MARYLAND TRANSPORTATION AUTHORITY
Baltimore, Maryland

Invitation for Bids

FORT MCHENRY TUNNEL

Maryland
Transportation
Authority

CONTRACT NO. FT 749-000-006R

REHABILITATION OF I-95 SOUTH OF THE FORT MCHENRY TUNNEL - PHASE I

Baltimore City and Baltimore County

January 2009

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NOTICE TO BIDDERS

Please review the checklist prior to submitting your bid on this Contract.

- When submitting your completed bid, do not separate the book. Submit the whole book including all addenda.

- Make sure that all addenda letters are attached outside of the front cover of the bid book.

- If the addendum has revised the Schedule of Prices, make sure that you have included the revised pages in your bid. Your price should reflect any and all changes.

- Prices must be written numerically and in words, unless approved substitute forms are used (Refer to GP-2.06). Don't leave any items blank.

- When tabulating your final price, make sure all your calculations are correct.

- Minority Business Enterprise Attachments A and B must be completed and submitted with your bid. If either of these attachments is missing your bid is non-responsive. Attachments C and D **should not** be submitted at time of bid.
  For additional information on how to complete the MBE Attachments, please see the insert named "Important Information regarding MBE Utilization and Bidding Requirements" located in the IFB.

- The Bid/Proposal Affidavit must be completely filled out and signed by all the parties as indicated.

- If Escrow is being offered in a contract, the contractor must indicate whether or not they wish to utilize an Escrow Account for Retained Funds on the provided form.

- A bid bond must accompany all bids of $100,000.00 or more. The bid bond document must be completely filled out and have an original Power of Attorney form attached.

- If the document is too large for the envelope that we have provided, you can place the document in another form of packaging that can be sealed and submitted. If the document is too large for the bid box, you should alert the receptionist.

- Make sure that your company's name, address, the contract number and the bid date appears on the front of the packaging.

- When submitting bid packages via US Mail, Federal Express, DHL, UPS or any other delivery service it is your responsibility to make sure that the bid reaches the bid box before the time deadline. It may be in your best interest to send the package 24 hours in advance of the deadline. Also, when sending packages this way, make sure that the labeling specifies that it is a bid submission.

IMPORTANT INFORMATION REGARDING MBE UTILIZATION AND BIDDING REQUIREMENTS

The Maryland Transportation Authority (the "Authority") has been forced to reject many recent bids/proposals due to bid submissions that were not in strict compliance with the stipulated MBE rules and regulations. The following checklist has been developed to highlight certain critical components of the MBE program requirements. This listing is not all-inclusive and the bidder **must** comply with all MBE rules and regulations listed throughout this entire proposal book.

Please read all of the instruction provided on Attachment A, B, C & D in its entirety before completing the forms.

Attachment A (Certified MBE Utilization and Fair Solicitation Affidavit) & Attachment B (MBE Participation Schedule) must be included with the submittal of the bid or offer. If the bidder or offeror fails to submit these forms with the bid/offer as required, the Procurement Officer **shall deem the bid non-responsive** or shall determine that the **offer is not reasonably susceptible** of being selected for award. MBE Prime Contractors must achieve the established MBE goal with other certified MBE contractors. A Prime MBE Contractor **can not** count itself as an MBE to obtain the goal.

ATTACHMENT A

When filling out Attachment A, make sure you complete the following:

- If the Prime Contractor can achieve the established overall goal and sub goals, you must check the appropriate box.
- If after making good faith efforts, you determine you can not achieve the established overall goal or subgoals, you must request a waiver by checking the appropriate box.
- If you do not request the waiver at time of bid and you **are not** meeting the established goal(s), your bid/offer will be considered **non-responsive or not reasonably susceptible of being selected for award.**
- Attachment A must be signed and dated.

ATTACHMENT B Part 2

When filling out Attachment B, make sure you have included the following:

- Prime Contractor's name, address and phone number.
- Project description.
- Project number/Solicitation Number.
- List the minority firm name(Column 1), certification number and MBE Classification (Column 2), Total sub contract dollar amount (Column 3) and NAICS Codes of the services to be performed or products to be supplied (Column 4)
- Clarify for each sub-contractor if it will provide services, is a supplier or will supply and install (Column 5)
- It is the Contractor's responsibility to ensure that the proposed subcontractors are certified to perform the proposed work. All Contractors are to submit an approvable MBE plan at time of bid. Approvable means, the subcontractors are certified in the applicable NAICS Codes through MDOT and can perform the proposed services for the required participation goal. Contractors pending MBE certification at time of bid are **not** eligible for participation. If you submit a firm that is not certified to perform the proposed services and your contract falls short of the established MBE goal, your firm will be considered **non-responsive**. Prime Contractors are strongly encouraged to check the MDOT database at www.mbe.mdot.state.md.us to see if the subcontractor is certified to perform the services and to make sure the subcontractor has not graduated from the listed NAICS codes. If you have questions after checking the data base, you may contact the Authority MBE Office at 410-537-1048 for further assistance.

  If you are using a supplier, the 60% rule applies. Please refer to the MBE Manual for the description of the 60% rule.

  Please provide details on how you arrived at the 60% on Attachment B (Column 5) (i.e. – $150,000.00 X 60% = $90,000.00).

- If you are requesting a third tier relationship, you must state that request on the Attachment B form (Column 1). Please note: Third Tier MBE/DBE subcontracting will be approved by the Authority only when the Authority is satisfied that there is no way except by Third Tier contracting that an MBE/DBE goal can be achieved. Specifics as to why a Third Tier contracting agreement must be included.

- Attachment B must be signed and dated.

- If you are the apparent low bidder, you will receive a letter from the Authority requesting your MBE Attachment C (Outreach Efforts Compliance Statement) and Attachment D (Subcontractor Project Participation Affidavit). You will have ten (10) working days to submit the attachments to the Authority. If you requested a waiver at time of bid, all of the back up documentation that complies with COMAR 21.11.03.11, must be submitted within the ten working days with Attachments C & D.

- If the apparent low bidder fails to return the required documentation within the allotted ten (10) days, the Procurement Officer may determine that the apparent low bidder is not responsible and therefore not eligible for contract award.

Notice to Bidders/Offerors

EMaryland Marketplace

In order to take advantage of Maryland State and Local government contracting opportunities, vendors/contractors are encouraged to register with eMaryland Marketplace. The free registration provides a means for businesses to receive e-mail notification of upcoming contracting opportunities in their specified areas of interest and expertise.

For registration requirements, visit:
www.eMarylandMarketplace.com

NOTICE TO ALL HOLDERS OF THIS CONTRACT DOCUMENT

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 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." When conformance with NCHRP Report 350 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).

(b) Temporary Barrier.

(1) Concrete Barrier.

(2) Traffic Barrier W Beam and Water Filled 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.

WORK ZONE DEVICES	IMPLEMENTATION SCHEDULE TO CONFORM TO NCHRP REPORT 350 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 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 criteria.
CATEGORY 3 (a) Truck Mounted Attenuators (TMA) (b) Temporary Barriers (1) Concrete Barrier (2) Traffic Barrier W Beam and Water Filled Barrier (c) Temporary End Treatments	All devices shall conform to NCHRP Report 350 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 criteria, until compliance dates are established. Use of these devices shall comply with the provisions of Part 6 of the MUTCD.

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Baltimore City and Baltimore County

JANUARY 2009

NOTICE TO BIDDERS

A "Pre-Bidding Session" for the purpose of answering or obtaining answers to questions of parties interested in constructing the work relative to Right-of-Way, Utilities, Design, and Construction Details will be conducted at **10:00am** on **January 26, 2009** , in the Conference Room, at the Maryland Transportation Authority, 300 Authority Drive, 2nd Floor, Baltimore, Maryland 21222. While attendance at the Pre-Bid conference is not mandatory, this is the offeror's opportunity to raise questions and/or issues of concern regarding the project.

