installation and will be marked either with WSSC'S logo, which means acceptable and ready for installation, or REJECTED-R which means it is rejected for installation until repaired by the manufacturer or REJECTED-NR which means it is rejected and non-repairable and shall not be installed. The Contractor shall return rejected items to the Anacostia Store yard to exchange for replacement pieces.
 2. Zinc Coated DIP :
 - a. External Coating for Ductile Iron Pipe: Zinc Coating conforming to AWWA C150 and C151 with the following minimum properties, or approved equal.

- 1) Coating system shall conform to ISO 8179
 - 2) Coated with a layer of arc-sprayed zinc.
 - a) 200 g of zinc shall be applied per m² of pipe surface area.
 - 3) Asphaltic top-coat shall be applied. The mean dry film thickness shall be greater than or equal to 3 mils. The local allowable minimum thickness is 2 mils.
 - 4) Interior surface shall be cleaned and lined at the pipe casting facility with a standard thickness cement-mortar lining applied in conformity with AWWA C104. An asphalt seal coat may be applied to the surface of the cement-mortar lining if part of manufacturer's standard practice.
 - 5) Pipe bell shall be painted with white or gray paint to signify the pipe is zinc coated.
 - 6) Flanged pipe for vault piping:
 - a) Does not require zinc coating.
 - b) Exterior:
 - (1) Asphalt coated: AWWA C151 and AWWA C111, unless otherwise shown on the Drawings or Standard Details. Zinc coating is allowed as an option.
- b. Handling, Transportation and Storage: per AWWA C600.
 - c. Class: Unless otherwise shown on Drawings, follow Special Thickness Class in AWWA C151, minimum Class 54 for 4 inch through 54 inch.
 - d. Lengths:
 - 1) 18 or 20 feet.
 - 2) Pipe provided for installation on curved alignment: Pipe lengths that will not require joint to be deflected more than 80 percent of manufacturer's recommendation.
 - e. In addition to markings required in AWWA C151, for pipe 36 inch and larger diameter, clearly mark manufacturer's pipe control number on each pipe length on face or near inside of bell.
 - f. Imperfections:
 - 1) Wrinkles or dimples:
 - a) On spigot sealing surface: Unacceptable.
 - b) On bell and contour: Acceptable to depth of 3/16 inch, provided minimum metal thickness under imperfection is maintained.
 - c) On pipe barrel: Acceptable to depth of 1/16 inch, provided minimum wall thickness requirements are met.
 - 2) Laminations: On spigot sealing surface and those greater than 1/16 inch in depth on remaining outside surface of pipe: Unacceptable.
 - 3) Pinholes: Acceptable when minimum wall thickness for designated class is maintained.
 - g. Approved manufacturers:
 - 1) American Cast Iron Pipe Company.
 - 2) United States Pipe and Foundry Co. (U.S. Pipe)
 - 3) McWane Cast Iron Pipe Company
 - 4) or approved equal

3. Alternative Externally Coated Pipe: When shown on Drawings, coat outside of pipe, fittings, valves, valve boxes and extension stems with one of the two methods identified below.
 - a. Class: Unless otherwise shown on Drawings, follow Special Thickness Class in AWWA C151, minimum Class 54 for 4 inch through 54 inch.
 - b. Lengths:
 - 1) 18 or 20 feet.
 - 2) Pipe provided for installation on curved alignment: Pipe lengths that will not require joint to be deflected more than 80 percent of manufacturer's recommendation.
 - c. In addition to markings required in AWWA C151, for pipe 36 inch and larger diameter, clearly mark manufacturer's pipe control number on each pipe length on face or near inside of bell.
 - d. Approved manufacturers:
 - a) American Cast Iron Pipe Company.
 - b) United States Pipe and Foundry Co. (U.S. Pipe)
 - c) McWane Cast Iron Pipe Company
 - d) or approved equal
 - e. Handling, Transportation and Storage: Following AWWA C215 and AWWA C600 and in such a manner as to protect pipe and coating from damage.
 - 1) Coating plant: Bearing surfaces of forklift must be padded with suitable material. Web slings may also be used.
 - 2) Project site: Handle with minimum of two slings of type that will not damage coating.
 - a) Slings:
 - (1) Minimum 18 inches wide and sufficient strength to handle weight safely.
 - (2) Slings shall not pass through pipe.
 - (3) Hooks on ends of pipe will not be allowed.
 - 3) Cables and chains used during transportation must be padded with approved material. Use padded horizontal separator strip between rows of piping and all contact areas where pipe will rest. Use of wood spacers between rows of pipe is acceptable if proper padding is used to protect the coating.
 - 4) Store on padded minimum 12-inch-wide skids or select loamy or sand dirt berms, or suspended from cutback ends where possible. Skid chucks used should be padded.
 - f. External Coating systems: Polyolefin system or Tape Coating.
 - 1) General
 - a) Predominant method to be shop applied coatings, at pipe manufacturers shop or separate applicator's facility.
 - b) Manufactured by single supplier.
 - c) Coating products: Compatible and same products used throughout.
 - d) Pipe surfaces that come in contact with potable water inside the pipeline to be coated with materials having NSF 61 certification.
 - e) Coating Applicator: Certified as qualified by the coating manufacturer.

- 2) Polyolefin System
 - a) External Coating for Ductile Iron pipe: Polyolefin system following NACE SP0185 and AWWA C215 with the following minimum properties, or approved equal.
 - (1) Surface preparation: Following coating manufacturers and coating applicator's recommendations.
 - (a) Compounded butyl rubber adhesive coating.
 - (b) Less than 0.1% water absorption.
 - (c) Nominal thickness 10 mils.
 - (2) Top Coat: High density polyethylene resin spirally extruded onto adhesive coating in multiple layers to form a seamless bonded coating with the following properties;
 - (a) Nominal thickness: 40 mils.
 - (b) Density: >0.95 (ASTM D1505).
 - (c) Elongation: >600% (ASTM D638)
 - (d) Tensile strength: <2800 psi (ASTM 638).
 - (3) Total coating system:
 - (a) Thickness: 50 mils (40 mils polyethylene top coat, 10 mils butyl rubber adhesive)
 - (b) Impact resistance: >60 inch-lbs (ASTM G14)
 - (c) Cathodic disbondment: 6 mm radius (ASTM G8 of G95)
 - (d) Water absorption: 0.06% (ASTM D570)
 - (4) Approved manufacturer:
 - (a) Pritec as manufactured by Bredero Shaw, Division of ShawCor Ltd.
 - (b) Or equal.
- 3) Tape Coating.
 - a) Pipeline: Coated with specified coating system.
 - (1) Polyken Technologies, Westwood, MA.
 - (2) Applicator Experience: Factory applied by an approved Polyken applicator with minimum 5 years of experience coating pipe with a tape system that is, by definition, a bonded coating system.
 - (3) Pipe to be received by coating applicator with outer diameter bare, no pipe manufacturer applied coatings.
 - (4) Surface preparation: Mechanical wire brushing to remove excess rust, dirt, dust and other surface contaminants.
 - (a) Mill scale or oxide layer on the outer diameter may remain on pipe after this step.
 - (5) Coating System components:
 - (a) Primer - Polyken # 1027 Liquid Adhesive
 - (b) Filler Tape-Polyken # 939-125 Filler tape and/or #939-1000 Filler rope
 - (c) First Coat - Polyken #930-35 Innerwrap; 35 mils, to be applied with a 50/50 overlap to provide a total thickness of 70 mils.

- (d) First Coat Properties:
 1. Tensile Strength: 15 lbs./in. (ASTM D1000)
 2. Elongation: 340% (ASTM D1000)
 3. Adhesion: 250 oz./in. (ASTM D1000)
 4. Cathodic Disbondment: 0.25 in. radius (ASTM G8)
 5. Water Vapor Transmission: 0.07 perm (ASTM E96B)
 6. Volume Resistivity: 2.5×10^{16} ohm•cm (ASTM E257)
 7. Dielectric Breakdown: 650 volts/mil (ASTM D1000)
 8. Dielectric Strength: 21 kV (ASTM D149)
 9. Insulation Resistance: 1.4×10^7 M ohm (ASTM D1000)
 10. Impact Resistance: >8 Nm (EN12068)
 11. Penetration Resistance: Class B30 (EN12068)
- (e) Second Coat - Polyken #954-15 Outerwrap; 15 mils, to be applied with a 1 inch overlap to provide full coverage.
- (f) Second Coat Properties:
 1. Tensile Strength: 20 lbs./in. (ASTM D1000)
 2. Elongation: 200% (ASTM D1000)
 3. Adhesion: 25 oz./in. (ASTM D1000)
- (g) Tape colors between first and second coats: Different colors to ensure full coverage.
- (6) Average final thickness: Minimum 85 mils.
- b) Joints and Fittings: Coated with specified coating system.
 - (1) Polyken Technologies, Westwood, MA
 - (2) Applicator Experience: Factory applied by an approved Polyken applicator with minimum 5 years experience coating pipe with a tape system that is, by definition, a bonded coating system.
 - (3) Fittings to be received by coating applicator with bare external surface, no manufacturer applied coatings.
 - (a) If the receipt of bare fittings will cause the project to be delayed, coating system can be applied over factory applied asphaltic coating.
 - (b) Preferred method is bare fitting.
 - (4) Surface preparation: Mechanical wire brushing to remove excess rust, dirt, dust and other surface contaminants.
 - (a) Mill scale or oxide layer on the outer diameter may remain on pipe after this step.
 - (5) Coating System components:
 - (a) Primer - Polyken #1027 Liquid Adhesive
 - (b) Filler Tape-Polyken # 939-125 Filler tape and/or #939-1000 Filler rope
 - (c) First Coat - Polyken #930-35 Innerwrap; 35 mils, to be applied with a 50/50 overlap to provide a total thickness of 70 mils.
 - (d) First Coat Properties:
 1. Tensile Strength: 15 lbs./in. (ASTM D1000)

2. Elongation: 340% (ASTM D1000)
 3. Adhesion: 250 oz./in. (ASTM D1000)
 4. Cathodic Disbondment: 0.25 in. radius (ASTM G8)
 5. Water Vapor Transmission: 0.07 perm (ASTM E96B)
 6. Volume Resistivity: 2.5×10^{16} ohm•cm (ASTM E257)
 7. Dielectric Breakdown: 650 volts/mil (ASTM D1000)
 8. Dielectric Strength: 21 kV (ASTM D149)
 9. Insulation Resistance: 1.4×10^7 M ohm (ASTM D1000)
 10. Impact Resistance: >8 Nm (EN12068)
 11. Penetration Resistance: Class B30 (EN12068)
- (e) Second Coat - Polyken #954-15; 15 mils, to be applied with a 1 inch overlap to provide full coverage.
- (f) Second Coat Properties:
1. Tensile Strength: 20 lbs./in. (ASTM D1000)
 2. Elongation: 200% (ASTM D1000)
 3. Adhesion: 25 oz./in. (ASTM D1000)
- (g) Tape colors between first and second coats: Different colors to ensure full coverage.
- (6) Average final thickness: Minimum 85 mils.
- g. Field Applied Materials.
- 1) Coating Repairs.
 - a) Shop applied coatings damaged in transit or during handling: Repair as recommended by shop applied coating manufacturer and in a manner that is entirely compatible with original coating system.
 - 2) Coating Ductile Iron Pipe Joints: One of the following systems.
 - a) Required for all joints in systems using Alternatively Externally Coated Pipe.
 - b) Joint wrap and repair tape: Two component extruded tape consisting of polyethylene and butyl rubber adhesive following AWWA C209.
 - (1) Thickness: 35 mils (7 mils polyethylene backing, 28 mils butyl rubber adhesive).
 - (2) Adhesion: 225 oz. /in width (ASTM D1000).
 - (3) Tensile strength: 15 lbs./in width (ASTM 1000)
 - (4) Water vapor transmission rate: 0.05 gm/100 in²/24 hrs.
 - (5) Dielectric strength: 23kV (ASTM D149).
 - (6) Insulation resistance 1.4×10^7 M Ohms (ASTM D257)
 - (7) Tape width: As recommended by coating manufacturer.
 - (8) Use filler tape, recommended by the joint tape manufacturer to fill uneven areas at the top of pipe joint to assure smooth application of joint wrap tape.
 - (9) Approved manufacturer: Polyken 939 or equal.
 - c) Heat shrinkable sleeves designed for corrosion protection of water pipelines that utilize crosslinked polyolefin backing coated with protective, heat activated adhesive for bonding to metallic substrates and pipeline coatings following AWWA C216. Minimum properties:

- (1) Tensile strength: 2,200 psi
 - (2) Elongation: 400%
 - (3) Volume resistivity: 10^{14} ohm-cm
 - (4) Water vapor transmission: 0.05
 - (5) Adhesion to steel: 25 N/cm
 - (6) Lap shear: 12 psi
 - (7) Impact: 25 in-lbs.
 - (8) Use filler material recommended by heat-shrink sleeve manufacturer to fill uneven area at the pipe joint to assure smooth application of heat shrink sleeve.
- d) Fitting and joint wrap tape: Polyken Tape Coating System
- (1) Fittings and joints will be delivered to the site with manufacturer applied fusion bonded epoxy coating:
 - (2) Surface preparation:
 - (a) Remove external coating to bare metal at thermite weld locations.
 - (b) Mechanical wire brushing to remove excess rust, dirt, dust and other surface contaminants.
 1. Mill scale or oxide layer on the outer diameter may remain on pipe after this step.
 - (3) Coating System Components
 - (a) Primer - Polyken # 1027 Liquid Adhesive
 - (b) Filler- Polyken # 939-125 Filler Tape and/or #939-1000 Filler Rope
 - (c) First Coat - Polyken #930-35 Innerwrap; 35 mils, to be applied with a 50/50 overlap to provide a total thickness of 70 mils.
 - (d) First Coat Properties:
 1. Tensile Strength: 15 lbs./in. (ASTM D1000)
 2. Elongation: 340% (ASTM D1000)
 3. Adhesion: 250 oz./in. (ASTM D1000)
 4. Cathodic Disbondment: 0.25 in. radius (ASTM G8)
 5. Water Vapor Transmission: 0.07 perm (ASTM E96B)
 6. Volume Resistivity: 2.5×10^{16} ohm•cm (ASTM E257)
 7. Dielectric Breakdown: 650 volts/mil (ASTM D1000)
 8. Dielectric Strength: 21 kV (ASTM D149)
 9. Insulation Resistance: 1.4×10^7 M ohm (ASTM D1000)
 10. Impact Resistance: >8 Nm (EN12068)
 11. Penetration Resistance: Class B30 (EN12068)
 - (e) Second Coat - Polyken #954-15; 15 mils, to be applied with a 1 inch overlap to provide full coverage.
 - (f) Second Coat Properties:
 1. Tensile Strength: 20 lbs./in. (ASTM D1000)
 2. Elongation: 200% (ASTM D1000)
 3. Adhesion: 25 oz./in. (ASTM D1000)

- (g) Tape colors between first and second coats: Different colors to ensure full coverage
 - (h) Average final thickness: Minimum 85 mils.
- 4. Fittings: Ductile iron bell, mechanical, or push on joint, unless shown otherwise on Drawings or Standard Details.
 - a. Size, dimensions, and tolerances: AWWA C110 or AWWA C153 and AWWA C111.
 - b. Mechanical joint solid sleeves: AWWA C110 or AWWA C153 and AWWA C111.
 - c. Unless otherwise shown, furnish fittings 3 inch through 24 inch diameter having minimum pressure rating of 350 psi, and furnish fittings larger than 24 inch diameter having minimum pressure rating of 250 psi.
 - d. Mechanical joints: See Joint Material.
 - e. Coatings:
 - 1) Exterior and interior: Fusion bond epoxy coated: Follow AWWA C110 and AWWA C116
 - a) Shop applied materials: (fusion bonded epoxy)
 - f. Fittings 36 inch and larger diameter: In addition to cast markings required in AWWA C110 and C153, clearly stencil on with waterproof paint on each fitting the year, month, and day cast, lot number, and manufacturer's fitting control number.
 - g. Approved manufacturers:
 - 1) American Cast Iron Pipe Co.
 - 2) Clow Water Systems Company, (Division of McWane Incorporated).
 - 3) Tyler Union, (Division of McWane Incorporated).
 - 4) United States Pipe and Foundry Co.
 - 5) SIGMA Corporation.
 - 6) Star Pipe Products.
 - 7) North American Cast Iron Products, Inc. (NACIP, Inc.)
 - 8) SIP Industries (excluding products manufactured in the Mexico facility).
 - 9) or approved equal
- 5. Flanged Pipe and Fittings:
 - a. Flanged pipe: AWWA C115 and requirements for pipe above.
 - 1) Approved Manufacturers for Flanged Pipe:
 - a) American Cast Iron Pipe Company.
 - b) United States Pipe and Foundry Co. (U.S. Pipe)
 - c) McWane Cast Iron Pipe Company
 - d) or approved equal
 - b. Flanged fittings: AWWA C110 and requirements for fittings above except for flanged joints.
 - 1) Flanges for fittings: Cast integrally with body and with same thickness over their entire circumference.
 - a) Faces: Perpendicular to axis of pipe.
 - b) Bolt holes: Equally centered and spaced.
 - c) Joint accessories: See Joint Material.

- 2) Bolts, nuts and studs: ANSI A21.11 for end flange joints, except provide minimum 304 stainless steel nuts and bolts with protective coating to prevent galling.
- 3) Approved Manufacturers for Flanged Fittings:
 - a) American Cast Iron Pipe Company.
 - b) United States Pipe and Foundry Co.
 - c) Tyler Union (Division of McWane Incorporated).
 - d) Star Pipe Products.
 - e) Sigma Corporation.
 - f) North American Cast Iron Products, Inc. (NACIP, Inc.)
 - g) SIP Industries (excluding products manufactured in the Mexico facility).
 - h) or approved equal
- 4) Blind flanges for entry ports: Steel following AWWA C207
 - a) Drill for bolt circle to match flange on entry port tee.
 - b) Class D for total pressures (operation plus surge) up to 150 psi.
 - c) Class E for total pressures (operation plus surge) up to 275 psi.
 - d) Class F for total pressures (operation plus surge) up to 300 psi.
 - e) Coatings:
 - (1) Exterior and interior: Fusion bond epoxy coated following AWWA C110 and AWWA C116
6. Welded-on Connections (Bosses or Outlets) 8 Inch Diameter and Smaller: For coated DIP 24 inch and larger diameter when shown on Drawings, Standard Details, or when Contractor chooses welded on connections instead of AWWA C110 tee fittings.
 - a. Mechanical Joint or Flanged Joint: See Joint Material
 - b. Coatings:
 - 1) Exterior: Zinc or Alternative Externally Coated per AWWA C151, or C215, unless otherwise shown on Drawings.
 - 2) Interior:
 - a) Line welded-on bosses with liquid epoxy coating, certified by NSF for contact with potable water.
 - b) Line welded-on outlets with double thickness cement and seal coat: AWWA C104.
 - 3) Mainline pipe: Sufficient thickness to meet Class specified, including within heat affected area:
 - a) Welded-on bosses, minimum Class 54 or as shown on Drawings.
 - b) Welded-on outlets, minimum Class 54 or as shown on Drawings.
 - c) Minimum Charpy impact value is 10 foot-pounds.
 - d) Has passed 300 psi hydrostatic test without leakage.
 - 4) Approved manufacturers, welded-on bosses:
 - a) United States Pipe and Foundry Co.
 - 5) Approved manufacturer, welded-on outlets:
 - a) American Cast Iron Pipe Company

7. PVC Pipe and Fittings.
 - a. Pipe 12 inch and smaller: AWWA C900. Pipe 14 inch and larger: AWWA C905 as modified herein unless otherwise indicated elsewhere in Contract Documents.
 - 1) Class and thickness: DR14 or as noted on the drawings, with DIP equivalent outer diameters.
 - 2) Potable water use: NSF61.
 - 3) Pipe markings: AWWA C900 and AWWA C905
 - 4) Joining pipes: Utilize elastomeric gasket push on joints following AWWA C900 and AWWA C905
 - 5) Approved Manufacturers:
 - a) For PVC Pipe requiring joint deflections:
 - (1) IPEX
 - (2) National Pipe and Plastic, Inc.
 - (3) Plastic Trends; US Subsidiary of Royal Building Products
 - b) For PVC Pipe requiring no joint deflections:
 - (1) JM Eagle™
 - (2) Diamond Plastic Corp.
 - (3) North American Pipe.
 - (4) IPEX
 - (5) National Pipe and Plastic, Inc.
 - (6) Plastic Trends; US Subsidiary of Royal Building Products
 - (7) or approved equal
 - b. Fittings:
 - 1) See Fittings for Ductile Iron Pipe.
8. Tapping sleeves for existing gray iron, ductile iron, and PVC pipe 36 inch and smaller.
 - a. Cast from gray iron, ductile iron, or material manufactured from ASTM A283 Grade C, ASTM A36, or equal.
 - b. Full sleeve type (with test plug) capable of containing pressure with full volume of sleeve.
 - c. Gaskets butt against existing pipe ensuring a watertight seal.
 - d. Suitable for use with Class AB or CD cast iron pipe or ductile iron for sizes 12 inches and smaller without changing either half of sleeve, unless field measurements are taken for type and outside diameter of existing pipe.
 - e. Rated at minimum 200 psi water working pressure for 12 inch and smaller diameter sleeves and minimum 150 psi working pressure for 14 inch to 24 inch.
 - f. Capable of withstanding rated working pressure without leakage past side and end gaskets and no leakage at junction of the two.
 - g. Mechanical Joint:
 - 1) Bolts, hexagonal nuts, rubber gaskets, and other accessories: AWWA C111, except provide minimum 304 Stainless Steel nuts and bolts with protective coating to prevent galling.
 - h. Valve flange:

- 1) Suitable for connecting to mating end of tapping valve, which has a raised face to ensure true alignment of valve and tapping machine, following Manufacturers Standardization Society (MSS) SP60.
 - 2) AWWA C207 Class D, Class E, or Class F (match tapping valve flange) for material manufactured from ASTM A283 Grade C, ASTM A36, or equal.
- i. Coatings and linings:
 - 1) No coating or linings for NSF certified Stainless Steel.
 - 2) Gray or ductile iron casted tapping sleeves AWWA C110.
 - a) Material manufactured from ASTM A283 Grade C, ASTM A36, or equal tapping sleeves.
 - b) Interior Lining: Fusion bonded epoxy that is EPA or NSF approved for contact with potable water, a minimum thickness of 12 mils, following AWWA C213.
 - c) Exterior Coating: Fusion bonded epoxy, a minimum thickness of 12 mils, following AWWA C213.
 - j. Approved manufacturers:
 - 1) American Flow Control, Series 2800C and 1004.
 - 2) Clow Valve Company (A Division of McWane Inc.), Figure FS5205.
 - 3) M&H Valve Company (A Division of McWane Inc.), Style 1574 and 1674.
 - 4) Mueller Company, Style H-615-24.
 - 5) Tyler Pipe/Utilities Division.
 - 6) United States Pipe and Foundry Co., Ductile Iron T-9.
 - 7) JCM Industries, Inc., Nash, Texas, Number JCM 412 Fabricated Steel Tapping Sleeves with 150 lb ANSI outlet flange.
 - 8) [or approved equal](#)
9. Tapping sleeves for existing gray iron or DIP larger than 36 inch:
 - a. Material manufactured from ASTM A283 Grade C, ASTM A36, or equal.
 - b. Full sleeve type capable of containing pressure with full volume of sleeve.
 - c. Gaskets butt against existing pipe providing watertight seal.
 - d. Rated at minimum 150 psi water working pressure.
 - e. Capable of withstanding rated working pressure without leakage past the side and end gaskets and no leakage at the junction of the two.
 - f. Furnish test plug on sleeve for field pressurization of sleeve, valve, and tapping machine assembly before making tap.
 - g. Interior Lining: Lined with fusion bonded epoxy that is EPA or NSF approved for contact with potable water, minimum thickness of 12 mils, following AWWA C213.
 - h. Exterior Coating: Fusion bonded epoxy, a minimum thickness of 12 mils, following AWWA C213.
 - i. Mechanical joint bolts, hexagonal nuts, rubber gaskets and all other accessories: AWWA C111, except provide minimum 304 stainless steel nuts and bolts with protective coating to prevent galling.
 - j. Gasket material: AWWA C111.
 - k. Valve flange:

- 1) Manufactured: AWWA C207 Class D, Class E, or Class F (match tapping valve flange).
 - 2) Suitable for connecting to mating end of tapping valve, which has raised male face to ensure true alignment of valve and tapping machine, following MSS SP60.
 - 3) Bolts, nuts and studs: ANSI A21.11 for end flange joints, except provide minimum 304 stainless steel nuts and bolts with protective coating to prevent galling.
 - l. Marking on sleeve: Manufacturer's name or logo and barrel and outlet diameters, at a minimum. Either cast or stenciled with waterproof paint and all markings must be legible.
 - m. Approved manufacturers:
 - 1) [JCM Industries, Inc., Nash, Texas.](#)
 - a) Number JCM 412 ESS Fabricated Steel Tapping Sleeves.
 - b) Number JCM 414 ESS Fabricated Mechanical Joint Tapping Sleeves.
 - 2) [Romac Industries, Inc., Seattle, Washington, Number FTS425 Steel Fabricated Tapping Sleeve.](#)
10. Adapters: PCCP to DIP.
- a. Approved Manufacturer: Hanson Pipe & Precast for PCCP to DIP 16 inches through 54 inches diameter.
 - b. Construction: AWWA C301.
 - 1) Welding: AWS D1.1.
 - 2) Steel cylinder: Designed to withstand total pressure (working and surge pressure) or 275 psi, whichever is greater, following Barlow Formula.
 - a) Maximum allowable steel stress: 0.50 of steel yield stress.
 - b) Minimum steel cylinder thickness: 1/4 inch.
 - 3) Loads for adapters longer than 3'-0": Designed for external loads following AWWA Manual M-11.
 - 4) Adapter ends: Compatible with mating pipe ends.
 - 5) Required accessories: Complete with bolts, nuts, gaskets, and diapers.
 - 6) Flanges: Designed for total pressure or surge of 275 psi, whichever is greater, and matching bolt size, bolt hole diameter, and bolt hole circle of mating flange.
 - c. Shop Coatings.
 - 1) Machined surface: Coat with one coat of Porter Guard Alkyd Zinc Dust Coating No. 299.
 - 2) Steel surfaces: Coat with liquid epoxy that is certified by NSF for contact with potable water.
 - d. Shop Surface Preparation and Coating Application: AWWA C210.
 - 1) Liquid epoxy coating systems for interior and exterior of steel component pipelines: AWWA C210.
 - 2) Approved finish coats:
 - a) PorterLine 6000.
 - b) Carboline Carboguard 891.
 - c) Tnemec Series N140 Pota-pox Plus.

- d) or approved equal.
11. Linestop.
- a. General.
 - 1) Rated at minimum working pressure of 150 psi and hydrostatic test pressure of 300 psi.
 - 2) Lined waterways with Fusion-bonded epoxy, EPA or NSF approved for potable water, minimum thickness of 12 mils, following AWWA C213.
 - 3) Exterior coating: Fusion bonded epoxy minimum thickness 12 mils, following AWWA C-213.
 - 4) Bolts, nuts and studs: minimum 304 Stainless Steel with protective coating to prevent galling following ANSI A21.11.
 - b. Tapping Saddle Assembly.
 - 1) Full encirclement consisting of, at minimum, upper saddle plate with anchor neck, lower saddle plate, tapping flange and nozzle with gland or gasket for pressure tight seal suitable for potable water ranging in temperature from 32 degrees F to 100 degrees F. All components properly shaped and adequate strength to ensure proper mounting and pressure tight seal around existing pipe.
 - 2) Saddle plates manufactured from ASTM A283 Grade C, ATSM A36 or equal steel, clean and sound without defects that impact their service. No plugging or welding of such defects will be allowed.
 - 3) Outlet flange manufactured of same material as tapping saddle assemblies: Flat face and drill following ANSI B16.5, Class 150 flange. Provide suitable independently operating locking device in periphery of flange to secure completion plug.
 - 4) All waterways: Dye-penetrant inspected for water tightness.
 - c. Completion Plug:
 - 1) Manufactured from ASTM A283 Grade C, ASTM A36 or equal steel.
 - 2) Equipped with two circumferential grooves; one to receive the locking device from flange, and second to contain compressible "O" ring to seal pressure tight against interior diameter of nozzle.
 - d. Blind Flange:
 - 1) To seal tapping saddle assembly upon removal of tapping and linestop equipment.
 - 2) Manufactured from AWWA C207, Class D steel and drilled to match bolt circle of nozzle of tapping saddle assembly.
 - e. Linestop Machine:
 - 1) Tapping Equipment Fabricator/Installer: Furnish folding plug head linestop capable of pressure tight seal against inside diameter of existing pipe.
 - 2) Linestop: Advance into and retract from pipeline by means of hydraulic or mechanical actuator. When retracted the folding plug head to be housed in pressure tight chamber between the actuator and tapping valve.
 - 3) Folding plug: Capable of displacing accumulated grit deposits in interior of the pipe while advancing to its linestopping position and have molded

polyurethane sealing element around its perimeter and supply workable seal with interior diameter when fully advanced.

- f. Approved Tapping Equipment Fabricator/Installers:
 - 1) Hydra-Stop Services
 - 2) Flowserve US, Inc.
 - 3) Barton Construction Corp.
 - 4) Linestop International Flow-Technologies, Inc.
 - 5) or approved equal.
12. Insertion Valve.
 - a. General.
 - 1) Rated at minimum working pressure of 150 psi and hydrostatic test pressure of 250 psi.
 - 2) Vertical orientation required.
 - 3) Lined waterways of all ferrous materials: Fusion bonded epoxy, EPA or NSF approved for potable water, minimum thickness 12 mils, following AWWA C213.
 - 4) Exterior coating of all ferrous materials: Fusion bonded epoxy minimum thickness 12 mils, following AWWA C-213.
 - 5) Externally accessible bolts, nuts and washers:
 - a) Minimum 304 Stainless Steel with protective coating to prevent galling, following ANSI A21.11.
 - b. Valve Body.
 - 1) Three part pressure-tight assembly suitable for potable water ranging in temperature from 32 degrees F to 100 degrees F.
 - a) Two piece sleeve properly shaped and of adequate strength to ensure proper mounting and pressure tight seal around existing cast iron or ductile iron pipes.
 - b) Bonnet or Cartridge Closure Flange.
 - (1) To complete the pressure tight seal for the insertion valve.
 - c) Cast from gray iron, ductile iron or material manufactured from ASTM A283 Grade C, ASTM A36, Stainless Steel Type 304, or equal.
 - 2) Valve seat: Resilient rubber to provide pressure-tight bi-directional seal when valve is closed.
 - 3) Valve stem: Stainless steel or bronze following requirements of AWWA C500, C509 or C515.
 - 4) Operating nut: AWWA, 2-inch square, turned counterclockwise to open for non-rising stem with standard AWWA numbers of turns to open valve.
 - c. Tapping Equipment.
 - 1) Furnished by Fabricator/Installer.
 - 2) Remove existing pipe material during tapping or milling operation.
 - d. Approved Valve, Tapping Equipment Fabricator/Installers:
 - 1) Advanced Valve Technologies, LLC; 4 inch through 12 inch.
 - 2) Hydra-Stop (Division of ADS, LLC); 4 inch through 12 inch
 - 3) Team Industrial Services; 4 inch through 12 inch.
 - 4) or approved equal.

13. Copper Pipe and Fittings.
 - a. Pipe: Seamless, type K, and following ASTM B88.
 - b. Service Fittings: Copper following high pressure requirements of AWWA C800.
 - 1) Flared Copper tube connections: AWWA C800 for flared connections with straight threads.
 - a) Approved Manufacturers:
 - (1) A.Y. McDonald Manufacturing Company.
 - (2) Cambridge Brass.
 - (3) Ford Meter Box Company.
 - (4) Mueller Company.
 - (5) or approved equal.
 - 2) Brass Nipples: Following NSF 372 and ASTM B43
 - a) Reamed, chamfered with male NPT ends: Following ANSI/ASME B.1.20.1.
 - b) Approved manufacturers;
 - (1) A.Y. McDonald Manufacturing Company.
 - (2) Lee Brass Co.
 - (3) Merit Brass Company.
 - (4) or approved equal.
 - 3) Bronze castings: Manufactured of Copper Development Association (CDA) alloys meeting chemical and physical properties of ASTM B584 and following AWWA C800, NSF 372.
 - 4) Compression copper tube connections: Follow AWWA C800.
 - a) Elastomer seal to prevent leakage.
 - b) Corrosion resistant, e.g. stainless steel, split or gripper ring to restrain joint.
 - c) "Tighten to stop" design
 - d) Approved Manufacturers:
 - (1) A.Y. McDonald Manufacturing Company, Q style.
 - (2) Ford Meter Box Company, Q style.
 - (3) Cambridge Brass, Q style.
 - (4) Mueller Company, 110 style.
 - (5) or approved equal.
 - 5) Connections with National Pipe Threaded connections (NPT): Follow ANSI/ASME B1.20.1, NSF 372, and AWWA C800 or ANSI B 16.15.
 - a) Approved manufacturers;
 - (1) A.Y. McDonald Manufacturing Company.
 - (2) Ford Meter Box Company.
 - (3) Lee Brass Company.
 - (4) Merit Brass.
 - (5) or approved equal.
 - c. Service Insulator Assemblies (Available in flare or compression styles).
 - 1) Ensure thread compatibility;
 - a) Insulator: Use same style as outlet end of corporation stop.
 - b) Compression outlet stops: Use same manufacturer.

- 2) Approved manufacturers:
 - a) Mueller Insulated Products, Mueller Co.
 - b) Ford Meter Box Company, Inc.
 - c) A.Y. McDonald Manufacturing Company.
 - d) Cambridge Brass.
 - e) or approved equal.
14. Service Saddles:
- a. General:
 - 1) Use for 2 inch and smaller connections.
 - 2) Manufacture saddles with clamps for underground services:
 - a) Rated for minimum service of 150 psi.
 - b) Provide full support around the circumference of pipe.
 - c) Do not distort, scratch, or damage pipe when tightened.
 - d) Contains thick tapping boss, which has been precision-machined with full-length threads for watertight connection that resists pullout.
 - e) Threads: AWWA C800 with standard corporation stop thread.
 - f) Ductile Iron: ASTM A536 with epoxy coating.
 - g) Stainless Steel: ASTM A193 and ASTM A240, type 304.
 - h) Saddle body meeting ASTM A395 or A536 and AWWA C800.
 - (1) Uniform quality, true to pattern, of even grain, sound and smooth, and without cold shuts, swells, scales, blisters, sand holes, cracks or other defects.
 - (2) Surfaces: Smooth with no burnt-on sand.
 - (3) Finish: Minimum 12 mils fusion bonded meeting AWWA C213.
 - i) Double straps: Type 304 Stainless Steel.
 - j) Nuts, washers and studs: Type 304 Stainless Steel
 - k) Use watertight gaskets of Buna-N rubber meeting NSF 61 certified and ASTM D2000 or Nitrile around tap hole.
 - b. Saddles for Cast Iron or DIP.
 - 1) Approved manufacturers and models for 3 inch:
 - a) Ford Meter Box Co., Inc., Style No. FC202.
 - b) JCM Industries, Inc., Model No. 406-0413.
 - c) Mueller Company, Catalog No. DR 2S0356.
 - d) Smith-Blair, Inc., Model Nos. 317-000-41309-000, 317-000-41313-000, and 317-000-41315-000, all Double Strap.
 - e) PowerSeal Pipeline Products Corporation, Model 3417DI.
 - f) or approved equal
 - 2) Approved manufacturers and models for 4 inch and above:
 - a) Ford Meter Box Co., Inc., Style No. FC202.
 - b) Mueller Company, Catalog No. DR2S.
 - c) A.Y. McDonald Manufacturing Company Catalog No. 4855A.
 - d) Smith-Blair, Inc., Model No. 317.
 - e) JCM Industries, Model No. 406.
 - f) PowerSeal Pipeline Products Corporation, Model 3417DI.
 - g) or approved equal

- c. Saddles for PVC AWWA C900 and C905 Pipe.
 - 1) Use tapping saddle manufactured specifically for AWWA C900 and C905 PVC pipe with stainless steel wide band straps, nuts and washers.
 - 2) Approved Manufacturers and Models:
 - a) Ford Meter Box Co., Inc. FC202.
 - b) Smith Blair, Inc., Model No. 317.
 - c) Mueller Company, Series DR2S.
 - d) A.Y. McDonald Manufacturing Company, Model 4855A.
 - e) PowerSeal Pipeline Products Corporation, Model 3417DI.
 - f) [or approved equal.](#)

B. Joint Material:

- 1. Push on and Mechanical Joints: AWWA C111, C110, C153, C900, and C905.
 - a. Mechanical joints: minimum 304 stainless steel tee head bolts with protective coating to prevent galling.
 - b. Gaskets: AWWA C111
 - 1) Nitrile (NBR) Gaskets, if specified on Drawings: ANSI/AWWA C111/A211.11
- 2. Flanged Joints: AWWA C110, AWWA C115, and specified herein.
 - a. Flange bolts, nuts, and washers: minimum 304 stainless steel with protective coating to prevent galling.
 - b. Nuts: Cold punched, hexagonal, trimmed, and chamfered.
 - c. Heads, nuts and threads: ANSI B1.1.
 - d. Bolts: 1/4-inch projection beyond nut when joint with gasket is assembled.
 - e. Gaskets: Full-faced, 1/8-inch thick rubber.
 - f. When flange joints are required for connecting to Class 250 gate valves with flanges, follow ANSI B16.1, Class 250, flat face flanges, unless otherwise specified.
- 3. Mechanical Couplings: Heaviest standard type for each size without pipe stops and following Drawings.
 - a. Approved manufacturers:
 - 1) Cascade Waterworks Mfg. Co., Style CDC.
 - 2) Dresser Manufacturing Division, Dresser Style No. 138.
 - 3) PowerSeal Pipeline Products Corporation, Style No. 3501 and 3506.
 - 4) Romac Industries, Inc., Style 400.
 - 5) Smith-Blair, Inc. (formerly Rockwell International), Model No. 441.
 - 6) [or approved equal](#)
- 4. Joint Restraining Material:
 - a. Harness lug for Mechanical Couplings:
 - 1) Stainless Steel for strapping and harnessed joints: Minimum 3/4-inch diameter and in accordance with ASTM A193B8 (304) or B8M (316).
 - 2) Bolts and nuts: Minimum 304 Stainless Steel with protective coating to prevent galling.
 - 3) Approved Manufacturer:
 - a) [Romac Industries, Inc. Style 490](#)

- b. Wedge action restrainer glands:
 - 1) Approved manufacturers for DIP Mechanical Joint:
 - a) EBAA Iron, Inc., MEGALUG Series 11XX-DEC (with Mega-bond) MEGALUG Series 1100SD (with Mega-bond), for use with existing Mechanical joints.
 - b) Ford Meter Box Company, Inc., UNI-FLANGE Series UFR1400-DA-XX- (I or U) (with E-Coat),
 - c) Romac Industries, Inc., ROMAGRIP Series XX-RAP (with E-Coat)
 - d) SIGMA Corporation, ONE LOK Series SLDE-XPXX (with Corrsafe Coating System),
 - e) Star Pipe Products, STARGRIP, Series 3000-XX with accessories, (with Starbond Coating System).
 - f) Tyler Union, Tuf Grip Series TLD-XX-FBE with accessories (with E-coat).
 - g) Smith-Blair, Inc., 111 Cam-Lock with accessories (with fusion bonded Flex-Coat)
 - h) [or approved equal.](#)
 - 2) Approved manufacturers for PVC Pipe:
 - a) UniFlange, Series 1500.
 - b) EBAA Iron, Series 2000PV.
 - c) Capital Industries, EZ Lok 4 inch through 12 inch diameter.
 - d) PVC Stargrip Series 4000 (Only if being used in conjunction with the Starbond coating system as well as minimum 304 stainless steel bolts with protective coating to prevent galling).
 - e) [or approved equal.](#)
- c. Restrained joint for PVC Pipe push-on joint: Meet Uni-B-13.
 - 1) Approved manufacturers:
 - a) JCM 620 Sur-Grip.
 - b) EBAA Iron, Series 1600.
 - c) UniFlange, Series 1390-C.
 - d) [or approved equal.](#)
- d. Push on restrained joint gasket for 4 inch through 24-inch DIP.
 - 1) Approved manufacturers:
 - a) United States Pipe and Foundry Co., FIELD LOK 350® for use with TYTON JOINT pipe.
 - b) American Cast Iron Pipe Co., Fast-Grip for use with Fastite pipe.
 - c) McWane Cast Iron Pipe Co., Sure Stop 350® for use with TYTON JOINT pipe.
 - d) [or approved equal.](#)
- e. Restrained proprietary push on joint pipe and fittings: 16 inch and larger DIP.
 - 1) Approved manufacturers:
 - a) American Cast Iron Pipe Co.
 - (1) Flex-Ring Joint, 16 inch through 36 inch.
 - (2) Lok-Ring Joint, 42 inch through 54 inch.
 - b) United States Pipe and Foundry Co.