SP 1-1 PROJECT DESCRIPTION

CONTRACT NO.:	FT 749-000-006R
TITLE:	Rehabilitation of I-95 South of the Fort McHenry Tunnel-Phase I
FACILITY:	Fort McHenry Tunnel
LOCATION:	Baltimore City/Baltimore County
ADVERTISED:	**January 6, 2009**
PRE-BID MEETING:	**10:00 a.m. on January 26, 2009** in the Conference Room at the Maryland Transportation Authority, 300 Authority Drive, 2nd Floor, Engineering Building, Baltimore, MD 21222
PROJECT CONTACT:	Project Manager: Mr. Nafiz Alqasem (410) 537-7821 Contract Administration: Ms. Maggie Johnson (410) 537-7807
BIDS DUE:	**12:00 noon on February 13, 2009** in the Bid Box on the 1st floor of the Maryland Transportation Authority, Engineering Building, 300 Authority Drive, Baltimore, MD 21222
CLASSIFICATION:	Class - H ($15,000,001 – $30,000,000)
CONTRACT TIME:	Five Hundred Fifty (550) Calendar Days
LIQUIDATED DAMAGES:	**$3,000.00 per Calendar Day**
MINIMUM MBE GOALS:	Overall 25% Women owned businesses 6% African-American owned businesses 9%
BID DOCUMENTS:	**$50.00** - Bid documents can be purchased between 7:30am and 3:30pm, Mondays, Wednesdays, Thursdays and Fridays and between 10:00am and 4:00pm on Tuesdays at the Ticket Office located at the Francis Scott Key Bridge, Maryland Transportation Authority, Administration Building, 303 Authority Drive, Baltimore, MD 21222.

LOCATION AND SCOPE OF WORK

This project, located in Baltimore City and County, is for the reconstruction of a portion of I-95 and adjoining ramps. Reconstruction begins at the Baltimore City/County Line and continues north to just north of Washington Boulevard (MM51.6) for a total distance of approximately 2.0 miles. Maintenance of Traffic begins south of the I-95 / I-695 Interchange and continues north to the Russell Street Interchange. The repair of the High Mast Light Poles begins at the Baltimore City/County Line and continues north to the portal of the Ft. McHenry Tunnel.

The work will consist of the following: 1) Resurfacing Bridge Decks, 2) Miscellaneous Structural Repairs, 3) Milling and Overlaying Portions of the Roadway, 4) Drainage Improvements, 5) Safety Upgrades, 6) Installing Bridge Mounted Cantilever Sign Structures, 7) Installing Ground Mounted Overhead Sign Structures, 8) Installing Overhead and Ground Mounted Signs, and 9) Electrical Inspection and repairing of High Mast Lights.

SP 1-2 SPECIFICATIONS

All work on this project shall conform to the Maryland Department of Transportation, State Highway Administration's Specifications entitled, "Standard Specifications for Construction and Materials" dated January 2001, revisions thereof, or additions thereto, and the Special Provisions included in this Invitation for Bids.

SP 1-3 ORIGINAL FACILITY PLANS AND SITE VISITS

The original facility plans are on file at the Engineering/Finance Building of the Francis Scott Key Bridge and will be made available for inspection to prospective bidders. Parties interested in viewing the plans should contact Mr. Nafiz Alqasem, at (410) 537-7821. Parties interested in visiting the site should contact Mr. Dave Roehmer, Facility Administrator at (410) 537- 1310.

SP 1-4 - PROMPT PAYMENT TO SUBCONTRACTORS

The prime Contractor is responsible for making timely payments to all Subcontractors and Suppliers as required in the 1988 edition of the State Finance and Procurement Article of the Annotated Code of Maryland, Section 17-106.

This contract requires the Contractor to make payment to all Subcontractors within 10 days of receiving payment from the Authority.

Each month, the construction Project Engineer will review the current pay items with the prime Contractor and all involved Subcontractors to ensure that all work satisfactorily completed within specifications is included in the monthly progress payment. For payment purposes, the same quantity totals used to compute the payment to the prime Contractor will be the basis for payment to the Subcontractor.

If the Subcontractor does not receive payment within the required 10 days, the Subcontractor shall notify the Project Engineer in writing of the amount in dispute including the item numbers and payment quantity for each. The Project Engineer will then notify the Chief of Construction of the dispute. The Chief of Construction or his representative will verbally contact the prime Contractor within 48 hours to ascertain whether or not a performance dispute exists which necessitates non-payment to the Subcontractor. If a performance dispute exists, the prime Contractor must demonstrate that there is a valid basis to withhold payment from the Subcontractor. If the prime Contractor withholds payment from a Subcontractor, the prime Contractor shall provide to the Subcontractor written notice of the withholding of payment. The notice shall detail the reasons for withholding payment as well as the amount. A copy of the notice shall be provided to the Surety and the Authority. If no valid dispute exists, the prime Contractor will be directed to make immediate payment to the Subcontractor. The Subcontractor will be responsible for notifying the Chief of Construction if this payment is not made. Upon receipt of notification, the Chief of Construction will schedule a meeting with the Contractor and Subcontractor to verify and discuss the non-payment issue. This meeting will be held at the Authority's offices within 2 working days of the MdTA's contact with the subcontractor. If it is determined that the prime Contractor has withheld payment to the Subcontractor without cause, further progress payments to the prime Contractor will be withheld until the Subcontractor is paid. In addition, the MdTA may order a suspension of work or other administrative actions as it sees fit.

If an action is taken as stated above the Contractor shall notify the MdTA's Project Engineer when payment is made. After the MdTA's Project Engineer verifies that payment has been made to the Subcontractor the MdTA shall release withheld progress payments.

Nothing in this Special Provision shall be construed to prevent the Subcontractor from pursing a claim with the surety under the prime Contractor's payment bond at any time.

SP 1-5 WORK HOURS

Refer to Section 104, "Maintenance of Traffic", and Contract plans for lane closures.

Except for the above restrictions, the Contractor will be permitted to work twenty-four (24) hours, seven (7) days a week.

SP 1-6 INSURANCE

TC-5.01 INSURANCE

Section TC 5.01 of the Standard Specifications is supplemented as follows:

1. The Contractor shall not commence work under this contract until he has obtained all of the minimum amounts of insurance required by these Special Provisions and the insurance has been approved by the Engineer. The Contractor shall furnish to the Maryland Transportation Authority ("Authority") duly executed certification of all required insurance on forms satisfactory to the Authority. The certificates of insurance shall state that it is in force and cannot be cancelled, release or non-renewed except upon thirty (30) days prior written notice, registered mail to the Authority. All Contractors' insurance policies, with the exception of the Worker's Compensation and Employer's Liability, shall be endorsed to provide as additional insureds the Maryland Transportation Authority and the State of Maryland.

2. The Contractor shall purchase and maintain such insurance as is specified herein which will provide the Authority, its members, employees and agents, as well as the Contractor from claims which may arise out of or as a result of the Contractor's operations under this contract, whether such operations be by the Contractor, by any subcontractor, by anyone directly or indirectly employed by any of them or by anyone whose acts any of them may be liable. This insurance shall be maintained in full force until the Contract has been accepted by the Authority and final payment is made.

3. The Authority requires the following minimum levels of insurance coverage for this contract:

   a) Worker's Compensation and Employer's Liability

      The Contractor shall, at all times, maintain and keep in force such insurance as will protect him from claims under the Worker's Compensation Act of the State of Maryland and maintain and keep Employer's Liability Insurance at a limit of $100,000. The Contractor shall also maintain United States Long Shore and Harbors Act coverage, if such exposure exists.

   b) Comprehensive General Liability Insurance

      The Contractor shall maintain Comprehensive General Liability Insurance in the amount of at least One Million Dollars ($1,000,000) Combined Single Limit for Bodily Injury Liability and Property Damage Liability Insurance per occurrence and in the aggregate. Such insurance shall specifically include the Comprehensive General

      Liability Broad Form Endorsement and indicate explosion, collapse, and underground damage coverage.

   c) Comprehensive Automobile Liability Insurance

The Contractor shall maintain Comprehensive Automobile Liability Insurance (including all automotive equipment owned, operated, rented, or leased), in the amount of at least Five Hundred Thousand ($500,000) Combined Single Limit for bodily injury and property damage.

d) Additional Insurance

The Contractor shall also procure and keep in effect:

Excess liability (umbrella coverage) in excess of and applicable to the coverage in the Comprehensive General Public Liability and Property Damage Insurance, "X, C, U" and Comprehensive Automobile Insurance in the amount of at least Two Million Dollars ($2,000,000) for each occurrence.

4. Accident Notification - The Contractor shall send a written report to the Engineer and to the Maryland transportation Authority within twenty-four (24) hours of any accident or other event arising in any manner from the performance of the contract which results in or might result in personal injury or property damage.

5. Failure to comply with these Special Provisions may lead to termination from default/convenience.

6. There will be no special payment for the insurance as required by this contract and all costs incidental thereto shall be included in the (Lump Sum for "Mobilization", (refer to Section 108), or if the Contract does not include such an item, the insurance costs are to be included in pay items for the Proposal.

SP 1-7 MINORITY BUSINESS ENTERPRISE REGULATIONS GOVERNING CONSTRUCTION CONTRACTS IN EXCESS OF $50,000 EFFECTIVE JULY 1, 2001

GP – 7.29 of the General Provisions is supplemented as follows:

MBE participation goal for this contract is as indicated in these Special Provisions.

The Contractor shall:

1. Identify specific work categories appropriate for subcontracting;

2. At least 10 days before bid opening, solicit Minority Business Enterprises, through written notice that:

a) Describe the categories of work: and,

b) Provide information regarding the type of work being solicited and specific instructions on how to submit a bid.

3. Attempt to make personal contact with Minority Business firms:

4. Assist Minority Business Enterprises to fulfill bonding requirements or to obtain a waiver of these requirements:

5. Upon acceptance of a bid, provide the Maryland Transportation Authority (MdTA) with a list of Minority Businesses with whom the Contractor negotiated, including price quotes from Minority and Non-minority firms.

Third Tier Subcontracting:

Third Tier MBE/DBE Subcontracting will be approved by MdTA only when MdTA is satisfied that there is no way except by Third Tier contracting that an MBE/DBE goal can be achieved. The Contractor's written request must be submitted prior to contract award and contain specifics as to why a Third Tier contracting agreement is being requested.

Waivers:

If for any reason the bidder/offeror is unable to achieve the specified overall contract goal or subgoals for each certified MBE classification, the bidder/offeror must request, in writing, on Attachment A, (Certified MBE Utilization and Fair Solicitation Affidavit), a waiver at time of bid.

Strict adherence regarding documentation of the rationale for the waiver request and documentation of "Good Faith Efforts" of the Contractor are required for consideration of any waiver. For additional information on waivers, please see ***COMAR 21.11.03.11.***

Criminal Fraud Provisions:

All Contractors are reminded that Criminal Fraud Provision and Administrative Sanctions may be imposed for failure to achieve and maintain established MBE/DBE goals.

SP 1-8 PROGRESS SCHEDULE REQUIREMENTS

Refer to Section __109__ of the Standard Specifications.

SP 1-9 CORPORATE REGISTRATION

A foreign corporation is any corporation not incorporated under the Laws of the State of Maryland. All foreign corporations, prior to performing any services for the Authority, must

register with the Maryland State Department of Assessment and Taxation in compliance with Article 23, Section 90, Annotated Code of Maryland. Compliance is required of the successful vendor as well as the proposed subcontractors.

To accomplish the required registration, a foreign corporation must request and complete "Qualification Application Forms" which can be obtained from the Department of Assessment and Taxation, State Office Building, Room 803, 301 West Preston Street, Baltimore, Maryland 21201. Forms can be obtained via web site at e-mail address: www.dat.state.md.us.

The Contractor will be responsible for documenting compliance with the aforesaid. This documentation will be required prior to the execution of a contract with the successful bidder.

SP 1-10 CONTRACTOR'S EMPLOYEE IDENTIFICATION

The Contractor shall provide to the Authority, a list containing the following for Contractor and all sub-contractors that would be working at the site. This shall include trucking companies who would come to the site on a repetitive basis for supply or remove materials:

Name of Company
Name and title of contact person
Address of the Company
Phone Number
Facsimile number
E-Mail address of contact person (if any)

All Contractor's employees, including employees of subcontractors, on this project, present at the site, shall be in possession of a valid employee identification card provided by the Employer, which shall contain a photograph and identify the employee by name and job title. The employee must produce the said identification if required by the Engineer or the Authority Police.

When working in or around the Authority's buildings, said employees identification shall be displayed at all times.

While working on the transportation facility projects of the Authority, Contractor's personnel shall have an ID decal displayed on their hardhat. These decals will be provided by the Authority. All Contractor's vehicles shall have a parking decal, attached to the rear view mirror. These parking decals will also be provided by the Authority and a distribution list will be maintained. AT the time of project completion these decals shall be returned to the Authority. Request for hardhat and rearview mirror decals shall be made to the Construction Section before the beginning of construction and should include the number required of each type.

All costs associated with ID's will not be paid for separately and shall be incorporated under other items of payment in the contract.

GENERAL PROVISIONS
GP-SECTION 1
DEFINITIONS AND TERMS

GP 1.03 – ORGANIZATIONAL DEFINITIONS

Revise the definitions of Administration to read as follows:

Administration – The word "Administration" shall mean "Maryland Transportation Authority".

Except for Office of Materials and Research, all references to the Maryland State Highway Administration's offices and positions shall mean the Authority's corresponding offices and positions.

GENERAL PROVISIONS
GP-SECTION 1
DEFINITIONS AND TERMS

GP-1.04 ABBREVIATIONS

GP3 **ADD:** The following after SAWP

SSPC Steel Structures Painting Council

GP-1.05 DEFINITIONS

GP7 **ADD:** The following after State.

Subcontract—Any agreement entered into by the Contractor or a subcontractor for a portion of the construction or any other part of the work in connection with, and under the terms of, the Contract.

DELETE: The Subcontractor definition in its entirety.

INSERT: The following.

Subcontractor—Any person undertaking a portion of the construction or any other part of the work under the terms of the Contract, by virtue of an agreement with the Contractor or a subcontractor, who prior to such undertaking has received the approval of the Administration. Subcontractor does not include an employee with an employment contract, or an employee organization with a collective bargaining agreement.

ADD: The following after Surety.

Third Tier Contracting—The process in which the Contractor subcontracts a portion of the Contract to a subcontractor who in turn subcontracts a portion of a subcontract to a third party. This latter action is termed entering into a third tier Contract.

GENERAL PROVISIONS
GP- SECTION 1
DEFINITIONS AND TERMS

GP 1.05 - DEFINITIONS

Add the following definitions:

Highway Standards - The official Book of Standards for Highway and Incidental Structures, edited by the State Highway Administration, with the latest incorporated revisions issued on or before the date of advertisement on the contract.

GENERAL PROVISIONS
GP-SECTION 2
BIDDING REQUIREMENTS AND CONDITIONS

GP 2.04 SITE INVESTIGATION

Revise the paragraph to read as follows:

The Contractor acknowledges that he has investigated and satisfied himself as to the conditions affecting the work, including but not restricted to those bearing upon transportation, disposal, handling, and storage of materials, availability of labor, water, electric power, roads, and uncertainties of weather, river stages, tides, or similar physical conditions at the site, and confirmation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the work. The Contractor further acknowledges that he has satisfied himself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as the information is reasonably ascertainable from an inspection of the site, including all exploratory INFORMATION IN POSSESSION OF THE STATE, as well as from information presented by the drawings and Specifications made part of this contract. Any failure by the Contractor to acquaint himself with the available information may not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work. The State assumes no responsibility for any conclusions or interpretations made by the Contractor on the basis of the information made available by the State.

GENERAL PROVISIONS
GP-SECTION 2
BIDDING REQUIREMENTS AND CONDITIONS

GP-2.06 PREPARATION OF THE BID

GP9 **ADD**: After paragraph (a), the following.

The Contractor may elect to submit his bid on forms he has generated in the development of his bid. These may be submitted in lieu of the schedule of prices bid forms furnished by the Administration in the Invitation for Bids. These forms shall emulate the forms currently furnished by the Administrations and, as a minimum, contain the following information.

(1) State Contract No.
(2) State Item Nos.
(3) State's Proposed Quantities
(4) Description of Items
(5) Unit Price
(6) Total Cost of Each Item
(7) Total Bid Amount

The document shall be 8-1/2 x 11 inches, and oriented in a landscape format. The font size shall be no less than 10 points with horizontal lines dividing each item. Any addendum which revised items or quantities shall be noted on all affected schedule of prices sheets. Any special bid requirements that are noted in the schedule of prices shall also be listed on the form.