- (1) TR Flex Joint, 16 inch through 36 inch.
- (2) HP LOK, 30 inch through 54 inch.
- c) Clow Water Systems Company (Division of McWane Incorporated), Super Lock 16 inch through 30 inch.
- d) McWane Cast Iron Company (Division of McWane Incorporated), McWane restrained joint for Fastite joint pipe, 36 inch.
- e) [or approved equal.](#)
- f. Restraint of Field Cut Proprietary Restrained Joint Pipe, 16 Inch and Larger Diameter DIP.
 - 1) Approved manufacturers:
 - a) American Cast Iron Co., Field Flex-Ring, 16 inch through 36 inch.
 - b) United States Pipe and Foundry Co., TR Flex Gripper Ring, 16 inch through 36 inch.
- g. Anchor Coupling and Anchoring Tee: Ductile iron minimum pressure rating 250 and follow coating requirements for fittings above.
 - 1) Joint: Mechanical joint with integrally cast standard mechanical joint, rotatable glands on each end that has lock against joint separation.
 - 2) Anchor Coupling Length: 12 to 13 inches.
 - 3) As manufactured by approved fitting manufacturers listed herein.

C. Valves:

- 1. Gate Valves, Resilient Seated, sizes 3 inch through 14 inch: Designed, built and tested following AWWA C509 or AWWA C515 except as modified herein.
 - a. Working pressure rating: 250 psi.
 - b. General configuration:
 - 1) Non-rising stem, resilient seated design for installation in horizontal or near horizontal pipe lines.
 - 2) Operated with AWWA, 2 inch square operating nut turned counterclockwise to open.
 - c. Valve stem material: Minimum yield strength (determined as stress producing an elongation under load of 0.5 percent, which is 0.01 inches in gage length of 2.0 inches) of 40,000 psi. Following ASTM B763, UNS alloy C99500 or ASTM B138, UNS alloy C67600 in H04 temper.
 - d. Valve stem extension: Follow Standard Details.
 - 1) Approved manufacturer:
 - a) [The General Engineering Company, Model/Series WVR-XXWS4D](#)
 - b) [Kravitch Machine Company, Model/Series GVENXXXCR.](#)
 - e. Corrosion resistant coating:
 - 1) Fusion bonded epoxy, follow AWWA C550.
 - 2) Minimum 8 mils dry film thickness.
 - 3) Applied to all ferrous metal surfaces after rendering surfaces free from grease, dirt and moisture, and performing near-white, blast cleaning following SSPC-SP10/NACE 2.
 - 4) Do not coat fasteners or machined surfaces subject to contact and relative movement against other surfaces during operation of valve or other surfaces

- where such coating would compromise proper installation or functionality of valve.
- f. Externally accessible bolts, nuts and washers: minimum 304 Stainless steel with protective coating to prevent galling.
 - g. Direct buried valves:
 - 1) Mechanical joint ends following AWWA C111.
 - 2) Non-adjustable, elastomeric stem seals.
 - a) Adjustable packing glands not permitted for direct buried applications.
 - 3) Direct operation of stem from above via 2 inch square nut.
 - a) No gear box provided.
 - 4) Approved Manufacturers and Models:
 - a) American Flow Control Series 2500 (with factory provided round yellow “NDZ” tag under operating nut).
 - b) Clow Valve Co. Model 2638...74XX, Figure No. F-6100 or Model 2639...74XX, Figure 6100.
 - c) Kennedy Valve Co. Figure No. 8571YSS or 7571YSS (YST for Type 316 SS Bolting with protective coating to prevent galling)
 - d) M & H Valve Co. Style XX4067014002 (W/SS BOLTING with protective coating to prevent galling) or XX7571011002 (W/SS BOLTING with protective coating to prevent galling).
 - e) Mueller Company Catalog No. A2361LN-23.
 - f) U.S. Pipe, Valve and Hydrant Division Catalog No. AUSA1LN-23.
 - g) [or approved equal.](#)
 - h. Non Direct buried valves.
 - 1) Vertical orientation required.
 - 2) Flanged ends: ANSI B16.1 Class 125 or Class 250 if specified on Drawings.
 - 3) *Pipe plugs in valve body:
 - a) Minimum 1/2 inch for valve sizes up to 4 inches.
 - b) Minimum 3/4 inch for valve sizes larger than 4 inch.
 - c) Solid brass installed with Teflon tape seal on threads.
 - 4) Direct operation of stem from above via 2 inch square nut.
 - a) No gear box provided.
 - 5) Approved Manufacturers and Models:
 - a) American Flow Control Series 2500* (with factory provided round yellow “NDZ” tag under operating nut).
 - b) Clow Valve Co. Model 2638*...74XX, Figure No. F-6102* or Model 2639*...74XX, Figure No. F-6102.
 - c) Kennedy Valve Co. Figure No. 8561ANYSS* or 7561AYNSS* (YST for Type 316 SS Bolting with protective coating to prevent galling).
 - d) M & H Valve Co. Style XX4067024002* (W/SS BOLTING with protective coating to prevent galling) or XX7561021002* (W/ SS BOLTING with protective coating to prevent galling).
 - e) Mueller Company Catalog No. A2361LN-06(with factory provided rectangular yellow “WSSC” tag under operating nut).

- f) U.S. Pipe, Valve and Hydrant Division Catalog No. AUSP1LN-06. (with factory provided rectangular yellow “WSSC” tag under operating nut).
 - g) [or approved equal.](#)
 - i. Tapping Valves.
 - 1) Direct Buried: Vertical orientation required.
 - 2) Waterway sized to provide clearance for tapping machine cutter with minimum diameter 1/2 inch less than size of valve.
 - 3) Inlet end.
 - a) Flange: ANSI B16.1 Class 125 or Class 250 if specified on Drawings.
 - b) Flange with face having annular projection (configured following Manufacturers Standardization Society of Valve and Fitting Industry, SP-60) to center the valve in the recess of tapping sleeve flange (for gray iron and ductile iron pipe) or tapping assembly (for PCC pipe)
 - 4) Outlet end: Mechanical joint following AWWA C111.
 - 5) Direct operation of stem from above via 2 inch square nut.
 - a) No gear box provided.
 - 6) Approved Manufacturers and Models:
 - a) American Flow Control Series 2500 (with factory provided round yellow “NDZ” tag under operating nut).
 - b) Clow Valve Co. Model 2638...74XX, Figure No. F-6114 or Model 2639...74XX, Figure No. F-6114.
 - c) Kennedy Valve Co. Figure No. 8950YSS or Figure No. 7590YSS (YST for type 316 SS BOLTING with protective coating to prevent galling).
 - d) M & H Valve Co. Style XX4751014026 (W/SS BOLTING with protective coating to prevent galling) or XX7950011002 (W/SS BOLTING with protective coating to prevent galling).
 - e) Mueller Company Catalog No. T2361LN-19.
 - f) U.S. Pipe, Valve and Hydrant Division Catalog No. TUSP1LN-19.
 - g) [or approved equal.](#)
- 2. Gate Valves, Double Disc, Class 125: Built and tested following AWWA C500 with gray or ductile iron body, bronze mounted, parallel seat, double disc with nonrising stem, nut operated to open left with 2-inch square operating nut.
 - a. To withstand and operate under non-shock working pressure.
 - 1) Valves 12 inch and smaller diameter, 200 psi.
 - 2) Valves 14 inch diameter, 150 psi.
 - b. Bonnet test plugs: Allen or hexagonal socket type flush with bonnet surface.
 - c. Tapping Valves: Follow above requirements, except as modified for passage and clearance for tapping machine.
 - d. Valve ends:
 - 1) Not direct buried: Flanged Ends, ANSI B16.1 Class 125.
 - 2) Direct buried: Mechanical Joint, AWWA C111 and AWWA C500.
 - 3) Tapping valves: Flange inlet.

- a) Class 125, ANSI B16.1, suitable for connecting to tapping sleeve (gray iron or DIP)
 - 4) Tapping valve: Outlet.
 - a) Direct buried: Mechanical Joint, AWWA C111 and AWWA C500.
 - b) Not direct buried: Flanged Ends, ANSI B16.1 Class 125, and allowing tapping machine adapter to be attached directly to valve.
 - e. Bolts, nuts, washers, and gaskets: See Joint Material previously specified herein.
 - f. Valve Stem Extension: See Resilient Seated Gate Valves.
 - g. Hydrostatic tests shall be performed in accordance with Section 5.1 of AWWA C500. Each test shall be held at the pressure indicated in the standard for a period of a minimum of 20 minutes.
 - h. Approved manufacturers:
 - 1) Flanged end:
 - a) [Clow Valve Company \(Division of McWane Incorporated\), Model No. F-5070.](#)
 - b) [Kennedy Valve \(Division of McWane Incorporated\), Model No. F-5070.](#)
 - 2) Mechanical joint:
 - a) [Clow Valve Company \(Division of McWane Incorporated\), Model No. F-5065.](#)
 - b) [Kennedy Valve \(Division of McWane Incorporated\), Model No. F-5065.](#)
 - 3) Tapping valves:
 - a) [Clow Valve Company \(Division of McWane Incorporated\), Model No. F-5067](#)
 - b) [Kennedy Valve \(Division of McWane Incorporated\), Model No. F-5067.](#)
- 3. Gate Valves, double disc, sizes 16 inch through 48 inch for high working pressure applications.
 - a. Designed, built and tested following AWWA C500 except as modified herein.
 - b. Working pressure rating: Minimum 250 psi.
 - c. General Configuration:
 - 1) Non-rising stem, metal seated, parallel, double disc design for installation in horizontal or near horizontal pipe lines.
 - 2) Operated with AWWA, 2 inch square operating nut turned counterclockwise to open.
 - d. Non-Direct buried only.
 - 1) Horizontal orientation required.
 - 2) ANSI B16.1 Class 125 or 250 flanges as indicated on Drawings.
 - e. Valve Stem extension: See Resilient Seated Gate Valves.
 - f. Corrosion resistant coating:
 - 1) Follow AWWA C550 and NSF 61 certified.
 - 2) Minimum 8 mils dry film thickness.
 - 3) Tnemec N140-1211 epoxy or Amerlock 2 red oxide epoxy by Ameron International: Applied in two coats to interior and exterior ferrous metal

- surfaces after rendering surfaces free from grease, dirt and moisture, and performing near-white, blast cleaning following SSPC-SP10/NACE 2.
- 4) Do not coat fasteners or machined surfaces subject to contact and relative movement against other surfaces during operation of valve or other surfaces where such a coating would compromise the proper installation or functionality of the valve.
 - g. Externally accessible bolts, nuts and washers: minimum 304 Stainless steel with protective coating to prevent galling.
 - h. Pipe plug:
 - 1) Minimum 3/4 inch solid brass.
 - 2) Install with Teflon tape seal in tapped boss on bonnet or body.
 - i. Gear case: Following AWWA C500. Sealed, grease filled with bevel gearing operated from above via 2 inch square nut. Acceptable gear ratios:

Valve Size	Ratio	Valve Size	Ratio
16"	2:1 to 4:1	30"	4:1 to 6:1
18"	3:1 to 4:1	36"	4:1 to 6:1
20"	3:1 to 4:1	42"	6:1 to 8:1
24"	3:1 to 4:1	48"	8:1

- j. Bypass gate valve: Following AWWA C500.
 - 1) Locate at end of body opposite stem location.
 - 2) Operation of bypass from above via 2 inch square nut.
- k. Rollers, tracks and scrapers required or rolling disc design with tracks and scrapers acceptable in lieu of separate rollers on disc.
- l. Hydrostatic tests shall be performed in accordance with Section 5.1 of AWWA C500. Each test shall be held at the pressure indicated in the standard for a period of a minimum of 20 minutes.
- m. Manufacturers and Models:
 - 1) [Kennedy Model 50-ARD](#).
 - 2) [Ludlow Rensselaer Division of Patterson Pump Co. Model List 14](#).
- n. Tapping Valves.
 - 1) Waterway sized to provide clearance for tapping machine cutter with minimum diameter 1/2 inch less than size of valve.
 - 2) Non-Direct buried.
 - a) Horizontal orientation required.
 - b) Inlet end.
 - (1) ANSI B16.1 class 125 or 250 flange as indicated on Drawings.
 - (2) Flange with face having annular projection (configured following Manufacturers Standardization Society of Valve and Fitting Industry, SP-60) to center valve in recess of tapping flange (for gray iron and ductile iron pipe) or tapping assembly (for PCC pipe)
 - c) Outlet end: Following ANSI B16.1, class 125 or 250. Flange for connection to tapping machine adapter, as specified on Drawings.

- d) Gear case: Following AWWA C500. Sealed, grease filled with bevel gearing operated from above via 2 inch square nut. Acceptable gear ratios:

Valve Size	Ratio	Valve Size	Ratio
16"	2:1 to 4:1	30"	4:1 to 6:1
18"	3:1 to 4:1	36"	4:1 to 6:1
20"	3:1 to 4:1	42"	6:1 to 8:1
24"	3:1 to 4:1	48"	8:1

- 3) Bypass gate valve: Following AWWA C500.
 - a) Locate at end of body opposite stem location.
 - b) Operation of bypass from above via 2 inch square nut.
 - 4) Rollers, tracks and scrapers required or rolling disc design with tracks and scrapers acceptable in lieu of separate rollers on disc.
 - 5) Approved Manufacturers and Models:
 - a) [Kennedy Valve Model 42.](#)
 - b) [Ludlow Rensselaer Division of Patterson Pump Co. Model List 14.](#)
4. Gate Valves, double disc, sizes 16 inch through 48 inch for normal working pressure applications.
- a. Designed, built and tested following AWWA C500 except as modified herein.
 - b. Working pressure rating: 150 psi.
 - c. General Configuration:
 - 1) Non-rising stem, metal seated, parallel, double disc design for installation in horizontal or near horizontal pipe lines.
 - 2) Operated with AWWA, 2 inch square operating nut turned counterclockwise to open.
 - d. Non-Direct buried only.
 - 1) Horizontal orientation required.
 - 2) ANSI B16.1 Class 125 flanges.
 - e. Valve Stem extension: See Resilient Seated Gate Valves.
 - f. Corrosion resistant coating:
 - 1) Follow AWWA C550 and NSF 61 certified.
 - 2) Minimum 8 mils dry film thickness.
 - 3) [Tnemec N140-1211 epoxy or Amerlock 2 red oxide epoxy by Ameron International:](#) Applied in two coats to interior and exterior ferrous metal surfaces after rendering surfaces free from grease, dirt and moisture, and performing near-white, blast cleaning following SSPC-SP10/NACE 2.
 - 4) Do not coat fasteners or machined surfaces subject to contact and relative movement against other surfaces during operation of valve or other surfaces where such a coating would compromise the proper installation or functionality of the valve.
 - g. Externally accessible bolts, nuts and washers: minimum 304 Stainless steel with protective coating to prevent galling.

- h. Pipe plug:
 - 1) Minimum 3/4 inch solid brass.
 - 2) Install with Teflon tape seal in tapped boss on bonnet or body.
- i. Gear case: Following AWWA C500. Sealed, grease filled with bevel gearing operated from above via 2 inch square nut. Acceptable gear ratios:

Valve Size	Ratio	Valve Size	Ratio
16"	2:1 to 4:1	30"	4:1 to 6:1
18"	3:1 to 4:1	36"	4:1 to 6:1
20"	3:1 to 4:1	42"	6:1 to 8:1
24"	3:1 to 4:1	48"	8:1

- j. Bypass gate valve: Following AWWA C500.
 - 1) Locate at end of body opposite stem location.
 - 2) Operation of bypass from above via 2 inch square nut.
- k. Rollers, tracks and scrapers required or rolling disc design with tracks and scrapers acceptable in lieu of separate rollers on disc.
- l. Hydrostatic tests shall be performed in accordance with Section 5.1 of AWWA C500. Each test shall be held at the pressure indicated in the standard for a period of a minimum of 20 minutes.
- m. Manufacturers and Models:
 - 1) Kennedy Valve Model 52.
 - 2) Ludlow Rensselaer Division of Patterson Pump Co. Model List 13a.
 - 3) Clow Valve Co. figure No. F-5070,
 - 4) Kennedy Valve Co. style #C561/F5070,
 - 5) Mueller Company catalog no 2380.
 - 6) or approved equal.
- n. Tapping Valves.
 - 1) Waterway sized to provide clearance for tapping machine cutter with minimum diameter 1/2 inch less than size of valve.
 - 2) Non-Direct buried.
 - a) Horizontal orientation required.
 - b) Inlet end.
 - (1) ANSI B16.1 class 125.
 - (2) Flange with face having annular projection (configured following Manufacturers Standardization Society of Valve and Fitting Industry, SP-60) to center valve in recess of tapping flange (for gray iron and ductile iron pipe) or tapping assembly (for PCC pipe)
 - c) Outlet end: Following ANSI B16.1, class 125 Flange for connection to tapping machine adapter.
 - d) Gear case: Following AWWA C500. Sealed, grease filled with bevel gearing operated from above via 2 inch square nut. Acceptable gear ratios:

Valve Size	Ratio	Valve Size	Ratio
16"	2:1 to 4:1	30"	4:1 to 6:1
18"	3:1 to 4:1	36"	4:1 to 6:1
20"	3:1 to 4:1	42"	6:1 to 8:1
24"	3:1 to 4:1	48"	8:1

- 3) Bypass gate valve: Following AWWA C500.
 - a) Locate at end of body opposite stem location.
 - b) Operation of bypass from above via 2 inch square nut.
- 4) Rollers, tracks and scrapers required or rolling disc design with tracks and scrapers acceptable in lieu of separate rollers on disc.
- 5) Approved Manufacturers and Models:
 - a) [Kennedy Model 50-ARD.](#)
 - b) [Ludlow Rensselaer Division of Patterson Pump Co. Model List 13a.](#)
5. Air Valve: Combining operating features of both an air/vacuum valve and air release valve.
 - a. Type: Universal/combination type following AWWA C512.
 - b. Float, plug, guide shafts and bushings: Stainless Steel Type 316.
 - c. Resilient seats: Buna-N.
 - d. Metal internal parts and body only.
 - e. Minimum orifice diameter as listed below the range of working pressure from 0 to 200 psi.
 - 1) 3/16 inch for Crispin Valve.
 - 2) 3/32 inch for APCO.
 - 3) 3/32 inch for Val-Matic.
 - f. Inlet and outlet size: 2 inch NPT screwed connection.
 - g. Internal body parts of valves: See interior coating of valves specified herein.
 - h. Exterior coating of valves: Fusion bonded epoxy following AWWA C550.
 - i. Approved manufacturers:
 - 1) Crispin Valve Model No. UL-20.
 - 2) APCO, Valve and Primer Corporation Model No. 145C.
 - 3) Val-Matic Valve and Mfg. Corporation Model No. 202C.
 - 4) [or approved equal.](#)
6. Combination Air and Vacuum Valves, 3 inch and larger.
 - a. Air and Vacuum Valve installed in combination with Air Release Valve, following AWWA C512.
 - 1) Air Release Valve piped out of side of air and vacuum valve, following Standard Details.
 - b. Float, plug, guide shafts and bushings: Stainless Steel Type 316.
 - c. Resilient seats: Buna-N.
 - d. Metal internal parts and body only.
 - e. Size: Air and vacuum and air release valve following Drawings.
 - f. Configuration: Connecting pipe and gate valve same size as air release valve between combination air and vacuum valve and air release valve.
 - g. Inlet and outlet size:

- 1) Air and Vacuum Valve: Inlet and outlet type following Drawings (ANSI B16.1, Class 125 or 250 flanges).
 - 2) Air Release Valve: NPT screwed connection.
 - h. Piping layout:
 - 1) See Standard Details.
 - 2) Pressure rating of gate valve: See Drawings.
 - i. Internal body parts of valves: See interior coating of valves specified herein.
 - j. Exterior coating of valves: Fusion bonded epoxy following AWWA C550.
 - k. Approved manufacturer:
 - 1) Model number, outlet, and orifice following Drawings.
 - a) Crispin Valve.
 - b) APCO, Valve and Primer Corporation.
 - c) Val-Matic Valve and Mfg. Corporation Model.
 - d) [or approved equal](#)
7. Pressure Reducing Valves.
- a. Maintain constant downstream pressure regardless of inlet pressure or flow fluctuations.
 - b. Design: To withstand and operate under non-shock working pressure of 180 psi.
 - c. Valve size: 12 inch and smaller.
 - d. Valve ends:
 - 1) 4 inch and larger: Flange ends, see Joint Material.
 - 2) 3 inch and smaller: NPT screwed connection.
 - e. Valve body: Ductile or Cast Iron with stainless steel trim internally.
 - f. Pressure setting for valve: See Drawings.
 - g. Reducing pilot control:
 - 1) Body: Bronze with stainless steel valve seat ring and seat ring fasteners.
 - 2) Piping and fittings: Bronze with copper.
 - 3) External strainer and ball valves.
 - h. For valves 4 inches and larger:
 - 1) Gage connections on inlet and outlet side.
 - 2) Valve position indicator.
 - i. Internal body parts of valves: See interior coating of valves specified herein.
 - j. Exterior coating of valves: Fusion bonded epoxy following AWWA C550.
 - k. Approved Manufacturers:
 - 1) [Cal-Val Co., Model 90G-01ABS KC D.S. for 3 inch and smaller and Model 90G-01BCSY KC D.S. for 4 inch and larger.](#)
8. Pressure Relief Valve.
- a. Normally closed.
 - 1) Open when pressure at valve inlet increases above setting pressure.
 - 2) Outlet side is atmospheric pressure.
 - b. Design: To withstand and operate under non-shock working pressure of 180 psi.
 - c. Valve size: 12 inch and smaller.
 - d. Valve ends: Flange ends, see Joint Material.
 - e. Valve body: Ductile or Cast Iron with Stainless Steel trim internally.
 - f. Pressure setting for valve: See Drawings.

- g. Relief pilot control:
 - 1) Body: Bronze with stainless steel valve seat ring and seat ring fasteners.
 - 2) Piping and fittings: Bronze with copper.
 - 3) External strainer and ball valves.
 - h. Gage connection on inside side.
 - i. Internal body parts: See internal coating of valves specified herein.
 - j. Exterior coating: Fusion bonded epoxy following AWWA C550.
 - k. Approved Manufacturers:
 - 1) [Cla-Val Co., Model 50-01BY KC D.S.](#)
9. Flap Valve.
- a. Allow passage of flow in one direction, while preventing reverse flow.
 - b. Flange end: Class 125, ANSI B16.1, suitable for connecting to ductile iron flange pipe.
 - c. Approved manufacturers:
 - 1) [Clow Valve Company \(Division of McWane Incorporated\), Model No. F-3012.](#)
 - 2) [Tidflex Technologies, Inc., Series 35 with stainless steel backup ring.](#)
10. Valve Boxes.
- a. See Standard Details.
 - b. Approved manufacturers:
 - 1) Bingham and Taylor Corporation.
 - 2) Bibby Ste Croix Foundries, Inc.
 - 3) Capitol Foundry of Virginia, Inc.
 - 4) [or approved equal.](#)
11. Interior Coating of Valves: Fusion bonded epoxy, certified by NSF for contact with potable water following AWWA C550.
12. Flange Bolt End Protection in Vaults: Plastic caps, shop or field filled with anti corrosion compound or lubricant.
- a. Approved Manufacturers:
 - 1) [Sap-Seal Products, Inc.](#)
 - 2) [Advance Products & Systems, Inc.](#)
13. Curb Stops: AWWA C800, except with working and test pressures below.

Size In Inches	Water Temperature	Working Pressure	Test Pressure
3/4, 1, & 1-1/4	Up to 100 degrees F	Not less than 150 psi in closed position	Not less than 225 psi in open position
1-1/2 & 2	Up to 100 degrees F	Not less than 200 psi in closed position	Not less than 300 psi in open position

- a. Bronze: Castings manufactured of CDA alloys meeting chemical and physical properties of ASTM B584 and following AWWA C800 and NSF 372.
- b. Copper Tube Connections: Follow AWWA C 800.
 - 1) Flare or compression connection type, fitted with coupling nuts threaded for use with copper service tube type K.

- c. Compression Connections:
 - 1) Elastomer seal to prevent leakage.
 - 2) Corrosion resistant, e.g. stainless steel, split or gripper ring to restrain joint.
 - 3) “Tighten to stop” design
 - 4) Approved Manufacturers:
 - a) A.Y. McDonald Manufacturing Company, Q style.
 - b) Ford Meter Box Company, Q style.
 - c) Cambridge Brass, Q style.
 - d) Mueller Co., 110 style.
 - e) [or approved equal.](#)
 - d. Approved Curb Stop Manufacturers and Models:
 - 1) A.Y. McDonald Manufacturing Company, 6100 series (flare style) and 6100Q series (compression style).
 - 2) Ford Meter Box Co., Inc., B22 (flare style) and B44-Q (compression style) series.
 - 3) Mueller Co., B-25204 series (flare style) and Model No. B25209 series, (compression style).
 - 4) Cambridge Brass, 202-C (flare style) and 202-H (compression style) series.
 - 5) [or approved equal.](#)
14. Angle Ball Valve: ANSI/AWWA C800, ASTM B584 and UNS C89833
- a. Brass: Following NSF 61 and NSF 372
 - b. Inlet and outlet size: 2 inch Female National Pipe Thread (FNPT) screwed connection.
 - c. 300 psi working pressure
 - d. Approved Manufacturers:
 - 1) [A.Y. McDonald Manufacturing Company, Model 74604BF](#)
 - 2) [Ford Meter Box Company, BA-11-777W-NL](#)
15. Corporation Stops: ANSI/AWWA C800, except with working and test pressures below.

Size In Inches	Water Temperature	Working Pressure	Test Pressure
3/4, 1, & 1-1/4	Up to 100 degrees F	Note less than 150 psi in closed position	Not less than 225 psi in open position
1-1/2 & 2	Up to 100 degrees F	Not less than 200 psi in closed position	Not less than 300 psi in open position

- a. Bronze: Castings manufactured of CDA alloys meeting chemical and physical properties of ASTM B584 and following AWWA C800, NSF 372.
- b. Type of Threads.
 - 1) Inlet thread: Standard corporation stop thread following ANSI/AWWA C800.
 - 2) Copper tube outlet end: Flare or compression connection type, fitted with coupling nut threaded for use with copper service tube type K following ANSI/AWWA C800.
- c. Compression Connections:

- 1) Elastomer seal to prevent leakage.
 - 2) Corrosion resistant, e.g. stainless steel, split or gripper ring to restrain joint.
 - 3) “Tighten to stop” design
 - 4) Approved Manufacturers:
 - a) A.Y. McDonald Manufacturing Company, Q style.
 - b) Ford Meter Box Company, Q style.
 - c) Cambridge Brass, Q style.
 - d) Mueller Co., 110 style.
 - e) [or approved equal.](#)
 - d. Approved Corporation Stop Manufacturers and Models:
 - 1) A.Y. McDonald Manufacturing Company, 4701 B series (flare style) and 4701BQ series (compression style).
 - 2) Ford Meter Box Co., Inc., FB600 series (flare style) and FB1000-XQ series (compression style).
 - 3) Mueller Co., B-25000 series (flare style) and B-25008 series (compression style).
 - 4) Cambridge Brass, 301-XXC series (flare style) and 301-XXH series (compression style).
 - 5) [or approved equal.](#)
16. Curb Boxes.
- a. See Standard Details.
 - b. Approved manufacturers:
 - 1) [Geneco: 1101-2-39.](#)
 - 2) [Bingham & Taylor Corporation: ROD-39-WSSC-9010.](#)
- D. Fire Hydrants (Standard): Follow AWWA C502 for requirements not included on WSSC approved manufacturer’s drawings.
1. Shall be used unless otherwise noted on drawings.
 2. Approved Manufacturers and Drawings.
 - a. Kennedy Valve (Division of McWane Incorporated), Guardian K 81D, following Kennedy Drawing No. 80783 20781, Rev. 18, dated 3/08.
 - b. Mueller Company, Super Centurion 250, following Mueller Drawing No. FH 237, Rev. F, dated 1/14/11.
 - c. United States Pipe Valve and Hydrant Division (Division of Mueller Company), Sentinel 250, following USPV&HD Drawing No. FH 288, Rev. D, dated 1/14/11.
 - d. Clow Valve (Division of McWane Inc.), Medallion, following Clow Drawing No. D-22742, Rev. B, dated 12/10.
 - e. American Flow Control (Division of American Cast Iron Pipe Company), Model B-62-B-5 following American Flow Control Drawing No. 94-21085, Rev C dated 2/20/15.
 - f. [or approved equal.](#)
- E. Fire Hydrants (High Traffic):
1. Follow AWWA C502 and the following:

- a. Hydrants shall be complete insert type with lower barrel threaded to elbow, and breakaway feature.
 - b. Hydrants shall be fully maintainable through the unitized one piece design bonnet.
 - c. Lower barrel shall be ductile iron and lower elbow shall be epoxy coated ductile iron and utilize brass tube drain holes.
 - d. Brass seat ring insert shall be threaded into elbow and mechanically retained by two brass screws.
 - e. Protective case shall be AWWA C909 PVC pipe. The case cap shall be polyester coated iron.
 - f. Nozzles shall be tamper resistant ¼ turn type with O-rings and stainless steel retaining screws.
 - g. For additional requirement, see WSSC approved manufacturer's drawings.
2. Approved Manufacturers and Drawings.
- a. [Kennedy Valve \(Division of McWane Incorporated\), Guardian K-81AWC, following Kennedy Drawing No. 80804-WSSC, Revision 07, dated 5/09.](#)
 - b. Or equal
- F. Temporary Bypass Pipe, Hose, Fittings and Valves:
- 1. Withstand working pressures up to 125 psi.
 - 2. Follow NSF Standard 14 or 61 for potable water.
 - 3. Not impart objectionable color, taste, or odor to water being supplied.
 - 4. Temporary fire hydrant:
 - a. Consist of 4 inch by 4 inch tee or 4 inch 90° bend, with ball valve or equal, connected to end of the tee or bend and operating nut to control the valve.
 - b. Equipped with 4-1/2 inch diameter National Standard threaded nozzle with hydrant cap installed.
- G. Backflow Preventer and Basket Strainer for Temporary Water Main and Hydrostatic Testing: Reduced pressure principal type, flanged and supplied complete with integral valves, following the American Society of Safety Engineers Standard No. 1013 and AWWA C510.
- 1. Materials: Bronze, or liquid epoxy coated cast iron body with bronze and stainless steel working parts.
 - 2. Pressure Requirements: Suitable for supply pressure as high as 175 psi and hydrostatic test pressure of 350 psi.
 - 3. Approved manufacturer:
 - a. Wilkins (Zurn Industries).
 - b. Or equal.
 - 4. Basket Strainers.
 - a. Installation: Inlet side of backflow preventer following Drawings.
 - b. Strainers: Flanged ends, unless otherwise noted.
 - 1) Strainer bodies: Ductile iron, gray iron, or bronze and designed to withstand maximum working pressure of 175 psi with tapped opening for flushing strained debris.

- c. Screens: Unless otherwise noted, stainless steel or brass sheet metal with 1/4 inch perforations.
 - 1) Open area of screen: At least 4 times inside cross-sectional area of pipe.
- d. Approved manufacturers:
 - 1) [Hersey Products, Inc.](#)
 - 2) [Mueller Co.](#)

H. Meter Settings.

- 1. Meter Housings:
 - a. Polyethylene Meter Boxes and Extensions.
 - 1) Approved manufacturers:
 - a) [Oldcastle Precast, Inc.](#)
 - (1) 24" x 20" Top, Model No. 202001
 - (2) 30" Dia. x 30" H, Model No. 302003
 - (3) 24" x 30" (H), Model No. 242003
 - b) [DFW Plastics, Inc.](#)
 - (1) 24" x 20" Top, Model No. DFW242030TP
 - (2) 30" Dia. x 30" H, Model No. DFW3030
 - (3) 24" x 30" H, Model No. DFW2430
 - c) Or equal.
- 2. Meter Setting Outside Water Meters:
 - a. Copper Pipe: Seamless, type K and following ASTM B88.
 - b. Fittings and Accessories: Copper and 85-5-5-5 Red Brass following ASTM B62 and AWWA C800.
 - c. Approved Manufacturers and Models:
 - 1) Ford Meter Box Company.
 - a) 3/4 inch Single Meter Yoke Setter, Model No. YA-3-C13005-001-NL, following Drawing No. C13005-001, Rev. 2 dated 7/29/12 adaptable for 5/8 inch meter using two Ford A13 meter adapters.
 - b) 1 inch Single Meter Setter, Model No. YA-4-13005-003-LEX-NL following Drawing No. C13005-003, Rev. 2 dated 7/27/12.
 - c) 1-1/2 inch Single Meter Setter, Model No. VBB76-C13005-007-NL, following Drawing No. C13005-007, Rev. 1 dated 7/27/12
 - d) 2 inch Single Meter Setter, Model No. VBB87-C13005-004-NL, following Drawing No. C13005-004, Rev. 0 dated 4/10/12.
 - e) 3/4 inch Double Meter Yoke Setter, Model No. DYA-3-C13005-006-NL, following Drawing No. C13005-006, Rev. 3 dated 11/27/12 adaptable for 5/8 inch meter using two Ford A13 meter adapters per meter.
 - f) 1 inch Double Meter Setter, Model No. DYA-4-C13005-005-NL, following Drawing No. C13005-005, Rev. 2 dated 7/27/12.
 - 2) Mueller Company.
 - a) 3/4 inch Single Meter Yoke Setter, Model No. 250B5030----01N, following Drawing No. 250B5030----01N dated 5/29/12 adaptable for 5/8 inch meter using two Ford A13 meter adapters.

- b) 1 inch Single Meter Setter, Model No. 330B5040----01N, following Drawing No. 330B5040----01N dated 5/30/12.
 - c) 1-1/2 inch Single Meter Setter, Model No. 109B2422----05N, following Drawing No. 109B2422----05N dated 5/30/12.
 - d) 2 inch Single Meter Setter, Model No. 108B2426----05N following Drawing No. B2426----05N received 5/30/12.
 - e) 3/4 inch Double Meter Yoke Setter, Model No. 250B5030----02N, following Drawing No. 250B5030----02N, Rev. 0 dated 5/30/12, adaptable for 5/8 inch meter using two Ford A13.
 - f) 1 inch Double Meter Setter, Model No. 330B5040----02N, following Drawing No. 330B5040----02N, Rev. 0 dated 5/29/12.
- 3) A.Y. McDonald Manufacturing Company.
- a) 3/4 inch Single Meter Yoke Setter, Model No. 714G3--JJCC 44, following Drawing No. E-1-10077, Rev. A dated 6/15/12, adaptable for 5/8 inch meter using two A.Y. McDonald 10J13 meter adapters.
 - b) 1 inch Single Meter Setter, Model No. 714G427--JJQQ 660X375, following Drawing No. E-1-10076, Rev. A dated 6/15/12.
 - c) 1-1/2 inch Single Meter Setter, Model No. 721-727--WWQQ 770X13.25X375, following Drawing No. E-1-10080, Rev. A dated 6/15/12.
 - d) 2 inch Single Meter Setter, Model No. 31-724--WWQQ 770, following Drawing No. E-1-5915, Rev. 0 dated 8/3/05.
 - e) 3/4 inch Double Meter Yoke Setter, Model No. 714H327--JJQQ 64 X375, following Drawing No. E-1-10079, Rev. B dated 7/23/12, adaptable for 5/8 inch meter using two A.Y. McDonald 10J13 meter adapters per meter.
 - f) 1 inch Double Meter Setter, Model No. 714H427--JJQQ 76X375 following Drawing No. E-1-10078, Rev. A dated 6/15/12.
- 4) Cambridge Brass.
- a) 3/4 inch Single Meter Yoke Setter, Model No. 6029NL-300C4C4-UU following Drawing No. 6029NL-300C4C4-UU, Rev. C dated 12/13/12, adaptable for 5/8 inch meter using two Ford A13 meter adapters per meter.
 - b) 1 inch Single Meter Setter, Model No. 6029NL-427H6H6-UU following Drawing No. 6029NL-427H6H6-UU, Rev. E dated 12/13/12.
 - c) 1-1/2 inch Single Meter Setter, Model No. 6020NL-627H7H7-UU following Drawing No. 6020NL-627H7H7-UU, Rev. C dated 6/13/12.
 - d) 2 inch Single Meter Setter Model No. 6040-7__H7H7-UU following Drawing No. 6040-7__H7H7-UU, Rev. A dated 2/8/08.
 - e) 3/4 inch Double Meter Yoke Setter, Model No. 6029DNL-327H6H5-UU following Drawing No. 6029DNL-327H6H5-UU, Rev. D dated 12/13/12, adaptable for 5/8 inch meter using two Ford A13 meter adapters per meter.

- f) 1 inch Double Meter Setter, Model No. 6029DNL-427H7H6-UU following Drawing No. 6029DNL-427H7H6-UU, Rev. D dated 12/13/12.
 - 5) or approved equal.
- 3. Outlet Caps.
 - a. Approved Manufacturer and Models:
 - 1) Polymer Molding, Inc.
 - a) 1 inch type K copper, blue polyethylene end cap, Model No. C-1-1/8.
 - b) 1-1/2 inch type K copper, blue polyethylene end cap, Model No. C-1-5/8.
 - c) 2 inch type K copper, blue polyethylene end cap, Model No. C-2-1/8.
 - 2) Or equal.
- 4. Meter Frames and Covers.
 - a. Castings.
 - 1) Iron melted by any process following ASTM A48, Class 35 minimum.
 - 2) Surfaces: Sandblast clean or other approved process. Paint clean and rust free surface with 1 coat of asphaltum or coal tar.
 - b. Approved Manufacturers:
 - 1) A.Y. McDonald Manufacturing Company.
 - a) 11-1/2 inch single recess frame and cover for 20 inch diameter (at top) meter housing, 3/4 inch and 1 inch single meter setting, Model No. 74M3ACLBRTC.
 - b) 11-1/2 inch double recess frame and cover for 20 inch diameter (at top) meter housing, 3/4 inch and 1 inch double meter setting, Model No. 74M3ACLBRRTT.
 - c) 20 inch single recess monitor frame and cover for 30 inch diameter meter housing, 1-1/2 inch and 2 inch single meter setting, Model No. 74M30RTL B.
 - 2) Bingham & Taylor Corporation.
 - a) 11-1/2 inch single recess frame and cover for 20 inch diameter (at top) meter housing, 3/4 inch and 1 inch single meter setting, Model No. BTA-3C/11 1/2 inch BTC3L-WS.
 - b) 11-1/2 inch double recess frame and cover for 20 inch diameter (at top) meter housing, 3/4 inch and 1 inch double meter setting, Model No. BTA-3C/11 1/2 inch BTC3L-WSDD.
 - c) 20 inch single recess monitor frame and cover for 30 inch diameter meter housing, 1-1/2 inch and 2 inch single meter setting, Model Nos. BTA2030MFC-WS and IND2030MFCWS.
 - 3) Vestal Manufacturing Company.
 - a) 11-1/2 inch single recess frame and cover for 20 inch diameter (at top) meter housing, 3/4 inch and 1 inch single meter setting, Model No. 32-709 (BRMRC-20L W/LN W/RTR)
 - b) 11-1/2 inch double recess frame and cover for 20 inch diameter (at top) meter housing, 3/4 inch and 1 inch double meter setting, Model No. 32-711 (BRMRC-20L W/LN W/2RTR).

- c) 20 inch single recess monitor frame and cover for 30 inch diameter meter housing 1-1/2 and 2 inch single meter setting, Model No. 32-048(ER2030) and 32-479 (MONITOR R&C W/LN W/RTR).
 - 4) or approved equal.

- I. Field Applied Coating: Cold applied petrolatum or petroleum wax.
 - 1. Primer, Mastic, and Tape/wrap: AWWA C217 or NACE RP0375 and manufactured for buried or submerged applications.
 - 2. Petrolatum or Petroleum Wax Tape/Wrap: Minimum thickness of 40 mils.
 - 3. Approved Manufacturers:
 - a. Denso Incorporated.
 - b. Tapecoat Company.
 - c. Trenton Corporation.
 - d. or approved equal.

- J. V-Bio Polyethylene Encasement: AWWA C105.
 - 1. V-Bio polywrap linear low-density polyethylene film (minimum 8 mil).
 - 2. V-Bio polywrap flat tube: Meet appropriate minimum width for size of pipe installed following AWWA C105, Method A, secured with polyethylene compatible adhesive tape.
 - 3. Flat sheet V-Bio polywrap: Used for wrapping odd shaped appurtenances following AWWA C105, secured with polyethylene compatible adhesive tape.
 - 4. Approved Suppliers:
 - a. American Cast Iron Pipe Company.
 - b. United States Pipe and Foundry Co. (U.S. Pipe)
 - c. McWane Cast Iron Pipe Company
 - d. or approved equal.

- K. Detectable Warning Tape: See Section 02315.

- L. Tracer wire for PVC Pipe: TW, THW, THWN, or HMWPE insulated single-strand copper, 10 gauge or thicker wire.

- M. Continuity Test Station.
 - 1. Acrylonitrile- Butadiene-Styrene (A.B.S.) Plastic
 - 2. Diameter 12-inch.
 - 3. Heavy duty frame and lid.
 - 4. Lettering on lid "Water".
 - 5. Approved Manufacturer:
 - a. Bingham & Taylor Corporation, Figure 1200 with ADP4001006P Valve Box Stabilizer.

- N. Rubber Annular Hydrostatic Sealing Devices.
 - 1. Rubber annular sealing device:

- a. Modular mechanical type, utilizing interlocking synthetic rubber shaped to continuously fill the annular space between the pipe sleeve or opening and carrier pipe.
- b. Links when assembled to form a continuous rubber belt around the pipe, with a pressure plate under each bolthead and nut.
- 2. Materials.
 - a. Pressure Plate: Delrin Plastic ASTM D2133.
 - b. Bolts and nuts for links: minimum 304 Stainless Steel with protective coating to prevent galling.
 - c. Sealing element: EPDM.
- 3. Size of wall sleeve: To accommodate the carrier pipe, size as recommended by rubber annular seal manufacturer.
- 4. Approved Manufacturers:
 - a. [Pipeline Seal and Insulator, Inc. \(Link-Seal\)](#).
 - b. [Advance Products and Systems, Inc. \(Innerlynx\)](#).

O. Pipe Embedment Material: See Section 02315.

P. Concrete: See Section 03300.

Q. Reinforced Concrete Casing Pipe: See Section 02445.

R. Masonry: Work: See Section 04200.

S. Precast Concrete: See Section 03400.

T. Wood for Blocking, Valve, and Meter Box Installations: See Standard Details.

U. Castings: Gray iron and following Section 05500.

V. Access Manhole: See Standard Details.

W. Cathodic Protection Materials: See Section 13110

2.2 SOURCE QUALITY CONTROL

- A. Notify Engineer following Section 01450 for performance of factory tests required herein.
 - 1. Factory hydrostatically test 16 inch and larger diameter Class 125 double disc gate valves following AWWA C500.
 - 2. Factory hydrostatically test 16 inch and larger diameter resilient seated gate valves following AWWA C509.
 - 3. Factory hydrostatically test 16-inch and larger diameter Class 250 double disc gate valve to pass hydrostatic test of 400 psi applied between discs with no visible leakage through the metal, flanged joints, or stem seals.
 - a. Double disc gate valves:

- 1) Test valve seats to pass factory leakage test with water between gates at working water pressure of 250 psi.
 - 2) Allowable leakage past either seat not to exceed rate of 1.0 oz./hour/inch of nominal valve size.
4. Operation test for gate valves 16 inch and larger diameter: AWWA C500 and C509.

PART 3 EXECUTION

3.1 PUBLIC NOTIFICATION

- A. See Section 01110.

3.2 INSTALLATION OF WATER MAIN

- A. Inspection of Delivered Materials: See Section 01450.

- B. Handling of Pipe and Fittings: Zinc coated ductile iron pipe and fittings following AWWA C600.

1. If damage or coating abrasion occurs and is repairable, repair following approved manufacturer's recommendations.
 - a. Paint used for repair of zinc coating must meet ISO 8179 requirements of a minimum 85% zinc in the dry film.
 - 1) Approved Manufacturer
 - a) [Tnemec Series 90-98](#)
 - b) [Rustoleum Cold Galvanizing Paint](#)
2. Cement Mortar Lining:
 - a. Remove and replace rejected pipe, fittings or appurtenance at Contractor's expense.
 - b. Field cut and remove damaged section of pipe to 6 inches beyond damaged lining.
3. Alternative Externally Coated pipe and fittings.
 - a. Repair as directed by coating manufacturer.
 - b. For cathodically protected systems, test coating for flaws electrically with holiday detector, following NACE SP0274 or SP0188. Repair holidays and recheck. Coating must be verified free of holidays prior to use.
4. Remove pipe, fittings, and valves when contaminated with oil, gasoline, kerosene, or other material that damages coating, and replace at no cost to the Commission.
5. Remove foreign matter from each pipe, fitting, and valve before installing V-Bio polyethylene encasement and placing in trench (not applicable for cathodically protected systems).
6. Keep interior of pipe clean during installation and thereafter.
7. Should foreign material or contaminants be observed in previously installed pipe, fittings, and valves, cease work until foreign material is removed or contaminated pipe, fittings, and valves are decontaminated or replaced.

8. Close open ends of pipes and fittings with watertight seal during periods when work is not proceeding.
- C. Trench Excavation, Backfill, and Test Pits: Follow Section 02315 and as specified herein.
1. Before pipe installation:
 - a. Dig test pits to determine size, type, and exact location of existing pipe to which proposed pipe will connect.
 - 1) If poured lead joint pipe is found, replace with mechanical joint pipe and fittings. Removal of lead joint is incidental to the contract.
 - b. Excavate sufficient trench in advance and test pit all existing underground utilities or structures, whether shown on Drawings or visually identified in the field, to:
 - 1) Verify actual locations.
 - 2) Make reasonable changes in line and grade to resolve conflicts, with Engineer's approval.
 - c. Furnish Engineer location and elevation information when previously unknown or different underground utilities or structures are encountered.
 2. Perform additional work made necessary because of failure to take above precautions at no cost to the Commission.
- D. Pipe Placement.
1. Excavate bell holes at each joint to assemble joint so entire length of each pipe barrel, fitting, and valve is supported on firm bedding or soil.
 2. Field Cutting: Smooth and at right angles to pipe axis with cutting/joints to meet pipe locations and elevations shown on Drawings.
 3. Joint Deflections: Follow manufacturer's recommendations.
 - a. Do not deflect PVC pipe at connection to DIP or fittings.
 4. V-Bio polyethylene encasement:
 - a. Zinc Coated DIP and fusion bonded epoxy coated fittings and valves: AWWA C105, for Method A, secured with polyethylene compatible adhesive tape.
 - 1) Seal V-Bio polywrap with minimum two layers of tape on the zinc coated DIP and overlap polyethylene at joint to provide double layer of polyethylene, secure end with minimum two layers of tape.
 - 2) Along pipe barrel, take up slack in V-Bio polywrap tube, making snug but not tight fit. Fold over on top of pipe and secure in place every three feet along the barrel of pipe with minimum 6-inch length of tape.
In wet trench area, secure in place every two feet along barrel of pipe with minimum one layer of tape around the pipe.
 - 3) For odd-shaped appurtenances, use flat sheet V-Bio polywrap: AWWA C105, Section 4.4.4, secure ends with minimum two layers of tape.
 - b. PVC pipe: Encase fusion bonded epoxy coated ductile iron fittings and valves in V-Bio polywrap as specified herein. Overlap V-Bio polywrap onto PVC pipe minimum 6 inches.
 - c. Fire hydrant lead pipe: Use zinc coated DIP and fittings and encase in V-Bio polyethylene following Standard Details.

- d. Before backfilling, inspect V-Bio polywrap for rips, punctures and other damage and repair following AWWA C105.
 - 5. After placement of pipe, fittings, and valves with External Coating system;
 - a. Before backfilling, inspect coating for possible damage.
 - 1) If damage is detected, repair and holiday test (cathodically protected systems only) as stated herein and in Section 13110.
 - 6. PVC AWWA C900 and C905 Pressure Pipe:
 - a. Make changes in horizontal, vertical, and curved alignment shown on Drawings by using fittings, high-deflection coupling, or joint deflections in the amount permissible by manufacturer's recommendations.
 - b. Use short lengths of pipe as necessary to accomplish curvature without exceeding individual allowable joint deflections specified by manufacturer.
 - c. Do not bend pipe.
 - d. Tracer Wires for PVC Pipe:
 - 1) Tape wire to top of pipe using PVC tape every 4 feet along the pipe, and on each side of each fitting.
 - a) Tape: Minimum 2 inches wide and wrapping full circumference of pipe.
 - 2) Where required, splice with direct-bury wire connector, wire nut, or splice kit and install as recommended by manufacturer. Protect and secure splice to pipe specified above.
 - 3) Terminate tracer wire at a Continuity Test Station following Standard Details.
 - 7. Detectable Warning Tape.
 - a. Place detectable tape in trench as follows;
 - 1) Use Blue tape for water mainlines and water service connections. See section 02315.
 - 2) Use Yellow tape for coated pipe and test station lead wires. See Section 02315 and 13110.
 - 3) Use Red tape for restrained joint pipe: See below and Section 02315.
- E. Restrained Joints and Buttresses.
- 1. General: Make provisions for counteracting expected thrust due to static and dynamic forces including surge at bends, tees, reducers, valves, fire hydrants, and dead-ends whether or not shown on Drawings.
 - 2. Restrained Joints: Provide following Drawings and Standard Details.
 - a. Mark restrained joints at crown with 2 foot long by 4 inch wide orange paint stripe perpendicular to and centered on joint.
 - b. If testing pipeline for own convenience before backfilling is complete, provide adequate temporary blocking at no cost to the Commission.
 - c. Install restrained joints on pipe following Standard Details and manufacturer's recommended installation procedures.
 - 1) Place "RESTRAINED JOINT PIPE" tape on outside of V-Bio polywrap encasement at top of pipe with restrained joints before backfill operations have reached top of pipe.

- a) PVC Water Main: Place "RESTRAINED JOINT PIPE" tape under tracer wire.
- b) Secure "RESTRAINED JOINT PIPE" tape to V-Bio polywrap encasement every 4 feet along the pipe, and on each side of each fitting, using polyethylene compatible adhesive tape, wrapping full circumference of pipe.
- 2) Continue backfill operations following specifications and avoid displacement of warning tape.
- d. Apply field coating wherever restraining device installation results in bare metal surfaces, including all thread and re-bar: See FIELD APPLIED COATING OF EXPOSED FERROUS METAL specified herein.
- 3. Buttresses and Anchors: See Drawings and Standard Details. Engineer may inspect and approve excavations before buttresses and anchors are placed.
 - a. Entire face of excavation against which buttresses will bear: Firm bearing, flat and at proper angle to pipeline and reaction force.
 - b. Wood form both sides of buttress and maintain dimensions following Standard Details. Protect mechanical joint bolts from concrete.

3.3 JOINTS

A. Mechanical Joints.

- 1. Before assembling joint, clean both bell and plain end of rust and foreign matter.
- 2. Assemble joint following AWWA C111, C600, C605, C900, C905 and as specified herein.
- 3. For pipe plain ends to be inserted into mechanical joint bells, square cut and bevel end.
 - a. Clean and lubricate joint surfaces.
 - b. Place gland on plain end followed by gasket and insert pipe into bell.
 - c. Press gasket firmly and evenly into bell recess to center plain end in bell.
 - d. Keep joint straight during assembly.
 - e. Make deflection after joint assembly but before tightening bolts.
 - 1) Do not deflect PVC pipe at connection to ductile iron or cast iron pipe or fittings.
 - f. Complete joint by alternate tightening of bolts with torque wrench set between:
 - 1) 45-60 foot/pounds for 3 inch diameter.
 - 2) 75-90 foot/pounds for 4 inch through 24 inch diameter.
 - 3) 100-120 foot/pounds for 30 inch and 36 inch diameter.
 - 4) 120-150 foot/pounds for 42 inch and 48 inch diameter.
 - g. Tighten bolts so gland and face of bell have approximately same distance between them at all times.
- 4. Where satisfactory sealing of joint is not attained at maximum permissible torque, disassemble, reclean, and reassemble joint with new gasket.
- 5. Coat uncoated metal components following FIELD APPLIED COATING OF EXPOSED FERROUS METAL specified herein.

B. Push on Joints.

1. File or grind bevel on plain end of field cut pipe lengths to resemble pipe as manufactured so plain end will slip into bell without hindrance or gasket damage.
 - a. Place identifying mark on pipe that is not furnished with depth mark on plain end to show depth of bell and to verify that pipe is fully set in bell.
2. Assemble joints following AWWA C600, C605, C900, C905 and as specified herein:
 - a. Clean inside of bell and outside of plain end to obtain clean, smooth surfaces free of foreign matter.
 - b. Insert gasket in bell.
 - c. Do not damage rubber to metal bond on restrained gaskets.
 - d. Apply thin film of gasket lubricant furnished by joint manufacturer to inside surface of gasket and to outside surface of plain end.
 - e. Push plain end into bell.
 - f. Keep joint straight while pushing.
 - g. Complete joint by forcing spigot into bell up to depth mark on spigot, using equipment designed for purpose.
 - h. DIP: Make deflection after joint is completely home.
 - 1) Do not deflect PVC pipe at connection to ductile iron or cast iron pipe or fittings.
 - i. Assembly of PVC plain end into bell: Follow PVC pipe manufacturer's recommendations.
 - j. Install restrained joints following manufacturer's recommendations.
3. Assemble proprietary restrained joint pipe and fittings following "Assemble Joints" specified above and with modifications below.
 - a. Fully extend assembled joints.
 - b. Protect exposed ferrous metals following FIELD APPLIED COATING OF EXPOSED FERROUS METAL specified herein.
 - c. Make connections to field cut restrained pipe with restrained push on joint kits or mechanical joint solid sleeves restrained with wedge action restrainer glands specified herein.
 - d. No field welding of retainer rings.
4. Coat uncoated metal components following FIELD APPLIED COATING OF EXPOSED FERROUS METAL specified herein.

C. Flanged Joints.

1. Remove grease from flange surface using solvent-soaked rag and wipe clean of dirt and grit.
2. Align flanges accurately, using spirit level, and pipe properly supported before gasket and bolts are inserted.
 - a. Carefully place rubber gasket to ensure full flow and proper sealing of joint.
 - b. Give bolt threads light coat of thread lubricant and then insert and turn nuts by hand.
 - c. Pull up bolts with wrench, employing crossover method.
 - d. Bolt lengths and required torque: Follow manufacturer's requirements.

3. Coat uncoated metal components following FIELD APPLIED COATING OF EXPOSED FERROUS METAL specified herein below.

D. Mechanical Couplings.

1. Assemble mechanical coupling joint by placing coupling pieces on pipe ends and then place pipe ends together.
 - a. Do not exceed tolerance between pipe ends of 1/2 inch.
 - b. If tolerance is more than 1/2 inch, provide pipe spacer with 1/2 inch tolerance.
 - c. Do not exceed coupling manufacturer's recommendations for spacer size for leak proof joint assembly.
 - d. Slide middle ring so it is centered at pipe ends juncture.
 - e. Place gaskets and follower rings in place and bolt up.
 - f. Tighten bolts to torque recommended by manufacturer.
2. Coat uncoated metal components following FIELD APPLIED COATING OF EXPOSED FERROUS METAL specified herein.

E. Solid Sleeves.

1. Install solid sleeves following Standard Detail and specified herein.
 - a. Insert spacer cut from same type and size of pipe being used inside of sleeve when using one solid sleeve.
2. Coat uncoated metal components following FIELD APPLIED COATING OF EXPOSED FERROUS METAL specified herein.

- F. V-Bio Polyethylene Encasement of Joints: When it is impractical to encase joints with V-Bio polyethylene tubing, wrap joints with flat sheet or split length of V-Bio polyethylene tube specified herein. Seal V-Bio polyethylene with minimum two layers of polyethylene compatible adhesive tape.

3.4 FITTINGS, VALVES, AND ADAPTERS

A. Install fittings and valves following Drawings.

1. See Field Testing for testing before installation.
2. Set fittings and valves and join pipe as specified previously herein.
3. Where valves occur on end of pipeline, place plug, cap, or blind flange and secure in exposed bell before backfilling trench.

- B. V-Bio Polyethylene Encasement: For all systems that are not cathodically protected, wrap fusion bonded epoxy coated ductile iron fittings, blind flanges, plugs, caps, valves and other odd shaped appurtenances with V-Bio polyethylene encasement following AWWA C105 and as specified herein.

- C. Install valve box with extension stem where shown or required for nut operated valves following Standard Details.

- D. Set valve box at right angle to water main, centered and plumb over valve operating nut with box cover flush with surface of finished grade or as otherwise directed.
 - 1. Before installation, exercise valve for proper working order.
 - 2. Backfill and compact under and around valve boxes to ensure no vertical loads are transmitted to valve operators or bonnets.
 - 3. When valve box is located in unpaved area to be improved, provide marker stake consisting of a piece of 2 inch by 4 inch lumber, minimum of 5 feet long and painted blue its entire length, adjacent to valve box with approximately 3 feet extended above ground.
- E. Install PCCP adapter following manufacturer's recommendations to include maximum joint opening and diapering of finished joint.
- F. PVC fittings: Use pressure class fusion bonded epoxy coated ductile iron fitting equal to or greater than the pressure class of the pipe to which it is connecting. Where fitting with restrained joints is required, use ductile iron mechanical joint.

3.5 FIRE HYDRANTS

- A. Install fire hydrants where indicated on Drawings following Standard Details. Place streamer outlet perpendicular to street.
- B. Install fire hydrant lead connection level, unless shown otherwise on Drawings.
- C. Replacing Existing Fire Hydrant to Existing Main: Follow Drawings, Standard Details and as specified herein.
 - 1. Blow off hydrant to confirm water flow (attach diffuser unless connecting to sanitary sewer).
 - 2. Leave hydrant open and close lead valve.
 - 3. Confirm fire hydrant flow has stopped.
 - 4. Test pit on lead valve and tee only to confirm existence and condition of strapping.
 - 5. Install or replace strapping as necessary from tee to valve.
 - 6. Install new lead pipe and fire hydrant to existing tee, following Standard Details.
 - 7. Remove and salvage valve and fire hydrant and deliver to Commission warehouse or as noted on Drawings.
- D. Poured Lead Joint Lead Valve and Fittings:
 - 1. Before removing existing tee and valve, clean existing pipe and check pipe for:
 - a. Lead joint valve and fittings larger than 16 inches in diameter, check outside diameter and roundness to verify that new solid sleeve and pipe will be watertight, before removing existing pipe, valves and fittings.
 - b. Lead joint valve and fittings 16 inches and smaller in diameter, with outside diameter or roundness not suitable for watertight connection, abandon as directed by Engineer.

2. Do not cut existing pipe closer than 18 inches to joint bell unless joint bell will be removed.
3. Reconnect existing main with new tee and solid sleeve, and install new valve, lead pipe and fire hydrant to existing tee following Standard Details.

3.6 WATER SERVICE CONNECTIONS

- A. Install water service connections from main water line to property lines at elevations indicated on Drawings, Standard Details, or at Engineer's direction.
 1. When elevations are not shown, install water service connections with minimum cover of 42 inches.
 2. To make direct service taps, apply 2 to 3 layers of polyethylene compatible adhesive tape completely around polyethylene encased pipe to cover area where tapping machine and chain will be mounted or a minimum of 12 inches. Direct tap through the taped polyethylene encasement.
 3. When connecting to existing polyethylene encased cast or ductile iron water main, wrap water service connection pipe 3 feet from main (including corporation stop and saddle) with V-Bio polyethylene encasement following AWWA C105. Seal polyethylene with minimum 2 layers of tape.
 4. When connecting to existing non-polyethylene encased cast or ductile iron water main, provide service insulator and field applied coating on:
 - a. Exposed water main up to 3 feet both sides of the tap (including service saddle, if used).
 - b. Service connection from water main for distance of 3 feet (including service insulator) following Standard Details and specified herein.
 5. Use copper pipe bending tools.
 6. Mark location of end of water service connection pipe at property line with piece of 2 inch by 4 inch lumber, painted blue its entire length, placed vertically from bottom of trench and extending 2 feet above grade.
 7. For connections to a PVC water main, install tracer wire along the top of the water service connection pipe. Follow instructions under Tracer Wires for PVC Pipe, specified herein and the Standard Details.
- B. Perform tapping of water main and insertion of corporation stop by qualified personnel having in their possession qualification card issued by the Commission for performance of this work.
 1. When no source of water is available from existing mains, provide potable water.
 - a. Maintain 60 psi pressure during service connection tapping process.
 2. Use wrenches with smooth jaws of proper size to install corporation stops and connect pipes thereto. Do not use wrenches with jaws that will score brass or copper.
 3. Maintain minimum of 18 inches between taps, minimum 18 inches clear from DIP bells and minimum 24 inches clear from PVC pipe bells.
 4. Install service saddle when tapping 3 or 4 inch diameter water main and for taps larger than 1 inch diameter on 6 inch through 12 inch diameter water mains.

5. After installing saddle, field coat saddle, straps, and associated hardware following FIELD APPLIED COATING OF EXPOSED FERROUS METAL specified herein.
 6. After making tap and completing service connection, blow off at curb stop, pressurize, check for leaks to curb stop, and leave corporation stop in open position.
 7. Backfill excavated area around pipe following Section 02315 and Standard Details.
 8. Do not dry tap ductile iron mains without Engineer's approval.
 - a. If so approved, make tap as specified herein, including lubrication of stop during installation.
 - b. Keep trench open at tap until water main has been placed in service so tap can be inspected for leakage.
 9. PVC Water Pipe: Use of Service-tee fittings or service couplings permitted.
 10. Tapping of PVC Pipe: AWWA C605, pipe manufacturer's recommendations, and specified herein.
- C. Assemble compression joints for type K copper pipe according to manufacturer's recommendations.
1. Prepare copper pipe for connection by cleaning, deburring and rounding.
 2. When rounding, use copper pipe rounding tool as recommended by compression manufacturer.
 3. Insert pipe into connection until it is completely home, tighten nut until it stops turning at end of its internal threads.
 4. Pressure test connection prior to backfilling.
- D. Install service connections with outside meters following Drawings, Standard Details and as specified herein.
1. Mark location of the outside water meter with a piece of 2 inch by 4 inch lumber, painted blue its entire length, placed vertically along side the setting from bottom of excavation and extending 2 feet above grade.
 2. Locate lumber within one foot horizontally of setting.
 3. Paint 4 inch high letters "WATER METER" in black on both sides of the lumber above grade.
- E. Right of way service connections: Extend to right of way or property line, whichever is closer to main.
- F. For service connections 3 inch and larger diameter, install bends as required.
- G. Replacement of Service Connections.
1. Minimum size copper pipe to property line, or as directed by Engineer.
 - a. 1 inch for any existing connections of 1 inch or smaller in diameter.
 - b. 1 1/2 inch for any existing connections of 1 1/4 and 1 1/2.
 2. Utilize existing tap at water main unless otherwise directed by Engineer to:
 - a. Abandon existing tap and retap main line water pipe, or
 - b. Remove existing tap and plug hole.
 3. Replace existing curb stop or meter setting.

- a. Use freeze coupling to cut off flow from existing water service connection. Do not use crimping tools.
- H. Area Service Connection Contracts Only.
1. Engineer will issue an average of 3 work orders per week for water service connections; to be constructed in the order they are received, or as directed by Engineer.
 2. Schedule work orders designated as health hazards to be substantially completed within 10 working days and other work orders to be completed within 20 working days of issuance.
 3. Provide sufficient equipment and work forces to commence and complete each connection within prescribed timeframe.
 4. When directed to mobilize to site designated as Emergency by Engineer start within 24 hours.
 - a. Cost incurred by the Commission due to work orders not completed within timeframe specified herein may be deducted from monies owed Contractor.
 - b. Issuance of new work orders may be suspended until outstanding work orders are completed.
 - c. Complete cleanup, restabilization, and restoration as weather permits on each service connection location before leaving site to commence work at another location.
 - 1) [Restore non-paved areas following the contract documents.](#)

3.7 CHLORINATION

- A. Chlorinate and dechlorinate following Section 02511 and specified herein.
- B. Install 1 inch or 2 inch diameter corporation stops and couplings in water mains for chlorination as required.
 1. Remove stops not used for services and replace with plug.
- C. While the sample analysis is being performed, Contractor may pressurize main for purpose of making taps for service connections, by installing temporary jumper with approved backflow preventer to isolate main.
 1. Remove as soon as taps are completed.
- D. Place mains in service when analysis is complete and approved by Engineer.

3.8 VAULTS AND MANHOLES

- A. Access Manhole: Required when shown on Drawings and following Standard Details [enclosed herein.](#)
- B. Valve Vaults and Manholes: See Drawings, applicable sections of specifications, and Standard Details.

3.9 LINESSTOP

- A. Before ordering linstop tapping saddle assembly.
 - 1. Clean existing pipe, make circumferential measurement of pipe and check for roundness to verify sleeve will fit.
 - 2. Repair any damage to existing pipe coating with suitable coating material to original line of coating as directed by pipe manufacturer's technical representative at no additional expense before backfilling.

- B. Installation of linstop.
 - 1. Excavate around existing pipe so as not to disturb thrust blocking.
 - 2. Clean existing pipe.
 - 3. Check pipe outside diameter and roundness to verify assembly will fit.
 - 4. Provide all materials and equipment, to perform installation of linstop.
 - 5. Provide blocking/support following Drawings.
 - 6. Approved Tapping Equipment Fabricator/Installer to install tapping saddle assembly to pipe and to insert linstop into pipe for line isolation.
 - 7. After linstop is no longer required, approved Tapping Equipment Fabricator/Installer to remove linstop and install completion plug and blind flange.

3.10 INSERTION VALVE

- A. Before ordering insertion valve.
 - 1. Clean existing pipe. Make circumferential measurement of pipe. Check for roundness to verify sleeve will fit.
 - 2. Prior to backfilling, repair any damage to existing pipe coating, with suitable coating material to original line of coating as directed by pipe manufacturer's technical representative at no additional expense to the Commission.

- B. Installation of Insertion valve.
 - 1. Excavate around and clean existing pipe.
 - 2. Check pipe outside diameter and roundness to verify assembly will fit.
 - 3. Provide materials and equipment to perform installation of insertion valve.
 - 4. Provide blocking/ support following Drawings.
 - 5. Approved Tapping Equipment Fabricator/Installer to install insertion valve.
 - 1) Advance Valve, Tapping Equipment Fabricator/Installers:
 - 2) Hydra-Stop (Division of ADS, LLC) 4 inch through 12 inch.
 - 3) Team Industrial Services, 4 inch through 12 inch.
 - 4) or approved equal.

3.11 CONNECTION TO EXISTING MAIN BY TAPPING SLEEVE

- A. Before ordering Tapping Assemblies or Tapping Sleeves for existing pipe larger than 12 inches:

1. Confirm existing pipe type, clean pipe, make circumferential measurement and check for roundness of pipe to verify sleeve will fit.
2. Repair any damage to existing pipe coating with suitable coating material to original line of coating as directed by pipe manufacturer's technical representative at no additional expense before backfilling.

B. Tapping Sleeve and Valve Procedure for Gray Iron and DIP and PVC pipe.

1. Before Tapping Pipe:
 - a. Clean existing pipe and check pipe outside diameter and roundness to verify that sleeve will fit.
 - b. If existing poured lead joint is encountered, remove and install mechanical joint tee and valve. Restrain valve to tee.
 - c. Install test plug on sleeve for field pressurization of sleeve, valve and tapping machine assembly.
 - d. Air test or hydrostatically test sleeve following manufacturer's instructions to ensure watertightness in presence of Engineer.
2. Install sleeve and valve.
3. Keep closest edge of sleeve minimum of 9 inches from face of existing joint bell for ductile iron and gray iron pipe.
4. In addition to cast markings required in AWWA C110, cast or stencil with waterproof paint, the class designation of connecting pipe (AB or CD).
5. PVC Pipe:
 - a. Use only cutting/tapping tools and machines made specifically for cutting AWWA C900 pipe.
 - b. Keep closest edge of sleeve minimum of 15 inches from face of existing joint bell.
 - c. Install tapping machine without damage, scarring, or distortion to pipe.
 - d. Support tapping sleeve and valve so its weight is not carried by pipe.
 - e. Before backfilling, fill void under sleeve with compacted granular material or flowable fill.
6. After tapping sleeve installation is complete on existing gray iron or DIP, field coat tapping sleeve following FIELD APPLIED COATING OF EXPOSED FERROUS METAL specified herein.

C. Approved Tapping Contractors.

1. All Counties Tapping & Testing Inc., 4-12 inch DI/CI.
2. Antron Tapping Service, Inc., 4-12 inch DI/CI.
3. Aqua New Jersey, Inc., 6-20inch CI.
4. B. K. Utilities Tapping Service, 4-12 inch DI/CI.
5. Cherry Hill Construction, Inc., 1-24 inch, DI/ CI /Transite (asbestos cement).
6. DHC Corporation, 4-12 inch DI/CI.
7. Hydra Stop, Inc., all sizes DI/CI.
8. Hydro Tap Service, Inc., 4-16 inch DI/CI, and linestops.
9. Mega Tap, 1-12 inch DI/CI.
10. Owens & Dove, 4-16 inch DI/CI.

11. Penniman & Browne, Inc., 1/2-16 inch PVC/DI/CI/RCP/steel.
12. Pennsylvania American Water, 6-20 inch CI/ DI/ Transite (asbestos cement).
13. Pro Tapping, Inc., 3/4-36 inch DI/CI /Transite (asbestos cement).
14. Quality Cut Tapping Service, 4-16 inch DI/CI.
15. TDW Services, Inc., all sizes DI/CI.
16. The Sunbury Municipal Authority, 4-24 inch CI.
17. W. D. Fox Tapping and Welding, Inc., DI/CI/Transite (asbestos cement).
18. Western Berks Water Authority, 36" x 16" DI.
19. [or approved equal.](#)

3.12 INSTALLATION OF CASING PIPE IN OPEN CUT

- A. Install casing pipe in open cut following Section 02315 and 02530, and specified herein.

3.13 CONNECTIONS TO EXISTING MAINS

- A. Certain information is shown on Drawings relative to existing pipe and other construction.
 1. This information was transferred from existing records and is not guaranteed to be accurate. Contractor is to test pit and verify, at no cost to the Commission [or City of Takoma Park.](#)
- B. Before pipe installation see Excavation under INSTALLATION OF WATER MAIN previously specified herein.
 1. Do not cut existing pipe closer than 18 inches to joint bell unless joint bell will be removed.
 2. When trench excavation encounters existing poured lead joint on existing pipe, remove poured lead joint.
 - a. Before removing poured lead joint, clean existing pipe and measure existing pipe outside diameter. Check for roundness to verify that new solid sleeve and pipe can be installed according to manufacturer's specifications.
- C. Shutdowns.
 1. Mains smaller than 16 inches: Operate valves under direct supervision of certified WSSC employee. Mains 16 inches and larger: Commission will operate valves for shutdown.
 - a. The Commission cannot warrant that mains will be dry and free from all leakage.
 - b. After bacteriological analysis is completed and approved by the Engineer, provide written request to shut down main 3 working days prior to intent.
 - c. When new PRV is added to system and/or pressure zone boundary changes are required, provide written request to shut down main 5 working days prior to intent.
 - d. Intent to shut down mains between the hours of 4 p.m. and 7:30 a.m. and on Saturdays, Sundays, and holidays requires 5 working days written request.

- e. Shutdowns will not occur without Engineer's approval and in the presence of his/her designee.
 - f. Prior to any modification that involves the penetration of PCCP mains (i.e. the installation of valves, tees, etc.), confirm that the affected portions of PCCP main had been depressurized, using available service connections, hydrants or blow offs.
2. Pump and dewater to make necessary connections to existing water mains.
 3. Maintain safe working distance from unrestrained closed valve.
 - a. Safe working distance from closed, unrestrained valve chart

Pipe Diameter (Inches)	Length of Straight Pipe in Front of Valve (Feet)
4	65
6	90
8	120
10	150
12	185
14	215
16	250
20	320
24	395
30	525
36	660

Length of straight pipe is the amount of buried straight pipe on dewatered side of closed, unrestrained valve to prevent the valve from moving. No bends, joint deflections, gaps between plain-end inside couplings, or tunnels are to be within the designated length of straight pipe.

4. Make connections with greatest possible speed. Working more than 8 hours, at nighttime, or on weekends, requires prior permission from Engineer. Confirm shutdown time with Critical customers prior to scheduling.
5. Will not be scheduled or performed on day before, day of or day after the following days:
 - a. New Years Day.
 - b. Good Friday.
 - c. Easter.
 - d. Beginning of Passover.
 - e. Memorial Day.
 - f. Independence Day.
 - g. Labor Day.
 - h. Rosh Hashanah.
 - i. Yom Kippur.
 - j. Thanksgiving.
 - k. Hanukkah.

1. Christmas.
 6. Provide excavation and backfill required for shutdowns.
 7. Cooperate and coordinate with Commission forces.
 8. Commission will notify consumers prior to shutdown.
- D. When making connection to existing PCCP utilizing ductile iron to PCCP adapter, Contractor may tack weld adapter to existing PCCP.
1. Repair damage to gasket or pipe adapter at no cost to the Commission.
- E. When connecting to existing polyethylene encased pipe, overlap joint following AWWA C105, Method A.
1. When connecting V-Bio polyethylene encased pipe to non-encased pipe, overlap polyethylene 3 feet onto non-encased pipe following AWWA C105. Seal polyethylene with minimum two layers of compatible adhesive tape.

3.14 FIELD APPLIED COATING OF EXPOSED FERROUS METAL AND PIPE CONNECTIONS OF DISSIMILAR MATERIALS

- A. For cathodically protected systems, coat exposed ferrous metal surfaces of joints, couplings, and uncoated steel with primer and tape coating system after installation.
1. Do not coat stainless steel nuts and bolts.
- B. Surface Preparation: Clean surfaces of rust, scale, soil, mud, oil, grease, and other contaminants by hand or power tool following SSPC-SP2 or SP3 and other appropriate means as recommended by coating manufacturer.
1. Remove excess moisture and provide surface dryness as recommended by coating manufacturer.
- C. Application:
1. Apply primer in uniform manner to clean and dry surfaces following coating manufacturer's recommendations.
 2. Fill complex and irregular surfaces with appropriate mastic or filler tape to eliminate bridging.
 3. Apply inner layer of tape/wrap to primed and filled surfaces following coating manufacturer's recommendations.
 - a. When coating restraining rods or strapping, apply tape wrap longitudinally, i.e., cigarette wrapped.
 - b. Where metal being coated enters concrete, overlap coating onto concrete by minimum of 2 inches after placement of concrete.
 4. Complete the Tape Wrapping System by wrapping the outer layer in a cylindrical motion that allows for 1 inch overlap of each revolution until the inner layer is completely covered.
- D. Inspection: After field coating of specified items, conduct visual inspection to verify complete coverage has been accomplished.

1. Repair damaged or incompletely coated surfaces following coating manufacturer's recommendations.

3.15 ABANDONMENT

- A. Remove a 6-12" piece of the pipe to be abandoned and take a soil sample at the location of the abandoned pipe and provide to WSSC for forensics testing.
- B. Cap ends of mains as shown and place required concrete blocking to retain cap on water main to remain in service.
- C. For abandonment of water mains, construct brick or 2500 psi concrete bulkhead 9 inches thick, or install approved plug or cap at each location where pipe was cut or valve removed.
 1. Instead of above, Contractor may fill severed abandoned pipe with flowable fill.
- D. Where mains are to be abandoned and removed to a fitting or valve, cut and plug main at fitting or valve.
 1. When shown on Drawings remove fire hydrants and valves, including lead joint tees when encountered; salvage and deliver removed fire hydrants and valves to the Commission Depot.
 2. Pipe, fittings, and other appurtenances that are removed, but not required to be salvaged become property of Contractor.
 - a. Remove and dispose of offsite.
- E. Abandon service connections 2 inches and smaller in diameter by:
 1. Closing the corporation stop and disconnect the copper.
 2. Capping corporation stop.
 3. Removal of curb box.
 4. Removal of meter setting in its entirety or when relocating service connection remove meter setting 1 foot below existing ground, crimp existing service near bottom of meter box, fill meter box with dirt and compact to existing grade.
- F. Abandonment of service connections 3 inches and larger.
 1. Removal of Existing Gate Valve.
 - a. For mechanical joint gate valve and fittings, remove existing gate valve and install mechanical joint plug to existing tee.
 - b. For tapping sleeve and valve connections, remove existing gate valve from existing tapping sleeve assembly.
 - 1) Install blind flange to existing flange end of tapping sleeve assembly.
 - c. For lead joint valve and fittings, remove existing gate valve and existing tee.
 - 1) Before removing existing tee and valve, clean existing pipe and check pipe diameter and roundness to verify that solid sleeve will fit pipe before removing existing pipe, valves, and fittings.

- 2) Do not cut existing pipe closer than 18 inches to joint bell unless joint bell will be removed.
- 3) Reconnect existing main with new pipe and solid sleeve.
- 2. Plug or cap ends of existing service connection abandoned sections.
- G. After abandonment or removal of pipe, fittings, and valves with External coating system: Field coat damaged and field cut pipe remaining in service following requirements for External coating systems, stated previously herein.
- H. Abandonment of Valve Vaults.
 - 1. Remove valve vault top slab and lower vault walls to minimum depth of 2 feet below finish grade.
 - 2. Fill remainder of vault with lean mix concrete or flowable fill following Section 03300
 - 3. Salvage frames and covers.
 - a. Reuse when approved.
 - b. Deliver surplus frames and covers to the Commission Depot.

3.16 FIELD TESTING

- A. Before hydrostatic leak test and installation of double disc and resilient-seated gate valves.
 - 1. Operate valves at site from fully closed to fully open and return to fully closed position.
 - 2. Observe for proper movement of discs and gate, and smooth function of valve parts.
 - 3. If required, correct until satisfactory performance is demonstrated.
- B. Before installation, hydrostatically test double disc and resilient-seated gate valves 16 inch and larger diameter for leakage at site in orientation as when installed.
 - 1. Vent air from valve before conducting test.
 - 2. Double disc gate valves:
 - a. Apply hydrostatic test pressure equal to valve's rated working pressure between discs for 15 minutes.
 - 1) Rated working pressure: 150 psi unless otherwise noted.
 - 2) Leakage past disc not to exceed 1 ounce per hour per inch of nominal valve size.
 - 3) No leakage through metal, flanged joints, or stem seals.
 - b. Alternatively, provide bulkhead, tapped as necessary, on 1 side of closed valve. Perform hydrostatic leakage test, as described above, between bulkhead and disc.
 - 1) Repeat test on other side of valve.
 - 3. Resilient seated gate valves:
 - a. Apply hydrostatic test pressure equal to valve's rated working pressure with gate in open position for 15 minutes.
 - 1) Rated working pressure: 150 psi unless otherwise noted.
 - 2) No leakage through metal, pressure-containing joints or stem seals.

- b. Alternatively, provide bulkhead, tapped as necessary, on 1 side of closed valve. Perform hydrostatic leakage test, as described above.
 - 1) Repeat test on other side of valve.

C. Hydrostatic tests for water pipes.

- 1. For pipe 36-inch and larger diameter, an internal visual inspection will be made by the Commission of entire test section before ends are closed for test.
 - a. Coordinate and assist as required with internal visual inspection.
- 2. Close ends of test sections with caps or plugs properly blocked or restrained to withstand pressures to be imposed.
- 3. Do not use existing or new WSSC pipe or appurtenances for temporary restraint or support during test.
- 4. Do not use resilient seated gate valves in closed position as the pressure boundary of a test section when test pressure exceeds 250 psi.
- 5. Equip and conduct hydrostatic tests with pressures computed by the Commission and described herein.
 - a. When pipe installation is ready for testing and approved backfill operations completed, notify Engineer in writing 5 working days in advance of test.
 - b. Perform chlorination simultaneously with hydrostatic test unless otherwise approved by Engineer.
 - c. Conduct preliminary test to ensure main is ready for final test.
 - d. Provide pressure gage recorder capable of printing continuous record of pressure test readings (by [Dickson Pressure Recorders, Model Numbers PW457 or PR81000](#)), and charts, for testing.
 - e. Water meter for testing: Furnished by the Commission.
 - f. Protect and shelter testing equipment.
 - g. Set up testing equipment following Standard Details, and conduct tests on pipe following AWWA C600.
 - 1) Pressure Test:
 - a) Hydraulic gradient following Drawings.
 - b) Pressure (operation plus surge) to be induced at low point of test section for pressure test is equal to elevation of hydraulic gradient minus low point elevation of water main section to be tested, multiplied by 0.433, plus surge pressure as shown below:

<u>Diameter of Pipe</u>	<u>Psi</u>
3-inch to 10-inch	120
12-inch to 14-inch	110
16-inch to 18-inch	100
20-inch	90
24-inch	85
30-inch	80
36-inch	75
42-inch to 60-inch	70

- c) Fill length of water main to be tested with water, expelling air and subject it to pressure computed as described above.
 - d) Maintain this pressure for minimum of 2 hours.
- 2) Leakage Test:
- a) Conduct leakage test consecutively with pressure test.
 - b) For leakage test induce pressure at high point of test section that is equal to elevation of high hydraulic gradient minus high point elevation of water main section to be tested, multiplied by 0.433, but never less than 100 psi.
 - c) Maintain this pressure for minimum of 8 hours.
 - d) Calculate maximum allowable leakage for water main using formula:

$$L = \frac{SD\sqrt{P}}{133,200}$$

where:

L = maximum allowable leakage, gallons/hour.

S = length of pipe in test section, in feet.

D = nominal diameter of tested pipe, in inches.

P = average test pressure, pounds per square inch, which will be computed by averaging test pressures at low point and pressure at high point above.