Should the Contractor elect to submit bids on the Contractor's own forms, the Contractor shall submit a sample of the form to the Administration at least two weeks prior to the scheduled opening of bids. The use of Contractor generated forms shall be approved, in writing, prior to their use. If the Contractor's forms were previously approved in writing on another Administration project and have not changed, they need not be resubmitted for this project.

Sample forms shall be submitted to:

Mr. Benjamin Mondell
Chief of Engineering Procurement
Maryland Transportation Authority
300 Authority Drive
Baltimore, MD 21222

GENERAL PROVISIONS
GP-SECTION 2
BIDDING REQUIREMENTS AND CONDITIONS

GP 2.23 - BID PROTESTS

Section GP 2.23 of the General Provisions is supplemented as follows:

The Board of Public Works does not have the jurisdiction to consider protests relating to this solicitation or an award of this contract under this solicitation.

All protests relating to this solicitation, the selection, and/or award must be filed in writing with the Authority's Procurement Officer, within the time limitations set forth in COMAR 21.10.07 and 21.10.02. Bid protests shall be filed not later than 7 days after the basis for protest is known, or should had been known, whichever is earlier. Oral protests will not be considered.

The specific details of the protest procedures shall be followed by aggrieved actual or prospective bidders or offerors are contained in COMAR 21.10.

GENERAL PROVISIONS
GP SECTION 4
SCOPE OF WORK

GP 4.10 - WARRANTY OF CONSTRUCTION

GP 4.10 of the Standard Specifications is revised to read as follows:

Delete: The first paragraph in its entirety.

Insert: The following:

The Warranty as defined under paragraphs A through G in GP 4.10 (Warranty of Construction) shall apply to this Maryland Transportation Authority contract unless specified elsewhere in this Invitation for Bids.

GENERAL PROVISIONS
GP SECTION 5
CONTROL OF WORK

GP 5.12 - FAILURE TO MAINTAIN ENTIRE PROJECT

Delete: Section GP 5.12 in its entirety

Insert: Revise the paragraph to read as follows:

Failure on the part of the Contractor, at any time, to RESPOND TO the provisions of GP 5.11 above, will result in the procurement officer's immediately notifying the Contractor to comply with the required maintenance provisions. In the event that the Contractor fails to PROCEED WITH CORRECTIONS TO UNSATISFACTORY MAINTENANCE SO AS TO CONFORM TO THE PROVISIONS OF GP 5.11 within 4 hours of receipt of such notice, the procurement officer MAY NOTIFY THE CONTRACTOR TO SUSPEND ALL OTHER WORK ON THE CONTRACT UNTIL SUCH TIME AS THE UNSATISFACTORY MAINTENANCE IS CORRECTED. In the event that the Contractor fails to RESPOND TO unsatisfactory maintenance within 4 hours after receipt of such notice, the procurement officer will immediately proceed with adequate forces and equipment to maintain the project, and the entire cost of this maintenance will be deducted from monies due the Contractor ON THE NEXT MONTHLY ESTIMATE.

GENERAL PROVISIONS
GP-SECTION 8
PROSECUTION AND PROGRESS

GP56 **DELETE:** GP-8.01 SUBCONTRACTING in its entirety.

INSERT: The following.

GP-8.01 SUBCONTRACTING

Except as may be provided elsewhere in the Contract, the Contractor to whom a Contract is awarded shall perform with his own organization and with the assistance of workmen under his immediate supervision, work of a value of not less than 50 percent of the total original value of the Contract.

No portion of the Contract shall be subcontracted, assigned or otherwise disposed of except with the written consent of the procurement officer. Any assignment, subcontract or other disposition of all or part of this Contract without the express written consent of the procurement officer shall be null and void. Consent to subcontract, assign or otherwise dispose of any portion of the Contract shall not be construed to relieve the Contractor or surety of any responsibility for the fulfilling of all the requirements of the Contract.

The Contractor shall incorporate by reference or otherwise include these General Provisions in every subcontract issued pursuant to or under this Contract, and shall require that the same reference or inclusion be contained in every subcontract entered into by any of its subcontractors.

GENERAL PROVISIONS
GP SECTION 8
PROSECUTION AND PROGRESS

GP 8.09 - LIQUIDATED DAMAGES

Delete: Section GP 8.09 in its entirety

Insert: Time is an essential element of the Contract and it is important that the work be vigorously prosecuted until completion.

For every calendar day that the contract remains uncompleted after the expiration of the contract time specified herein, or amended by extra work authorization, change orders or supplemental agreements, the Contractor will be liable for Liquidated Damages. The amount of Liquidated Damages shall be as specified in Contract Time and Bonding. This amount shall be deducted from any money due the Contractor, not as a penalty, but as Liquidated Damages. Damages in excess of any retained percentage shall be paid to the Authority by the Contractor.

Refer to Contract time and Bonding sheet contained elsewhere herein. See Table of Contents.

GENERAL PROVISIONS
GP-SECTION 9
PAYMENT

GP70 **DELETE:** GP-9.01 SCOPE OF PAYMENT in its entirety.

INSERT: The following.

GP-9.01 SCOPE OF PAYMENT

Payment to the Contractor will be made for the actual quantities of Contract items performed in accordance with the Plans and Specifications and if, upon completion of the construction, these actual quantities show either an increase or decrease from the quantities given in the bid schedule, the Contract unit prices will still prevail, except as provided in GP-4.04 Variations in Estimated Quantities.

The payment of any partial estimate or of any retained percentage except by and under the approved final estimate and voucher, in no way shall affect the obligation of the Contractor to repair or renew any defective parts of the construction or to be responsible for all damages due to such defects.

When requested in writing by the Contractor and approved by the procurement officer, payment allowance will be made for nonperishable material to be incorporated in the work delivered and stockpiled at the work site or other approved site. Material for which payment has been made, wholly or partially, shall not be removed from the worksite or other approved site.

Payment to the Contractor under this section for materials on hand in no way will be construed as acceptance by the Administration of title to the material. Title shall remain with the Contractor until the project has been completed and accepted in accordance with GP-5.13.

The Contractor shall indicate his Federal Tax Identification or Social Security Number on the face of each invoice billed to the State.

On Contracts in excess of $25,000, the Contractor and any subcontractor with a lower tier subcontract, prior to receiving a progress or final payment under this Contract, shall first certify in writing that he has made payment from proceeds of prior payments, and that he will make timely payments, from the proceeds of the progress or final payment then due him, to his subcontractors and suppliers in accordance with his contractual arrangements with them.

The Contractor shall also obtain from each subcontractor a certification that it has made payment from proceeds of prior payments to any of its lower tier subcontractors, and will make timely payments to its lower tier subcontractors and suppliers in accordance with its contractual arrangements with them. This certification is not required from

subcontractors who have no lower tier subcontracts. These certifications may be required by the procurement officer for contracts of $25,000 or less.

In addition to any other remedies provided by law or this Contract, any Contractor or subcontractor of any tier who fails to make payments as required by the certifications set forth in the above paragraphs within thirty (30) days from the date such payment is due shall be obligated to include with such payment interest at the rate of 10 percent per annum from the date the payment was due to the date the payment was actually made to the subcontractor or lower tier subcontractor.

GENERAL PROVISIONS
GP SECTION 9
PAYMENT

GP 9.05 LATE PAYMENTS

ADD the following:

(e) Payments will be made within thirty (30) days of the date when the contract amount becomes due and payable or the date of receipt of a proper invoice, whichever is later. The State's failure to remit payment within forty-five (45) days from that date may entitle the Contractor to interest at the rate of 10% per annum beginning on the 31st day.

TERMS AND CONDITIONS
TC SECTION 1
REFERENCES AND DEFINITIONS

TC-1.01 REFERENCES.

1 **ADD**: As the third paragraph.

References to all specifications and procedures shall be understood to be the most recently published standard at the time of advertisement unless otherwise specified in the Contract Documents.

TC-1.02 DEFINITIONS.

5 **ADD**: After **Special Provisions.**

Special Provisions Inserts — Additions and revisions to the Standard Specifications that have not been officially approved as an Interim Specifications Addenda (ISA).

TERMS AND CONDITIONS

TC SECTION 2
BIDDING REQUIREMENTS AND CONDITIONS

87 **DELETE:** TC-2.01 PROJECT CLASSIFICATION in its entirety.

INSERT: The following.

TC-2.01 PROJECT CLASSIFICATION

The Administration will estimate the cost of the Contract and classify it within one cost group and letter designation as follows:

COST GROUP ESTIMATE	COST GROUP LETTER CLASS
Up to $ 100 000	A
$ 100 001 to $ 500 000	B
$ 500 001 to $ 1 000 000	C
$ 1 000 001 to $ 2 500 000	D
$ 2 500 001 to $ 5 000 000	E
$ 5 000 001 to $ 10 000 000	F
$ 10 000 001 to $ 15 000 000	G
$ 15 000 001 to $ 30 000 000	H
$ 30 000 001 to $ 50 000 000	I
$ 50 000 001 to $ 75 000 000	J
$ 75 000 001 to $ 100 000 000	K
Over $ 100 000 000	L

The letter designation will be published as part of the Notice to Contractors.

TERMS AND CONDITIONS
TC SECTION 3
SCOPE OF WORK

TC-3.01 GOVERNING ORDER OF CONTRACT DOCUMENTS.

11 **DELETE**: The first paragraph in its entirety.

INSERT: The following.

The Contract Documents, including but not limited to the Standard Specifications, the Interim Specifications Addenda, the Special Provisions Inserts, the Plans, Special Provisions, and all supplementary documents are essential parts of the Contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In the event of any discrepancy between the drawing and figures written thereon, the figures, unless obviously incorrect, will govern over scaled dimensions. In the event of any discrepancy between the various Contract Documents, the governing order from highest to lowest shall be Special Provisions, Plans, Special Provisions Inserts, Interim Specifications Addenda, and Standard Specifications.

TC-3.03 CONTINGENT ITEMS.

12 **DELETE**: In the second paragraph the last sentence "Neither party shall . . . of such items."

INSERT: The following.

The requirements of GP-4.04 (Variations in Estimated Quantities) and TC-7.07 (Eliminated Items) shall apply.

TERMS AND CONDITIONS
TC SECTION 4
CONTROL OF WORK

TC 4.01 - SHOP PLANS AND WORKING DRAWINGS

Section TC 4.01 of the Specifications is amended to add:

All shop plans and working drawings for this project shall be submitted to:

Maryland Transportation Authority
Engineering Division
300 Authority Drive
Baltimore, Maryland 21222-2200
ATTN: Mr. Nafiz Alqasem

The Contractor shall allow a minimum of four (4) weeks turn around time on all drawings from the date they are received by the Authority. All shop plans and working drawings shall be reviewed and approved by the Contractor prior to submitting for approval to the Maryland Transportation Authority and shall be submitted by the general Contractor only. No drawings sent to the Authority directly by subcontractors, fabricators, etc. will be accepted. Ten (10) sets of drawings shall be submitted for approval.

Acceptance of a material source by the Engineer does not constitute approval of the material as a substitute as an "equal". Submission of a material as an "or equal" must be done in accordance with the following paragraphs:

All shop drawings, regardless if "Submitted as Specified" or "Submitted as Equal to Specified", shall be furnished with complete, specific, detailed information from the manufacturer or supplier or the material or equipment the Contractor proposes to furnish, in which the requirements of the Specifications are clearly shown to be met. This shall include a point by point comparison with the detail requirements of the Specifications.

When any article is specified by trade name of manufacturer with or without the clause "or equal", it is intended to establish the quality of the article. If the Contractor proposes to use material or equipment of another manufacturer as an "or equal" to material or equipment specified, all shop drawings shall conform to the following requirements, conditions, and procedure:

1. Substitution of equipment or materials other than those specified will be considered, providing, in the opinion of the Engineer, such equipment or material is equal to, or better than specified. The decision of the Engineer with respect to approval or disapproval of any material or equipment proposed to be substituted as an "or equal" is final. The Contractor shall have no claim of any sort by reason of such decision.

2. If the Contractor proposes to substitute materials or equipment as "or equal" to those specified, it shall be his responsibility to furnish, in addition to the information discussed above, a point by point comparison of the material or equipment specified under the Contract and that proposed to be substituted. The burden of responsibility in furnishing this information is with the Contractor.

If incomplete or irrelevant data is submitted as evidence of compliance with this section of the Specifications, the data will be returned and the request for approval will be denied.

TERMS AND CONDITIONS
TC SECTION 4
CONTROL OF WORK

TC-4.02 FAILURE TO ADEQUATELY MAINTAIN PROJECT.

16 **ADD**: To the existing 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 deduction will be equal to a prorata share of the lump sum price bid for Maintenance of Traffic or an amount prorated from the Engineer's estimate, whichever is more. The amount prorated will be the per diem amount established by using the working days (based upon calendar dates when required) divided into the total value of the bid item or the Engineer's estimate of that item, whichever is more.

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 equal to the daily prorated share of the lump sum price bid for Maintenance of Traffic or $ 2,000.00 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.

SPECIAL PROVISIONS INSERT

TERMS AND CONDITIONS
TC SECTION 5
LEGAL RELATIONS AND PROGRESS

TC-5.01 INSURANCE.

17 **DELETE:** The first three paragraphs under TC-5.01 in their entireties.

INSERT: The following.

The requirement of GP-7.14 (Liability Insurance) to submit Certificate of Insurance prior to starting work is modified for Administration Contracts to require the certificate of insurance to be submitted prior to the execution of the Contract.

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 which 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; or other liability insurance form deemed acceptable by the State. The State of Maryland shall be listed as an additional named 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. The policies shall be endorsed to provide 30 days notice of cancellation or non-renewal to:

Chief of Construction
Maryland Transportation Authority
304 Authority Drive
Baltimore, Maryland 21222

TERMS AND CONDITIONS
TC SECTION 6
RESTRICTIONS AND PERMITS

TC-6.03 COMPLIANCE WITH MARYLAND VEHICLE LAWS.

The Maryland Vehicle Law requires each motor vehicle, trailer, semitrailer and pole trailer driven on a highway to be registered.

There are some exceptions to this general requirement concerning nonresidents. If a nonresident is operating a vehicle(s) in Maryland as described below, the nonresident exemption is not applicable and the vehicle(s) being operated shall be titled and registered in conformance with the applicable Motor Vehicle Laws.

The vehicle is:

(a) Used for transporting persons for hire, compensation, or profit

(b) Regularly operated in carrying on business in this State

(c) Designed, used, or maintained primarily for the transportation of property, or

(d) In the custody of any resident for more than 30 days during any registration year.

In addition to the titling and registration requirements for vehicles being operated in Maryland, all equipment being used shall be properly identified. Maryland classifies this equipment as "Special Mobile Equipment" which is defined as a vehicle that:

(a) Is not used primarily for highway transportation or property; and

(b) Is operated or moved on highway only as an incident to its nonhighway use.

Special mobile equipment includes a road construction or maintenance machine, mobile crane, ditch digger, well driller, concrete mixer, jobsite office vehicle or portable power generator.

An interchangeable license plate is issued to special mobile equipment. However, titling is not required.

For additional information concerning the requirements for titling and registering your vehicles in Maryland, please contact the Motor Vehicle Administration, Chief, Division of Vehicle Registration.

The Contractor shall adhere to all State Motor Vehicle laws and safety regulations.

TERMS AND CONDITIONS
TC SECTION 6
RESTRICTIONS AND PERMITS

25 **DELETE:** TC-6.09 HAZARDOUS MATERIAL in its entirety.

INSERT: The following.

TC-6.09 HAZARDOUS MATERIAL.

(a) If the Contractor encounters or exposes during construction any abnormal conditions, which indicate the presence of a hazardous material or toxic waste, work in the area shall immediately be suspended and the Engineer notified. The Contractor's operations in this area shall not resume until permitted by the Engineer, however, the Contractor may continue working in other areas of the project, unless directed otherwise.

Abnormal conditions shall include, but not be limited to the presence of barrels, obnoxious or unusual odors, excessively hot earth, smoke, or any other condition which could be a possible indicator of hazardous material or toxic waste.

Where the Contractor performs necessary work required to dispose of these materials and no items have been identified in the Contract Documents, the work shall be performed under an extra work order.