- 6. Pipes 14 Inch and Smaller: Conduct 2 hour combination pressure/leakage test.
 - a. For 14 inch and smaller diameter mains the Contractor has the option for 2 hour test to substitute the recording gage with a Calibrated Needle Pressure Gage with zero leakage.
 - b. After installation of the water service connections, conduct a 2 hour pressure test at 125 psi, utilizing either option to conduct the test.
 - 1) Not to be conducted on replacement and relocation projects without Engineer's direction.
- D. Hydrostatically test thrust restraint system of double disc and resilient-seated gate valves, 16 inch and larger diameter, after valve installation and successful testing of water main.
- 1. Double disc gate valves:
 - a. Pressure test each side of closed valve for no less than 1 hour to same pressure used for water main pressure test, while other side is depressurized.
 - b. Dewatering of depressurized side is not necessary.
 - c. Pressure not to exceed twice rated working pressure of valve.
 - d. Repeat test on other side of valve.
 - e. Repair leaks or damages to valve body, vault, piping, joints, fittings, or appurtenances in vault at no cost to the Commission.
 - f. Do not operate valve when water pressure is greater than valve's rated working pressure.
 - 2. Resilient-seated gate valves:
 - a. Pressure test each side of closed valve for no less than 1 hour to same pressure used for water main pressure test, while other side is depressurized.

- b. Dewatering of depressurized side is not necessary.
 - c. Pressure not to exceed 250 psi.
 - d. Repeat test on other side of valve.
 - e. Repair leaks or damages to valve body, vault, piping, joints, fittings, or appurtenances in vault at no cost to the Commission.
 - f. Do not operate valve when water pressure is greater than 250 psi.
- E. Should test results show displacement, damage, or leakage in excess of allowable amount, repair displacement, damage, and eliminate leakage.
- 1. Retest until specified conditions are met, to Engineer's requirement, at no cost to the Commission.
 - 2. Commission will observe test for each segment once without charge to Contractor.
 - a. Cost of further tests will be deducted from monies owed Contractor at prevailing hourly rates published by the Commission.
 - 3. Additional water use resulting from failed water main test shall be metered in gallons with the Commission reimbursed for water use at the prevailing rates.
- F. PVC Water Pipe Continuity Testing.
- 1. Test tracer wire for continuity, in presence of Engineer, after backfill is complete and before Substantial Completion.
 - 2. Notify Engineer in writing 5 working days in advance to schedule testing.
 - 3. Continuity test to consist of locating the PVC water pipe and water services with an electronic-type pipe locator.
 - 4. If test for continuity is negative, repair or replace as necessary to achieve continuity.

3.17 TEMPORARY BYPASS WATER SERVICE SYSTEM

- A. Provide telephone numbers to Engineer for designated after hours emergency work crew before installation of bypass system.
- B. Remove no more than 5,000 feet of existing main from service at one time unless Engineer approves otherwise.
- C. Before water main to be replaced or cleaned and lined is shut down, provide temporary bypass piping system of adequate size to provide water service and fire protection to affected properties as required herein and as directed by the Engineer:
- 1. Notify Engineer:
 - a. At least 24 hours in advance for installation of temporary connections.
 - b. When additional bypass services are made.
 - c. When problems develop with any meters or services.
- D. Use nearest available fire hydrant for connection to temporary bypass system.
- 1. Where fire hydrants cannot be used, excavate and tap existing water main at Engineer's direction.
 - 2. Provide backflow preventers on temporary bypass piping at connection to source.

3. Make temporary bypass service attachments to fire hydrants in a manner that will allow removal with minimum effort in case of emergency.
 4. Provide temporary fire hydrants;
 - a. Provide markers that are clearly visible from street.
 - b. Brace hydrants.
 - c. Spacing as follows;
 - 1) Single family residential area.
 - a) Spacing maximum 500 feet apart measured along an improved roadway and within 400 feet from the most distant corner of any dwelling.
 - 2) Townhouses and garden apartments.
 - a) Spacing maximum 250 to 300 feet apart measured along an improved roadway and within 300 feet from the most distant corner of any building.
 - 3) Commercial, industrial, high-rise, and elevator type apartments.
 - a) Spacing maximum 250 to 300 feet apart measured along an improved roadway.
- E. Provide temporary service connection for existing water services less than 2 inch diameter affected by required water main shutdowns.
1. Existing inside meters:
 - a. Connect temporary service using temporary curb stop following Special Detail W/5.16a
 - b. When temporary service is no longer required, reconnect water service and provide new curb stop and curb box assembly.
 2. Existing outside meters:
 - a. Connect temporary service to existing meter following Special Detail W/5.16
 - b. Use notched meter covers when temporary services are connected.
 - c. Angle ball valves improperly connected to existing meter will be removed and correctly install by the Commission.
 - 1) A cost of \$500 per incident will be deducted from payment to Contractor.
 - d. When temporary service connection is no longer required:
 - 1) Reconnect water service and provide new meter assembly.
 - 2) Reset existing meter in new assembly.
 - 3) Meters improperly installed will be removed and correctly installed by the Commission.
 - a) A cost of \$500 per incident will be deducted from payment to Contractor.
- F. Placement and protection of temporary bypass piping system.
1. Do not install between November 15 and March 1.
 2. Remove by November 15.
 3. Do not place during freezing weather and if already installed, protect from freezing.
 4. Provide cap and sampling connection at downstream end of each separate bypass piping segment.

- a. Do not loop downstream end of segment back to or near inlet of segment.
 5. Cover sections of temporary bypass lines that cross driveways or sidewalks and ramp with bituminous cold mix.
 6. Protect concrete and brick driveways to prevent discoloration from bituminous material.
 7. Place bypass lines at road crossings below the existing road surface.
 8. Place sections of bypass or services that cross sidewalks with barricades, ramps, and fluorescent paint.
 9. Place crossings of bypass lines parallel and/or perpendicular to handicap ramps, below existing grade.
 10. Install and support temporary bypass piping at storm drain inlet crossing so that piping and supports do not impede storm water from entering storm drain inlet.
- G. House to house connections are prohibited.
- H. Temporary bypass piping for existing service connections 3 inch and larger diameter and temporary fire protection: Minimum 4 inch diameter.
- I. Disinfect temporary bypass piping, including temporary house services, utilizing distribution system residual.
1. Commission will take bacteriological samples within 3 working days after receipt of written notification from Contractor that disinfection is complete.
 2. Results of sample analysis will be available within 3 working days after sampling.
 3. If samples are not approved, chlorinate and notify the Engineer to take new samples for testing.
 4. Cost of the additional disinfection, samples and testing: Contractor's expense.
 5. After samples are approved by the Commission, place bypass piping in service.
- J. Maintenance or repair of temporary bypass piping system.
1. Respond to Commission's notification within 30 minutes and arrive at work site within 2 hours of notification.
 2. Provide adequate equipment, materials, and labor to take remedial actions within 1 hour of arrival at site in order to restore temporary bypass system in a timely manner at no cost to the Commission.
 3. Call radio room (301-206-4002) immediately after arriving at the work site and after work has been completed.
 4. Failure to respond back to Commission within 30 minutes, failure to arrive at work site within 2 hours or failure to take remedial action within 1 hour of arrival on site will result in a \$500 fee per remedial action event and cost incurred by the Commission to restore service and will be assessed to Contractor and deducted from payments

PART 4 MEASUREMENT AND PAYMENT

4.1 PIPE

- A. Measurement: By linear foot of various types and sizes measured horizontally along centerline of pipe with no deductions made for lengths of fittings, connections, or valves, except:
 - 1. Fire hydrant leads will be measured beginning at water main centerline to hydrant centerline.
- B. Payment: At unit price for each linear foot for each size listed in Bid Schedule.
 - 1. Payment includes test pits required by Contract Documents, excavation, bedding and backfill; installation of pipe, fittings, valves, valve boxes, branch connections, connections to new and existing mains, corporation stops, and couplings for chlorination.

4.2 SERVICE CONNECTIONS

- A. Measurement: By linear foot of various types and sizes provided measured horizontally along centerline of pipe from center of main to property line following Standard Details.
 - 1. No deductions will be made for lengths of fittings, connections, or valves.
- B. Payment: At unit price for each linear foot for each size listed in Bid Schedule.
 - 1. Payment includes excavation, bedding and backfill; installations of pipe, fittings, curb stops, corporation stops, valves, valve boxes, and connections to new and existing mains.

4.3 SERVICE CONNECTION WITH OUTSIDE METER

- A. Measurement: By linear foot of various types and sizes measured horizontally along centerline of pipe from center of main to the limits following Drawings and Standard Details.
 - 1. No deductions will be made for lengths of fittings, connections, or valves.
- B. Payment: At unit price for each linear foot for each size listed in Bid Schedule.
 - 1. Payment includes excavation, bedding and backfill; installation of pipe, fittings, valves, valve boxes, meter setting, meter, and connections to new and existing mains.

4.4 EXTEND AND RECONNECT EXISTING WATER SERVICE CONNECTIONS TO NEW MAIN

- A. Measurement: By linear foot measured horizontally along center line of pipe from centerline of existing main to centerline of new main.
 - 1. No deductions will be made for lengths of fittings, connections, or valves.
- B. Payment: At unit price for each linear foot listed in Bid Schedule.

1. Payment includes excavation, bedding and backfill; installation of pipe, fittings, corporation stops, valves, valve boxes, reconnection to new main, and temporary water service.

4.5 RECONNECTION OF EXISTING WATER SERVICE CONNECTIONS

- A. Measurement: By each complete in place.
- B. Payment: At unit price for each listed in Bid Schedule.
 1. Payment includes excavation, bedding and backfill; installation of fittings, corporation stops, valves, valve boxes, reconnection to new main; and temporary water service.

4.6 REPLACEMENT OF SERVICE CONNECTIONS

- A. Measurement: By linear foot of various types and sizes provided measured horizontally along centerline of connection from center of main to property line, including each branch on the backside of double meter setting, following Standard Details.
 1. No deductions will be made for lengths of fittings, connections, or valves.
- B. Payment: At unit price for each linear foot listed in Bid Schedule.
 1. Payment includes excavation, bedding and backfill; installation of pipe, fittings, corporation stops, valves, valve boxes, curb stops or meter setting and meter, as required; abandonment of existing service connection, connection to new and existing mains; and temporary water service.

4.7 FIRE HYDRANTS

- A. Measurement: By each complete in place, including connection to fire hydrant lead following Standard Details included herein the documents.
- B. Payment: At unit price for each listed in Bid Schedule.
 1. Payment includes excavation, bedding and backfill; incidental appurtenances and installation of fire hydrant.
 2. Excludes fire hydrants installed on meter vault bypass piping.

4.8 STRUCTURES

- A. Measurement: By each for valve manholes and vaults, blowoffs, and entry port manholes of various types and sizes provided complete, in place.
- B. Payment: At unit price for each of various types and sizes as listed in Bid Schedule.
 1. Payment includes excavation, bedding and backfill; installation of pipe, valves and fittings from main, provision of flanged pipe and fittings, manholes, vaults, other

materials not furnished by the Commission and incidentals following Drawings and Standard Details.

2. Payment does not include mainline pipe, mainline valves or mainline fittings.

4.9 METER VAULTS

- A. Measurement: By each of various types and sizes provided complete in place, including frame and cover.
- B. Payment: At unit price for each of various types and sizes listed in Bid Schedule.
 1. Payment includes excavation, bedding and backfill, installation of pipe, fittings, fire hydrants, valves, and valve boxes that make up bypass and are within vault area between 2 bypass tees or taps, and incidentals following Standard Details.

4.10 PIPE IN TUNNELS OR CASINGS

- A. Measurement: By linear foot measured horizontally along centerline of pipe.
- B. Payment: At unit price for each linear foot for each size listed in Bid Schedule.
 1. Payment includes bulkheads casing spacers, incidental appurtenances and installation of pipe following Drawings and Standard Details.

4.11 CASING PIPE INSTALLED IN OPEN CUT

- A. Measurement: By linear foot measured horizontally along centerline of pipe from bulkhead to bulkhead.
- B. Payment: At unit price for each linear foot listed in Bid Schedule.
 1. Payment includes excavation, bedding and backfill; casing pipe, and incidental appurtenances following Drawings and Standard Details.

4.12 OUTSIDE METER SETTING ONLY

- A. Measurement: By each complete in place, at Engineer's direction.
- B. Payment: At fixed contingent unit price or unit price for each of various types and sizes listed in Bid Schedule.
 1. Payment includes excavation, backfill and bedding, installation of meter setting, housing, and appurtenances following Drawings and Standard Details and disposal of existing meter setting and housing.

4.13 MOBILIZATION: See Section 01110.

4.14 ABANDONMENT OF SERVICE CONNECTIONS

- A. Measurement: By each of various types and sizes abandoned in separate trench from new or renewed service, complete in place.
- B. Payment: At unit price or contingent unit price for various types and sizes listed in Bid Schedule.
 - 1. Payment includes excavation, abandonment of existing service connection, and backfill.

4.15 INSERTION VALVE

- A. Measurement: By each of various sizes provided in place.
- B. Payment: At unit price for each of various sizes listed in Bid Schedule.
 - 1. Payment includes excavation, bedding and backfill, provision of insertion valve and incidental appurtenances.

4.16 TEMPORARY BYPASS

- A. Measurement: By linear foot of mainline to be bypassed. Measured horizontally along the mainline from point of bypass connection at mainline to opposite end of bypass at mainline.
- B. Payment: At unit price for each linear foot listed in Bid Schedule.
 - 1. Payment includes provision and installation of bypass piping, hoses, corporation stops, valves, fire hydrants, fittings and appurtenances, disinfecting and maintaining bypass line (including all repairs), connection and disconnection to mainline.

WSSC

STANDARD SPECIFICATIONS
SECTION 02950
PAVEMENT REQUIREMENTS

PART 1 GENERAL

1.1 DESCRIPTION

- A. Section includes requirements for removing, replacing and providing new paving for roads, driveways, parking areas, curb and gutter, walks, and paved areas within limits indicated, including subgrade and base courses.

1.2 DEFINITIONS

- A. Paved: Covered with gravel, stone, brick, asphalt, concrete, or other material providing a firm, level, or convenient surface for vehicular or pedestrian traffic.

1.3 JURISDICTIONAL REQUIREMENTS

- A. Commission utility contracts involve work in roads, parking and paved areas under following jurisdictions:
 - 1. Maryland State Highway Administration (MSHA).
 - 2. Montgomery County Department of Permitting Services.
 - 3. Prince George's County Public Works and Transportation Department.
 - 4. Incorporated municipalities.
 - 5. Other jurisdictions.
- B. When working in these areas, remove and replace roads, driveways, parking areas, curb and gutter, walks and other paved areas following specific requirements of the authority having jurisdiction.

1.4 PAVEMENT REPLACEMENT

- A. Service Connection Contracts (AC, LC, and SC).
 - 1. Temporary pavement only.

PART 2 PRODUCTS

2.1 MATERIAL

- A. Commission Furnished Materials.
 - 1. Pavement Repair Identification Markers.
- B. Concrete.

1. Meet requirements in Section 03300, except where jurisdictional requirements apply.

C. Other Materials.

1. Materials for permanent pavement replacement: Meet latest editions of following jurisdictional requirements:
 - a. State Roads: MSHA Standard Specifications, Standard Details, and Master Permits.
 - b. Montgomery County Roads: Montgomery County Department of Permitting Services, Specifications for Utility Construction Permit.
 - c. Prince George's County Roads: Prince George's County Public Works and Transportation Department Specifications and Standard Details.
 - 1) Material must be obtained from county approved hot mix asphalt plants.
 - d. Areas not covered above: Follow Right of Way Construction Permit.

D. Temporary Pavement Replacement:

1. Hot Mix Asphalt Surface-Fine (SF): Follow MSHA Standard Specifications.
 - a. When not available, use Engineer approved high performance cold mix asphalt.
2. High Performance Cold Mix Asphalt: Composed of approved suitable aggregate, plant mixed with approved asphaltic liquid blend following blend manufacturer's specifications.
 - a. Final mix:
 - 1) Stripping resistance of retained coating minimum 75% when testing to ASTM-D-1664, latest revision.
 - 2) Remain flexible and cohesive to minus fifteen degrees F (-26 degrees C).
 - 3) Homogeneous, free of lumps.
 - 4) Retain its adhesive qualities in wet applications.
 - 5) Approved High Performance Cold Mix Products:
 - a) National Paving and Contracting, Perma-Patch
 - b) Seaboard Asphalt Product, Bond-X Green
 - c) Lafarge North America, QPR
 - d) RoadStone Production LLC, Aquaphalt
 - e) Cold Mix Manufacturing Corp., Green Patch.
 - f) Unique Paving Materials, High Performance Cold Patch.
 - g) or approved equal
 - b. Acceptable aggregate: Consist of 10% crushed stone or laboratory approved equivalent under ASTM C-136.

Recommended Gradation:

Sieve Size	Percent Passing by Weight
3/8"	90-100%
#4	20-55%
#8	5-30%
#16	0-10%
#50	0-5%
#200	0-2%

- c. Acceptable Liquid Asphaltic Blends:

- 1) National Paving and Contracting, Co., Perma-Patch Liquid
- 2) Sylvax Corp., UPM Liquid Asphalt Blend
- 3) Lafarge North America, QPR Blend
- 4) Sylcrete Corp., Sylcrete-EV
- 5) Co-Products Corp., I.A.R.
- 6) Seaboard Asphalt Product, BondX

- 7) or approved equal

PART 3 EXECUTION

3.1 PUBLIC NOTIFICATION

3.2 GENERAL

- A. Construction requiring removal and replacement of roads, driveways, parking areas, curb and gutter, walks and paved areas, and new paving: Meet latest editions of jurisdictional requirements listed above in PART 2.

3.3 REMOVAL OF EXISTING PAVEMENT

- A. Cut and remove existing pavement in advance of excavating to neat lines following appropriate jurisdictional standard detail utilizing the Commission standard trench widths.
- B. Saw cut existing concrete pavement and concrete base course full depth and remove load transfer devices where they exist.
- C. Provide temporary walkways and curb and gutter at Engineer's direction.

3.4 USE OF STEEL PLATING

- A. Whenever Steel plating is required or used during construction within paved roadway:
 1. Notify Engineer and authority having jurisdiction at least 48 hours in advance of placing steel plates in roadway.
 2. Follow jurisdictional requirements and as specified herein.
 3. Dimensions: At least 1 inch thick and large enough to allow minimum of 1 foot of bearing on 3 sides of excavation.
 4. Placement: Pin plates to prevent movement. Recess plates at Engineer's direction.
 5. Taper cold mix asphalt on all edges of steel plate from height of steel plate extending minimum of 1 foot to existing road surface.
 6. During months when snowfall may be expected, mark steel plates with 2 inch square stake painted International Orange and extending at least 4 feet above ground, placed adjacent to edge of roadway.

7. If jurisdictional or Commission forces must correct emergency condition due to excavation and/or plate placement, Contractor will be charged for cost of corrective measures required.
8. Unless otherwise approved by Engineer, remove steel plates from service in 7 calendar days or less.

3.5 PREPARATION FOR PAVEMENT REPLACEMENT

- A. Compact Trench Backfill following the contract plans and special provisions.
- B. Provide temporary or permanent pavement immediately upon completion of backfill.

3.6 TEMPORARY PAVEMENT

- A. Place temporary pavement as specified herein except where otherwise required by jurisdictional requirements.
 1. Place and compact hot mix asphalt bituminous concrete mix minimum thickness of 3 inches and at same grade as surrounding surface on Trench Backfills required in Section 02315 for Type I areas under existing paving.
 2. When approved by Engineer for use, place and compact high performance cold mix asphalt minimum thickness of 3 inches and at same grade as surrounding surface on Trench Backfills required in Section 02315 for Type I areas under existing paving.
 - a. Stockpiling of high performance cold mix asphalt will be permitted provided it is stored in manner to prevent infiltration of deleterious material and not longer than 1 month from date of mixing.
 - b. Compact high performance cold mix asphalt using uniform tamping equipment.
 3. Provide hot mix asphalt for temporary curb and gutter, walks, and driveways.
 4. Mark temporary pavement repairs in all roads with blue paint for water or water and sewer, and green paint for sewer in 4 inch high letters to read WSSC-S for Systems Construction or WSSC-F for Facilities Construction.
 5. Temporary pavement: Remain in place maximum of 60 days, unless jurisdictional requirements are more stringent.
 - a. If approved suppliers of permanent paving are unavailable due to wintertime shutdown, allotted time period will be extended to include shutdown period, upon written request to Engineer.
 6. Maintain temporary pavement in condition acceptable to Engineer, or authority having jurisdiction until permanent pavement is placed.
 7. If temporary pavement becomes defective and creates an emergency, commence repair to rectify situation within 1 hour after notification by Engineer or Engineer may arrange to have Work performed by others and deduct costs of corrective measures from monies owed Contractor.

3.7 PERMANENT PAVEMENT

- A. Dimensions: Follow jurisdictional requirements.
 - 1. If pavement has been undermined, damaged, or disturbed by Contractor's operations, increase extent of repaving so that new pavement and base extends at least 18 inches over undisturbed soil.
 - 2. Install pavement repair identification markers in each repair and every 50 feet in longitudinal repairs.

- B. Bituminous Concrete Overlay:
 - 1. Place bituminous concrete overlay to limits and depth specified in Drawings, trench details and Right of Way Construction Permit.
 - 2. Pavement replacement for trenches to be overlaid: Follow standard jurisdictional requirements or as specified below.

- C. Milling and Bituminous Concrete Overlay:
 - 1. Mill and place bituminous concrete overlay to limits and depth specified following jurisdictional requirements.
 - 2. Pavement replacement for trenches to be overlaid: Follow standard jurisdictional requirements or as specified below.

- D. Bituminous Concrete Pavement Replacement:
 - 1. Prime coat cut surfaces to receive asphalt patch and between each new layer of asphalt.
 - a. Clean surface of loose and foreign materials.
 - b. Apply under pressure: Uniformly, at rate of 0.01 to 0.05 gallons per square yard of area.
 - 2. Bituminous Concrete: Follow jurisdictional requirements.

- E. Concrete Pavement Replacement:
 - 1. Replace load transfer devices where removed.
 - 2. Place concrete pavement following jurisdictional requirements.
 - 3. Place expansion joints at 40 feet on center, maximum, or space to match existing joints, whichever is less.

- F. Shoulder Replacement:
 - 1. Replace disturbed shoulder areas with type of material existing before disturbance, following appropriate jurisdictional requirements.
 - 2. Reuse of gravel or aggregate material may be permitted with Engineer's approval, provided gravel or aggregate is removed and stockpiled separately, and is not infiltrated with foreign material.

- G. Curb and Gutter Replacement:
 - 1. Do not tunnel concrete and asphalt curbs without Engineer's approval.
 - 2. Replace curb and gutter following jurisdictional requirements.

3. When curb replacement is required within 4 feet of construction joint, extend replacement to joint.

H. Walkway Replacement:

1. Remove and replace entire sidewalk square affected.
2. Space joints to match existing surrounding sidewalk.

I. Driveway and Other Replacement:

1. Driveways in State or County Rights-of-way: Replace following applicable jurisdictional requirements.
2. Unless otherwise shown on Drawings, replace driveways at other locations and other paved areas in kind.

PART 4 MEASUREMENT AND PAYMENT

4.1 ROADWAY PAVEMENT REPLACEMENT

- A. Measurement: By square yard following Commission standard trench widths measured horizontally along trench centerline and following requirements of authority having jurisdiction including but not limited to cutbacks and paving between curbs and trench.
- B. Payment: At unit price listed in Bid Schedule.
 1. Payment includes excavation and disposal of existing and temporary pavement.

4.2 BITUMINOUS CONCRETE OVERLAY

- A. Measurement: By square yard, following requirements of authority having jurisdiction.
- B. Payment: At unit price for each square yard listed in Bid Schedule.
 1. Payment includes labor, material, and equipment to provide bituminous concrete overlay specified herein.

4.3 MILLING AND BITUMINOUS CONCRETE OVERLAY

- A. Measurement: By square yard, following requirements of authority having jurisdiction.
- B. Payment: At unit price for each square yard listed in Bid Schedule.
 1. Payment includes labor, material, and equipment to provide milling and bituminous concrete overlay specified herein.

4.4 TEMPORARY HOT BITUMINOUS CONCRETE TO REPLACE COLD PATCH IN MARYLAND STATE HIGHWAY ADMINISTRATION ROADWAYS

- A. Measurement: By square yard following Commission standard trench widths measured horizontally along trench centerline.
- B. Payment: At fixed contingent unit price for each square yard listed in Bid Schedule.
 - 1. Payment includes removal of temporary cold mix, labor, material and equipment to provide hot bituminous concrete patch as specified herein.

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STANDARD SPECIFICATIONS
SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 DESCRIPTION

- A. Section includes requirements for providing normal weight cast-in-place concrete to sizes and shapes shown.
 - 1. See other Sections of Specifications for concrete used for other than normal weight cast-in-place concrete and for pipes and precast concrete.

1.2 QUALITY ASSURANCE

- A. Field Requirements
 - 1. Obtain and maintain on site a copy of ACI 301, ACI 347, ACI 350, and appropriate documents referred to therein.
 - 2. Furnish materials and labor; make cylinders for reinforced concrete.
 - 3. Provide visual means of identification of reinforcing steel, size, strength, and specification designation, and welded wire fabric designation, following CRSI Manual of Standard Practice.

1.3 SUBMITTALS

- A. Submit following Section 01330.
 - 1. Certified concrete mix design for each strength following ACI 301 and ACI 211. Include dry weight of ingredients and volume of water per cubic yard of concrete.
 - 2. Source of fly ash and mix design for flowable fill.
 - 3. Shop drawings showing reinforcing steel prepared following ACI 315, including bar lists and bending diagrams, placement drawings, and special details.
 - 4. Drawings showing location, types, and details of joints.
 - 5. Sequence of pours.
 - 6. Calculations showing concrete strength to be attained at proposed time of removal of formwork, falsework, and centering.
- B. Submit following Section 01450 before delivery of materials.
 - 1. Certified Test Reports:
 - a. Admixtures.
 - b. Aggregate.
 - c. Cement with percentage of alkali (Na_2O).
 - d. Copy of ASTM C1260 test with percentage of expansion due to Alkali Silica Reaction (ASR) when alkali content in cement exceeds 0.6 percent.

- e. Fly ash for flowable fill showing chemical analysis, including quantity of calcium as CaO and analytical Toxicity Characteristic Leaching Procedure (TCLP) data, establishing that fly ash is not hazardous, following 40 CFR 261.
- C. Submit certified delivery tickets for concrete furnished.
- 1. Name and location of batch plant and name of plant inspector.
 - 2. Ticket number.
 - 3. Load number (batch number).
 - 4. Date and truck number.
 - 5. Destination including name and location of WSSC contract.
 - 6. Concrete type and class (strength) and design mix designation.
 - 7. Actual quantities of all materials including admixtures and amount of concrete in cubic yards.
 - 8. Time at which mixer drum was charged with cement.
 - 9. Amount of free moisture by percentage of permissible mixing water in aggregates, and maximum amount of mixing water that can be added at job site to obtain specified water to cement ratio.
 - 10. Blank space for initials of on-site receiving party.
 - 11. Time of arrival of concrete or flowable fill truck on site.
 - 12. Time of concrete or flowable fill placement.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Reinforcement.
- 1. Reinforcing Bars: Unless otherwise indicated, ASTM A615, with minimum yield strength of 60,000 psi.
 - 2. Welded Wire Fabric: ASTM A185, size and spacing of wires following Drawings.
 - 3. Reinforcing Accessories: CRSI Manual of Standard Practice.
- B. Fast Setting Repair Mortar:
- 1. Approved Products:
 - a. Regular applications.
 - 1) IPA Systems Inc., Octocrete.
 - 2) Bonsai, Inc., Blendcrete.
 - 3) National Permacrete Company, Inc., Permacrete.
 - 4) Chesco Creative Products, Cempatch
 - 5) Kaufman Products, Inc., HiCap.
 - 6) or approved equal
- C. Non-Shrink Grout: Dry Pack Under Structure Steel and Equipment: ASTM C1107.

1. Approved Products:
 - a. Degussa Admixtures, Inc., Masterflow 713 grout.
 - b. Five Star Products Inc., Five Star Grout.
 - c. Euclid Chemical, NS Grout.
 - d. Kaufman Products, Inc., SureGrout.
 - e. or approved equal

D. Appurtenant Materials:

1. Vapor Barrier:
 - a. Building Paper: FS-UU-B-790A.
 - b. Polyethylene Sheeting: ASTM D2103, 6 mil thick.
2. Curing Materials:
 - a. Curing Compound for Concrete Surfaces: ASTM C309.
 - b. Sheet Materials for Curing: ASTM C171.
 - c. Burlap Cloth Made From Jute or Kenaf For Curing: AASHTO M182, Class 1.
3. Expansion Joint Filler:
 - a. Filler Not Exposed To Traffic or Weather: ASTM D994.
 - b. Filler Exposed To Traffic or Weather: ASTM D1751 or ASTM D1752.
4. Temporary Wood Joint Filler:
 - a. Straight, sound strips of width and depth shown on Drawings or as approved, to produce true, straight joint edges.
 - b. Tapered slightly from face-to-back and coated with paraffin, or equivalent, to seal against moisture and to promote ready removal with forms.
5. Joint Sealer:
 - a. Hot applied: ASTM D6690.
 - b. Cold applied: ASTM C920.
6. Waterstops:
 - a. For expansion joints, unless otherwise shown on Drawings: Nine inches wide and minimum 3/8 inch thick, dumbbell type with center bulb of minimum 3/4 inch inside diameter.
 - b. For construction or control joints, unless otherwise shown on Drawings: Six inch wide and 3/8 inch thick, dumbbell type without center bulb.
 - c. Materials:
 - 1) Polyvinyl chloride: U.S. Corps of Engineers Specifications, CRD C572.
 - 2) Rubber or neoprene: U.S. Corps of Engineers Specifications, CRD C513.
 - d. Manufactured accessories at waterstop intersections: Form field splices with butt joints only following manufacturer's recommendations.
 - e. Heat-sealed field splices: Capable of developing water tightness equal to that of unspliced material and with tensile strength of not less than 50 percent of unspliced material.
7. Epoxy Bonding Compound: ASTM C881.
8. Corrosion Protection for Aluminum to be in Contact with Concrete:
 - a. Prepare, prime and topcoat surfaces to be coated following coating manufacturer's recommendations and apply 2 coats

- b. Coating system: 10 to 16 mils DFT (dry film thickness).
- E. Cement: ASTM C150, Types I and II. Utilize Type III cement only when approved by Engineer.
- F. Formwork: ACI 347 with materials suitable for use intended and adequate to support loads within tolerances as recommended.
- G. Aggregates: ASTM C33.
- H. Fly Ash: ASTM C618, Class F.
- I. Ground Granulated Blast-Furnace (GGBF) Slag: ASTM C-989, Grade 120.
- J. Water:
 - 1. Mixing and Curing Concrete: Clean, fresh, and free from injurious substances.
 - 2. Water of Questionable Quality: Meet limits of comparison tests with distilled water following AASHTO T26.

PART 3 EXECUTION

3.1 DESIGN MIX

- A. Design Strength of 28-Day Concrete:
 - 1. Minimum 4,000 psi concrete for structurally reinforced concrete work, concrete ditches, channels, slope protection, exterior work, and flatwork underfoot, including walks, steps, ramps, drives, slabs, and floors.
 - 2. Minimum 3,000 psi for non-reinforced concrete thrust blocking, water pipe cradle in casing or tunnels, and masonry cell fill.
 - 3. Minimum 2,000 psi concrete for mud mats, pipe encasement and cradle, filling voids between sewer pipes and casing or tunnel liners, and for under foundations where excavated to excessive depth.
 - 4. Minimum 2,000 psi concrete for grout with maximum size coarse aggregate not exceeding 3/8 inch.
 - 5. Minimum 94 pounds cement per cubic yard and aggregate no larger than 1-1/2 inch for lean mix concrete for filling abandoned manholes.
 - 6. 50 to 150 psi for flowable fill for filling voids between sewer pipes and casing or tunnel liners, limited site voids, soil boring voids, manholes and pipes.
- B. Mix Proportioning:

1. 4,000 psi concrete: ACI 301, to produce watertight concrete resistant to naturally occurring or commonly used chemicals, and following:
 - a. Water to cement ratio: Maximum 0.45.
 - b. Minimum cement content and air entrainment:

<u>ASTM C33 Coarse Aggregate No.</u>	<u>Pounds/Cubic Yard</u>	<u>Air Entrainment</u>
467	517	5±1 percent
57 or 67	564	6±1 percent

- c. Slump: 1 inch minimum, 4 inches maximum.
2. Other concrete: ACI 301.
3. Substitution: GGBF Slag
 - a. Maximum of 50 percent of weight of cement.
 - b. Percentage: Establish by
 - 1) Importance of early strength.
 - 2) Curing temperature involved.
 - 3) Properties of other concrete materials.
 - c. Minimum percentage: Determine by performing ASTM C1260 test if alkali content of cement is higher than 0.6 percent, so expansion of test mortar does not exceed 0.1 percent
 - d. Minimum cement content and water to cement ratio: Determine on basis of combined weight of cement and GGBF slag.
4. Flowable fill: Cement, fly ash, and water.
 - a. Filler, if required: Sand and/or aggregates of 3/8 inch maximum size.
 - b. Fly ash: Maximum of 25 percent of weight of cement.

C. Admixtures:

1. Water reducing and retarding admixtures may be used with Engineer's approval. Ensure compatibility of admixtures, and if retarding admixtures are used, follow form removal procedure specified below.
2. Do not use calcium chloride without prior approval.

3.2 FORMWORK DESIGN AND CONSTRUCTION

- A. Design, engineer, construct, and remove formwork:
 1. Chamfer exposed concrete corners of edges not less than 3/4 inch in each dimension.
 2. Do not use removable form ties in water-retaining structures.
- B. Design and construct to support loads following ACI 347 within tolerances specified in ACI 301.
- C. Provide form coatings producing desired finish.
- D. Schedule for Removal of Forms, Falsework, and Centering:

1. Forms, Falsework, and Centering: ACI 347.
 2. Provided concrete has attained proper design strength, and Contractor meets requirements below, Engineer will approve removal of forms, falsework, and centering for:
 - a. Forms under unordinary conditions.
 - b. Concrete made with cement other than Type I or Type II.
 - c. Concrete made with GGBF slag.
 - d. Concrete made with retarders.
 3. Determine concrete strength attained before removal of forms, falsework, and centering from tests of job-cured cylinders, cured under conditions not more favorable than most unfavorable conditions for portions of concrete which specimens represent.
 - a. Test following ASTM C31 except as modified herein.
 - b. Provide 3 additional cylinders for each pour or for each 1,000 square feet of form contact area, whichever is less, for testing.
 - 1) See Section 01450.
 - 2) Submit certified test report of cylinders to Engineer.
 4. Demonstrate conclusively specified strength of concrete has been attained.
 - a. After removal of forms, falsework, and centering and before attainment of design strength by concrete, do not alter loading conditions to exceed permissible stresses and deformations at attained strength of concrete.
 - b. Minimum strength level required for each cylinder: 28 days compressive strength.
 5. Immediately after forms are stripped, repair defects following ACI 301.
- E. Use of earth cuts as forms for small foundations will be permitted, provided cuts are vertical, sharp, true, and with Engineer's approval.

3.3 PLACING REINFORCEMENT

- A. Unless otherwise indicated, place reinforcement following ACI 301 and with concrete cover following in ACI 318.

3.4 PLACING CONCRETE

- A. Notify Engineer at least 24 hours before placing concrete.
1. Place vapor barrier under slabs poured on earth, following Drawings.
 2. Wet down formwork and reinforcement before placing concrete to prevent leaching of water from concrete, but do not allow free water to stand in forms.
 3. Place concrete within 90 minutes after addition of cement, aggregates, water, and admixtures.
 4. Discard off-site concrete not placed within these time limits.
 5. Do not exceed the concrete free drop of 5 feet without use of adjustable length pipes.
 6. Locate joints where shown on Drawings and approved submittals.

7. Seal control joints in exterior slabs.
8. When bonding new concrete to existing, prepare for subsequent placement following ACI 301 with approved bonding compound applied and permitted to cure following manufacturer's recommendations, or as directed by Engineer.

B. Weather Conditions.

1. When air temperature has fallen to, or may be expected to fall below, 40 degrees F. during 7-day period after placement:
 - a. Protect concrete work from physical damage or reduced strength caused by frost, freezing action, or low temperatures following recommendations of ACI 306 and as specified herein.
 - b. Provide adequate means to maintain temperature, in area where concrete is being placed, at between 50 and 70 degrees F. for at least 7 days after placement.
 - c. Uniformly heat water and aggregates before mixing as required to obtain concrete mixture temperature of not less than 55 degrees F. and not more than 85 degrees F. at point of placement.
 - d. Provide temporary housings or coverings and maintain heat and protection to ensure that ambient temperature does not fall more than 30 degrees F. in 24 hours during 7-day period after placement.
 - e. Avoid rapid dry-out of concrete due to overheating, and avoid thermal shock due to sudden cooling or heating.
 - f. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - g. Ensure that forms, reinforcing steel, and adjacent concrete surfaces are entirely free of frost, snow, and ice before placing concrete.
 - h. Do not use chlorides and other materials containing antifreeze agents, or chemical accelerators, or set-control admixtures in mix designs, unless approved by Engineer in advance.
2. When Hot Weather Conditions Exist:
 - a. Place concrete following recommendations of ACI 305 and as specified herein.
 - b. Cool ingredients before mixing to maintain concrete temperature at time of placement below 80 degrees F. when temperature is rising and below 85 degrees F. when temperature is falling.
 - c. Cover reinforcing steel with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedment in concrete.
 - d. Do not place concrete when hot weather conditions will cause difficulty from loss of slump, flash set, or cold joints.
 - e. Do not use set control admixtures in mix designs unless approved by Engineer in advance.

3.5 CURING AND PROTECTION

- A. Method of Curing and Protection: Follow ACI 301 and as required elsewhere in Contract Documents.

- B. Protect structural floors left exposed to atmosphere for more than 3 days by polyethylene covering, dampened burlap, straw, or equivalent materials, as required to control hydration.
- C. During hot and cold weather, cure and protect concrete as required for placing concrete herein.
- D. Cure unreinforced concrete formed with earth, wood, or metal for thrust blocks, joint encasements, pipe encasements, and cradles for at least 2 hours before placing backfill.

3.6 FINISHES

- A. Method of Finishing: Follow ACI 301 and as required elsewhere in Contract Documents.
- B. Where not shown on Drawings, use following finishes:
 - 1. Curbs and Equipment Bases: Rubbed finish.
 - 2. Exterior Slabs: Broom finish, Class B tolerance.
 - 3. Interior Slabs: Trowel finish, Class A tolerance.
 - 4. Other Concrete Not Exposed To View: Rough form finish.
 - 5. Other Concrete Exposed To View: Smooth form finish with voids filled and rubbed smooth.

3.7 ACCEPTANCE OF STRUCTURE

- A. For sanitary engineering installations defined by ACI 350, concrete meeting acceptance criteria of ACI 301 and ACI 350 will be acceptable.
- B. If concrete is cored and cores fail to meet specified 28-day strength, Engineer may reject.
- C. For other structures, concrete will be acceptable if it meets acceptance criteria of ACI 301.
- D. Engineer: Sole judge of whether concrete meets requirements.
- E. Remove, dispose of, and replace concrete not meeting specified requirements at no cost to the Commission.
- F. Make repairs using approved repair procedure in Engineer's presence.

PART 4 MEASUREMENT AND PAYMENT

4.1 Measurement of concrete work for payment will not be made under this Section. Concrete work is considered essential material required in construction of specific items of work that will be measured and paid for under various items or lump sums listed in Bid Schedule.

****WSSC****

STANDARD SPECIFICATIONS
SECTION 03400
PRECAST CONCRETE

PART 1 GENERAL

1.1 DESCRIPTION

- A. Section includes requirements for providing precast concrete structures, manholes, valve vaults, and other specified miscellaneous structures.

1.2 REQUIREMENTS FOR MANUFACTURERS AND SUPPLIERS BEFORE DELIVERY

- A. Testing and Inspection.
1. Engineer may inspect and test all precast structures, fittings, lining and joint material after delivery to site or at factory.
 2. Manufacturer or Supplier: Furnish materials for tests and labor to assist Engineer with tests.
 3. Engineer may continually perform plant certification and process inspections.
 4. Concrete design mix for precast manhole sections by manufacturer showing sieve analysis for aggregates, suppliers of materials, and thirty 28-day compressive strength test results performed within 1 year of submittal.
 5. Notify Engineer following Section 01450.
- B. Factory or Site Inspected Material: See Section 01450.
- C. Storage and Handling.
1. Manufacturer or Supplier:
 - a. Store reinforcing steel off ground in well drained area to prevent deformation.
 - b. Aggregates and sand: Store on concrete slab and handle to maintain separation and to prevent infiltration of deleterious materials.
 - c. Completed structures: Store off ground using wood blocks, pallets, or other appropriate means to give ample space between rows and individual pieces, and with enough clearance above and below to allow full view of walls and joint ends for inspection purposes.
 - d. Joint ends: Keep clean and off ground.
 2. Manufacturer's Batching Plant, Casting Equipment, and Curing Facilities: Complete, operating properly, and of proper size and range.
 3. Manufacturer's Records: Show evidence of continual maintenance and quality control over casting forms and joint forming rings.
- D. Shipment Identification: Before inspection of precast structures for an order, manufacturer or supplier shall furnish to Engineer:
1. Commission's Contract Number.