(b) For any material furnished on the project by the Contractor suspected to be hazardous or toxic the Engineer may require the Contractor to have it tested and certified to be in conformance with all applicable requirements and regulations. Material found to be hazardous or toxic shall not be incorporated into the work. The required testing will be determined by the Engineer and may include, but not be limited to, the EPA Toxicity Characteristic Leaching Procedure (TCLP) or its successor. The evaluation and interpretation of the test data will be made by the Engineer. Testing and certification shall be at no additional cost to the Administration.

(c) Disposition of the hazardous material or toxic waste shall be made in conformance with all applicable requirements and regulations.

TERMS AND CONDITIONS
TC SECTION 6
RESTRICTIONS AND PERMITS

26 **DELETE:** TC-6.10 RECYCLED OR REHANDLED MATERIALS in its entirety.

INSERT: The following.

TC-6.10 RECYCLED OR REHANDLED MATERIALS.

The Contractor shall submit to the Engineer, using MD SHA Form TC-6.09, the specific type and quantity of recycled materials (a) through (h) anticipated for use on the project prior to receipt of the Notice to Proceed. This submission does not preclude the normal materials process. Recycled materials shall conform to all applicable Specifications.

Typical recycled materials are:

(a) Crumb Rubber. Any rubber derived from processing whole scrap tires or shredded tire materials from automobiles, vehicles or other equipment owned and operated in the United States, provided the processing does not produce waste casings or other round tire material that can hold water when stored or disposed above ground. Rubber tire buffings produced by the retreading process qualify as a source of crumb rubber.

(b) Recycled Asphalt Pavement. Existing asphalt pavement milled or otherwise removed. Recycled in-place material is excluded.

(c) Glass. Waste glass crushed to be used as aggregate.

(d) Blast Furnace Slag. The nonmetallic by-product of iron production.

(e) Recycled Concrete Pavement. Existing concrete pavement crushed to be used as aggregate.

(f) Mining Waste Rock. The coarse material removed during the ore mining process.

(g) Coal Fly Ash. Fine material collected from the stack gases after coal combustion.

(h) Other. Any materials not listed above which are recycled as the original product or incorporated into other products.

For recycled or rehandled material furnished on the project by the Contractor for use in embankment, base, subbase or drainage media, the Engineer may require the Contractor to

have the material tested and certified to be in conformance with all applicable environmental requirements. The required testing will be determined by the Engineer and may include, but not be limited to, the EPA Toxicity Characteristic Leaching Procedure (TCLP) or its successor. The evaluation and interpretation of the test data will be made by the Engineer and be based on the project environment. Testing and certification shall be at the Contractor's expense.

TC-6.11 CONSTRUCTION AND WASTE MATERIAL.

All wood, trash debris and other foreign matter shall be removed from the right-of-way and disposed of by the Contractor. The Contractor shall make all necessary arrangements to obtain suitable disposal locations and shall furnish the Engineer with a copy of resulting agreements. Disposal shall be in conformance with all Federal, State and local ordinances.

TC-6.12 STRUCTURE UNDERCLEARANCES AND OVERHEAD CLEARANCES

General. The requirements for underclearances at structures shall apply to the entire usable roadway areas including shoulders. Unless otherwise specified in the Contract Documents or directed by the Engineer, the Contractor shall ensure that the following underclearances are maintained.

(a) All bridges (except pedestrian bridges) over Interstate, United States, or State highways shall have a 16.0 ft minimum vertical underclearance.

(b) All bridges (except pedestrian bridges) over secondary/ county roads, and local roads and streets shall have a 14.5 ft minimum vertical underclearance.

(c) Pedestrian bridges shall have a minimum vertical underclearance 1 ft higher than those specified above. However, if there are bridges in the general vicinity of the proposed pedestrian bridge that have an underclearance greater than the minimum required underclearance of the pedestrian bridge, then the pedestrian bridge will have its underclearance increased to equal the highest overpass bridge.

(d) Removal of existing pavement under an existing pedestrian bridge to conform to the 1 ft higher requirement will not be required unless specified in the Contract Documents.

(e) All bridges with overhead structural elements (e.g. through truss bridges, movable bridges with overhead bracing for counterweights, etc.) shall have a 17.5 ft minimum overhead vertical clearance.

When the above requirements are not met, the Contractor shall take remedial actions as directed by the Engineer. When remedial actions are required, and there are no pay items for the work in the Contract Documents, the provisions of GP-4.06 (Changes) and GP-4.07 (Negotiated Payment Provisions) shall apply. The cost of measurements to determine clearance heights will be incidental to other pertinent items in the Contract Documents.

A minimum of 14.5 ft underclearance shall be maintained at all bridges throughout construction over each lane or shoulder open to traffic. No portion of formwork, temporary protective shields, etc. including connection devices shall encroach on this underclearance. If less than 16.0 ft vertical underclearance is provided on bridges specified in (a) or (d) above, the Engineer will notify the Director of Construction of the exact reduced minimum clearance and the effective dates of the reduction. The Contractor shall furnish and erect signs indicating the exact minimum underclearance. The signs and their locations shall be approved by the Engineer. Signs shall be removed and become the property of the Contractor when the intended underclearance is restored.

Resurfacing. These minimum underclearances shall be maintained whenever resurfacing a roadway. This may require grinding the existing pavement prior to placing the resurfacing material. Whenever highway overpass bridges are in the general vicinity of a pedestrian and grinding is not required to maintain the specified clearances, the roadway under the pedestrian bridge shall be ground to provide a higher underclearance than the adjacent bridges. This requirement will be waived whenever the Engineer contacts the Director of Construction and determines that the grinding would have an adverse effect on drainage, utilities, etc.

TERMS AND CONDITIONS
TC SECTION 7
PAYMENT

29 **DELETE:** TC-7.02 PAYMENT ALLOWANCES FOR STORED MATERIALS in its entirety.

INSERT: The following.

TC-7.02 PAYMENT ALLOWANCES FOR STORED MATERIALS.

When the Contractor requests payment allowance for materials, the following terms and conditions shall apply:

(a) For superstructure members delivered on the project site, an allowance of 100 percent of the material cost plus freight charges as invoiced may be made provided the cost does not exceed 90 percent of the Contract price of the applicable Contract item. The allowance will be based upon validated invoices or bills for material including freight charges, and a copy thereof shall be made a part of the documented records for the project.

(b) For reinforcement steel, piling, pipe, traffic barrier, signs and sign assemblies, and other nonperishable material in storage on the project, but excluding aggregates, cement, seed, plants, fertilizer or other perishable items, an allowance of 100 percent of the invoiced cost of the material plus freight charges to the Contractor may be made provided the cost does not exceed 90 percent of the Contract price of the applicable Contract item. Such material shall be delivered and stock-piled at the project site, and have been tested by the Administration and found to have conformed to the Specifications or have been accepted under an approved certification program prior to the allowance.

(c) No allowance will be made for fuels, form lumber, falsework, temporary structures or other materials of any kind which will not become an integral part of the finished construction.

No payment for stored material will be made if it is anticipated that the material will be incorporated into the work within 30 days of the written request.

Only end product manufactured material or fully fabricated products that are awaiting installation or incorporation into the finished work are eligible for prepayment. Components, elements, or ingredients of a finished product are not eligible for prepayment.

(d) Material for which an allowance is requested shall be stored in an approved manner in areas within the State of Maryland where damage is not likely to occur. If any of the stored materials are lost or become damaged in any manner, the Contractor shall

be responsible for repairing or replacing the damaged materials. The value of the lost or damaged material will be deducted from the Contractor's subsequent estimates until replacement has been accomplished. The request for allowances for any materials stored on private property within the State of Maryland shall be accompanied by a release from the owner and/or tenant of such property agreeing to permit the removal of the materials from the property without cost to the State of Maryland.

The material shall be clearly marked with the Administration's Contract number on individual units. If the material is normally shipped to the project in bundles or other forms of packaging, the Administration's Contract number shall be clearly marked or affixed to the package. When the material is not stored at the actual project site, the material shall be physically separated by fencing or equivalent barrier from other materials stored at the same site. The material shall be accessible to the Administration at all times.

When it is considered impractical to store materials on the actual project, the Engineer may approve storage areas in the vicinity of the actual project which will be considered at the project site.

When storage of the materials within the State of Maryland is not practical, approval shall be obtained from the District Engineer for storage elsewhere. Storage of materials outside the State of Maryland will be subject to the conditions set forth in this provision and limited to materials exceeding twenty-five thousand dollars ($25 000), which are designed and fabricated exclusively for use on a specific project.

(e) Material for which payment has been made, either wholly or partially, shall not be removed from the approved location until such time that it is to be incorporated into the work unless authorized by the Engineer.

(f) The Contractor shall submit a written request for payment to the District Engineer at least two weeks prior to the estimate cutoff date established by the District Engineer. The following items shall accompany the written request for payment:

(1) Consent of surety specifying the material type and the item(s) in which the material is to be used.

(2) Validated invoices with the signature of an officer of the company supplying the material showing actual cost.

(3) A notarized statement from the Contractor attesting that the invoices as submitted do not include charges or fees for placing, handling, erecting or any other charges or markups other than the actual material cost, sales tax(es), if applicable, and freight charges.

(4) Bills of lading showing delivery of the material. The request for allowances for any materials stored on property outside the State of Maryland shall be

accompanied by a release from the owner or tenant of such property agreeing to permit verification by the Inspector that the material is stored at the approved location, and to permit the removal of the materials from the property without cost to the State of Maryland.

(5) Inspection test reports, certifications and/or a written statement from the Inspector attesting to the inspection and approval of the material.

Upon receipt of the above by the District Engineer and verification by the Inspector that the material is stored at the approved location, the District Engineer will authorize payment.

(6) A statement explaining why the material can not be stored on the project, if the Contractor is requesting to store material at a location other than the project site. The statement shall include the methods of storage, separation, and identification to be used by the Contractor. The Contractor shall provide a method of inventory control and withdrawal satisfactory to the Administration which shall be used by the Contractor to monitor materials not stored on the project.

(7) A breakdown of the Contract line item bid unit price showing the relationship of the cost of the stored material to the costs of all other materials, labor, and components of the work included in the Contract line item unit price bid by the Contractor.

Upon receipt of the above by the District Engineer and verification by the Inspector that the material is stored at the approved location, the District Engineer will authorize payment.

The Contractor shall pay the material provider the amount shown on the invoice within 10 calendar days of receipt of payment from the Administration. Evidence of payment shall be provided to the Administration. Failure to make invoice payments as specified will be cause to deduct the monies from future estimates and/or deny future stored materials payment requests.

Copies of all pertinent data shall be made by the Contractor and distributed to the Inspector for retention as part of the documented records for the project.

TC-7.03 FORCE ACCOUNT WORK.

(e) Subcontracting.

35 **ADD:** The following to the end of the paragraph.

"or five hundred dollars ($500) which ever sum is greater."

DELETE: TC-7.05 PROGRESS PAYMENTS Subsection (a) (3) Variable Retainage

INSERT: The following.

(3) **VARIABLE RETAINAGE.** The Contract will be subject to a variable retainage based upon the Authority's performance evaluations of the Contractor.

Those qualifying may have retainage reduced upon request of the Contractor with consent of surety. This request must be processed through the Construction Manager. If at any time during the performance of the project, the evaluation of the Contractor changes, retainage reduction may be reconsidered.

Contractors with "A" evaluations for the last two years may be reduced from 5 percent to 2.0 percent upon request after 15 percent project completion. Project completion percentage will be based upon actual work completed (excluding monies paid for stored materials). An interim evaluation of the current project must be completed and must be an "A". Contractors with "A" evaluations for the last two years may petition to have all retainage at that point released upon completion of a significant milestone. Retainage will continue at 2.0 percent until the next milestone of completion of the contract.

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 at 50 percent project completion 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 shall be completed and shall be an "A" or "B".

Contractors with "C" evaluations or any combination of "C" and "D" evaluations for the last two years will begin and remain at 5 percent for the life of the project. An interim evaluation of the current project shall be completed and shall be a "C" or better rating.

Contractors with a "D" evaluation for the last two years will begin at 5 percent. Project performance will be evaluated monthly. Should the contractor performance remain at the "D" level, to protect the State's interest 10% of the progress payment will be withheld until performance improves to a "C".

New Bidders. Contractors who have not been previously rated by the Authority may be eligible for a reduction in retainage. To be eligible, their past performance on highway and bridge work shall be documented by the government agency with whom they had a contract and their performance shall be documented on Authority forms.

All other Contractors who do not fit into the above criteria would require a 5 percent retainage throughout the life of the Contract.

TC SECTION 7
PAYMENT

TC-7.09 PRICE ADJUSTMENT FOR DIESEL FUEL

(a) General. 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 diesel fuel.

The monthly index price used for calculating the PA will be the On-Highway Diesel Fuel Price for the Central Atlantic Region published by the U.S. Department of Energy, Energy Information Administration, at www.eia.doe.gov. The monthly index price will be the average of the weekly prices posted for the month.

The prevailing base index price of diesel fuel for this Contract is $3.142 per gallon.

The adjustment factors for specific categories of the work are included in Table TC-7.09. Category A-E will apply to this Contract.

The PA will be calculated when the index for the current month increases or decreases more than 5 percent of the base index. The total dollar amount of fuel adjustment will be limited to 5 percent of the Contract Total Amount as bid. If an increase or decrease in costs exceeds 5 percent of the Contract Total Amount as bid, no further adjustment will be made.

Computations for adjustment will be as follows:

$$\text{Percent Change} = [(E - B)/B] \times 100$$

$$PA = [E - (B \times D)] \times F \times Q$$

Where:

PA = Amount of the price adjustment
E = Current monthly index price
B = Prevailing base index price
D = 1.05 when increase is over 5%; 0.95 when decrease is over 5%
F = Applicable fuel adjustment factor from Table TC-7.09
Q = Quantity of individual units of work

TABLE TC-7.09

COST ADJUSTMENT FACTORS FOR DIESEL FUEL			
CATEGORY	**DESCRIPTION**	**UNITS**	**FACTOR**
A	Sum of Cubic Yards of Excavation in Category 200	Gallons/Cubic Yard	0.29
B	Sum of Structure Concrete in Category 400	Gallons/Cubic Yard	1.892
C	Sum of Aggregate Base in Category 500	Gallons per ton	0.60
D	Sum of HMA in Category 500	Gallons per ton	3.50
E	Sum of Rigid Concrete Pavement in Category 500	Gallons/Cubic Yard	0.95

Any difference between the checked final quantity and the sum of quantities shown on the monthly estimates for any item will be adjusted by the following formula:

$$FPA = [(FCQ \div PRQ) - 1] \times EA$$

Where:

FPA = Final PA for the item that increased or decreased
FCQ = Final Checked Quantity of the item
PRQ = Total Quantity of the item reported on the most recent estimate
EA = Total PA of the item shown on most recent estimate

(b) Price Adjustment Criteria and Conditions. The following criteria and conditions will be considered in determining the PA.

(1) Payment. The PA will be computed on a monthly basis. PA resulting in increased payment to the contractor will be paid under the item Price Adjustment for Diesel Fuel. 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.

The monthly base price for determining a PA for all work performed after the Contract completion date, as revised by an approved time extensions, will be the monthly base price at the time of the Contract completion date (as extended) or at the time the work was performed, whichever is less.

(2) Expiration of Contract Time. When eligible items of work are performed after the expiration of Contract time with assessable liquidated damages, no PA will be made.

(3) Final Quantities. Upon completion of the work and determination of final pay quantities, an adjusting Change Order will be prepared to reconcile any difference between estimated quantities previously paid and the final quantities.

(4) Inspection of Records. The Administration reserves the right to inspect the records of the Contractor to ascertain actual pricing and cost information for the diesel fuel used in the performance of the applicable items of work.

(5) Additional Work. When applicable items of work, as specified herein, are added to the Contract as additional work, in accordance with the Contract provisions, no PA will be made for the fluctuations in the cost of diesel fuel unless otherwise approved by the Engineer. The Contractor shall use current fuel costs when preparing required backup data for work to be performed at a negotiated price.

(6) Force Account. Additional work performed on a force account basis, reimbursement for material, equipment, and man-hours as well as overhead and profit markups will be considered to include full compensation for the current cost of diesel fuel.