2. Contractor's name.
 3. Section sizes.
 4. Footage or number of pieces required to fill order.
 5. Evidence that concrete has cured to minimum 80 percent of design strength.
- E. Ship only Commission approved precast concrete structures to Contract site.
- F. Repairs: Follow manufacturer's procedures filed with Engineer.
- G. Manufacturer or Supplier: Follow standard cold weather concreting practices of ACI 306R "Cold Weather Concreting."
1. Engineer may make special requirements to ensure quality.

1.3 SUBMITTALS

- A. Submit following Section 01330.
1. Shop Drawings: Show complete details, pertinent calculations, design loads, materials, strengths, sizes, and thicknesses, joint and connection design and details for precast structures.
 - a. Reinforcing steel following ACI 315, including bar lists and bending diagrams, placement drawings, and special details.
 - b. Location, types, and details of joints.
 - c. Sequence of pours.
 - d. Calculations showing concrete strength to be attained at proposed time of removal of formwork, falsework, and centering.
 2. Waivers.
 - a. Shop drawing submittal waived when:
 - 1) Standard Details allow use of precast structures.
 - 2) Approved design drawings and calculations for precast structures are on file with Engineer.
 - b. To obtain waiver submit letter citing:
 - 1) Commission's Contract Number.
 - 2) Precast structure manufacturer.
 - 3) Approved design drawing number.
 - c. Installation Methods for Precast Sections when manufacturer's recommended methods are on file with Engineer.
 - d. If Standard Details or specifications change, new submittals will be required.
 3. Coating manufacturer's catalog data for lining interior surfaces of precast concrete manholes, including recommendations for surface preparation, application, curing, handling, and repair procedures for coated manhole sections.
- B. Submit following Section 01450.
1. Certificate of Compliance:
 - a. Precast Manhole Manufacturer or Supplier: Flexible connector assembly, including seals and metallic or non-metallic mechanical devices used therein.

- b. Manhole lining material meets physical property requirements of lining manufacturer and passes in-plant tests, as recommended by lining manufacturer.
 - c. Engineer may require manufacturer or supplier to furnish test results substantiating certificate of compliance, or in case of failure, may elect to witness testing to his or her satisfaction.
2. Certified Test Reports:
- a. Aggregates, cement, admixtures, and steel reinforcement used in production of vaults, manhole sections, and grade rings following ASTM.
 - b. Initial reports with above referenced concrete design mixes.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Suitability of Precast Structures for Transport to Contract Site: When concrete has cured to minimum of 80 percent of design strength.
- B. Storage.
 - 1. Store off ground on wood blocks, pallets, or other appropriate means away from brush, and in area accessible for inspection.
 - 2. Do not place excavated or other material over or against stored precast structures.
- C. Handling of Precast Structures and Appurtenances: Unload and handle with crane, backhoe, or equipment of adequate capacity, equipped with appropriate slings and lifting devices to protect material from damage.
- D. Repair or Replacement.
 - 1. When Engineer deems repairable: Repair as directed by Engineer.
 - 2. When Engineer deems not repairable: Remove and replace as directed by Engineer before initiating work.
 - 3. Repair or replacement of defective or damaged material and equipment will be at no cost to Commission.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Reinforced Concrete Materials: Follow Section 03300, and modification herein, except slump requirement shall not apply to manholes.
- B. Precast Concrete Manholes: ASTM C478 except:
 - 1. Compressive Design Strength of Concrete:
 - a. Minimum 5000 psi using Type II cement.
 - b. Minimum compression cylinder test of 4000 psi at time of shipment.
 - 2. Configurations: Follow Drawings and Standard Details.
 - 3. Joints: ASTM C443.

4. Sizes: Furnish in lengths of 1 foot minimum, except do not use more than one, 1 foot section in each manhole.
5. Appurtenances.
 - a. Steps: Manufactured and of style specified in Section 02530.
 - b. Bolt inserts: Follow Standard Details.
 - 1) Embed one of following minimum of 3 inches, to accommodate 3/4 inch diameter bolts.
 - a) Heckman Building Products Corporation, No. 444 Star Threaded Inserts.
 - b) Pennsylvania Insert Corporation, the Liberator.
 - c) Atlantic Concrete Products Co., Bolt Slot Insert System.
 - d) Strut Service Company inserts.
 - e) or approved equal
 - 2) Provide with plugs for transport to Contract site.
6. Flexible Gasket Connectors: ASTM C923.
 - a. Stainless steel, Type 304 may be used when not in contact with sewage or sewage gas.
 - b. Identification: Permanent markings of date and production runs.
 - c. Approved manufacturers for connectors connecting with diameter dimension of ductile iron pipes, polyvinyl chloride (PVC) ASTM D3034, and PVC ASTM F679 to sewer manholes:
 - 1) A-LOK Products Inc., A-LOK or A-LOK X-CEL.
 - 2) Chardon Rubber Company, Lock Joint Flexible Manhole Sleeve.
 - 3) Hail Mary Rubber Co., Star Seal.
 - 4) Press Seal Gasket Corporation, Press Boot, PSX Series, Econoseal, CAST- A-SEAL® 12-08 Cast In Boot, or equal.
 - 5) NPC Incorporated, KOR-N-SEAL I Toggle Korband with Series 106 or 406 rubber boot.
 - 6) International Precast Supply, Cobra Style, Toggle Style, and Adjustment Style.
 - 7) or approved equal
7. Precast Channels/Benches:
 - a. Compressive design strength of concrete:
 - 1) Minimum 28 day compressive strength of 4000 psi using Type II cement.
 - 2) Compressive strength of 3200 psi at time of shipment.
 - b. Construction and finish:
 - 1) Furnish access for jointing pipes to flexible manhole connectors.
 - 2) Once channel/bench has been poured and initial concrete set has taken place, add no additional concrete to modify shape or repair defects.
 - 3) Top surface of bench: Brush or light broom finish.
 - 4) Channels: Troweled smooth surface.
 - c. Sizes:
 - 1) Lining: Minimum following Standard Details.
 - 2) Slopes.
 - a) Bench: Slope toward channel with maximum 1 inch vertical drop for each foot horizontal.
 - b) Channels: Slope smoothly and uniformly from incoming pipes to outlet pipe.

- 3) Width and height.
 - a) Match inside diameters of incoming and outgoing pipes and blend channel to smooth contour.
 - b) Deviations to channel width above spring line of pipe and at flexible connectors; Permitted for this purpose with Engineer's approval.

C. Miscellaneous Materials.

1. Granular Bedding: ASTM C33 coarse aggregate size number 4.
2. Weepholes: Service weight cast iron covered with non-erodible filter on earth side.

2.2 SOURCE QUALITY CONTROL

A. Test Equipment: Instruments, gages, and other testing and measuring equipment of proper range, type, and accuracy to verify conformance with specification requirements.

1. Ensure equipment is calibrated and certified at annual intervals.
2. Calibrate against measurement standards with known relationship to existing national standards.
3. Calibrate and certify gages on equipment to which they belong, and keep them on equipment following certification.
4. Do not use instruments, gages, testing, and measuring equipment found to be out of calibration or adjustment until applicable requirements have been met.
5. Calibration by agency regularly engaged in this type of activity.

B. Precast Manhole Testing.

1. Joint and Barrel Testing: ASTM C443.
 - a. Plant vacuum testing: ASTM C1244.
2. Pipe to Manhole Connection Testing: Flexible gasket connectors following ASTM C923, except modified herein.
 - a. During every 90 day period, test at least 1 connector.

- b. Perform hydrostatic testing of connectors following ASTM C923.
 - 1) If manufacturer chooses to perform vacuum test following ASTM C1244, test connector with pipe in straight alignment, 7 degrees minimum axially deflected alignment, and loaded in shear following ASTM C923.
 - 2) Use test pipe of same size, class, design and type as pipe to be provided under Contract.
 - 3) Measure pressure at horizontal centerline of connector using calibrated pressure gage, minimum 4-1/2 inch diameter, calibrated from 0 to 30 psi with 1/2 pound subdivisions.
 - 4) Manufacturer may use standpipe calibrated in 1/2 foot increments with permanent markings instead of calibrated pressure gage.
 - a) Use standpipe high enough to develop specified water pressure and equipped with overflow line adjusted to height for developing specified pressure.
 - b) Ensure that continuous stream of water flows from overflow line during test and is visible from test site.
- c. Hydrostatic test at or above 40 degrees F and in environment free from effects of wind, inclement weather, and conditions that would interfere with conducting tests and observing their results.
 - 1) Adjust test medium and specimens to, and maintain at, 40 degrees F or above prior to commencing and for duration of test.
 - 2) Faulty performance or failure of test equipment during test phase will necessitate rerunning phase using properly performing test equipment.
- d. Retesting: If connector fails to meet requirements herein and in referenced ASTM document, Engineer will randomly select and test 2 additional connectors of same diameter and from bases originally manufactured on same day as failed connector.
 - 1) If either of 2 additional connectors fails, Engineer will reject all bases manufactured that day with connectors of same size as those tested, as well as bases with other connector sizes mixed with original size tested.
 - 2) Perform retest of next day's production until compliance with requirements is proven.
- e. Repairs.
 - 1) Failure of seal between connector and manhole wall due to occasional imperfections in manufacture or accidental injury during test may be repaired using methods recommended by manufacturer and on file with the Commission, and will be acceptable if Engineer finds repairs are sound, properly finished, and cured.
 - 2) Demonstrate to Engineer that repairs will result in seal conforming to requirements of this specification.
- f. Post test failures: If previously tested and complying connectors resubjected to prescribed hydrostatic or vacuum pressure during testing of other sizes fail, and/or seal between them and manhole wall fails watertightness or vacuum tightness requirements, Engineer will reject base.
 - 1) Engineer will randomly select and test 2 additional bases fitted with same size connectors originally manufactured on same date as failed base.

- 2) If previously tested connector sizes fail retest, all bases with same size connectors manufactured on that date will be rejected.
 - 3) Perform retest of next day's production until compliance with requirements is proven.
 - 4) Perform retest of connectors that fail to meet requirements herein and in referenced ASTM document as specified in above.
 - 5) During retesting of flexible connectors on manhole parts or joints between manhole parts, leakage of water as described in this section in any area constitutes failure requiring retest.
 - 6) Leakage consisting of a small run adjacent to lifting inserts on manhole sections shall not be cause for rejection.
- C. Acceptance Procedure for Concrete Strength of Precast Manhole Sections: Procedure applies to acceptance and approval of precast manhole bases, riser and cone sections, flat top slabs, and grade rings.
1. Concrete Design Mix Approval: Based on submittal specified above herein.
 - a. The Commission will issue approval for 3 years, provided design mix materials and sources are not changed and in-plant concrete testing of manhole sections continues to be accepted without rejection of more than 2 days' production in a row.
 - 1) Every 3 years thereafter, and under failure conditions stated above resubmit concrete design mix for approval.
 - 2) Production from mixes other than those approved will be rejected.
 - b. Compressive strength test: ACI 301 and ACI 318.
- D. Vaults and Other Precast Concrete Structures.
1. Determination of concrete compressive strength: From compressive tests made on concrete cylinders.
 2. Unless otherwise specified, retain independent testing facility approved by Engineer for molding, capping, and testing concrete cylinders following appropriate ASTM requirements or, at Engineer's option, make cylinders and use own equipment to test.
 - a. Furnish test results to Engineer.
 - b. Engineer may require core samples of finished products.
 - c. When requested by Engineer, furnish compressive test specimens for testing in addition to requirements above, and continue to monitor quality of concrete.
 3. Notify Engineer at least 10 working days prior to pouring any structure.
 4. The Commission may perform random or full inspections of manufacture of boxes, vaults, and precast structures to inspect:
 - a. Steel placement and size.
 - b. Overall fabrication.
 - c. Workmanship.
 - d. Other general or specific aspects of production and specification compliance.

WSSC

STANDARD SPECIFICATION
SECTION 04200
MASONRY

PART 1 GENERAL

1.1 DESCRIPTION

- A. Section includes requirements for providing masonry work above and below grade.

1.2 QUALITY ASSURANCE

- A. Engineered Masonry: ACI 530.1/ASCE 6.

1.3 SUBMITTALS

- A. Submit following Section 01330.
1. Sewer and Manhole Brick Samples.
 - a. Submit at least 4 bricks before purchase and delivery of each type required.
 - 1) Do not purchase brick until Engineer has approved samples.
 2. Concrete Block Samples.
 - a. Submit at least 4 blocks of each type required before purchase and delivery.
 - 1) Do not purchase blocks until Engineer has approved samples
- B. Submit following Section 01450 before delivery to site.
1. Certificates of Compliance:
 - a. Bricks.
 - b. Concrete blocks.
 - c. Prepackaged mortar mix.
 - d. Portland cement.
 - e. Masonry cement.

1.4 DELIVERY, HANDLING, AND STORAGE

- A. Deliver cement, lime, and other cementitious materials to site and store in unbroken bags, barrels, or other approved containers, plainly marked and labeled with manufacturers' names and brands.
- B. Handle masonry units to avoid chipping and breakage, and store off ground on wood blocks, pallets, or other means.
- C. Store mortar materials in dry, weather tight sheds or enclosures, to prevent inclusion of foreign materials and damage by water or dampness.

1.5 PROJECT CONDITIONS

A. Masonry Placement:

1. Do not place masonry when air temperature falls below 40 degrees F. or when temperatures below 40 degrees F. are likely within 72 hours after mortar is placed, unless Engineer approves adequate means for protecting work from freezing.
2. Heat and maintain temperature of masonry materials at not less than 40 degrees F. but not more than 160 degrees F. and maintain air temperature above 40 degrees F. on both sides of masonry for not less than 72 hours.
 - a. Do not work with or on frozen materials.
3. Protect new work against freezing weather for period of 72 hours after masonry is placed.

B. During hot weather, protect masonry from direct rays of sun.

1. Cover or wet all finished work for period of 3 days after placing.
2. When ambient air temperature is warmer than 95 degrees F. or when it appears probable that temperatures above 95 degrees F. will be encountered, protect work from sun and prevent drying out for not less than 72 hours after masonry is placed.

PART 2 PRODUCTS

2.1 MATERIALS

A. Concrete Block.

1. Masonry Units for Manholes and Structures: ASTM C139.
2. Admixtures: Not allowed without Engineer's approval.

B. Mortar.

1. Mortar Proportions for Placing Concrete Block, Bricks, and Unit Masonry Structures:
 - a. ASTM C270 and ASTM C91 for foundation walls, and work below grade, Type M.
 - b. For all other masonry work, Type S.
2. Mortar for Parging Masonry Walls below Grade: Composed of 1 part Portland cement, 1/4 part hydrated lime, and 3 parts sand.
3. Sewer and Water Main Construction: Unless otherwise shown on Drawings, 1 part Type II cement and 3 parts masonry sand meeting ASTM C144.
4. Prepackaged Mortar Mix: Meet requirements of mortar depending on use specified above.
5. Cement for Mortar: ASTM C150.

C. Grout: ASTM C476 with minimum compressive strength of 2000 psi at 28 days, tested following ASTM C1019.

D. Water for Mixing Mortar and Grout: See Section 03300.

PART 3 EXECUTION

3.1 PREPARATION

A. General.

1. Clean dirt, debris, oil, grease and other foreign substances which would affect bond of mortar, from surfaces to receive masonry.
2. Ascertain location of chases and openings for pipes.

3.2 MORTAR

A. Measuring Materials for Mortar: Method that will control and maintain specified proportions during entire progress of Work.

B. Mixing Mortar.

1. Mix mortar in mechanically operated batch mixer of drum type.
2. Hand mixing will be permitted if quantities of materials and water are accurately measured and if Engineer approves method of mixing.
3. Mix cement, lime, and sand, add water and mix for at least 5 minutes.
4. Do not use mortar that has obtained its initial set or has been mixed for longer than 45 minutes.
5. Do not add water to mortar that has started to stiffen.

C. Grout.

1. Add water in sufficient quantity to produce fluid mixture.
2. Place fine grout in spaces less than 2 inches in any horizontal dimension and where clearance between reinforcing and masonry is less than 3/4 inch.
3. Place coarse grout in spaces 2 inches or greater in any horizontal dimension and where clearance between reinforcing and masonry is not less than 3/4 inch.

3.3 PLACING

A. Workmanship.

1. Place masonry plumb, true to line, with level and accurately spaced courses, and each course breaking joint with course below.
 - a. Make joints uniform in thickness with average thickness of any 3 consecutive joints 3/8 to 1/2 inch.
2. Remove mortar splashed or smeared on finished surfaces with stiff bristle brushes as work progresses.

B. Brick: Drenched with water just before laying.

1. Joints: Filled between bricks completely with mortar.
 - a. Form bed joints with thick layer of mortar, smoothed.
 - b. Buttering at corners of brick and then throwing mortar or scrapings into empty joints will not be permitted.

2. Brick Placement.
 - a. Place brickwork in common bond.
 - b. Place brick carefully without disturbing brick previously placed.
 - c. Dry or butt joints will not be permitted.
 - d. Grout where indicated.

3.4 PROTECTION OF WORK

- A. Cover completed work each day to prevent rain or melting snow from penetrating mortar.

PART 4 MEASUREMENT AND PAYMENT

- 4.1 Measurement of masonry work for payment will not be made under this Section and is considered essential material required in construction of specific items of work that will be measured and paid for under various items or lump sum listed in Bid Schedule.

****WSSC****

**WSSC WATER MAIN
RE7902A14**

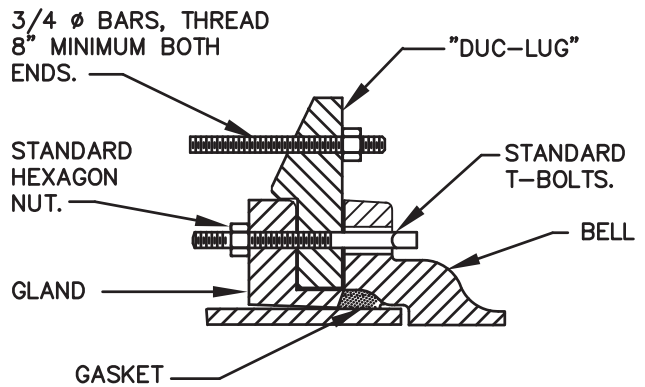
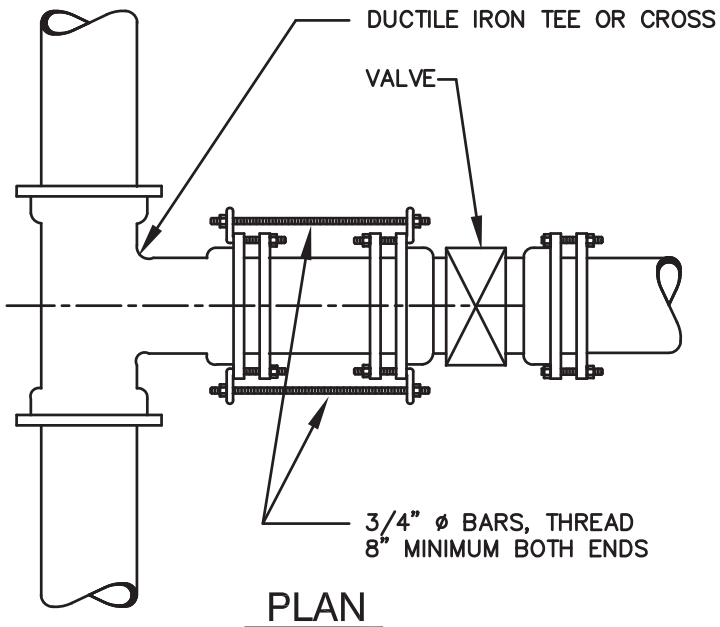
DESCRIPTION. This item of work is for the furnishing and installation of 6-inch, Class 54, ductile iron pipe in accordance with Section 02510 of the WSSC Specifications and the plans, included herein.

MATERIALS. See contract plans and WSSC Specifications, included herein.

CONSTRUCTION. Full depth bituminous concrete paving patch, including dense graded stabilized aggregate base, will be used in lieu of concrete patch.

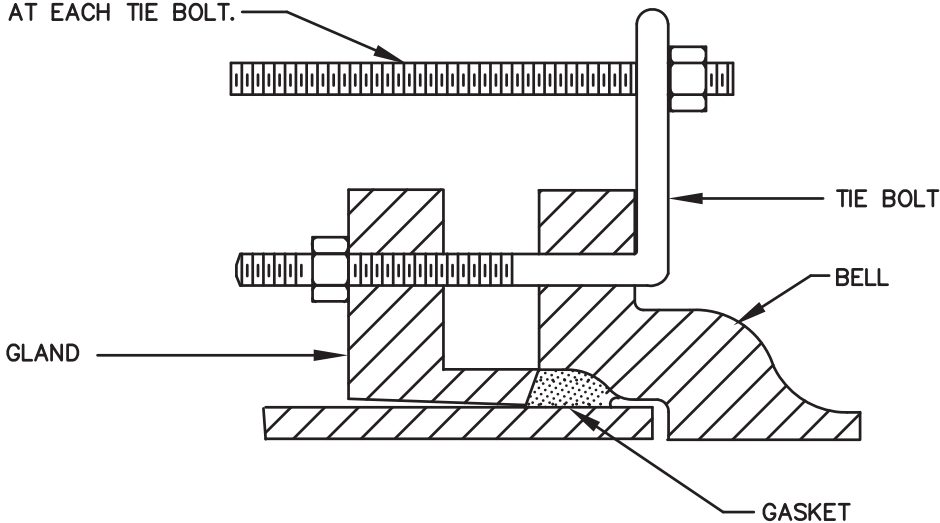
The shutdown of existing water systems for connection of new water lines will be performed by WSSC personnel. The Contractor shall notify the WSSC's Construction Division Office a minimum of 48 hours before such work is required.

MEASUREMENT AND PAYMENT. Price bid per linear foot for Furnish and Install 6-Inch (Ductile Iron Class 54) shall be full compensation for the saw cutting of any existing concrete pavement, excavation of any type, thrust collars, sheeting and shoring, removal, furnishing and installing of 6-inch, Class 54, ductile iron pipe, all necessary connections, removal of excavated materials, backfill and compaction of the entire excavation with select material (crusher run or approved equal), compaction testing, and the backfill from subgrade to finished grade with dense graded stabilized aggregate base and bituminous concrete in accordance with the typical section. Also included will be labor, tools, equipment, materials, and incidentals necessary to complete the work as specified.



**CROSS SECTION
DUC-LUG ASSEMBLY**

EQUALLY SPACED 3/4" ϕ BARS, THREAD 8" MINIMUM BOTH ENDS AT EACH TIE BOLT.



**CROSS SECTION BOLT
ASSEMBLY**

NO. OF TIE BOLTS PER JOINT.

PIPE SIZE	TIE BOLT SIZE	NUMBER OF BOLT REQUIRED
3	5/8"	2
4	3/4"	2
6	3/4"	2
8	3/4"	2
10	3/4"	4
12	3/4"	6
14	3/4"	6
16	3/4"	8
18	3/4"	10
20	3/4"	12
24	3/4"	16
30	3/4"	20

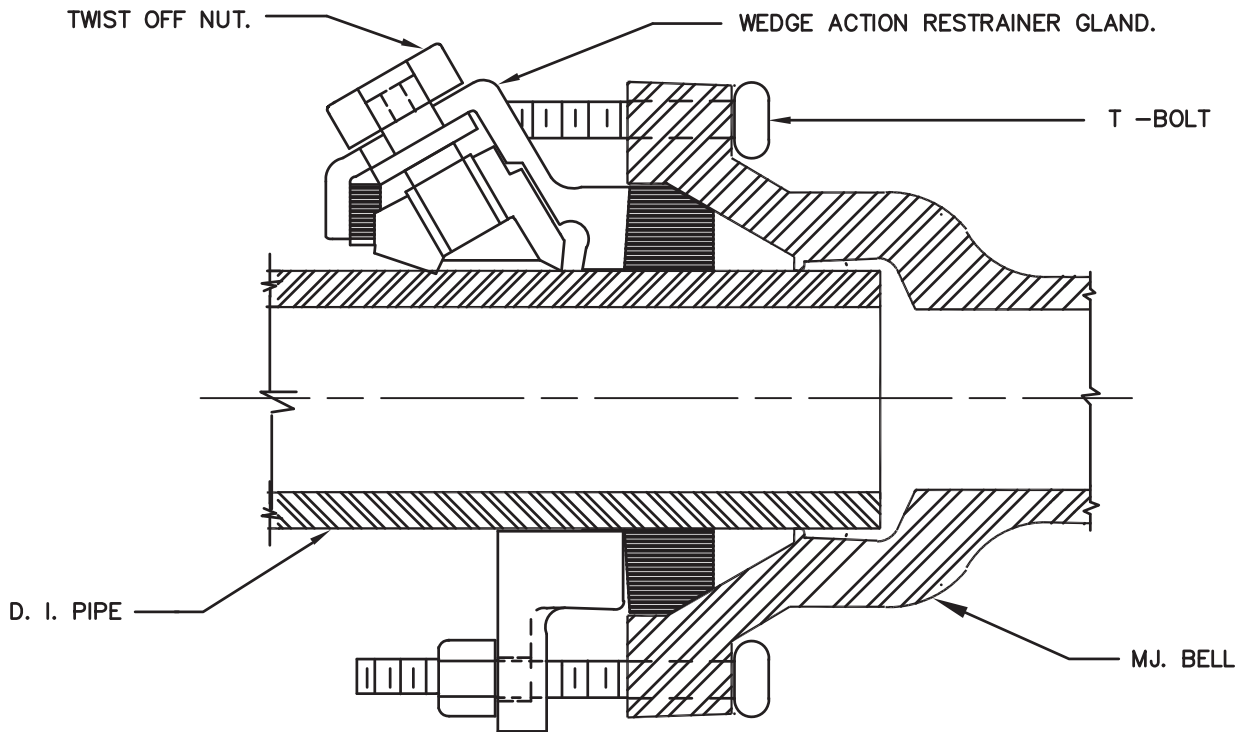
NOTES:

1. USE DUCTILE IRON MECHANICAL JOINT FITTINGS ONLY.
2. COAT BARS AND APPURTENANCES WITH FIELD APPLIED COATING, SEE SPECIFICATIONS.
3. IF WORKING PLUS SURGE PRESSURES ARE HIGHER THAN 250 PSI, SPECIAL DESIGN IS REQUIRED.
4. USE DUC-LUG ONLY WHEN VALVE BODY BELL HAS SLOTTED HOLES. TIGHTEN ALL JOINT T AND TIE BOLTS. THEN CHECK DUC-LUGS. LUGS MUST BE LOOSE, IF TIGHT REPLACE DUC-LUG.

DETAIL

ALTERNATE METHOD
OF STRAPPING VALVE
TO MAIN WITH TIE BOLTS

B
2.3



SPECIFICATIONS

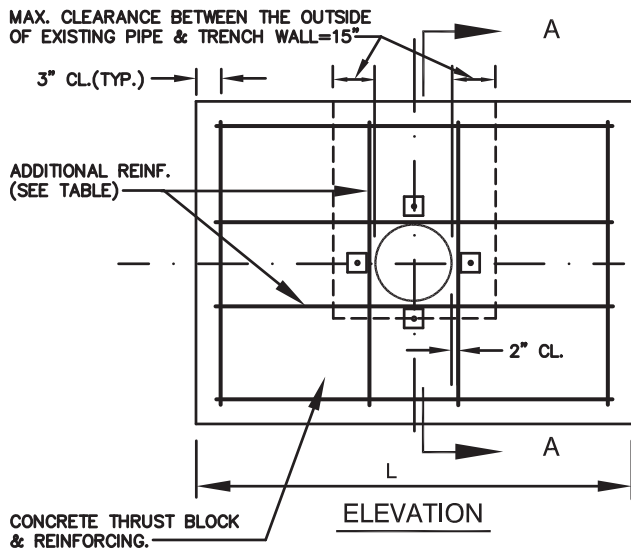
NOMINAL PIPE SIZE (INCHES)	NUMBER OF WEDGES	TOTAL PRESSURE (PSI)	NUMBER OF T BOLTS
3	2	350	4
4	2	350	4
6	3	350	6
8	4	350	6
10	6	350	8
12	8	350	8
14	10	350	10
16	12	350	12
18	12	250	12
20	14	250	14
24	16	250	16
30	20	250	20

NOTES:

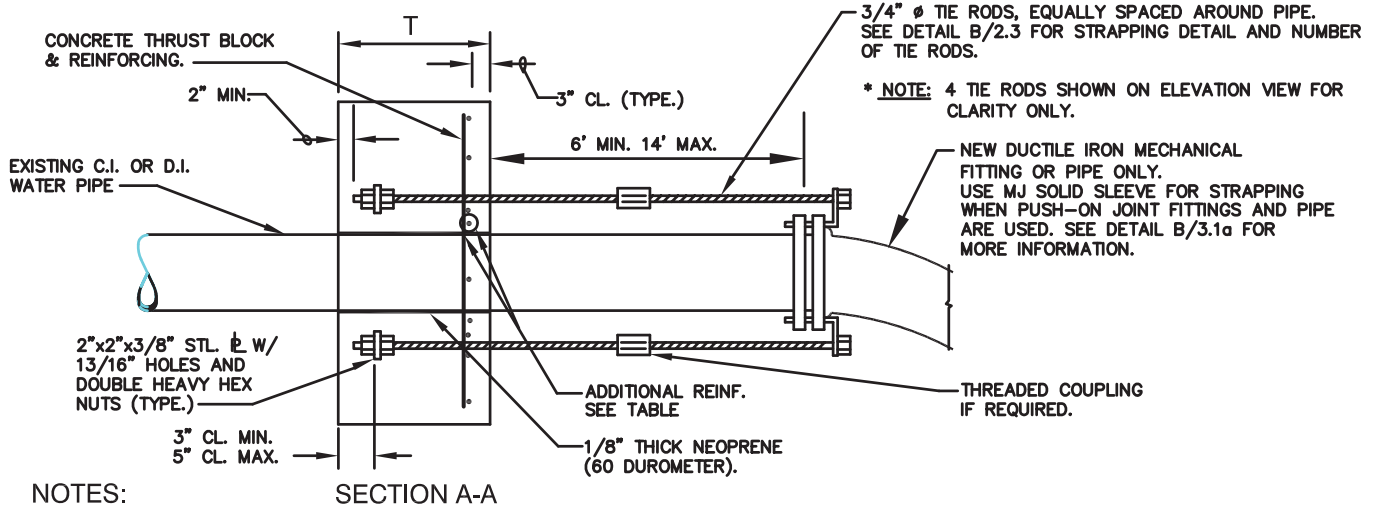
1. TOTAL PRESSURE EQUAL TO OPERATING PRESSURE + SURGE PRESSURE.
2. CONNECTIONS TO EXISTING PIPE: WHERE SIGNIFICANT CORROSION OR GRAPHITIZATION IS EVIDENT, NOTIFY ENGINEER PRIOR TO CONNECTING TO EXISTING PIPE.

WEDGE ACTION
RESTRAINER GLAND

B
2.7



PIPE DIAMETER INCH	THRUST BLOCK DIMENSIONS			THRUST BLOCK REINF.
	T	H	L	
4 AND 6	1'-2"	2'-6"	3'-6"	#5@ 12" c/c E.W.+4#5 ADD'L REINF.
8	1'-2"	3'-0"	4'-0"	#5@ 12" c/c E.W.+4#5 ADD'L REINF.
10	1'-4"	4'-0"	4'-0"	#5@ 12" c/c E.W.+4#5 ADD'L REINF.
12	1'-4"	5'-0"	5'-0"	#5@ 12" c/c E.W.+4#5 ADD'L REINF.
14	1'-4"	6'-0"	6'-0"	#5@ 10" c/c E.W.+4#5 ADD'L REINF.
16	1'-6"	6'-0"	8'-0"	#5@ 8" c/c E.W.+4#5 ADD'L REINF.
18	1'-6"	6'-0"	11'-0"	#5@ 6" c/c E.W.+4#5 ADD'L REINF.

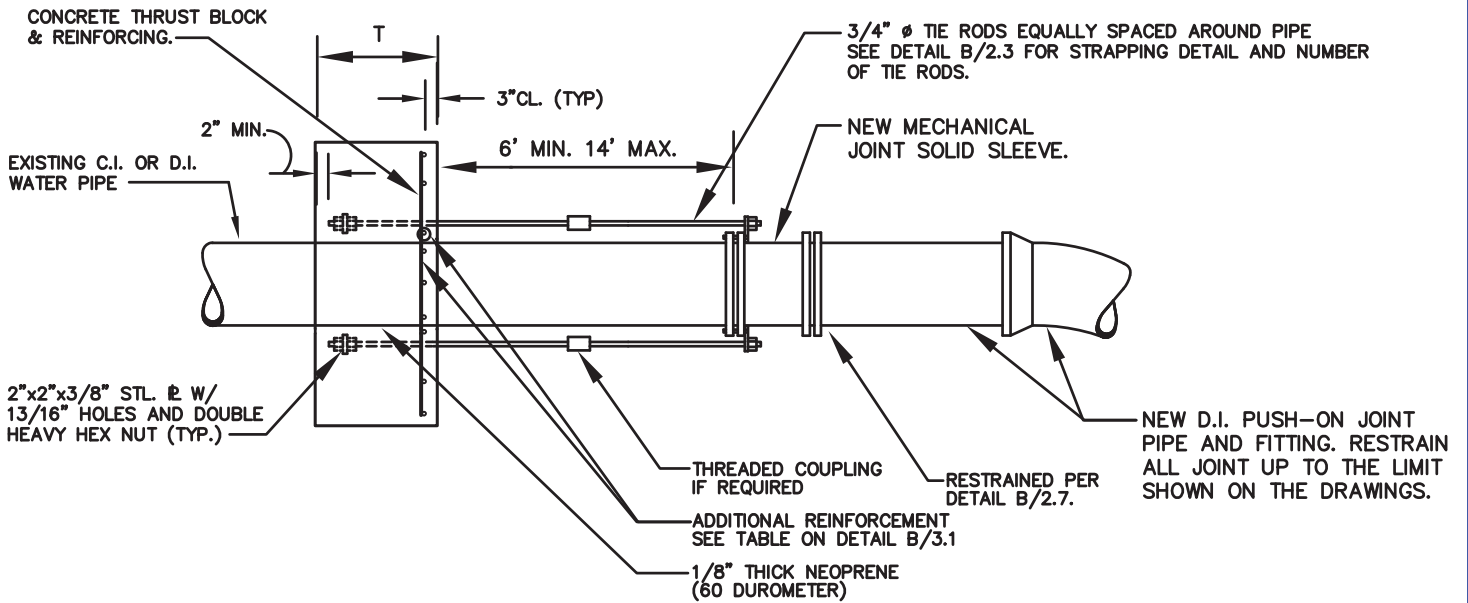


NOTES:

1. ALL CONCRETE SHALL BE $f'_c=4000$ PSI @ 28 DAYS. PIPELINE SHALL NOT BE PRESSURIZED UNTIL CONCRETE STRENGTH REACHES 4000 PSI. AND TRENCH HAS BEEN BACKFILLED.
2. ALL REBARS SHALL BE ASTM A615 GRADE 60.
3. STEEL PLATES SHALL BE ASTM A36.
4. MAINTAIN 2" CLEAR BETWEEN ALL REBARS AND PIPE.
5. COAT ALL EXPOSED STEEL WITH FIELD APPLIED COATING.
6. BOLT CIRCLE FOR 3/4" TIE RODS @ THRUST COLLAR EQUAL BOLT CIRCLE @ TIE BOLTS.
7. TIE RODS SHALL BE PARALLEL TO AXIS OF PIPE.
8. TIE COUPLING, IF NECESSARY, SHALL BE STAR NATIONAL PRODUCTS SUPER STAR TIE COUPLING NO. SS10.
9. IF WORKING PLUS SURGE PRESSURES ARE HIGHER THAN 250 PSI, SPECIAL DESIGN IS REQUIRED.
10. SPECIAL DESIGN IS REQUIRED FOR MAINS LARGER THAN 18 INCH.
11. DEPTH OF FINISHED GRADE TO TOP OF PIPE ASSUMED TO EQUAL 4'-0". IF SHALLOWER, SPECIAL BLOCK DESIGN IS REQUIRED.
12. ELEVATION OF GROUNDWATER TABLE ASSUMED TO BE BELOW BOTTOM OF BLOCK. IF GROUNDWATER IS ABOVE BOTTOM OF BLOCK, SPECIAL BLOCK DESIGN IS REQUIRED.
13. SOFT OR ORGANIC SOIL CONDITIONS REQUIRE SPECIAL BLOCK DESIGN.
14. REPLACE ALL DISTURBED SOIL BETWEEN NEW FITTING AND CONCRETE COLLAR WITH CRUSHED STONE COMPACTED AS STRUCTURAL FILL.

QUICK HARNESSSED CONNECTION
TO THRUST BLOCKING
FOR DUCTILE IRON
OR CAST IRON PIPE

B
3.1



SECTION A-A

NOTE:

1. FOR CONC. THRUST BLOCK INFORMATION AND NOTES SEE DETAIL B/3.1.

QUICK HARNESSSED CONNECTION
TO THRUST BLOCKING
FOR DUCTILE IRON
OR CAST IRON PIPE

B
3.1a

**CITY OF TAKOMA PARK
PROPOSAL FORM**

Proposal by _____
Name

Address (Street and/or P.O. Box)

City State Zip

() ()
A.C. Phone No. A.C. Fax No.

to furnish and deliver all materials and to do and perform all work, in conformance with the Standard Specifications, revisions thereto, General Provisions and the Special Provisions in this contract to the City of Takoma Park located in Montgomery County, Maryland, for which Invitation for Bids will be received until **3:30 pm** on the **18th day of April 2017**, this work being situated as follows:

To the City of Takoma Park
Housing and Community Development Department
7500 Maple Avenue
Takoma Park, Maryland 20912

In response to the advertisement by the Administration, inviting bids for the work in conformance with the Contract Documents, now on file in the office of the Administration. I/We hereby certify that I/we am/are the only person, or persons, interested in this bid proposal as principals, and that an examination has been made of the work site, the Specifications, the Plans, and Invitation for Bids, including the Special Provisions contained herein. I/We propose to furnish all necessary machinery, equipment, tools, labor and other means of construction, and to furnish all materials required to complete the project at the following unit price or lump sum price.

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
1001 110100	LUMP SUM	CLEARING AND GRUBBING	101	LUMP SUM			
1002 110350	LUMP SUM	TYPE B ENGINEERS OFFICE	103	LUMP SUM			
1003 114005	1,700	LINEAR FEET OF 5 INCH YELLOW NONTOXIC LEAD FREE WATERBORNE PAVEMENT MARKING PAINT	104.11 SP				
1004 114010	3,200	LINEAR FEET OF 5 INCH WHITE NONTOXIC LEAD FREE WATERBORNE PAVEMENT MARKING PAINT	104.11 SP				
1005 114020	425	LINEAR FEET OF 10 INCH WHITE NONTOXIC LEAD FREE WATERBORNE PAVEMENT MARKING PAINT	104.11 SP				
1006 114035	1,210	LINEAR FEET OF 12 INCH WHITE NONTOXIC LEAD FREE WATERBORNE PAVEMENT MARKING PAINT	104.11 SP				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
1007 114045	210	LINEAR FEET OF 24 INCH WHITE NONTOXIC LEAD FREE WATERBORNE PAVEMENT MARKING PAINT	104.11 SP				
1008 114215	1,700	LINEAR FEET OF 5 INCH YELLOW REMOVABLE PREFORMED PAVEMENT LINE MARKINGS	104.11 SP				
1009 114220	3,200	LINEAR FEET OF 5 INCH WHITE REMOVABLE PREFORMED PAVEMENT LINE MARKINGS	104.11 SP				
1010 114230	425	LINEAR FEET OF 10 INCH WHITE REMOVABLE PREFORMED PAVEMENT LINE MARKINGS	104.11 SP				
1011 114235	1,210	LINEAR FEET OF 12 INCH WHITE REMOVABLE PREFORMED PAVEMENT LINE MARKINGS	104.11 SP				
1012 114245	210	LINEAR FEET OF 24 INCH WHITE REMOVABLE PREFORMED PAVEMENT LINE MARKINGS	104.11 SP				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
1013 114275	6,745	LINEAR FEET OF REMOVAL OF REMOVABLE PREFORMED PAVEMENT MARKINGS - ANY WIDTH	104.11 SP				
1014 114280	4,200	LINEAR FEET OF REMOVAL OF EXISTING PAVEMENT LINE MARKINGS, ANY WIDTH	104.11 SP				
1015 120500	LUMP SUM	MAINTENANCE OF TRAFFIC	104	LUMP SUM			
1016 120555	60	TONS OF GRADED AGGREGATE BASE FOR MAINTENANCE OF TRAFFIC	105				
1017 120562	60	TONS OF ASPHALT FOR MAINTENANCE OF TRAFFIC	106				
1018 120610	120	PER UNIT DAY ARROW PANEL	104.07				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
1019 120625	1,150	SQUARE FEET OF TEMPORARY TRAFFIC SIGNS HIGH PERFORMANCE WIDE ANGLE RETROREFLECTIVE SHEETING	104.08				
1020 120719	20	LINEAR FEET OF WOODEN BARRICADE FOR PEDESTRIAN CONTROL	104.13				
1021 120784	717	LINEAR FEET OF TEMPORARY ORANGE CONSTRUCTION FENCE	104.2				
1022 120820	290	EACH OF DRUMS FOR MAINTENANCE OF TRAFFIC	104.12				
1023 120860	180	PER UNIT DAY PORTABLE VARIABLE MESSAGE SIGN	104.19 SP				
1024 130840	LUMP SUM	CONSTRUCTION STAKEOUT	107		LUMP SUM		

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
1025 130850	LUMP SUM	MOBILIZATION	108	LUMP SUM			
1026 131000	LUMP SUM	CPM PROJECT SCHEDULE	108	LUMP SUM			
1027 199000	50	EACH OF CONES FOR MAINTENANCE OF TRAFFIC	108				

END OF CATEGORY NO. 1

STATE CONTRACT - MO0705125

FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
2001 201030	2,025	CUBIC YARDS OF CLASS 1 EXCAVATION	201				
2002 201031	60	CUBIC YARDS OF CLASS 1-A EXCAVATION	201 SP				
2003 202065	680	CUBIC YARDS OF COMMON BORROW	205				
2004 203030	65	CUBIC YARDS OF TEST PIT EXCAVATION	205				
2005 210081	1	EACH OF REMOVE EXISTING MANHOLE	205				

END OF CATEGORY NO. 2

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
3001 300000	5	CUBIC YARDS OF HIGH FLOW TREATMENT MEDIA (HFTM)	316 SP				
3002 300000	21	CUBIC YARDS OF RAIN GARDEN SOIL MIX (RGSM)	316 SP				
3003 300000	31	CUBIC YARDS OF MIX NO. 8 CONCRETE FOR SWM STRUCTURES	XXX				
3004 300000	2	CUBIC YARDS OF MIX NO. 9 CONCRETE FOR MISCELLANEOUS STRUCTURES	XXX				
3005 300000	1	EACH OF SPECIAL A-10 INLET	XXX				
3006 300000	1	EACH OF SPECIAL A-20 INLET	XXX				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
3007 300000	1	EACH OF CONVERT EXISTING INLET TO MANHOLE	XXX				
3008 300000	2	EACH OF ONSITE CONCRETE WASHOUT STRUCTURE	XXX				
3009 300000	1	SQUARE YARDS OF CLASS 0 RIPRAP FOR SLOPE AND CHANNEL PROTECTION	XXX				
3010 300000	6	CUBIC YARDS OF 2" – 3" STONE FOR STORMWATER MANAGEMENT FACILITY	XXX				
3011 300000	3	CUBIC YARDS OF 4" – 7" STONE FOR STORMWATER MANAGEMENT FACILITY	XXX				
3012 300000	8	LINEAR FEET OF 4 INCH PVC	XXX				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
3013 301010	3	CUBIC YARDS OF CLASS 3 EXCAVATION FOR INCIDENTAL CONSTRUCTION	301				
3014 301110	3	CUBIC YARDS OF SELECTED BACKFILL USING AASHTO NO. 57 AGGREGATE	XXX				
3015 301311	3	CUBIC YARDS OF MIX 2 CONCRETE FOR MISCELLANEOUS STRUCTURES	XXX				
3016 301112	4	CUBIC YARDS OF FLOWABLE BACKFILL FOR UTILITY CUTS	XXX				
3017 301312	2	CUBIC YARDS OF BRICK MASONRY FOR MISCELLANEOUS STRUCTURES	XXX				
3018 301315	1	CUBIC YARD OF MIX 3 CONCRETE FOR MISCELLANEOUS STRUCTURES	XXX				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
3019 301320	80	LINEAR FEET OF CLEAN EXISTING PIPE ANY SIZE	303				
3020 301322	5	EACH OF CLEAN EXISTING INLETS	305				
3021 302424	8	LINEAR FEET OF 24 INCH REINFORCED CONCRETE PIPE, CLASS IV	305				
3022 302430	5	LINEAR FEET OF 30 INCH REINFORCED CONCRETE PIPE, CLASS IV	305				
3023 374015	2	EACH OF STANDARD 10 FT COG INLET – MINIMUM DEPTH	305				
3024 374045	4	LINEAR FEET OF STANDARD COG INLET – VERTICAL DEPTH	305				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
3025 374100	1	EACH OF 5 FOOT COG/COS OPENING	305				
3026 374110	1	EACH OF 10 FOOT COG/COS OPENING	305				
3027 380610	1	EACH OF 60" DIA MANHOLE 27"-36" PIPE MIN DEPTH	305				
3028 388063	1	EACH OF PORTABLE SEDIMENT TANK	308				
3029 388066	10	EACH OF INLET PROTECTION	308				
3030 390320	6	SQUARE YARDS OF CLASS 0 RIPRAP FOR SLOPE AND CHANNEL PROTECTION	312				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
3031 390630	1	CUBIC YARD OF NO 7 AGGREGATE FOR STORMWATER MANAGEMENT FACILITIES	XXX				
3032 390640	28	LINEAR FEET OF 6 INCH SUB-DRAIN PIPE	XXX				
3033 390665	LUMP SUM	STORMWATER MANAGEMENT FACILITY AS-BUILT CERTIFICATION	300 SP	LUMP SUM			

END OF CATEGORY NO. 3

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
5001 500000	210	SQUARE YARDS OF 9 INCH PLAIN PORTLAND CEMENT CONCRETE PAVEMENT, MIX NO. 9	XXX				
5002 500000	120	SQUARE YARDS OF 8 INCH PLAIN PORTLAND CEMENT CONCRETE PAVEMENT, MIX NO. 9	XXX				
5003 504512	1,530	TONS OF SUPERPAVE ASPHALT MIX 9.5 MM FOR SURFACE, HDFV, PG 64E-22, LEVEL 2	504				
5004 504518	50	TONS OF VARIABLE DEPTH SUPERPAVE ASPHALT MIX 9.5MM FOR WEDGE/LEVEL, PG 64S-22, LEVEL 2	504				
5005 504560	225	TONS OF SUPERPAVE ASPHALT MIX 19.0 MM FOR BASE, PG 64S-22, LEVEL 2	504				
5006 504586	20	TONS OF SUPERPAVE ASPHALT MIX 25.0 MM FOR PARTIAL- DEPTH PATCH, PG 64S-22, LEVEL 2	505				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
5007 504600	6,000	EACH OF PRICE ADJUSTMENT FOR ASPHALT BINDER	504 SP	1	00	6,000	00
5008 520113	1,850	SQUARE YARDS OF 6" GRADED AGGREGATE BASE COURSE	501				
5009 530101	12,050	SQUARE YARDS OF GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCH	509				
5010 535100	7,000	EACH OF PAVEMENT SURFACE PROFILE PAY ADJUSTMENT	535 SP	1	00	7,000	00
5011 561118	550	SQUARE YARDS OF 8 INCH PORTLAND CEMENT CONCRETE PAVEMENT FOR DRIVEWAY MIX 9	XXX				
5012 571205	60	CUBIC YARDS OF REMOVAL OF UNSUITABLE MATERIAL AND REFILL	522				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
5013 585340	36	EACH OF SNOWPLOWABLE RAISED PAVEMENT MARKERS	557 SP				
5014 585600	3,200	LINEAR FEET OF 5 INCH WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS	559 SP				
5015 585602	425	LINEAR FEET OF 10 INCH WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS	559 SP				
5016 585604	1,700	LINEAR FEET OF 5 INCH YELLOW PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS	559 SP				
5017 585621	1,210	LINEAR FEET OF 12 INCH WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING LINES	556 SP				
5018 585625	210	LINEAR FEET OF 24 INCH WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING LINES	556 SP				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
5019 585627	91	SQUARE FEET OF WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING LEGENDS AND SYMBOLS	556 SP				
5020 585700	800	LINEAR FEET OF REMOVAL OF EXISTING PAVEMENT MARKING LINES, ANY WIDTH	XXX				

END OF CATEGORY NO. 5

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
6001 600000	1,990	SQUARE FEET OF TYPE 2 PAVERS	600 SP				
6002 600000	6	EACH OF LITTER / RECYCLE RECEPTACLE	600 SP				
6003 600000	6	EACH OF BENCH	600 SP				
6004 600000	6	EACH OF BICYCLE RACKS	600 SP				
6005 600000	15	LINEAR FEET OF REMOVE AND RELOCATE WOOD FENCE	600 SP				
6006 634204	1,310	LINEAR FEET OF TYPE A CURB ANY HEIGHT OR DEPTH	602				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
6007 634312	4,290	LINEAR FEET OF TYPE A COMBINATION CURB AND GUTTER ANY HEIGHT OR DEPTH	602				
6008 648160	120	LINEAR FEET OF MONOLITHIC CONCRETE MEDIAN 6 FEET 0 INCH WIDE TYPE A-1	602				
6009 655105	13,370	SQUARE FEET OF 5 INCH CONCRETE SIDEWALK	603				
6010 655120	265	SQUARE FEET OF DETECTABLE WARNING SURFACE FOR CURB RAMPS	611 SP				
6011 695183	10	LINEAR FEET OF REMOVE AND RESET EXISTING FENCE	607				

END OF CATEGORY NO. 6

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
7001 700000	18	TONS OF BOULDER	700 SP				
7002 701205	1,210	CUBIC YARDS OF PLACING FURNISHED SUBSOIL	701				
7003 704345	625	SQUARE YARDS OF PLACING FURNISHED TOPSOIL 4 INCH DEPTH	701				
7004 705565	1,250	SQUARE YARDS OF REFERTILIZING	705				
7005 715015	50	SQUARE YARDS OF SHREDDED HARDWOOD BARK MULCHING 3 INCH DEPTH	708				
7006 705412	1,250	SQUARE YARDS OF TEMPORARY MULCH	704				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
7007 708220	625	SQUARE YARDS OF TURFGRASS SOD ESTABLISHMENT	708				
7008 710150	LUMP SUM	TREE, SHRUB, AND PERENNIAL INSTALLATION AND ESTABLISHMENT	710	LUMP SUM			
7009 710170	1,221	SQUARE YARDS OF CONSTRUCTING PLANTING BEDS	710				
7010 715050	781	LINEAR FEET OF TREE ROOT PRUNING	715				

END OF CATEGORY NO. 7

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
8001 800000	68	LINEAR FEET OF FURNISH AND INSTALL 6-INCH (DUCTILE IRON CLASS 54)	XXX				
8002 800000	7	EACH OF 12 FT DECORATIVE ALUMINUM POLE – 24 IN. DECORATIVE ARM	812				
8003 800000	9	EACH OF 30 FT DECORATIVE STEEL POLE – 30 IN. DECORATIVE ARM	XXX				
8004 800000	7	EACH OF 60W DECORATIVE PENDANT LUMINAIRE (TYPE III, 49LED, 350MA, 4000K)	XXX				
8005 800000	9	EACH OF 75W DECORATIVE PENDANT LUMINAIRE (TYPE III, 63LED, 350MA, 4000K)	XXX				
8006 800000	21	EACH OF FURNISH AND INSTALL LIGHTING HANDBOX	XXX				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
8007 80000	1	EACH OF BASE MOUNTED METERED SERVICE PEDESTAL WITH PHOTO CONTROL	XXX				
8008 801003	18	CUBIC YARDS OF CONCRETE FOR LIGHT FOUNDATION	XXX				
8009 801004	2	CUBIC YARDS OF CONCRETE FOR SIGNAL FOUNDATION	XXX				
8010 801104	236	LINEAR FEET OF WOOD SIGN SUPPORTS 4 INCH X 4 INCH	XXX				
8011 801106	503	LINEAR FEET OF WOOD SIGN SUPPORTS 4 INCH X 6 INCH	XXX				
8012 801130	10	EACH OF SQUARE PERFORATED TUBULAR STEEL SIGN POSTS	XXX				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
8013 801135	10	EACH OF SQUARE TUBULAR STEEL ANCHOR BASES	XXX				
8014 801605	434	SQUARE FEET OF SHEET ALUMINUM SIGNS	813				
8015 801711	299	SQUARE FEET OF REMOVE EXISTING GROUND MOUNTED SIGNS AND SUPPORTS	813				
8016 802501	3,035	LINEAR FEET OF NO. 6 AWG STRANDED BARE COPPER GROUND WIRE	800 SP				
8017 802503	60	LINEAR FEET OF NO. 2 AWG STRANDED BARE COPPER GROUND WIRE	800 SP				
8018 802146	5	EACH OF ADJUST HANDHOLE TO GRADE AND REPLACE FRAME AND COVER	811				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
8019 805118	440	LINEAR FEET OF 4 INCH SCHEDULE 80 RIGID PVC CONDUIT-BORED	805				
8020 805125	140	LINEAR FEET OF 2 INCH SCHEDULE 80 RIGID PVC CONDUIT-TRENCHED	805				
8021 805135	2,000	LINEAR FEET OF 3 INCH SCHEDULE 80 RIGID PVC CONDUIT-TRENCHED	805				
8022 805140	115	LINEAR FEET OF 4 INCH SCHEDULE 80 RIGID PVC CONDUIT-TRENCHED	805				
8023 805155	455	LINEAR FEET OF 4 INCH SCHEDULE 80 RIGID PVC CONDUIT - SLOTTED	805				
8024 811003	1	EACH OF FURNISH AND INSTALL ELECTRICAL MANHOLE	811 SP				

STATE CONTRACT - MO0705125
FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
8025 813007	24	SQUARE FEET OF RELOCATE EXISTING OVERHEAD SIGNAL SIGN INCLUDING NEW MOUNTING HARDWARE	814				
8026 813014	6	SQUARE FEET OF INSTALL GROUND MOUNTED SIGN	813				
8027 813015	46	SQUARE FEET OF INSTALL OVERHEAD SIGN	813				
8028 813023	7	SQUARE FEET OF RELOCATE EXISTING GROUND MOUNTED SIGNS	822				
8029 816002	2	EACH OF IP-BASED VIDEO DETECTION CAMERA & ANY LENGTH LEAD-IN CABLE	800 SP				
8030 818004	6	EACH OF 10 FOOT BREAKAWAY PEDESTAL POLE	818				

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FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
8031 822510	970	LINEAR FEET OF DISCONNECT, PULL-BACK AND REROUTE CABLES	800 SP				
8032 832016	8,750	LINEAR FEET OF CABLE – 1 CONDUCTOR, NO 6 AWG, TYPE USE, 600V	810				
8033 832018	120	LINEAR FEET OF CABLE – 1 CONDUCTOR, NO 2 AWG, TYPE USE, 600V	810				
8034 832019	2,150	LINEAR FEET OF CABLE – 1 CONDUCTOR, NO 10 AWG, TYPE THWN/THHN, 600V	810				
8035 834001	4	EACH OF CONNECTOR KIT – TYPE I	825				
8036 834002	14	EACH OF CONNECTOR KIT – TYPE II	825				

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ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
8037 834003	20	EACH OF CONNECTOR KIT – TYPE III	825				
8038 834004	14	EACH OF CONNECTOR KIT – TYPE IV	825				
8039 837001	42	EACH OF GROUND ROD – ¾ INCH DIAMETER X 10 FOOT LENGTH	825				
8040 860284	43	EACH OF 12 INCH LED VEHICULAR TRAFFIC SIGNAL HEAD SECTION	825				
8041 860285	5	EACH OF 16 INCH LED COUNTDOWN PEDESTRIAN SIGNAL HEAD	825				
8042 860292	1	EACH OF CUT, CLEAN, GALVANIZE AND CAP TRAFFIC SIGNAL STRUCTURE	825				

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FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
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ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
8043 860296	1	EACH OF REMOVE AND DISPOSE OF LIGHTING STRUCTURE	823				
8044 861105	1,905	LINEAR FEET OF ELECTRICAL CABLE – 2 CONDUCTOR (NO. 14 AWG)	810				
8045 861107	2,030	LINEAR FEET OF ELECTRICAL CABLE – 5 CONDUCTOR (NO. 14 AWG)	810				
8046 861108	4,850	LINEAR FEET OF ELECTRICAL CABLE – 7 CONDUCTOR (NO. 14 AWG)	810				
8047 865210	8	EACH OF AUDIBLE/TACTILE PEDESTRIAN PUSHBUTTON STATION AND SIGNS	800 SP				
8048 865300	1	EACH OF 2-WIRE APS CENTRAL CONTROL UNIT	800 SP				

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FEDERAL CONTRACT - FAP NO. TAP-3(481)E

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ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
8049 873002	LUMP SUM	REMOVE AND DISPOSE OF EXISTING SIGNAL EQUIPMENT	XXX	LUMP SUM	_____	_____	_____
8050 800000	1,755	LINEAR FEET OF IP-BASED VIDEO DETECTION CAMERA LEAD-IN CABLE	800 SP	_____	_____	_____	_____

END OF CATEGORY NO. 8

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FEDERAL CONTRACT - FAP NO. TAP-3(481)E

SCHEDULE OF PRICES
City of Takoma Park IFB No. HCD-20170201

ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
9001 973025	52	SQUARE FEET OF SHEET ALUMINUM MAST ARM / POLE MOUNTED SIGN	813				

END OF CATEGORY NO. 9

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ITEM NO. CCS NO.	APPROXIMATE QUANTITIES	DESCRIPTION OF ITEMS	SECTION	UNIT PRICE		AMOUNTS	
				DOLLARS	CENTS	DOLLARS	CENTS
		AGGREGATE AMOUNT AT UNIT PRICES ALTERNATE A IS USING BID 1001-1027, 2001-2005, 3001-3033, 5001- 5020, 6001-6011, 7001-7010, 8001-8050, 9001		_____	_____	_____	_____
		THIS PROPOSAL SHALL BE FILLED IN BY THE BIDDER WITH PRICES IN NUMERALS AND EXTENSIONS SHALL BE MADE BY HIM.		_____	_____	_____	_____
				_____	_____	_____	_____
				_____	_____	_____	_____

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GENERAL MATERIAL REQUIREMENTS

CONVICT PRODUCED MATERIALS

Section 1019 of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) clarifies that materials produced by convict labor after July 1, 1991 may not be used for Federal-aid highway construction projects unless produced at a prison facility producing convict made materials for Federal-aid construction projects prior to July 1, 1987.

CONTRACT PROVISION BUY AMERICA

This section only applies to projects partially or totally financed with Federal funds. The Contractor shall comply with Section 165 of the Surface Transportation Assistance Act of 1982 as amended by Section 1041(a) and 1048(a) of the Intermodal Surface Transportation Efficiency Act of 1991 (codified by SAFETEA-LU, §1903 as 23 U.S.C 313) with regard to the furnishing and coating of iron and steel products.

The Contract, if awarded, will be awarded to the responsive and responsible bidder who submits the lowest total bid for the Contract based on furnishing Domestic Products unless such bid exceeds the lowest total bid based on furnishing Foreign Products by more than twenty five percent (25%). Foreign Products will not be permitted to be used as a substitution for Domestic ones after the bid has been awarded.

Furnish steel or iron construction materials, including coating, for permanently incorporated work according to 23 CFR 635.410 and as follows:

- (a)** All manufacturing processes of steel or iron materials in a product, including coating; and any subsequent process that alters the steel or iron material's physical form or shape, changes its chemical composition, or the final finish; are to occur within the United States (One of the 50 States, the District of Columbia, Puerto Rico, or in territories and possessions of the U.S.). Manufacturing begins with the initial melting and mixing, and continues through the coating stage. The processes include rolling, extruding, machining, bending, grinding, drilling, welding, and coating. The action of applying a coating to steel or iron is deemed a manufacturing process. Coating includes epoxy coating, galvanizing, aluminizing, painting, and any other coating that protects or enhances the value of steel or iron. Any process from the original reduction from ore to the finished product constitutes a manufacturing process for iron.
- (b)** The following are considered to be steel manufacturing processes:



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- (1) Production of steel by any of the following processes:
 - (a) Open hearth furnace.
 - (b) Basic oxygen.
 - (c) Electric furnace.
 - (d) Direct reduction.

- (2) Rolling, heat treating, and any other similar processing.

- (3) Fabrication of the products:
 - (a) Spinning wire into cable or strand.
 - (b) Corrugating and rolling into culverts.
 - (c) Shop fabrication.

- (c) The manufacturing process for a steel/iron product is considered complete when the product is ready for use as an item (e.g., fencing, posts, girders, pipe, manhole cover, etc.) or could be incorporated as a component of a more complex product through a further manufacturing process (e.g., prestressed concrete girders, reinforced concrete pipe, traffic control devices, bearing pads, etc.). A product containing both steel and/or iron components, may be assembled outside the United States and meet Buy America requirements if the constituent steel and iron components (in excess of the minimal amounts permitted) were manufactured domestically and are not modified at the assembly location prior to final assembly.

- (d) If domestically produced steel billets or iron ingots are exported outside of the U.S., as defined above, for any manufacturing process then the resulting product does not conform to the Buy America requirements. Additionally, products manufactured domestically from foreign source steel billets or iron ingots do not conform to the Buy America requirements because the initial melting and mixing of alloys to create the material occurred in a foreign country.

- (e) Due to a nationwide waiver, Buy America does not apply to raw materials (iron ore and alloys), scrap (recycled steel or iron), and pig iron or processed, pelletized, and reduced iron ore.

- (f) For the Buy America provisions to apply, the steel or iron product must be permanently incorporated into the project. If an item is rendered as a “donated material” in accordance with 23 U.S.C. 323 – Donations and Credits, it will have to comply with Buy America requirements. While States and local governments may receive a credit for donated material, this material must generally comply with Buy America requirements. Buy America does not apply to temporary steel items, e.g., temporary sheet piling, temporary



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bridges, steel scaffolding and falsework. Further, Buy America does not apply to materials which remain in place at the contractor convenience.

- (g)** Certifications which document that steel and iron have been manufactured and that coatings for iron or steel have been applied in the United States shall be provided to the Contractor by the manufacturer. The Contractor shall provide the required certifications to the Engineer prior to such items being incorporated into the permanent work. Certifications shall extend to materials utilized in manufactured and fabricated products purchased by the Contractor.
- (h)** Products manufactured of foreign steel or iron materials may be used, provided the cost of such products as they are delivered to the project does not exceed 0.1% of the total contract amount, or \$2,500, whichever is greater. If a supplier or fabricator wishes to use a partial fabrication process where domestic and foreign source components are assembled at a domestic location, the “as delivered cost” of the foreign components should include any transportation, assembly and testing costs required to install them in the final product.



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**ALTERNATE BID
USING FOREIGN PRODUCTS**

When a bidder elects to utilize Foreign Products on one or more items, the following summation indicating the Total Bid using Foreign Products must be completed in addition to the individual item bid tabulations.

The following instructions are given to the bidder in completing the Total Bid summation using Foreign Products:

- 1 - The "Bid Total" for the initial bid using Domestic Products shall be shown on line (1).
- 2 - The subtotal for Item Amounts using Domestic Products shall be shown on line (2), for those items which the Contractor elects to use Foreign Products.
- 3 - The subtotal for Item Amounts using Foreign Products shall be shown on line (3).
- 4 - The total Bid, utilizing Foreign Products shall be shown on line (4). The value is obtained by subtracting subtotal (2) from the Total Bid (1) and then adding subtotal (3).

Bid Total for Bid 1 using Domestic items	Line (1)_____
Total of Domestic Items	Line (2)-_____
Total of Foreign Items	Line (3)+_____
Bid Total using Foreign Items	Line (4)_____

ALTERNATE BID - USING FOREIGN PRODUCTS
 BIDDER'S INSTRUCTIONS

When the bidder elects to submit a bid for one or more items using Foreign Products, the following form must be used. For each item that Foreign Products are contemplated, the appropriate "Item Numbers", "Approximate Quantities", "Description of Items", "Unit Price or Lump Sum Price", "Item Amount Domestic" and "Item Amount Foreign" shall be tabulated below as specified in the initial bid. The bidder shall indicate the unit price in dollars and cents and show the total cost of the item for each item that utilizes Foreign Products. When all items utilizing Foreign Products have been listed, the bidder shall indicate on Page 6 of 45 the subtotals of the Item Amounts for Domestic Products in Line (2) and for Foreign Products in Line (3).

Item Nos.	Approximate Quantities	Description of Items	Unit Price or Lump Sum Dollars.Cts.	Items Amount Domestic Dollars.Cts.	Items Amount Foreign Dollars.Cts.



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BID/PROPOSAL AFFIDAVIT

A. AUTHORIZED REPRESENTATIVE AND AFFIANT

I HEREBY AFFIRM THAT:

I am the (title) _____ and the duly authorized representative of (business) _____ and that I possess the legal authority to make this Affidavit on behalf of myself and the business for which I am acting.

B. CERTIFICATION REGARDING COMMERCIAL NONDISCRIMINATION

The undersigned bidder or offeror hereby certifies and agrees that the following information is correct:

In preparing its bid on this project, the bidder or offeror has considered all proposals submitted from qualified, potential subcontractors and suppliers, and has not engaged in “discrimination” as defined in §19-103 of the State Finance and Procurement Article of the Annotated Code of Maryland. “Discrimination” means any disadvantage, difference, distinction, or preference in the solicitation, selection, hiring, or commercial treatment of a vendor, subcontractor, or commercial customer on the basis of race, color, religion, ancestry, or national origin, sex, age, marital status, sexual orientation, or on the basis of disability or any otherwise unlawful use of characteristics regarding the vendors, supplier’s or commercial customer’s employees or owners. “Discrimination” also includes retaliating against any person or other entity for reporting any incident of “discrimination”. Without limiting any other provision of the solicitation on this project, it is understood that, if the certification is false, such false certification constitutes grounds for the State to reject the bid submitted by the bidder or offeror on this project, and terminate any contract awarded based on the bid. As part of its bid or proposal, the bidder or offeror herewith submits a list of all instances within the past 4 years where there has been a final adjudicated determination in a legal or administrative proceeding in the state of Maryland that the bidder or offeror discriminated against subcontractors, vendors, suppliers, or commercial customers, and a description of the status or resolution of that determination, including any remedial action taken. Bidder or Offeror agrees to comply in all respects with the State’s Commercial Nondiscrimination Policy as described under Title 19 of the State Finance and Procurement Article of the Annotated Code of Maryland.



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C. AFFIRMATION REGARDING BRIBERY CONVICTIONS

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the above business (as is defined in Section 16-101(b) of the State Finance and Procurement Article of the Annotated Code of Maryland), or any of its officers, directors, partners, controlling stockholders, or any of its employees directly involved in the business's contracting activities, including obtaining or performing contracts with public bodies, has been convicted of, or has had probation before judgment imposed pursuant to Criminal Procedure Article, §6-220, Annotated Code of Maryland, or has pleaded nolo contendere to a charge of, bribery, attempted bribery, or conspiracy to bribe in violation of Maryland law, or of the law of any other state or federal law, except as follows (indicate the reasons why the affirmation cannot be given and list any conviction, plea, or imposition of probation before judgment with the date, court, official or administrative body, the sentence or disposition, the name(s) of person(s) involved, and their current positions and responsibilities with the business):

D. AFFIRMATION REGARDING OTHER CONVICTIONS

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the above business, or any of its officers, directors, partners, controlling stockholders, or any of its employees directly involved in the business's contracting activities including obtaining or performing contracts with public bodies, has:

1. Been convicted under state or federal statute of:
(a) a criminal offense incident to obtaining, attempting to obtain, or performing a public or private contract; or

(b) fraud, embezzlement, theft, forgery, falsification or destruction of records, or receiving stolen property;
2. Been convicted of any criminal violation of a state or federal antitrust statute;
3. Been convicted under the provisions of Title 18 of the United States Code for violation of the Racketeer Influenced and Corrupt Organization Act, 18 U.S.C. §1961, et seq., or the Mail



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Fraud Act, 18 U.S.C. §1341, et seq., for acts in connection with the submission of bids or proposals for a public or private contract;

4. Been convicted of a violation of the State Minority Business Enterprise Law, Section 14-308 of the State Finance and Procurement Article of the Annotated Code of Maryland;

5. Been convicted of a violation of the Section 11-205.1 of the State Finance and Procurement Article of the Annotated Code of Maryland;

6. Been convicted of conspiracy to commit any act or omission that would constitute grounds for conviction or liability under any law or statute described in subsection (1) through (5) above;

7. Been found civilly liable under a state or federal antitrust statute for acts or omissions in connection with the submission of bids or proposals for a public or private contract;

8. Been found in a final adjudicated decision to have violated the Commercial Nondiscrimination Policy under Title 19 of the State Finance and Procurement Article of the Annotated Code of Maryland with regard to a public or private contract; or

9. Admitted in writing or under oath, during the course of an official investigation or other proceedings, acts or omissions that would constitute grounds for conviction or liability under any law or statute described in Section B – C and subsections (1) through (8) above, except as follows (indicate reasons why the affirmations cannot be given, and list any conviction, plea, or imposition of probation before judgment with the date, court, official or administrative body, the sentence or disposition, the name(s) of the person(s) involved and their current positions and responsibilities with the business, and the status of any debarment):

E. AFFIRMATION REGARDING DEBARMENT

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the above business, or any of its officers, directors, partners, controlling stockholders, or any of its employees directly involved in the business’s contracting activities, including obtaining or performing contracts with public bodies, has ever been suspended or debarred (including being issued a limited denial of participation) by any public entity, except as follows (list each debarment or suspension providing the dates of the suspension or debarment, the name of the public entity and the status



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of the proceedings, the name(s) of the person(s) involved and their current positions and responsibilities with the business, the grounds of the debarment or suspension, and the details of each person's involvement in any activity that formed the grounds of the debarment or suspension): _____

F. AFFIRMATION REGARDING DEBARMENT OF RELATED ENTITIES

I FURTHER AFFIRM THAT:

1. The business was not established and it does not operate in a manner designed to evade the application of or defeat the purpose of debarment pursuant to Sections 16-101, et seq., of the State Finance and Procurement Article of the Annotated Code of Maryland; and
2. The business is not a successor, assignee, subsidiary, or affiliate of a suspended or debarred business, except as follows (you must indicate the reasons why the affirmations cannot be given without qualification):

_____.

G. SUB-CONTRACT AFFIRMATION

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the above business, has knowingly entered into a contract with a public body under which a person debarred or suspended under Title 16 of the State Finance and Procurement Article of the Annotated Code of Maryland will provide, directly or indirectly, supplies, services, architectural services, construction related services, leases of real property, or construction.

H. AFFIRMATION REGARDING COLLUSION

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the above business has:



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1. Agreed, conspired, connived, or colluded to produce a deceptive show of competition in the compilation of the accompanying bid or offer that is being submitted;
2. In any manner, directly or indirectly, entered into any agreement of any kind to fix the bid price or price proposal of the bidder or Offeror or of any competitor, or otherwise taken any action in restraint of free competitive bidding in connection with the contract for which the accompanying bid or offer is submitted.

I. FINANCIAL DISCLOSURE AFFIRMATION

I FURTHER AFFIRM THAT:

I am aware of, and the above business will comply with, the provisions of Section 13-221 of the State Finance and Procurement Article of the Annotated Code of Maryland, which require that every business that enters into contracts, leases, or other agreements with the State of Maryland or its agencies during a calendar year under which the business is to receive in the aggregate \$100,000 or more shall, within 30 days of the time when the aggregate value of the contracts, leases, or other agreements reaches \$100,000, file with the Secretary of State of Maryland certain specified information to include disclosure of beneficial ownership of the business.

J. POLITICAL CONTRIBUTION DISCLOSURE AFFIRMATION

I FURTHER AFFIRM THAT:

I am aware of, and the above business will comply with, Election Law Article, §§14-101—14-108, Annotated Code of Maryland, which requires that every person that enters into contracts, leases, or other agreements with the State of Maryland, including its agencies or a political subdivision of the State, during a calendar year in which the person receives in the aggregate \$100,000 or more shall file with the State Board of Elections a statement disclosing contributions in excess of \$500 made during the reporting period to a candidate for elective office in any primary or general election.

K. DRUG AND ALCOHOL FREE WORKPLACE

(Applicable to all contracts unless the contract is for a law enforcement agency and the agency head or the agency head's designee has determined that application of COMAR 21.11.08 and this certification would be inappropriate in connection with the law enforcement agency's undercover operations.)



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I CERTIFY THAT:

1. Terms defined in COMAR 21.11.08 shall have the same meanings when used in this certification.

2. By submission of its bid or offer, the business, if other than an individual, certifies and agrees that, with respect to its employees to be employed under a contract resulting from this solicitation, the business shall:
 - (a) Maintain a workplace free of drug and alcohol abuse during the term of the contract;

 - (b) Publish a statement notifying its employees that the unlawful manufacture, distribution, dispensing, possession, or use of drugs, and the abuse of drugs or alcohol is prohibited in the business' workplace and specifying the actions that will be taken against employees for violation of these prohibitions;

 - (c) Prohibit its employees from working under the influence of drugs or alcohol;

 - (d) Not hire or assign to work on the contract anyone whom the business knows, or in the exercise of due diligence should know, currently abuses drugs or alcohol and is not actively engaged in a bona fide drug or alcohol abuse assistance or rehabilitation program;

 - (e) Promptly inform the appropriate law enforcement agency of every drug-related crime that occurs in its workplace if the business has observed the violation or otherwise has reliable information that a violation has occurred;

 - (f) Establish drug and alcohol abuse awareness programs to inform its employees about:
 - (i) The dangers of drug and alcohol abuse in the workplace;
 - (ii) The business' policy of maintaining a drug and alcohol free workplace;
 - (iii) Any available drug and alcohol counseling, rehabilitation, and employee assistance programs; and
 - (iv) The penalties that may be imposed upon employees who abuse drugs and alcohol in the workplace;

 - (g) Provide all employees engaged in the performance of the contract with a copy of the statement required by §K(2)(b), above;

 - (h) Notify its employees in the statement required by §K(2)(b), above, that as a condition of continued employment on the contract, the employee shall:

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- (i) Abide by the terms of the statement; and
 - (ii) Notify the employer of any criminal drug or alcohol abuse conviction for an offense occurring in the workplace not later than 5 days after a conviction;
 - (i) Notify the procurement officer within 10 days after receiving notice under §K(2)(h)(ii), above, or otherwise receiving actual notice of a conviction;
 - (j) Within 30 days after receiving notice under §K(2)(h)(ii), above, or otherwise receiving actual notice of a conviction, impose either of the following sanctions or remedial measures on any employee who is convicted of a drug or alcohol abuse offense occurring in the workplace:
 - (i) Take appropriate personnel action against an employee, up to and including termination; or
 - (ii) Require an employee to satisfactorily participate in a bona fide drug or alcohol abuse assistance or rehabilitation program; and
 - (k) Make a good faith effort to maintain a drug and alcohol free workplace through implementation of §K(2)(a)—(j), above.
3. If the business is an individual, the individual shall certify and agree as set forth in §K(4), below, that the individual shall not engage in the unlawful manufacture, distribution, dispensing, possession, or use of drugs or the abuse of drugs or alcohol in the performance of the contract.
4. I acknowledge and agree that:
- (a) The award of the contract is conditional upon compliance with COMAR 21.11.08 and this certification;
 - (b) The violation of the provisions of COMAR 21.11.08 or this certification shall be cause to suspend payments under, or terminate the contract for default under COMAR 21.07.01.11 or 21.07.03.15, as applicable; and
 - (c) The violation of the provisions of COMAR 21.11.08 or this certification in connection with the contract may, in the exercise of the discretion of the Board of Public Works, result in suspension and debarment of the business under COMAR 21.08.03.



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L. CERTIFICATION OF CORPORATION REGISTRATION AND TAX PAYMENT

I FURTHER AFFIRM THAT:

1 The business named above is a (domestic ___) (foreign ___) corporation registered in accordance with the Corporations and Associations Article, Annotated Code of Maryland, and that it is in good standing and has filed all of its annual reports, together with filing fees, with the Maryland State Department of Assessments and Taxation, and that the name and address of its resident agent filed with the State Department of Assessments and Taxation is (IF NOT APPLICABLE, SO STATE):

Name: _____
Address: _____

2. Except as validly contested, the business has paid, or has arranged for payment of, all taxes due the State of Maryland and has filed all required returns and reports with the Comptroller of the Treasury, the State Department of Assessments and Taxation, and the Department of Labor, Licensing, and Regulation, as applicable, and will have paid all withholding taxes due the State of Maryland prior to final settlement.

M. CONTINGENT FEES

I FURTHER AFFIRM THAT:

The business has not employed or retained any person, partnership, corporation, or other entity, other than a bona fide employee, bona fide agent, bona fide salesperson, or commercial selling agency working for the business, to solicit or secure the Contract, and that the business has not paid or agreed to pay any person, partnership, corporation, or other entity, other than a bona fide employee, bona fide agent, bona fide salesperson, or commercial selling agency, any fee or any other consideration contingent on the making of the Contract.

N. REPEALED



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O. ACKNOWLEDGEMENT

I ACKNOWLEDGE THAT this Affidavit is to be furnished to the Procurement Officer and may be distributed to units of: (1) the State of Maryland; (2) counties or other subdivisions of the State of Maryland; (3) other states; and (4) the federal government. I further acknowledge that this Affidavit is subject to applicable laws of the United States and the State of Maryland, both criminal and civil, and that nothing in this Affidavit or any contract resulting from the submission of this bid or proposal shall be construed to supersede, amend, modify or waive, on behalf of the State of Maryland, or any unit of the State of Maryland having jurisdiction, the exercise of any statutory right or remedy conferred by the Constitution and the laws of Maryland with respect to any misrepresentation made or any violation of the obligations, terms and covenants undertaken by the above business with respect to (1) this Affidavit, (2) the contract, and (3) other Affidavits comprising part of the contract.

I DO SOLEMNLY DECLARE AND AFFIRM UNDER THE PENALTIES OF PERJURY THAT THE CONTENTS OF THIS AFFIDAVIT ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF.

Date: _____

By: _____
(Authorized Representative and Affiant)



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COMPREHENSIVE SIGNATURE PAGE 1 OF 2

THE BIDDER IS HEREBY NOTIFIED THAT THIS DOCUMENT SHALL BE SIGNED IN INK IN ORDER FOR THE BID TO BE ACCEPTED. BY SIGNING, THE BIDDER CERTIFIES THAT HE/SHE WILL COMPLY IN EVERY ASPECT WITH THESE SPECIFICATIONS.

FURTHER, I DO SOLEMNLY DECLARE AND AFFIRM UNDER THE PENALTIES OF PERJURY THAT THE CONTENTS OF THIS AFFIDAVIT (PARAGRAPHS A-N) ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF.

This bid form shall be filled out legibly in ink or typed. The bid, if submitted by an individual, shall be signed by an individual; if submitted by a partnership, shall be signed by such member or members of the partnership as have authority to bind the partnership; if submitted by a corporation the same shall be signed by the President and attested by the Secretary or an Assistant Secretary. If not signed by the President as aforesaid, there must be attached a copy of that portion of the By-Laws, or a copy of a Board resolution, duly certified by the Secretary, showing the authority of the person so signing on behalf of the corporation. In lieu thereof, the corporation may file such evidence with the Administration, duly certified by the Secretary, together with a list of the names of those officers having authority to execute documents on behalf of the corporation, duly certified by the Secretary, which listing shall remain in full force and effect until such time as the Administration is advised in writing to the contrary. In any case where a bid is signed by an Attorney in Fact the same must be accompanied by a copy of the appointing document, duly certified.

IF AN INDIVIDUAL:

NAME: _____

_____ Street and/or P.O. Box

_____ City State Zip Code Fed ID or SSN

_____ (SEAL) Signature Date

_____ Print Signature

WITNESS: _____ Signature

_____ Print Signature



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COMPREHENSIVE SIGNATURE PAGE 2 OF 2

IF A PARTNERSHIP:

NAME OF PARTNERSHIP: _____

Street and/or P.O. Box

City State Zip Code Fed ID or SSN

BY: _____ (SEAL) _____
Member Signature Date

Print Signature

TITLE: _____ WITNESS: _____
Signature

Print Signature

IF A CORPORATION:

NAME OF CORPORATION: _____

Street and/or P.O. Box

City State Zip Code Fed ID or SSN

STATE OF INCORPORATION: _____

BY: _____ (SEAL) _____
Signature Date

Print Signature

TITLE: _____ WITNESS: _____
Secretary's Signature

Print Signature



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MDOT DBE FORM A
FEDERALLY-FUNDED CONTRACTS
CERTIFIED DBE UTILIZATION AND FAIR SOLICITATION AFFIDAVIT
PAGE 1 OF 2

This affidavit must be included with the bid/ proposal. If the bidder/offeror fails to accurately complete and submit this affidavit as required, the bid shall be deemed not responsive or the proposal shall be deemed not susceptible of being selected for award.

In connection with the bid/proposal submitted in response to City of Takoma Park Solicitation No. **HCD-20170201**, I affirm the following:

1. DBE Participation (PLEASE CHECK ONLY ONE)

I have met the overall certified Disadvantaged Business Enterprise (DBE) participation goal of Twenty-Eight percent (28%). I agree that this percentage of the total dollar amount of the Contract for the DBE goal will be performed by certified DBE firms as set forth in the DBE Participation Schedule - Part 2 of the MDOT DBE Form B (Federally-Funded Contracts).

OR

I conclude that I am unable to achieve the DBE participation goal. I hereby request a waiver, in whole or in part, of the goal. Within 10 business days of receiving notice that our firm is the apparent awardee or as requested by the Procurement Officer, I will submit a written waiver request and all required documentation in accordance with COMAR 21.11.03.11. For a partial waiver request, I agree that certified DBE firms will be used to accomplish the percentages of the total dollar amount of the Contract as set forth in the DBE Participation Schedule - Part 2 of the MDOT DBE Form B (Federally-Funded Contracts).

2. Additional DBE Documentation

I understand that if I am notified that I am the apparent awardee or as requested by the Procurement Officer, I must submit the following documentation within 10 business days of receiving such notice: (a) Outreach Efforts Compliance Statement (MDOT DBE Form C - Federally-Funded Contracts); (b) Subcontractor Project Participation Statement (MDOT DBE Form D - Federally-Funded Contracts); (c) DBE Waiver Request documentation per COMAR 21.11.03.11 (if waiver was requested); and (d) Any other documentation required by the Procurement Officer to ascertain bidder's responsibility/ offeror's susceptibility of being selected for award in connection with the certified DBE participation goal.



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MDOT DBE FORM A
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PAGE 2 OF 2

I acknowledge that if I fail to return each completed document (in 2 (a) through (d)) within the required time, the Procurement Officer may determine that I am not responsible and therefore not eligible for contract award or not susceptible of being selected for award.

3. Information Provided to DBE firms

In the solicitation of subcontract quotations or offers, DBE firms were provided not less than the same information and amount of time to respond as were non-DBE firms.

4. Products and Services Provided by DBE firms

I hereby affirm that the DBEs are only providing those products and services for which they are MDOT certified.

I solemnly affirm under the penalties of perjury that the information in this affidavit is true to the best of my knowledge, information and belief.

Company Name

Signature of Representative

Address

Printed Name and Title

City, State and Zip Code

Date



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**MDOT DBE FORM B
FEDERALLY-FUNDED CONTRACTS
DBE PARTICIPATION SCHEDULE**

PART 1 – INSTRUCTIONS FOR DBE PARTICIPATION SCHEDULE

PARTS 2 AND 3 MUST BE INCLUDED WITH THE BID/PROPOSAL. IF THE BIDDER/OFFEROR FAILS TO ACCURATELY COMPLETE AND SUBMIT PART 2 WITH THE BID/PROPOSAL AS REQUIRED, THE BID SHALL BE DEEMED NOT RESPONSIVE OR THE PROPOSAL SHALL BE DEEMED NOT SUSCEPTIBLE OF BEING SELECTED FOR AWARD.

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***** STOP *****

**FORM INSTRUCTIONS
PLEASE READ BEFORE COMPLETING THIS FORM**

1. Please refer to the Maryland Department of Transportation (MDOT) DBE Directory at www.mdot.state.md.us to determine if a firm is certified for the appropriate North American Industry Classification System (“NAICS”) Code **and** the product/services description (specific product that a firm is certified to provide or specific areas of work that a firm is certified to perform). For more general information about NAICS, please visit www.naics.com. Only those specific products and/or services for which a firm is certified in the MDOT Directory can be used for purposes of achieving the DBE participation goal.
2. In order to be counted for purposes of achieving the DBE participation goal, the firm must be certified for that specific NAICS (“DBE” for Federally-funded projects designation after NAICS Code). **WARNING:** If the firm’s NAICS Code is in **graduated status**, such services/products **will not be counted** for purposes of achieving the DBE participation goals. Graduated status is clearly identified in the MDOT Directory (such graduated codes are designated with the word graduated after the appropriate NAICS Code).
3. Examining the NAICS Code is the **first step** in determining whether a DBE firm is certified and eligible to receive DBE participation credit for the specific products/services to be supplied or performed under the contract. The **second step** is to determine whether a firm’s Products/Services Description in the DBE Directory includes the products to be supplied and/or services to be performed that are being used to achieve the DBE participation goal.
4. If you have any questions as to whether a firm is MDOT DBE certified, or if it is certified to perform specific services or provide specific products, please call MDOT’s Office of Minority Business Enterprise at 1-800-544-6056 or send an email to mbe@mdot.state.md.us.

02-09-16



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5. The Contractor's subcontractors are considered second-tier subcontractors. Third-tier contracting used to meet a DBE goal is to be considered the exception and not the rule. The following two conditions must be met before MDOT, its Modal Administrations and the Maryland Transportation Authority may approve a third-tier contracting agreement: (a) the bidder/offeror must request in writing approval of each third-tier contract arrangement, and (b) the request must contain specifics as to why a third-tier contracting arrangement should be approved. These documents must be submitted with the bid/proposal in Part 2 of this DBE Participation Schedule.
6. For each DBE firm that is being used as supplier/wholesaler/regular dealer/broker/manufacturer, please follow these instructions for calculating the **amount of the subcontract for purposes of achieving the DBE participation goal:**
 - A. Is the firm certified as a broker of the products/supplies? If the answer is YES, please continue to Item C. If the answer is NO, please continue to Item B.
 - B. Is the firm certified as a supplier, wholesaler, regular dealer, or manufacturer of such products/supplies? If the answer is YES, continue to Item D. If the answer is NO, continue to Item C only if the DBE firm is certified to perform trucking/hauling services under NAICS Codes 484110, 484121, 484122, 484210, 484220 and 484230. If the answer is NO and the firm is not certified under these NAICS Codes, then no DBE participation credit will be given for the supply of these products.
 - C. For purposes of achieving the DBE participation goal, you may count only the amount of any reasonable fee that the DBE firm will receive for the provision of such products/supplies - not the total subcontract amount or the value (or a percentage thereof) of such products and/or supplies. For Column 3 of the DBE Participation Schedule, please divide the amount of any reasonable fee that the DBE firm will receive for the provision of such products/services by the total Contract value and insert the percentage in Line 3.1.
 - D. Is the firm certified as a manufacturer (refer to the firm's NAICS Code and specific description of products/services) of the products/supplies to be provided? If the answer is NO please continue to Item E. If the answer is YES, for purposes of achieving the DBE participation goal, you may count the total amount of the subcontract. For Column 3 of the DBE Participation Schedule, please divide the total amount of the subcontract by the total Contract value and insert the percentage in Line 3.1.



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PART 1 – INSTRUCTIONS FOR DBE PARTICIPATION SCHEDULE
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- E. Is the firm certified as a supplier, wholesaler and/or regular dealer? If the answer is YES and the DBE firm is furnishing and installing the materials and is certified to perform these services, please divide the total subcontract amount (including full value of supplies) by the total Contract value and insert the percentage in Line 3.1. If the answer is YES and the DBE firm is only being used as a supplier, wholesaler and/or regular dealer or is not certified to install the supplies/materials, for purposes of achieving the DBE participation goal, you may only count sixty percent (60%) of the value of the subcontract for these supplies/products (60% Rule). To apply the 60% Rule, first divide the amount of the subcontract for these supplies/products only (not installation) by the total Contract value. Then, multiply the result by sixty percent (60%) and insert the percentage in Line 3.2.
7. For each DBE firm that **is not** being used as a supplier/wholesaler/regular dealer/broker/manufacture, to calculate the **amount of the subcontract for purposes of achieving the DBE participation goal**, divide the total amount of the subcontract by the total Contract value and insert the percentage in Line 3.1.
- Example:** \$ 2,500 (Total Subcontract Amount) ÷ \$10,000 (Total Contract Value) x 100 = 25%.
8. Please note that for USDOT-funded projects, a DBE prime may count towards its DBE participation goal work performed by its own forces. Include information about the DBE prime in Part 2.
9. **WARNING:** The percentage of DBE participation, computed using the dollar amounts in Column 3 for all of the DBE firms listed in Part 2, MUST at least equal the DBE participation goal as set forth in MDOT DBE Form A – Federally-Funded Contracts for this solicitation. If the bidder/offeror is unable to achieve the DBE participation goals, then the bidder/offeror must request a waiver in Form A or the bid will be deemed not responsive, or the proposal not susceptible of being selected for award. You may wish to use the Goal Worksheet shown below to assist you in calculating the percentage and confirming that you have met the applicable DBE participation goal.



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PART 1 – INSTRUCTIONS FOR DBE PARTICIPATION SCHEDULE
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GOAL WORKSHEET	
Total DBE Firm Participation (Add percentages in Column 3 for all DBE firms listed in DBE Participation Schedule)	(A) _____%
The percentage amount in Box A above should be equal to the percentage amount in Box E below.	
Add <i>Countable</i> Subcontract Amounts (see 6 through 8 of Instructions) for all DBE firms listed in DBE Participation Schedule, and insert in Box B	(B) \$ _____
Insert the Total Contract Amount in Box C	(C) \$ _____
Divide Box B by Box C and Insert in Box D	(D) = _____
Multiply Box D by 100 and insert in Box E	(E) = _____%



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PART 2 – DBE PARTICIPATION SCHEDULE

PARTS 2 AND 3 MUST BE INCLUDED WITH THE BID/PROPOSAL. IF THE BIDDER/OFFEROR FAILS TO ACCURATELY COMPLETE AND SUBMIT PART 2 WITH THE BID/PROPOSAL AS REQUIRED, THE BID SHALL BE DEEMED NOT RESPONSIVE OR THE PROPOSAL SHALL BE DEEMED NOT SUSCEPTIBLE OF BEING SELECTED FOR AWARD.

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Prime Contractor	Project Description	Solicitation Number

LIST INFORMATION FOR EACH CERTIFIED DBE SUBCONTRACTOR YOU AGREE TO USE TO ACHIEVE THE DBE PARTICIPATION GOAL.

COLUMN 1	COLUMN 2	COLUMN 3
		Unless the bidder/offeror requested a waiver in MDOT DBE Form A – Federally Funded Contracts for this solicitation, the cumulative DBE participation for all DBE firms listed herein must equal at least the DBE participation goal set forth in Form A.
NAME OF DBE SUBCONTRACTOR AND TIER	CERTIFICATION NO. AND DBE CLASSIFICATION	FOR PURPOSES OF ACHIEVING THE DBE PARTICIPATION GOAL, refer to sections 6, 7 and 8 in Part 1 - Instructions. State the percentage amount of the products/services in Line 3.1, except for those products or services where the DBE firm is being used as a wholesaler, supplier, or regular dealer. For items of work where the DBE firm is being used as a supplier, wholesaler and/or regular dealer, complete Line 3.2 using the 60% Rule.
<input type="checkbox"/> Please check if DBE firm is a third-tier contractor (if applicable). Please submit written documents in accordance with Section 5 of Part 1 - Instructions	Certification Number: <hr/> (If dually certified, check only one box.) <input type="checkbox"/> African American-Owned <input type="checkbox"/> Hispanic American- Owned <input type="checkbox"/> Asian American-Owned <input type="checkbox"/> Women-Owned <input type="checkbox"/> Other DBE Classification <hr/>	3.1. TOTAL PERCENTAGE TO BE PAID TO THE SUBCONTRACTOR (STATE THIS PERCENTAGE AS A PERCENTAGE OF THE TOTAL CONTRACT VALUE- EXCLUDING PRODUCTS/SERVICES FROM SUPPLIERS, WHOLESALERS OR REGULAR DEALERS). _____ % (Percentage for purposes of calculating achievement of DBE Participation goal) 3.2 TOTAL PERCENTAGE TO BE PAID TO THE SUBCONTRACTOR FOR ITEMS OF WORK WHERE THE DBE FIRM IS BEING USED AS A SUPPLIER, WHOLESALER AND/OR REGULAR DEALER) (STATE THE PERCENTAGE AS A PERCENTAGE OF THE TOTAL CONTRACT VALUE AND THEN APPLY THE 60% RULE PER SECTION 6(E) IN PART 1 - INSTRUCTIONS). _____ % Total percentage of Supplies/Products x _____ 60% (60% Rule) _____ % (Percentage for purposes of calculating achievement of DBE Participation goal)

Please check if Continuation Sheets are attached.



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CONTINUATION SHEET

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Prime Contractor	Project Description	Solicitation Number

LIST INFORMATION FOR EACH CERTIFIED DBE SUBCONTRACTOR YOU AGREE TO USE TO ACHIEVE THE DBE PARTICIPATION GOAL.

COLUMN 1	COLUMN 2	COLUMN 3
		Unless the bidder/offeror requested a waiver in MDOT DBE Form A – Federally Funded Contracts for this solicitation, the cumulative DBE participation for all DBE firms listed herein must equal at least the DBE participation goal set forth in Form A.
NAME OF DBE SUBCONTRACTOR AND TIER	CERTIFICATION NO. AND DBE CLASSIFICATION	FOR PURPOSES OF ACHIEVING THE DBE PARTICIPATION GOAL, refer to sections 6, 7 and 8 in Part 1 - Instructions. State the percentage amount of the products/services in Line 3.1, except for those products or services where the DBE firm is being used as a wholesaler, supplier, or regular dealer. For items of work where the DBE firm is being used as a supplier, wholesaler and/or regular dealer, complete Line 3.2 using the 60% Rule.
<input type="checkbox"/> Please check if DBE firm is a third-tier contractor (if applicable). Please submit written documents in accordance with Section 5 of Part 1 - Instructions	Certification Number: <hr/> (If dually certified, check only one box.) <input type="checkbox"/> African American-Owned <input type="checkbox"/> Hispanic American-Owned <input type="checkbox"/> Asian American-Owned <input type="checkbox"/> Women-Owned <input type="checkbox"/> Other DBE Classification <hr/>	3.1. TOTAL PERCENTAGE TO BE PAID TO THE SUBCONTRACTOR (STATE THIS PERCENTAGE AS A PERCENTAGE OF THE TOTAL CONTRACT VALUE- EXCLUDING PRODUCTS/SERVICES FROM SUPPLIERS, WHOLESALERS OR REGULAR DEALERS). _____ % (Percentage for purposes of calculating achievement of DBE Participation goal) 3.2 TOTAL PERCENTAGE TO BE PAID TO THE SUBCONTRACTOR FOR ITEMS OF WORK WHERE THE DBE FIRM IS BEING USED AS A SUPPLIER, WHOLESALER AND/OR REGULAR DEALER) (STATE THE PERCENTAGE AS A PERCENTAGE OF THE TOTAL CONTRACT VALUE AND THEN APPLY THE 60% RULE PER SECTION 6(E) IN PART 1 - INSTRUCTIONS). _____ % Total percentage of Supplies/Products x _____ 60% (60% Rule) _____ % (Percentage for purposes of calculating achievement of DBE Participation goal)

Please check if Continuation Sheets are attached.



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FEDERALLY-FUNDED CONTRACTS
DBE PARTICIPATION SCHEDULE

PART 3 – CERTIFICATION FOR DBE PARTICIPATION SCHEDULE

PARTS 2 AND 3 MUST BE INCLUDED WITH THE BID/PROPOSAL AS DIRECTED IN THE SOLICITATION.

I hereby affirm that I have reviewed the Products and Services Description (specific product that a firm is certified to provide or areas of work that a firm is certified to perform) set forth in the MDOT DBE Directory for each of the DBE firms listed in Part 2 of this DBE Form B for purposes of achieving the DBE participation goal that was identified in the DBE Form A that I submitted with this solicitation, and that the DBE firms listed are only performing those products/services/areas of work for which they are certified. I also hereby affirm that I have read and understand the form instructions set forth in Part 1 of this DBE Form B.

The undersigned Prime Contractor hereby certifies and agrees that it has fully complied with the State Minority Business Enterprise law, State Finance and Procurement Article §14-308(a)(2), Annotated Code of Maryland which provides that, except as otherwise provided by law, a contractor may not identify a certified minority business enterprise in a bid or proposal and:

- (1) fail to request, receive, or otherwise obtain authorization from the certified minority business enterprise to identify the certified minority business enterprise in its bid or proposal;
- (2) fail to notify the certified minority business enterprise before execution of the contract of its inclusion of the bid or proposal;
- (3) fail to use the certified minority business enterprise in the performance of the contract; or
- (4) pay the certified minority business enterprise solely for the use of its name in the bid or proposal.

I solemnly affirm under the penalties of perjury that the contents of Parts 2 and 3 of MDOT DBE Form B are true to the best of my knowledge, information and belief.

Company Name

Signature of Representative

Address

Printed Name and Title

City, State and Zip Code

Date



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MDOT MBE/DBE FORM E
GOOD FAITH EFFORTS GUIDANCE AND DOCUMENTATION

PART 1 – GUIDANCE FOR DEMONSTRATING GOOD FAITH EFFORTS
TO MEET MBE/DBE PARTICIPATION GOALS

In order to show that it has made good faith efforts to meet the Minority Business Enterprise (MBE)/Disadvantaged Business Enterprise (DBE) participation goal (including any MBE subgoals) on a contract, the bidder/offeror must either (1) meet the MBE/DBE Goal(s) and document its commitments for participation of MBE/DBE Firms, or (2) when it does not meet the MBE/DBE Goal(s), document its Good Faith Efforts to meet the goal(s).

I. Definitions

MBE/DBE Goal(s) – “MBE/DBE Goal(s)” refers to the MBE participation goal and MBE participation subgoal(s) on a State-funded procurement and the DBE participation goal on a federally-funded procurement.

Good Faith Efforts – The “Good Faith Efforts” requirement means that when requesting a waiver, the bidder/offeror must demonstrate that it took all necessary and reasonable steps to achieve the MBE/DBE Goal(s), which, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to obtain sufficient MBE/DBE participation, even if those steps were not fully successful. Whether a bidder/offeror that requests a waiver made adequate good faith efforts will be determined by considering the quality, quantity, and intensity of the different kinds of efforts that the bidder/offeror has made. The efforts employed by the bidder/offeror should be those that one could reasonably expect a bidder/offeror to take if the bidder/offeror were actively and aggressively trying to obtain DBE participation sufficient to meet the DBE contract goal. Mere *pro forma* efforts are not good faith efforts to meet the DBE contract requirements. The determination concerning the sufficiency of the bidder's/offeror's good faith efforts is a judgment call; meeting quantitative formulas is not required.

Identified Firms – “Identified Firms” means a list of the DBEs identified by the procuring agency during the goal setting process and listed in the federally-funded procurement as available to perform the Identified Items of Work. It also may include additional DBEs identified by the bidder/offeror as available to perform the Identified Items of Work, such as DBEs certified or granted an expansion of services after the procurement was issued. If the procurement does not include a list of Identified Firms or is a State-funded procurement, this term refers to all of the MBE Firms (if State-funded) or DBE Firms (if federally-funded) the bidder/offeror identified as available to perform the Identified Items of Work and should include all appropriately certified firms that are reasonably identifiable.



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Identified Items of Work – “Identified Items of Work” means the bid items identified by the procuring agency during the goal setting process and listed in the procurement as possible items of work for performance by MBE/DBE Firms. It also may include additional portions of items of work the bidder/offeror identified for performance by MBE/DBE Firms to increase the likelihood that the MBE/DBE Goal(s) will be achieved. If the procurement does not include a list of Identified Items of Work, this term refers to all of the items of work the bidder/offeror identified as possible items of work for performance by MBE/DBE Firms and should include all reasonably identifiable work opportunities.

MBE/DBE Firms – For State-funded contracts, “MBE/DBE Firms” refers to certified **MBE** Firms. Certified MBE Firms can participate in the State’s MBE Program. For federally-funded contracts, “MBE/DBE Firms” refers to certified **DBE** Firms. Certified DBE Firms can participate in the federal DBE Program.



II. Types of Actions MDOT will Consider

The bidder/offeror is responsible for making relevant portions of the work available to MBE/DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available MBE/DBE subcontractors and suppliers, so as to facilitate MBE/DBE participation. The following is a list of types of actions MDOT will consider as part of the bidder's/offeror's Good Faith Efforts when the bidder/offeror fails to meet the MBE/DBE Goal(s). This list is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases.

A. Identify Bid Items as Work for MBE/DBE Firms

1. Identified Items of Work in Procurements

(a) Certain procurements will include a list of bid items identified during the goal setting process as possible work for performance by MBE/DBE Firms. If the procurement provides a list of Identified Items of Work, the bidder/offeror shall make all reasonable efforts to solicit quotes from MBE Firms or DBE Firms, whichever is appropriate, to perform that work.

(b) Bidders/Offerors may, and are encouraged to, select additional items of work to be performed by MBE/DBE Firms to increase the likelihood that the MBEDBE Goal(s) will be achieved.

2. Identified Items of Work by Bidders/Offerors

(a) When the procurement does not include a list of Identified Items of Work, bidders/offerors should reasonably identify sufficient items of work to be performed by MBE/DBE Firms.

(b) Where appropriate, bidders/offerors should break out contract work items into economically feasible units to facilitate MBE/DBE participation, rather than perform these work items with their own forces. The ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the bidder/offeror of the responsibility to make Good Faith Efforts.

B. Identify MBE Firms or DBE Firms to Solicit

1. DBE Firms Identified in Procurements

(a) Certain procurements will include a list of the DBE Firms identified during the goal setting process as available to perform the items of work. If the procurement provides



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a list of Identified DBE Firms, the bidder/offeror shall make all reasonable efforts to solicit those DBE firms.

(b) Bidders/offerors may, and are encouraged to, search the MBE/DBE Directory to identify additional DBEs who may be available to perform the items of work, such as DBEs certified or granted an expansion of services after the solicitation was issued.

2. MBE/DBE Firms Identified by Bidders/Offerors

(a) When the procurement does not include a list of Identified MBE/DBE Firms, bidders/offerors should reasonably identify the MBE Firms or DBE Firms, whichever is appropriate, that are available to perform the Identified Items of Work.

(b) Any MBE/DBE Firms identified as available by the bidder/offeror should be certified in the appropriate program (MBE for State-funded procurements or DBE for federally-funded procurements)

(c) Any MBE/DBE Firms identified as available by the bidder/offeror should be certified to perform the Identified Items of Work.

C. Solicit MBE/DBEs

1. Solicit all Identified Firms for all Identified Items of Work by providing written notice. The bidder/offeror should:

(a) provide the written solicitation at least 10 days prior to bid opening to allow sufficient time for the MBE/DBE Firms to respond;

(b) send the written solicitation by first-class mail, facsimile, or email using contact information in the MBE/DBE Directory, unless the bidder/offeror has a valid basis for using different contact information; and

(c) provide adequate information about the plans, specifications, anticipated time schedule for portions of the work to be performed by the MBE/DBE, and other requirements of the contract to assist MBE/DBE Firms in responding. (This information may be provided by including hard copies in the written solicitation or by electronic means as described in C.3 below.)

2. “All” Identified Firms includes the DBEs listed in the procurement and any MBE/DBE Firms you identify as potentially available to perform the Identified Items of Work, but it does not include MBE/DBE Firms who are no longer certified to perform the work as of the date the bidder/offeror provides written solicitations.



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3. “Electronic Means” includes, for example, information provided *via* a website or file transfer protocol (FTP) site containing the plans, specifications, and other requirements of the contract. If an interested MBE/DBE cannot access the information provided by electronic means, the bidder/offeror must make the information available in a manner that is accessible by the interested MBE/DBE.

4. Follow up on initial written solicitations by contacting DBEs to determine if they are interested. The follow up contact may be made:

(a) by telephone using the contact information in the MBE/DBE Directory, unless the bidder/offeror has a valid basis for using different contact information; or

(b) in writing *via* a method that differs from the method used for the initial written solicitation.

5. In addition to the written solicitation set forth in C.1 and the follow up required in C.4, use all other reasonable and available means to solicit the interest of MBE/DBE Firms certified to perform the work of the contract. Examples of other means include:

(a) attending any pre-bid meetings at which MBE/DBE Firms could be informed of contracting and subcontracting opportunities;

(b) if recommended by the procurement, advertising with or effectively using the services of at least two minority focused entities or media, including trade associations, minority/women community organizations, minority/women contractors' groups, and local, state, and federal minority/women business assistance offices listed on the MDOT Office of Minority Business Enterprise website; and

(c) effectively using the services of other organizations, as allowed on a case-by-case basis and authorized in the procurement, to provide assistance in the recruitment and placement of MBE/DBE Firms.

D. Negotiate With Interested MBE/DBE Firms

Bidders/Offerors must negotiate in good faith with interested MBE/DBE Firms.

1. Evidence of negotiation includes, without limitation, the following:

(a) the names, addresses, and telephone numbers of MBE/DBE Firms that were considered;

(b) a description of the information provided regarding the plans and specifications for the work selected for subcontracting and the means used to provide that information; and



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(c) evidence as to why additional agreements could not be reached for MBE/DBE Firms to perform the work.

2. A bidder/offeror 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.

3. The fact that there may be some additional costs involved in finding and using MBE/DBE Firms is not in itself sufficient reason for a bidder's/offeror's failure to meet the contract DBE goal, as long as such costs are reasonable. Factors to take into consideration when determining whether a MBE/DBE Firm's quote is excessive or unreasonable include, without limitation, the following:

- (a) the dollar difference between the MBE/DBE subcontractor's quote and the average of the other subcontractors' quotes received by the bidder/offeror;
- (b) the percentage difference between the MBE/DBE subcontractor's quote and the average of the other subcontractors' quotes received by the bidder/offeror;
- (c) the percentage that the DBE subcontractor's quote represents of the overall contract amount;
- (d) the number of MBE/DBE firms that the bidder/offeror solicited for that portion of the work;
- (e) whether the work described in the MBE/DBE and Non-MBE/DBE subcontractor quotes (or portions thereof) submitted for review is the same or comparable; and
- (f) the number of quotes received by the bidder/offeror for that portion of the work.

4. The above factors are not intended to be mandatory, exclusive, or exhaustive, and other evidence of an excessive or unreasonable price may be relevant.

5. The bidder/offeror may not use its price for self-performing work as a basis for rejecting a MBE/DBE Firm's quote as excessive or unreasonable.

6. The "average of the other subcontractors' quotes received by the" bidder/offeror refers to the average of the quotes received from all subcontractors, except that there should be quotes from at least three subcontractors, and there must be at least one quote from a MBE/DBE and one quote from a Non-MBE/DBE.



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7. A bidder/offeror shall not reject a MBE/DBE Firm as unqualified without sound reasons based on a thorough investigation of the firm’s capabilities. For each certified MBE/DBE that is rejected as unqualified or that placed a subcontract quotation or offer that the bidder/offeror concludes is not acceptable, the bidder/offeror must provide a written detailed statement listing the reasons for this conclusion. The bidder/offeror also must document the steps taken to verify the capabilities of the MBE/DBE and Non-MBE/DBE Firms quoting similar work.

(a) The factors to take into consideration when assessing the capabilities of a MBE/DBE Firm, include, but are not limited to the following: financial capability, physical capacity to perform, available personnel and equipment, existing workload, experience performing the type of work, conduct and performance in previous contracts, and ability to meet reasonable contract requirements.

(b) The MBE/DBE Firm’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 efforts to meet the project goal.

E. Assisting Interested MBE/DBE Firms

When appropriate under the circumstances, the decision-maker will consider whether the bidder/offeror:

1. made reasonable efforts to assist interested MBE/DBE Firms in obtaining the bonding, lines of credit, or insurance required by MDOT or the bidder/offeror; and
2. made reasonable efforts to assist interested MBE/DBE Firms in obtaining necessary equipment, supplies, materials, or related assistance or services.

III. Other Considerations

In making a determination of Good Faith Efforts the decision-maker may consider engineering estimates, catalogue prices, general market availability and availability of certified MBE/DBE Firms in the area in which the work is to be performed, other bids or offers and subcontract bids or offers substantiating significant variances between certified MBE/DBE and Non-MBE/DBE costs of participation, and their impact on the overall cost of the contract to the State and any other relevant factors.

The decision-maker may take into account whether a bidder/offeror decided to self-perform subcontract work with its own forces, especially where the self-performed work is Identified Items of Work in the procurement. The decision-maker also may take into account the



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performance of other bidders/offers in meeting the contract. For example, when the apparent successful bidder/offeror fails to meet the contract goal, but others meet it, this reasonably raises the question of whether, with additional reasonable efforts, the apparent successful bidder/offeror could have met the goal. If the apparent successful bidder/offeror fails to meet the goal, but meets or exceeds the average MBE/DBE participation obtained by other bidders/offers, this, when viewed in conjunction with other factors, could be evidence of the apparent successful bidder/offeror having made Good Faith Efforts.

IV. Documenting Good Faith Efforts

At a minimum, a bidder/offeror seeking a waiver of the MBE/DBE Goal(s) or a portion thereof must provide written documentation of its Good Faith Efforts, in accordance with COMAR 21.11.03.11, within 10 business days after receiving notice that it is the apparent awardee. The written documentation shall include the following:

A. Items of Work (Complete Good Faith Efforts Documentation Form E, Part 2)

A detailed statement of the efforts made to select portions of the work proposed to be performed by certified MBE/DBE Firms in order to increase the likelihood of achieving the stated MBE/DBE Goal(s).

B. Outreach/Solicitation/Negotiation

1. The record of the bidder's/offeror's compliance with the outreach efforts prescribed by COMAR 21.11.03.09C(2)(a) through (e) and 49 C.F.R. Part 26, Appendix A. (**Complete Outreach Efforts Compliance Statement**)

2. A detailed statement of the efforts made to contact and negotiate with MBE/DBE Firms including:

(a) the names, addresses, and telephone numbers of the MBE/DBE Firms who were contacted, with the dates and manner of contacts (letter, fax, email, telephone, etc.) (**Complete Good Faith Efforts Form E, Part 3, and submit letters, fax cover sheets, emails, etc. documenting solicitations**); and

(b) a description of the information provided to MBE/DBE Firms regarding the plans, specifications, and anticipated time schedule for portions of the work to be performed and the means used to provide that information.

C. Rejected MBE/DBE Firms (Complete Good Faith Efforts Form E, Part 4)

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1. For each MBE/DBE Firm that the bidder/offeror concludes is not acceptable or qualified, a detailed statement of the reasons for the bidder's/offeror's conclusion, including the steps taken to verify the capabilities of the MBE/DBE and Non-MBE/DBE Firms quoting similar work.

2. For each certified MBE/DBE Firm that the bidder/offeror concludes has provided an excessive or unreasonable price, a detailed statement of the reasons for the bidder's/offeror's conclusion, including the quotes received from all MBE/DBE and Non-MBE/DBE firms bidding on the same or comparable work. **(Include copies of all quotes received.)**

3. A list of MBE/DBE Firms contacted but found to be unavailable. This list should be accompanied by a Minority Contractor Unavailability Certificate signed by the MBE/DBE contractor or a statement from the bidder/offeror that the MBE/DBE contractor refused to sign the Minority Contractor Unavailability Certificate.

D. Other Documentation

1. Submit any other documentation requested by the Procurement Officer to ascertain the bidder's/offeror's Good Faith Efforts.

2. Submit any other documentation the bidder/offeror believes will help the Procurement Officer ascertain its Good Faith Efforts.



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GOOD FAITH EFFORTS GUIDANCE AND DOCUMENTATION

PART 2 – CERTIFICATION REGARDING GOOD FAITH EFFORTS DOCUMENTATION

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Prime Contractor	Project Description	Solicitation Number

PARTS 3, 4, AND 5 MUST BE INCLUDED WITH THIS CERTIFICATE ALONG WITH ALL DOCUMENTS SUPPORTING YOUR WAIVER REQUEST.

I hereby request a waiver of (1) the Minority Business Enterprise (MBE) participation goal and/or subgoal(s), (2) the Disadvantaged Business Enterprise (DBE) participation goal, or (3) a portion of the pertinent MBE/DBE participation goal and/or MBE subgoal(s) for this procurement.¹ I affirm that I have reviewed the Good Faith Efforts Guidance MBE/DBE Form E. I further affirm under penalties of perjury that the contents of Parts 3, 4, and 5 of MDOT MBE/DBE Form E are true to the best of my knowledge, information and belief.

Company Name

Signature of Representative

Address

Printed Name and Title

City, State and Zip Code

Date

¹ MBE participation goals and subgoals apply to State-funded procurements. DBE participation goals apply to federally-funded procurements. Federally-funded contracts do not have subgoals.



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**PART 3 – IDENTIFIED ITEMS OF WORK BIDDER/OFFEROR MADE AVAILABLE TO
MBE/DBE FIRMS**

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Prime Contractor	Project Description	Solicitation Number

Identify those items of work that the bidder/offeror made available to MBE/DBE Firms. This includes, where appropriate, those items the bidder/offeror identified and determined to subdivide into economically feasible units to facilitate the MBE/DBE participation. For each item listed, show the anticipated percentage of the total contract amount. It is the bidder's/offeror's responsibility to demonstrate that sufficient work to meet the goal was made available to MBE/DBE Firms, and the total percentage of the items of work identified for MBE/DBE participation equals or exceeds the percentage MBE/DBE goal set for the procurement. Note: If the procurement includes a list of bid items identified during the goal setting process as possible items of work for performance by MBE/DBE Firms, the bidder/offeror should make all of those items of work available to MBE/DBE Firms or explain why that item was not made available. If the bidder/offeror selects additional items of work to make available to MBE/DBE Firms, those additional items should also be included below.

Identified Items of Work	Was this work listed in the procurement?	Does bidder/offeror normally self-perform this work?	Was this work made available to MBE/DBE Firms? If no, explain why?
	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

Please check if Additional Sheets are attached.



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PART 4 – IDENTIFIED MBE/DBE FIRMS AND RECORD OF SOLICITATIONS

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Identify the MBE/DBE Firms solicited to provide quotes for the Identified Items of Work made available for MBE/DBE participation. Include the name of the MBE/DBE Firm solicited, items of work for which bids/quotes were solicited, date and manner of initial and follow-up solicitations, whether the MBE/DBE provided a quote, and whether the MBE/DBE is being used to meet the MBE/DBE participation goal. MBE/DBE Firms used to meet the participation goal must be included on the MBE/DBE Participation Schedule, Form B. Note: If the procurement includes a list of the MBE/DBE Firms identified during the goal setting process as potentially available to perform the items of work, the bidder/offeror should solicit all of those MBE/DBE Firms or explain why a specific MBE/DBE was not solicited. If the bidder/offeror identifies additional MBE/DBE Firms who may be available to perform Identified Items of Work, those additional MBE/DBE Firms should also be included below. Copies of all written solicitations and documentation of follow-up calls to MBE/DBE Firms must be attached to this form. If the bidder/offeror used a Non-MBE/DBE or is self-performing the identified items of work, Part 4 must be completed.



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Name of Identified MBE/DBE Firm & MBE Classification	Describe Item of Work Solicited	Initial Solicitation Date & Method	Follow-up Solicitation Date & Method	Details for Follow-up Calls	Quote Rec'd	Quote Used	Reason Quote Rejected
Firm Name: _____ MBE Classification (Check only if requesting waiver of MBE subgoal.) <input type="checkbox"/> African American-Owned <input type="checkbox"/> Hispanic American-Owned <input type="checkbox"/> Asian American-Owned <input type="checkbox"/> Women-Owned <input type="checkbox"/> Other MBE Classification —		Date: <input type="checkbox"/> Mail <input type="checkbox"/> Facsimile <input type="checkbox"/> Email	Date: <input type="checkbox"/> Phone <input type="checkbox"/> Mail <input type="checkbox"/> Facsimile <input type="checkbox"/> Email	Time of Call: Spoke With: <input type="checkbox"/> Left Message	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Used Other MBE/DBE <input type="checkbox"/> Used Non-MBE/DBE <input type="checkbox"/> Self-performing
Firm Name: _____ MBE Classification (Check only if requesting waiver of MBE subgoal.) <input type="checkbox"/> African American-Owned <input type="checkbox"/> Hispanic American-Owned <input type="checkbox"/> Asian American-Owned <input type="checkbox"/> Women-Owned <input type="checkbox"/> Other MBE Classification —		Date: <input type="checkbox"/> Mail <input type="checkbox"/> Facsimile <input type="checkbox"/> Email	Date: <input type="checkbox"/> Phone <input type="checkbox"/> Mail <input type="checkbox"/> Facsimile <input type="checkbox"/> Email	Time of Call: Spoke With: <input type="checkbox"/> Left Message	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Used Other MBE/DBE <input type="checkbox"/> Used Non-MBE/DBE <input type="checkbox"/> Self-performing

Please check if Additional Sheets are attached.



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PART 5 – ADDITIONAL INFORMATION REGARDING REJECTED MBE/DBE QUOTES

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Prime Contractor	Project Description	Solicitation Number

This form must be completed if Part 3 indicates that a MBE/DBE quote was rejected because the bidder/offeror is using a Non-MBE/DBE or is self-performing the Identified Items of Work. Provide the Identified Items Work, indicate whether the work will be self-performed or performed by a Non-MBE/DBE, and if applicable, state the name of the Non-MBE/DBE. Also include the names of all MBE/DBE and Non-MBE/DBE Firms that provided a quote and the amount of each quote.

Describe Identified Items of Work Not Being Performed by MBE/DBE (Include spec/section number from bid)	Self-performing or Using Non-MBE/DBE (Provide name)	Amount of Non-MBE/DBE Quote	Name of Other Firms who Provided Quotes & Whether MBE/DBE or Non-MBE/DBE	Amount Quoted	Indicate Reason Why MBE/DBE Quote Rejected & Briefly Explain
	<input type="checkbox"/> Self-performing <input type="checkbox"/> Using Non-MBE/DBE	\$ _____	_____ <input type="checkbox"/> MBE/DBE <input type="checkbox"/> Non-MBE/DBE	\$ _____	<input type="checkbox"/> Price <input type="checkbox"/> Capabilities <input type="checkbox"/> Other
	<input type="checkbox"/> Self-performing <input type="checkbox"/> Using Non-MBE/DBE	\$ _____	_____ <input type="checkbox"/> MBE/DBE <input type="checkbox"/> Non-MBE/DBE	\$ _____	<input type="checkbox"/> Price <input type="checkbox"/> Capabilities <input type="checkbox"/> Other
	<input type="checkbox"/> Self-performing <input type="checkbox"/> Using Non-MBE/DBE	\$ _____	_____ <input type="checkbox"/> MBE/DBE <input type="checkbox"/> Non-MBE/DBE	\$ _____	<input type="checkbox"/> Price <input type="checkbox"/> Capabilities <input type="checkbox"/> Other

Please check if Additional Sheets are attached.



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INFORMATION REQUIRED TO BE SUBMITTED FOR FEDERALLY ASSISTED CONTRACTS:

(a) Each bidder shall provide the following information:

NAME OF FIRM: _____

Street and/or P.O. Box

City State Zip Code

____ DBE ____ Non-DBE Age of the firm ____ years
Annual gross receipts per last calendar year ____ <\$500,000 ____ \$500,000-1,000,000
____ \$1,000,000-3,000,000 ____ \$3,000,000-5,000,000 ____ \$5,000,000-10,000,000
____ >\$10,000,000

(b) Each bidder shall provide the following information for each firm quoting or considered as subcontractors and/or suppliers:

NAME OF FIRM: _____

Street and/or P.O. Box

City State Zip Code

____ DBE ____ Non-DBE Age of the firm ____ years
Annual gross receipts per last calendar year ____ <\$500,000 ____ \$500,000-1,000,000
____ \$1,000,000-3,000,000 ____ \$3,000,000-5,000,000 ____ \$5,000,000-10,000,000
____ > \$10,000,000

NAME OF FIRM: _____

Street and/or P.O. Box

City State Zip Code

____ DBE ____ Non-DBE Age of the firm ____ years
Annual gross receipts per last calendar year ____ <\$500,000 ____ \$500,000-1,000,000
____ \$1,000,000-3,000,000 ____ \$3,000,000-5,000,000 ____ \$5,000,000-10,000,000
____ > \$10,000,000



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NAME OF FIRM: _____

Street and/or P.O. Box

City State Zip Code

____ DBE ____ Non-DBE Age of the firm ____ years
Annual gross receipts per last calendar year ____ <\$500,000 ____ \$500,000-1,000,000
____ \$1,000,000-3,000,000 ____ \$3,000,000-5,000,000 ____ \$5,000,000-10,000,000
____ > \$10,000,000

NAME OF FIRM: _____

Street and/or P.O. Box

City State Zip Code

____ DBE ____ Non-DBE Age of the firm ____ years
Annual gross receipts per last calendar year ____ <\$500,000 ____ \$500,000-1,000,000
____ \$1,000,000-3,000,000 ____ \$3,000,000-5,000,000 ____ \$5,000,000-10,000,000
____ > \$10,000,000

NAME OF FIRM: _____

Street and/or P.O. Box

City State Zip Code

____ DBE ____ Non-DBE Age of the firm ____ years
Annual gross receipts per last calendar year ____ <\$500,000 ____ \$500,000-1,000,000
____ \$1,000,000-3,000,000 ____ \$3,000,000-5,000,000 ____ \$5,000,000-10,000,000
____ > \$10,000,000

Submit additional copies of this page as page 43A of 45, 43B of 45, etc. as necessary, and place them as the last pages in the Invitation for Bids. Place an "X" for "NO" on the last copy. Any additional Copies: _____ NO _____ YES



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EXTRA WORK, CONTRACT TIME, BONDING, LIQUIDATED DAMAGES, AND PROPOSAL GUARANTY

EXTRA WORK. It is further proposed to do all "Extra Work" which may be required to complete the work contemplated at unit prices or lump sum prices to be agreed upon in writing prior to starting such extra work, or if such prices or sums cannot be agreed upon, to perform such work on a Force Account basis as specified in TC-7.03.

CONTRACT TIME. To commence work as specified in the "Notice to Proceed" and to prosecute the work to complete the contract within/or before

180 calendar days / January 15, 2018

Any delay in awarding or the execution of this contract will not be considered as a basis for any monetary claim, however, an extension of time may be considered by the Administration, if warranted.

BONDING. When the Contractor's bid is \$100,000 or more, the Contractor shall furnish a Payment Bond and a Performance Bond in the full amount of the Contract Award as security for the construction and completion of the contract in conformance with the Plans, Standard Specifications, revisions thereto, General Provisions and Special Provisions.

To guarantee all of the work performed under this contract to be done in conformance with the Standard Specifications, revisions thereto, General Provisions and Special Provisions in a good workmanlike manner and to renew or repair any work which may be rejected due to defective materials or workmanship, prior to final completion and acceptance of the work, also we have the equipment, labor, supervision and financial capacity to perform this contract either with our organization or with Subcontractors.

LIQUIDATED DAMAGES. The Contractor is hereby advised that liquidated damages in the amount of 500 dollars per calendar day

will be assessed for unauthorized extensions beyond the contracted time of completion.



CONTRACT PROVISIONS
PROPOSAL FORM PACKET — FEDERAL
City of Takoma Park IFB No. HCD-20170201

SHA PERMIT NO. 15APMO01516
SHA Contract No. MO0705125
FAP No. TAP-3(481)E
45 of 45

PROPOSAL GUARANTY. A bid security is not required on Contract Proposals under \$100,000.

A bid security totaling at least five percent (5%) of the bid amount will be required on contracts of \$100,000 or over.

Acceptable forms of security for bid guaranty shall be:

- (1) A bond in a form satisfactory to the State underwritten by a company licensed to issue bonds in this State;
- (2) A bank certified check, bank cashier's check, bank treasurer's check, or cash;
- (3) Pledge of security backed by the full faith and full credit of the United States government or bonds issued by the State of Maryland.

Enclosed herewith, find bid security based on at least five percent (5%) of the aggregate amount of the bid submitted, and made payable to the "**City of Takoma Park**". This bid security is a Proposal Guarantee (which is understood will be forfeited in the event the contract is not executed, if awarded to the signer of this affidavit).

ROUTE
MD 410

DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OF MARYLAND
Baltimore, MD

DATE OF ISSUE
August 1, 2016

MILEPOINT
6.31

EXPIRATION DATE
August 1, 2017

PERMISSION IS HEREBY GIVEN:

City of Takoma park, c/o Mr. Erkin Ozberk, 7500 Maple Avenue, Takoma Park, MD 20912 (Phone: 301-891-7213) so far as the State Highway Administration has the right and power to grant same, to construct Streetscape improvements along Ethan Allen Avenue/ East-West Highway (MD 410) as part of the proposed Ethan Allen Gateway, located on Ethan Allen Avenue (MD 410) at its intersection with New Hampshire Avenue (MD 650).

Improvements include but are not limited to the following: full-depth pavement widening, resurfacing, curb and gutter, sidewalk, storm drain systems, storm water management facilities, signing, pavement markings, lighting, traffic signal modifications, streetscape improvements and landscape plantings.

Unless otherwise specified below, construction of these improvements and/or modifications shall be in accordance with the latest version of the Maryland Department of Transportation State Highway Administration's Standard Specifications for Construction and Materials and the attached plan, copies of which are on file in this office. The plans and all of their additions and attachments are hereby incorporated in this permit.

It is agreed and understood that this permit constitutes a binding contract between you, your heirs, successors, and assigns, and the SHA, to adhere to the terms and conditions set forth in this permit.

GENERAL PROVISIONS

I. Inspection and Pre-Construction Meeting

A. IMPORTANT: Prior to any work being performed in the State Highway Administration right-of-way, a pre-construction meeting shall be held with representatives of the Administration. In order to schedule the pre-construction meeting, all source of supply letters must be approved. Submit source of supply letters to SHA's Materials Management Division (Phone: 443-572-5020) at least two (2) weeks prior to the date you intend to begin construction. Once you have approved source of supply letters, you must notify the SHA Utility Permit Inspector, Ms. Carol Rainey, Greenbelt, Maryland (Phone: 301-513-7492) forty-eight (48) hours before the commencement of work, and prior to each successive stage of work. All work is subject to review and approval of the SHA Utility Engineer. Work deemed unacceptable shall be repaired and/or replaced to the satisfaction of the SHA Utility Engineer.

AND

You must make notification in accordance with Engineering Specifications Section II: Utilities, Section III: Work Zone Traffic Control and Maintenance of Traffic, Section VIII: Permanent Signing, Pavement Marking and Traffic Control, and Section VII: Traffic Signals, prior to commencement of work.

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If this notice is not given, it will be necessary to suspend work for a minimum period of twenty-four (24) hours to allow time for notification of the proper agencies.

B. It shall be the responsibility of you and/or your contractor to notify the SHA Utility Permit Inspector's office upon completion of the work, so that SHA can conduct a final inspection of the modifications and/or improvements. When SHA determines that all work required under the terms of this permit have been completed, SHA will release the permit. Release of this permit does not extinguish this agreement regarding continuing responsibilities of either party concerning maintenance, drainage, traffic signals, land use, etc.

II. The Permittee's and/or Owner's Responsibility for Work

A. You and/or your contractor shall fully perform the modifications and/or improvements set forth in this permit in a manner satisfactory to SHA. Failure to complete the modifications and/or improvements within the allotted time, may result in one of the following actions:

(1) Permit may be revoked if entrance work is not started and property is not in commercial use.

(2) Completion of all or part of the work at your expense if work is not completed, or you fail to comply with the permit provisions. With no prior notice to you, the SHA may proceed to immediately fulfill the terms of this permit and all administrative, engineering, and construction costs shall be chargeable to you. You shall be responsible for any additional costs.

B. SHA shall have the right to enter upon the property of the Permittee to perform or complete the work. Such action shall not be deemed an acceptance of any work not completed in accordance with this permit. That does not relieve you and/or your contractor of liability for loss or damage resulting from your negligence or that of your contractor.

C. If, due to circumstances beyond your control (i.e. weather, strikes, etc.) you cannot complete the work within the allotted time, please write this office thirty (30) days before it is going to expire to request an extension. Your request will need to include a detailed justified reason as to why the work has not been performed and a construction timetable of when this work will be completed. SHA may grant an extension of the work completion date within which the terms and conditions of the permit are to be fulfilled. A copy of the extension will be forwarded to you. Your concurrence will be assumed if written objections are not received within ten (10) days of the issuance of the extension.

D. It shall be your responsibility to obtain and provide copies to SHA, any and all other permits, approvals, etc., from the appropriate parties or agencies that may be necessary for you to complete the necessary modifications and/or improvements.

E. The personnel on the job site performing the modifications and/or improvements must have a copy of SHA's approved permit and plans at all times and they must have full knowledge of the contents of the permit. The SHA Utility Permit Inspector shall have the option of closing down projects where the job site personnel do not have a copy of the approved permit and plans and/or are not complying with the contents of the permit and plans.

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III. Future Adjustments

A. It is agreed that any expansion and/or modification of the development, or change of use or occupancy of the property, will require the approval of the SHA and may require the owner, developer, or tenant to obtain a new access permit to remove, modify, or reconstruct the entrance in accordance with SHA requirements in effect at that time and deemed necessary by the Administration.

B. In the event that any State highway is modified to become a dual or divided highway containing a median, or if a median is already in place, SHA may decline to construct or allow the construction of a crossover through the median that would allow left turns to and from the property. SHA reserves the right to restrict or eliminate the use of existing crossovers and new crossovers established under this permit.

IV. Right-of-Way Requirements

A. Vehicular access to and from the subject site by the public, for the purpose of conducting business for the permitted use of the property, shall not be allowed until such time as the work herein specified has been fully completed in accordance with the permit.

B. No obstructions shall be placed on or within the SHA right-of-way without written permission.

C. No signs or lights will be permitted on or above the State's right-of-way. (Except approved traffic control signs, traffic signals, intersection lighting, etc.).

D. If mailboxes are erected within the SHA right-of-way, they must be placed on a breakaway type post or support. The maximum size wooden post will be 4" x 4". The maximum size pipe support will be 2" in diameter. Any other type of support (ornamental) shall not have a structural strength greater than either of these. The owner and/or you will be directed to remove any mailbox support of a size greater than the aforementioned; and if not removed by the owner and/or you, it will be removed by SHA forces. SHA is not responsible for any damage to mailboxes regardless of how the damage may occur.

E. Fire hydrants on or adjacent to the project shall be kept accessible to fire departments at all times and no material or obstruction shall be placed within fifteen (15) feet of any such hydrant. All footways, gutters, sewer inlets adjoining the work under construction shall not be obstructed more than is absolutely necessary. Construction zones closed down for the winter or at any other times shall be left entirely accessible at all points to fire apparatus.

F. Proposed removal, selective thinning, or pruning of any trees within SHA right-of-way must be reviewed and approved by **SHA's Office of Environmental Design – Landscape Operations Division (Phone: 410-545-8590)** prior to contacting the **Maryland Department of Natural Resources – Forest Service (Phone: 301-854-6060)**, to determine whether that is permissible under the Annotated Code of Maryland, Title 08, Subtitle 07, Chapter 02.

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G. As part of this permit, permission is hereby granted to plant in the area behind the roadside curb. You and/or your contractor shall maintain the plants at a maximum height of 18", and the plants shall be trimmed so they will not overhang the outside edge of the concrete curb. Where grass is planted, it shall be mowed and trimmed periodically to insure a neat appearance.

H. Graded cut and fill slopes in the public right-of-way are to be sodded or seeded and mulched.

I. In the fill areas where the cross slope of the embankment fill is steeper than 3:1 (horizontal: vertical), and the height of the fill exceeds 5', Standard "W" beam is required as directed by the SHA Utility Permit Inspector.

J. It shall be the responsibility of you and/or your contractor to restore the right-of-way to its original condition if construction begins but is abandoned prior to completion.

K. All mud and debris tracked and/or spilled on the State highway shall be removed promptly to eliminate potential hazards and comply with sediment control requirements.

L. Maintenance of the area, beyond the roadside flowline, shall be the full responsibility of you and/or the Permittee or Lessee.

M. After construction is completed and prior to permit release, the Permittee must submit As-Built construction plans (two sets, plus digital copy) or certification from a licensed professional that the project was constructed as per the access permit plans with no changes.

V. Responsibility for Damage Claims

Permittee shall, subject to the availability of appropriations and the limitations of the Local Government Tort Claims Act, Subtitle 4 of Title 5 of the Courts & Judicial Proceedings article of the Annotated Code of Maryland, indemnify, defend and save harmless SHA, and all its representatives from all suits, actions, or claims of any character brought on account of any injuries or damages sustained by any person or property due to acts or omissions on the part of employees, officers or agents of Permittee in connection with the work performed pursuant to this Permit. Permittee further agrees that it shall require its contractor(s) to purchase and maintain comprehensive general public liability and property damage insurance pursuant to Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction and Materials (July 2008), GP-7.14 and TC-5.01. Contractor will obtain a certificate of insurance naming SHA as additional insured, and will provide SHA and Permittee satisfactory documented proof thereof.

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ENGINEERING SPECIFICATIONS

I. General Requirements

A. All construction on the State highway right-of-way shall conform to the latest version of SHA's "Standard Specifications for Construction and Materials", which shall be construed to include all pertinent Interim Specifications Addenda and Special Provision Inserts. In addition, these Engineering Specifications and approved site-specific Special Provisions attached to this permit shall apply. All construction shall conform to the latest version of SHA's "Book of Standards for Highway and Incidental Structures", except where the use of nonstandard or modified designs is expressly noted and detailed on the approved plans.

B. If there is a discrepancy between the actual elevations and the elevations shown on the plans, the grades of the proposed curbing and paving shall be established by using the actual elevation of the road edge. If, in SHA's sole judgment, the discrepancy is substantial enough to warrant formal plan revisions, such revisions shall be made by the Permittee and submitted for review and approval by the SHA. The SHA Utility Permit Inspector shall have the option of suspending work on the affected portions of the permitted work until the revisions have been approved and an Addendum to the permit has been issued.

C. Any deviations and/or adjustments as may be required at time of construction shall be constructed in accordance with the approval of and as directed by the SHA Utility Permit Inspector. If, in SHA's sole judgment, the deviations and/or adjustments are substantial enough to warrant formal plan revisions, such revisions shall be made by the Permittee and submitted for review and approval by the SHA. The SHA Utility Permit Inspector shall have the option of suspending work on the affected portions of the permitted work until the revisions have been approved and an Addendum to the permit has been issued.

D. If the access area is to be used for construction traffic prior to completion of the access, a standard stabilized construction entrance (SCE-1) shall be constructed at the direction of the SHA Utility Permit Inspector. The construction entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto the SHA right-of-way. This may require periodic top dressing with additional stone as conditions demand, and repair and/or clean out of any sediment control measures.

II. Utilities

A. You shall be responsible for the necessary relocation and/or adjustment of all existing utilities, as well as the installation of any new underground utilities to serve this development, prior to the construction of the improvements. All utility work shall be accomplished under a separate permit issued by the **SHA District Utilities Engineer, Mr. John Nesbitt, Greenbelt, Maryland, (Phone: 301-513-7350)**.

B. As indicated by your signature on the permit application, you acknowledge and agree to accept full financial responsibility regarding the relocation or adjustment of utilities.

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C. You must notify "**MISS UTILITY**" (Phone: 1-800-257-7777) forty-eight (48) hours in advance of any construction so that all underground utilities can be identified in the field. Use **BW996M82** when initiating a "MISS UTILITY" request.

D. You must notify the **Maryland State Highway Administration Office of Traffic and Safety** at **410-787-7650** forty-eight (48) hours in advance of excavation operations to allow any State owned underground facility to be marked.

III. Work Zone Traffic Control and Maintenance of Traffic

A. You are responsible for proper work zone traffic control and maintenance of traffic in accordance with the terms of this permit. In the event that the SHA is required to provide traffic control due to the Permittee failing to provide same, all cost and applicable overhead shall be billed directly to the Permittee.

B. Any work related to lane markings, signage, and/or traffic control, as appropriate for this permit, must be coordinated with the SHA Assistant District Engineer – Traffic. The Permittee shall notify the **SHA Assistant District Engineer – Traffic, Ms. Anyesha Mookherjee, (Phone: 301-513-7498)**, at least five (5) days prior to taking any action. Note: All temporary warning signs shall be completely covered and/or removed when not applicable.

C. Traffic controls shall conform to the latest version of the Maryland Manual on Uniform Traffic Control Devices (MdMUTCD), the Standard Specifications for Construction and Materials, the Standard General Notes MD 104.00, and the Special Provisions (DEAP'S) for Traffic – 1 (revised 7/31/05).

D. Work within and adjacent to the traveled way once initiated, shall be completed in successive days. All work is to be accomplished week days between the hours of 9:00 AM and 3:00 PM or as determined by the SHA Assistant District Engineer – Traffic. No lane closures will be allowed during non-work periods, unless approved prior to permit issuance by the SHA Assistant District Engineer – Traffic.

E. All work accomplished under this permit shall be controlled using the site-specific traffic control plan developed by professional representatives of the Permittee and approved in advance by the SHA Assistant District Engineer – Traffic and in accordance with the attached Special Provisions Traffic – 1 (revised 7/31/05). The SHA Book of Standards for Highway and Incidental Structures can be accessed at the following location:
<http://apps.roads.maryland.gov/BusinessWithSHA/bizStdsSpecs/desManualStdPub/publications/online/ohd/bookstd/index.asp>.

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F. Traffic control required as a result of pavement elevation differences, during both work and non-work periods, shall be in accordance with SHA's current Pavement Drop-off Guidelines and/or as directed by the SHA Utility Permit Inspector. Except as may otherwise be directed, the pertinent SHA Standard Temporary Traffic Control Typical Applications MD 104.06-15, MD 104.06-16, MD 104.06-17, MD 104.06-18, MD 104.06-19, and MD 104.01-28 shall be applied based on the height of the drop-off and proximity to the travel lane. For drop-off greater than five (5) inches, closure of the adjacent travel lane or placement of temporary concrete traffic barrier with appropriate end treatments is required.

G. In the event that the SHA is required to provide traffic control due to the Permittee failing to provide same, all costs and applicable overhead shall be billed directly to the Permittee.

H. Boxing out the entrance and/or shoulder area in preparation for paving is to be accomplished in accordance with "Paving Instructions" outlined in the attached Special Provisions for Traffic Control.

IV. Grading and Paving

A. Grading for excavation, subgrade preparation, embankments, and roadside cut and fill areas shall conform to the lines and grades identified on the approved permit plans, and as may be directed by the SHA Utility Permit Inspector. In no case shall any cut slope or fill slope be graded steeper than 2:1 (horizontal: vertical).

B. A full-depth vertical sawcut is required at the edge of all pavement removal and replacement and/or base widening, to form a neat, clean joint between new pavement and existing pavement. The vertical face shall be cleaned and tack-coated prior to placing the new pavement. All existing paving disturbed during construction of the work covered by this permit shall be replaced in kind, subject to approval of the SHA Utility Permit Inspector.

C. Paving shall be established on a subgrade acceptable to the Chief Engineer or his representative. The prepared and compacted subgrade shall have a density of not less than 97% of maximum dry density as specified in T 180. Unsuitable material shall be removed and replaced as directed by the SHA Utility Permit Inspector.

D. The permitted paving shall use the following full-depth section(s):

- (a) 2" Superpave Asphalt Mix 9.5 mm for Surface, HDFV, PG 64E-22, Level 2
4" Superpave Asphalt Mix 19.0 mm for Base, PG 64S-22, Level 2
12" Base Course Using Graded Aggregate (2 – 6" lifts)
- (b) 2" Superpave Asphalt Mix 9.5 mm for Surface, HDFV, PG 64E-22, Level 2
3" Superpave Asphalt Mix 19.0 mm for Base, PG 64S-22, Level 2
6" Base Course Using Graded Aggregate (2 – 6" lifts)
- (c) 2" Superpave Asphalt Mix 9.5 mm for Surface, HDFV, PG 64E-22, Level 2
8" Portland Cement Concrete Mix #9
12" Base Course Using Graded Aggregate (2 – 6" lifts)

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(d) NOTE: The ESALs range for the above noted HMA Superpave mix(es) shall be from 0.3 million to 3 million ESAL (Category 2) for a 20 year Superpave design analysis period.

(e) 9" Portland Cement Concrete Mix #9
6" Base Course Using Graded Aggregate
18" long #8 Dowel bars placed 12" on center for load transfer, 6" from longitudinal joint
Maximum Joint Spacing = 15 feet, no mid-slab reinforcement
14" long #4 "J" tie bars placed 36" on center

NOTE: At the sole discretion of the Permit Inspector, and/or the Resident Maintenance Engineer, cores may be required to verify the pavement depth prior to the construction and/or after the final paving. This is to allow the State Highway Administration's Permit Inspector/Resident Maintenance Engineer to determine if the pavement will need to be replaced by the Permittee.

NOTE: The Asphalt Binder shall conform to AASHTO MP 1-93 Table 1, Standard Specification for Performance Graded Asphalt Binder. Superpave mix designs shall be in conformance with AASHTO PP28-95, Standard Practice for Superpave Volumetric Design for HMA. The Contractor shall submit certificates of analysis showing that the HMA is in conformance with MP 1-93 and PP28-95 Specifications. The Performance Grading shall be achieved by the use of Neat Asphalt with Polymer modification when needed.

Each course of the options above must be thoroughly compacted with a road roller of not less than eight (8) tons in weight, unless otherwise directed by SHA.

E. The permitted paving shall conform to the following descriptions:

MILLING/GRINDING AND OVERLAY

Existing pavement shall be milled or carbide grinded within the limits shown on the plans to a depth of 2", prior to placement of the surface course for the overlay and the adjacent new full depth paving. The surface course overlay shall be applied on the properly prepared and cleaned surfaces and adjacent new base paving. The new surface course shall tie-in neatly with adjoining existing paving.

The following surface course is specified for the overlay:

2" Superpave Asphalt Mix 9.5 mm for Surface, HDFV, PG 64E-22, Level 2

NOTE: The ESALs range for the above noted HMA Superpave mix(es) shall be from 0.3 million to 3 million ESAL (Category 2) for a 20 year Superpave design analysis period.

TRENCH BACKFILL

Trench backfill for storm drains and utilities shall conform to Standard Detail MD-578.01 or as detailed on the plans. If steel plates are used, they must be 1" thick minimum, properly secured with anchors and temporary pavement wedging, and extend 1 foot minimum beyond all edges of the trench. The trench shall be backfilled with Flowable Backfill for Utility Cuts or other approved material up to the bottom of the full depth pavement patching section. The full depth patching pavement section, consisting of the specified graded aggregate and hot mix asphalt, shall be placed and constructed to be flush with existing road surface grade. Following this, the pavement shall be resurfaced as shown on the plans. If resurfacing of the existing roadway is not shown on the plans, the existing pavement shall be milled and overlaid for twenty-five (25) feet in each direction (measured from the centerline of the trench) for the full width of the roadway. Mill or grind 2" and replace with 2" of the above-noted Hot Mix Asphalt Superpave mix.

V. Concrete Curb and Gutter, Islands, Monolithic Median, and Sidewalk

A. Existing curb and gutter, islands, monolithic median, and sidewalk shall be removed to the nearest construction joint. A saw-cut shall be made at the joint and an expansion joint established, unless the existing joint is an expansion joint.

B. Graded aggregate base course and/or capping borrow for the chosen paving option shall be extended underneath the curb and gutter, islands and monolithic median. It shall be your responsibility to have the SHA Utility Permit Inspector inspect the forms prior to the pouring of any concrete.

C. Channelization along the site frontage and curbed island(s) shall consist of Standard Concrete Combination Curb and Gutter Type 'A' conforming to Standard No. MD 620.02 with a 1'-0" wide gutter pan, constructed as shown on the plans. Refer to the latest version of the Standard Specifications for joint spacing and construction practices.

D. The roadside face of curb shall be on line and grade with the adjoining existing curb. The grade on top of the replacement curb shall tie smoothly into the finished grades behind the curb. All curbs shall have a minimum of 3 ½' compacted earth backing for support, sloping up ½" per foot from top of curb for a minimum of 3 ½', thence on a slope not in excess of 2:1. The area behind the curb shall be graded, stabilized, and sodded, seeded, or paved.

E. The proposed entrance to be constructed is the depressed curb type. The apron shall be poured separately from the curb as shown on Standard No. MD 630.01/MD 630.02. Curbs shall be depressed from a full 8" reveal to a 0" reveal within a 8' transition on both sides of the proposed entrance(s). The depressed section shall be maintained for the full width of the proposed entrance(s).

F. Islands and medians 6' wide or greater shall be constructed of Standard Concrete Combination Curb and Gutter Type 'A'. The area between the curbs shall be backfilled with material meeting the requirements of Common Borrow to the grades specified on the plans or as directed by the SHA Utility Permit Inspector. Positive drainage shall be provided. The area shall be seeded and mulched or sodded.

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G. Medians less than 6' wide shall be constructed of Standard Monolithic Concrete Median Type 'A' (conforming to Standard No. MD 645.01 as shown on the plans.

H. If existing sidewalk must be closed as part of the permit work, the permittee is responsible for posting a sidewalk closure notice at the work site at least two weeks in advance of the closure. The above notice must specify the expected period of time during which the sidewalk will be closed, and the contact information of the permit holder and contractor. The posted notice must remain in place during the sidewalk closure period.

I. Sidewalks in the SHA right-of-way shall be constructed of 5" of SHA Concrete Mix No. 3, scored in 5' blocks, with expansion joints every 15'. The sidewalk grade shall meet the top of the roadside curb, then rise 1/4" per foot for the total width of the sidewalk.

J. Sidewalk ramps with ADA-compliant surfaces and slopes shall be provided for all sidewalk constructed in connection with this permit. It shall be your responsibility to construct sidewalk ramps in accordance with the appropriate SHA Standards 655.11, 655.12, 655.13 or Details(s), as shown on the attached plan. SHA standard for detectable warning surfaces is 655.40 and they shall be installed at street connections and signalized entrances. It is the Permittee's responsibility to construct all facilities to be compliant with ADA criteria in a manner acceptable to SHA. Entrances that include pedestrian crossings shall provide a minimum 60" wide path at 2% or less cross slope.

K. All existing curb and gutter, monolithic median, islands, and sidewalk disturbed during construction of the work covered by this permit shall be replaced in kind, subject to approval of the SHA Utility Permit Inspector.

VI. Traffic Barrier

NOT APPLICABLE

VII. Drainage

A. Positive and controlled flow of stormwater runoff to a suitable outfall, without ponding or erosion damage, shall be obtained. So that no increase in stormwater runoff is generated by this development into MD 650, proper stormwater management plans should be reviewed and approved by the County, Soil Conservation Districts and/or Maryland Department of the Environment and implemented by you. SHA is not an approving authority for stormwater management or sediment and erosion control requirements associated with the work within State right-of-way.

B. Should proper "Stormwater Management" not be included by you in development of the property, and upon being damaged by increased stormwater runoff from the development, SHA will institute legal proceedings to prevent a recurrence of such situations to protect the public's safety and to seek reimbursement for any damages sustained.

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C. You shall be responsible for the placement of any sediment and erosion control devices required by the approving authority or deemed necessary by the SHA Utility Permit Inspector during the construction of the improvements outlined in this permit. All existing drainage systems (including, but not limited to ditches structures, inlets, pipes, outfalls, etc.) shall continue to function in an effective manner while work is in progress, as well as upon completion of work. Should any disturbance be made to existing drainage systems, you must restore them to their original condition and function using appropriate methods (including, but not limited to, structural replacement, cleaning out, resodding, stabilization practices and paving) as directed by the SHA Utility Permit Inspector.

D. All drainage systems and construction incidental to drainage are a part of this permit, and the approved plans shall not be deviated from without written permission from this Administration. Storm drain structures, pipes and connections shall be constructed as indicated on the attached plan and as directed by the SHA Utility Permit Inspector. In the event that the storm drainage or stormwater management facilities cannot be constructed according to plan due to utility conflicts, adverse site conditions or other factors discovered during construction, it is your responsibility to accomplish a functionally equivalent design and submit revised plans to SHA for approval.

E. All new or replacement drainage structures shall conform to the latest version of SHA's Book of Standards for Highway and Incidental Structures, except where the use of modified or non-standard structures is expressly noted on the approved plans. All new or replacement drainage pipes shall conform to approved materials listed in the latest version of Section 905 of the SHA Standard Specifications.

F. Clearance with any existing utility shall be in accordance with the criteria established by the utility owner. Underground utilities shall be located and clearances determined prior to submission of final design plans, using appropriate engineering methods including test pitting. Should utility conflicts arise during construction, an alternative design will be required that is functionally equivalent to the permitted design and will require approval from the Highway Hydraulics Division.

VIII. Permanent Signing, Pavement Marking and Traffic Control

A. If it becomes necessary to adjust existing signs as part of the construction, they shall be removed, relocated and/or replaced as directed by the SHA Utility Permit Inspector.

B. The existing lane markings on the State highway must be eliminated so that new lines compatible with the lane configurations to be established under this permit may be installed. You shall be responsible for the elimination of the lines by a method approved by the SHA Assistant District Engineer – Traffic, as well as the placement of new pavement markings (to include stop bars, crosswalks, turn arrows, etc.). You shall notify the SHA Assistant District Engineer – Traffic, at least five (5) days prior to the removal and/or application of new markings.

C. Permanent pavement markings shall comply with the latest version of the MdMUTCD, the SHA Standard Specifications, and the approved plans.

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D. In the event that the SHA is required to provide traffic control due to the Permittee failing to provide same, all costs and applicable overhead shall be billed directly to the Permittee.

IX. Traffic Signals

A. Traffic signal installations and/or modifications that have not been approved by the Director, SHA Office of Traffic and Safety, are neither authorized for construction nor approved in concept under this Permit.

B. Traffic signals may be required by the Administrator and his authorized agent for installation after review and consideration of recommendations by the SHA Office of Traffic and Safety, based on an engineering investigation and analysis in conformance with the latest requirements of the MdMUTCD for Streets and Highways.

C. The modification of traffic signals is required under this permit, in accordance with the design request approved by the SHA Office of Traffic and Safety. All work shall be in accordance with SHA requirements and traffic signal design plans approved by the SHA Office of Traffic and Safety.

D. In the case of existing SHA traffic signal poles, controllers, detectors, conduits, etc., relocation will be made by you or your authorized representative at the sole expense of you and/or others, but not SHA. You shall have worked out the necessary detail through contact with the SHA Assistant District Engineer – Traffic as previously noted.

E. Traffic signal construction activities are to be supervised by the SHA Office of Traffic and Safety, Traffic Operations Division. At least five (5) days prior to beginning any approved signal work, you should contact **Corren Johnson, Chief, Traffic Operations Division at the SHA Office of Traffic & Safety (Phone: 410 787-7630)**.

F. All signals on the State Highway System shall be approved for installation and functional operation through the SHA Assistant District Engineer – Traffic.

X. Lighting

A. Adjustments to existing lighting standards and/or systems necessitated by changes in grade, alignment, etc., shall be as directed by the SHA Utility Permit Inspector. Any costs associated with the adjustments shall be the full responsibility of you or others; but not the SHA.

B. Conditions dictate the new installation of highway lighting standards and/or systems along MD 410. All work shall be subject to SHA requirements and in accordance with the approved plans. Installation and equipment costs shall be your responsibility.

C. All new, modified, or adjusted roadway and street lighting on the State Highway System shall be approved for installation and functional operation through the SHA Utility Permit Inspector.

STATE HIGHWAY ADMINISTRATION
OF MARYLAND
BALTIMORE, MARYLAND

SHA Permit No. 15APMO01516

Page 13

D. Energy costs shall be accepted by you. You shall be responsible for contacting the **SHA District Utility Engineer, Mr. John Nesbitt, Greenbelt, Maryland (Phone: 301-513-7350)** to initiate billing for the energy costs to be paid by you.

XI. Surety

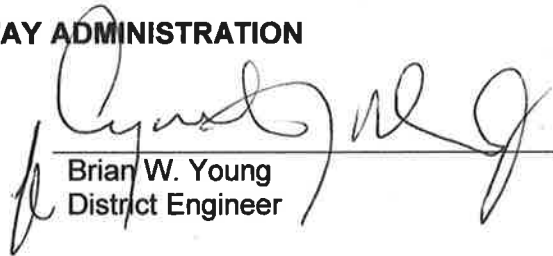
NOT APPLICABLE

XII. Signal Fee

NOT APPLICABLE

STATE HIGHWAY ADMINISTRATION

Gregory C. Johnson
SHA Administrator



Brian W. Young
District Engineer

City of Takoma Park

DEPARTMENT OF PUBLIC WORKS

Telephone: 301-891-7633

FAX: 301-585-2405



31 Oswego Avenue

Silver Spring, MD 20910

October 29, 2015

STORM WATER MANAGEMENT PERMIT

Ethan Allen Gateway Streetscape Project's SWM Final Report has been reviewed and found to satisfy the requirements of Takoma Park Municipal Code Title 16 and referencing MDE Manual. Both the SWM Final Report and the Storm Drainage Report were prepared by RK&K, LLP Consultants and dated October 2015. Accordingly, the Office of the City Engineer hereby affixes the Stormwater Management Permit, which may be displayed on the stormwater management and drainage plans and specifications, as necessary.

APPLICATION NO.: _____

STORMWATER MANAGEMENT

Takoma Park, MD

Permit Waiver
 Exemption Variance

Approved Not Approved
 Approved as Noted Revised & Resubmit

Approval inconsistent with any provision of Takoma Park Municipal Code Title 16 most current Ordinance which is not specifically noted and identified as an authorized deviation from the Ordinance does not relieve the applicant of responsibility for compliance with all provisions of the Ordinance.

Ale Khalilov 04/29, 2015
City Engineer Date



DEPARTMENT OF PERMITTING SERVICES

Isiah Leggett
County Executive

Diane R Schwartz Jones
Director

SEDIMENT CONTROL PERMIT

Issue Date: 07/27/2016

Permit No: 277875
Expires: 07/27/2018
Ref. No:
ID: 1277355

THIS IS TO CERTIFY THAT: _ SHA/C/O CITY OF TAKOMA PARK
7500 MAPLE AVENUE
ATTN: ERKIN OZBERK
TAKOMA PARK, MD 20912

HAS PERMISSION TO: DISTURB 176,131

PURPOSE: CONSTRUCTION

PERMIT CONDITIONS: The on-site representative "MUST" provide the Sediment Control Inspector with an approved set of sediment control plans at the pre-construction meeting. If approved plans are not provided the pre-construction meeting will fail and construction may not begin until an acceptable pre-construction meeting has been held.

PREMISE ADDRESS: Intersection of MD-650 (NH Ave.) and MD 410 (Ethan Allen Avenue/East West Hwy)

The permit fee is calculated based on the approved Executive Regulations multiplied by the Enterprise Fund Stabilization Factor for the current fiscal year.

If the permit is inactive at the time of expiration, it may not be extended.

The permittee must contact JOHN THRASHER Field Inspector at (301)370-3633 or john.thrasher@montgomerycountymd.gov to obtain an inspection prior to:

- 1. Commencing land-disturbing activity;
- 2. Installing sediment-control basins or stormwater-management structures;
- 3. Removing sediment-control devices; and.

LOT - BLOCK: -	ZONE:	ELECTION DISTRICT:
BOND NO.:	BOND TYPE:	PS NUMBER:
PERMIT FEE:	SUBDIVISION: Ethan Allen Gateway	

Director, Department of Permitting Services



Maryland

Department of the Environment

Larry Hogan
Governor

Boyd Rutherford
Lieutenant Governor

Ben Grumbles
Secretary

7/13/2016

City of Takoma Park
7500 Maple Avenue
Takoma Park, Maryland 20912

RE: MDRCP020Y

Dear Mr. Erkin Ozberk:

Please find enclosed documentation of coverage under the 2014 General Permit for Stormwater Associated with Construction Activity (MDRC) for:

Ethan Allen Gateway Streetscape
issued to
City of Takoma Park

Please note that the effective date of coverage under the General Permit is the date on the attached cover sheet. If the current erosion and sediment control plan approval covers only part of the entire site covered by this permit, be advised that this permit does not authorize discharges from the other portions of the site until the appropriate erosion and sediment control approval authority approves the erosion and sediment control plan for those portions. The permit also requires that the site have an approved stormwater management plan (unless exempt or waived by the stormwater approval authority) prior to earth disturbance. Part IV.C.3 of the permit requires the permittee to use the standard written report form as provided by MDE. The form is available on MDE's website at the following location both as a fillable Microsoft Word form and as an Adobe Acrobat file.

<http://go.usa.gov/gFMW>

Print this letter and the cover sheet and keep them with your permit file. In addition, download the 2014 General Permit from the above website, print it for your permit file, and refer to it to ensure compliance with its terms. Submit any modifications to this coverage, Transfers of Authorization, or Notices of Termination via the ePermits portal. If your contact information changes, update it through the ePermits portal.

Your cooperation in this matter is appreciated. If you have any questions, please call the administrative team for the General Permit at (410) 537-3019.

Sincerely,

Lynn Buhl, Director
Water Management Administration



**GENERAL PERMIT FOR STORMWATER ASSOCIATED
WITH CONSTRUCTION ACTIVITY**

State Discharge Permit Number:

MDRCP020Y

Effective Date: 7/13/2016

Expiration Date: 12/31/2019

NOTE: If site work is complete per Part II. I. prior to the expiration date, the permittee must submit a Notice of Termination and terminate the permit.

Pursuant to the provisions of Title 9 of the Environment Article, Annotated Code of Maryland, and regulations promulgated thereunder, and the provisions of the Clean Water Act, 33 U.S.C., Section 1251 et. seq., and implementing regulations 40 CFR Parts 122, 123, 124 and 125, the Department of the Environment hereby establishes conditions and requirements pertinent to stormwater associated with construction activity at the site described below and authorizes:

**City of Takoma Park
7500 Maple Avenue
Takoma Park, Maryland 20912**

TO DISCHARGE STORMWATER FROM:

Ethan Allen Gateway Streetscape

construction project on

1.27 acres

at property located at

**Ethan Allen ave/East West Hwy (MD 410) from 400 feet west of
New Hampshire Ave (MD 650) to 200 feet east of Kentland Avenue., Takoma Park, Maryland 20912**

If the current erosion and sediment control plan approval covers only part of the entire site covered by this permit, this permit does not authorize discharges from the other portions of the site until the appropriate erosion and sediment control approval authority approves the erosion and sediment control plan for those portions.

TO:

A municipal separate storm sewer system -- SHA, Sligo Creek

which is

Waters protected for Water Contact Recreation, Fishing, and Protection of Aquatic Life and Wildlife

in accordance with the 2014 General Permit. The vicinity map submitted with the Notice of Intent is considered incorporated herein and made a part hereof.



Name: Erkin Ozberk, Housing & Community Devel. City of Takoma Park
Address: 7500 Maple Avenue, Takoma Park MD, 20912
County: MO; MONTGOMERY

Applicant Type: An authorized agent of a responsible party The applicant is a public agency: No

Is hereby granted a permit to perform:

Tree Removal, 8 Tree(s) Takoma Park

The proposed tree care will: Improve the general aesthetic appearance of the right-of-way

Described as follows:

PARTICULAR TREE OR TREES INVOLVED:

Remove one 4" Redbud, one 1" red maple, three 2" Red Maples and three 8" Crepe Myrtle at 611 Ethan Allen Ave. to 1010 East West Highway, in Takoma Park, Md. 20912

LIMITATIONS OR CONDITIONS ON TREE CARE OR PLANTING:

Contract/Job #: Old Permit #:

Location:

NOTE: The roadside tree law does not convey tree ownership to the Department. Permission from the owner of the tree or trees in question (SHA, MdTA, local DPW, etc.) must also be obtained prior to beginning any work. Work on the tree or trees in question without permission of the owner may be considered a trespass by the owner of the tree or trees despite possession of a valid permit from the Department.

EXCLUDING ANY TREE NOT WITHIN THE RIGHT-OF-WAY OF A PUBLIC HIGHWAY

Provided, that the work authorized by this permit shall not begin until the Forest Warden designated by the Director as his agent shall be present and give their sanction to the means employed, and that the work may be suspended by order of the Forest Warden upon any failure or refusal of the operators to perform it in accordance with the rules and regulations of the Department of Natural Resources - Forest Service. This permit is granted under authority of the Annotated Code of Maryland, 1973, under Title 5, Subtitle 406, which places the care and protection of all trees growing within the right-of-way of any public road or between the curb and property lines of any street in any incorporated town in Maryland under the Department of Natural Resources - Forest Service. This permit, in no way cancels or contravenes the right of property owners to restrict or prevent the trimming or cutting of trees upon their own properties, except that trees covered by this permit may not be treated in any way other than as herein specified.

Authorized By: Sabooh Hikim

Title: Forest Ranger

Address: 17400 Annapolis Rock Road, Woodbine, MD., 21797

Review Date: 09/14/2015

LTE performing the work: TBD

Sabooh Hikim Six Month Extension 09/06/2016





MONTGOMERY COUNTY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

October 8, 2014

Mr. Erkin Ozberk
Housing and Community Development
City of Takoma Park
7500 Maple Avenue
Takoma Park, MD. 20910

Re: Existing Conditions plan; Forest Conservation Exemption 42014191E
Ethan Allen Gateway Streetscape

Dear Mr. Erkin:

Based on the review by staff of the Montgomery County Planning Department, the Forest Conservation Exemption Request submitted on October 8, 2014 for the plan identified above, is confirmed. The project site is exempt from Article II of the Montgomery County Code, Chapter 22A (Forest Conservation Law), Section 22A-5(t) because the site is a modification to an existing non-residential developed property: (1) no more than 5,000 square feet of forest is ever cleared at one time or cumulatively after an exemption is issued, (2) the modification does not result in the cutting, clearing, or grading of any forest in a stream buffer or located on property in a special protection area which must submit a water quality plan, (3) the modification does not require approval of a preliminary plan of subdivision, and (4) the modification does not increase the developed area by more than 50% and the existing development is maintained.

You should contact the contact the Montgomery County Planning Department inspection staff before construction to verify the limits of disturbance and to determine if any tree protection is required. The property owner, construction superintendent, forest conservation inspector, and Department of Permitting Services (DPS) sediment control inspector should attend this pre-construction meeting.

If you have any questions regarding these actions, please feel free to contact by email at david.wigglesworth@montgomeryplanning.org or at (301) 495-4581.

Sincerely,


David Wigglesworth
Sr. Planner
Development Applications & Regulatory Coordination

CC: 42014191E