CATEGORY 100
PRELIMINARY

SECTION 100-01 — MAINTENANCE OF RAILROAD TRAFFIC

100-01.01 DESCRIPTION. This work shall consist of the maintenance of Railroad traffic in accordance with the requirements specified herein for work performed in or near Railroad property. For the purposes of these Special Provisions, CSX Transportation, Inc. will hereinafter be referred to as the "Railroad".

100-01.02 MATERIALS. None.

100-01.03 CONSTRUCTION. Railroad traffic shall be maintained at all times with safety and continuity within the limitations stated below, and the Contractor shall conduct all operations on, over, and adjacent to the Railroad's property fully within the rules, regulations, and requirements of the Railroad. The Contractor shall be responsible for acquainting himself with such requirements as the Railroad may demand.

Before proceeding with any construction work on, over, or adjacent to the Railroad's property, the Contractor shall submit Plans and a detailed description of the Method Of Procedure, which will be followed for work in these areas for the approval of the Engineer and the Railroad; however, such approval shall not serve in any way to relieve the Contractor's responsibility for the adequacy and safety of the Method Of Procedure.

Since the work in the field will not be permitted to proceed until the Plans and Method of Procedure have been approved by the Engineer and the Railroad, it shall be the responsibility of the Contractor to submit his Plans and Method of Procedure promptly so that unnecessary delays in construction operations will be avoided.

The Contractor shall be required to submit to the Railroad a written Safety Program prepared by the Contractor for the education and protection of his employees. This program shall address the hazards and safety considerations in working in the vicinity of the Railroad's property and operation.

No work shall be performed on these portions of the project until such times as all Insurance Policies, and other requirements of the Railroad have been complied with and their approval, in writing, has been obtained by the Engineer.

The proper official of the Railroad to be contacted is as follows:

CSX TRANSPORTATION, INC.
Mr. Carl A. Roe, Jr., P.E., Principal Engineer
500 Water Street
13th Floor #J301
Jacksonville, FL 32256
Telephone: (904)-245-1036

Except in emergencies, contact shall be made with the above specified official through the Engineer.

All construction performed on, under, adjacent to, or over Railroad property will be subject to the inspection and approval of the Railroad.

At least ten (10) days advance notice shall be given, through the Engineer, to the Railroad, prior to entering upon or commencing any work on Railroad property.

Scheduling of the Contractor's operations that may affect the Railroad shall be coordinated through the Railroad. Scheduling or permission to occupy the track shall be made through the appropriate Yardmaster in addition to the above specified official.

All work herein provided to be done on, over, and adjacent to the Railroad's property shall be performed by the Contractor in a manner satisfactory to the Railroad, and shall be performed at such times, and in such a manner, as not to interfere with the movements of trains or traffic upon the tracks of the Railroad. The Contractor shall use all reasonable care and precaution in order to avoid accidents, damage, delay, or interference with the Railroad's trains or other property.

The Contractor shall consult the Railroad in order to determine the type of protection to ensure safety and continuity of Railroad traffic incident to the particular methods of operation and equipment to be used on the work.

The Railroad will furnish such qualified Flagmen, Signalmen, or Protection Men other than Crossing Watchmen, as may be required, to insure complete protection of train operations and Railroad facilities. The need for this type of service will be determined on the basis of Railroad Regulations and the Contractor's approved Construction Schedule. No work shall proceed without proper protection on the site. The providing of Watchmen and Guards, or any other precautionary and protective services by the Railroad, shall not relieve the Contractor from liability for payment of damages caused by or in consequence of the Contractor's operations.

All expenses incurred in connection with protection of Railroad facilities by Railroad employees will be borne by the Maryland Transportation Authority. Billings for such services or expense will be made directly to the Maryland Transportation Authority by the Railroad.

It shall be expressly understood that this Contract includes no work for which the Railroad is to be billed by the Contractor, and it shall be further understood that the Contractor is not to bill the Railroad for any work which he may perform, unless the Railroad gives written permission that such work be performed at the Railroad's expense.

Any work performed by the Railroad at the Contractor's request, other than protective services and work specifically designated in these Special Provisions, shall be paid for by the Contractor immediately upon presentation of the bills by the Railroad. Final settlement by the Maryland Transportation Authority with the Contractor shall be contingent upon: **(a)** the Contractor showing proof that the Railroad's property has been cleared of all machinery, equipment, surplus materials, false work, rubbish, temporary buildings, and other property in a condition satisfactory to the Railroad; **(b)** the Contractor showing proof that no bills are owed by the Contractor to the Railroad in connection with the work performed on this project.

The Contractor shall secure permission from the Railroad, in writing, for the erection of any temporary structures, scaffolding, rigging on, over, or adjacent to the Railroad's property. Forms for concrete, false work, and bracing on, or over the Railroad's property shall be approved by the Railroad with respect to any reduction of existing clearance. All work on or over the Railroad's property shall be approved by the Railroad with respect to any reduction of existing clearance. All work on or over the Railroad's property shall be performed under the supervision of both the Engineer and the Railroad.

Approved minimum temporary construction clearances from Railroad tracks are 22.00 ft. vertical from top of rail and 18.00 ft. horizontal from track centerline. Approval for clearances less than noted must be obtained by the Contractor through the Engineer from the Railroad and from the regulatory agency having jurisdiction over Railroad clearances in the State of Maryland before beginning any work involving such clearances.

The Contractor shall be held responsible to see that his employees enter upon Railroad or other property through points of access designated by the property owner. Operations within these properties shall be confined to the rights-of-way as shown on the Drawings and as designated by the Engineer.

Should the Contractor require a temporary grade crossing of Railroad tracks, the Contractor shall be required to apply for and execute the standard Private Grade Crossing Agreement for each crossing required, application for the crossing shall be made to the Railroad at least six weeks before the crossing is required. A Letter Size Plan showing location and size of crossing should accompany the letter of application. The letter should state the purpose for which the crossing is needed and the expected life of the crossing. The Contractor shall pay all construction, maintenance, removal, protection, and other costs. The roadbed shall be restored to its original condition.

The Contractor shall conduct his operations both on and off Railroad right-of-way so that no earth, mud, silt, or other foreign matter will be deposited on Railroad ballast or cause flooding or saturation of subgrade. In order to accomplish this, it may be necessary for the Contractor to construct temporary drainage facilities, temporary sheeting or take other precautionary action, such as nailing canvas or other similar materials to the ties to cover the ballast. The protective measures shall be performed by the Contractor at the Contractor's own expense in a manner satisfactory to the Railroad.

However, in addition to the aforementioned protective measures, if the Railroad track ballast does become fouled due to the Contractor's operations, the Railroad, with its own forces, will remove the fouled ballast and replace it with clean ballast. The charges for this work will be billed against the Contractor by the Railroad.

The Contractor shall furnish and maintain during all construction work, such watchmen, lights, barricades, fences, and other appropriate protection as, in the opinion of the Railroad, shall be necessary for the protection of all persons having access to property and facilities of the Railroad.

Every Bidder is required to ascertain from the Railroad its rules, regulations, and requirements and what, if any, delays that he shall be subjected to, or scheduled days when work would be permitted, in connection with the supporting of tracks, and in connection with other Railroad operations, and every Bidder will be assumed to have included in his Bid Price, all costs and expenses and all risks of loss and damage to him, due to such delays, rules, regulations, and requirements.

Should any damage occur to Railroad property as a result of the Contractor's operations, the Railroad may repair such damage and perform any work for protection of its property it may deem necessary and the actual cost for such work shall be borne by the Contractor.
The Contractor will not be permitted to use Railroad personnel for the Contractor's purposes when such personnel are required at the immediate site of project construction by the Railroad solely for the safe operations of the Railroad.

Any approvals given by the Railroad will not be considered as a release from responsibility for any damage to the Railroad by the acts of the Contractor, his Sub-Contractors, or those of the Contractor's or Sub-Contractor's employees.

100-01.03.01 Shop and Working Drawings for Railroad Approval. Where the Contract Documents require that Shop and/or Working Drawings are to be submitted for Railroad review and approval, such submission shall be as required above and modified herein.

Six (6) copies of Shop AND/OR Working Drawings shall be submitted through the Engineer to the Railroad at least sixty (60) calendar days in advance of their being required for the work. All Working Drawings submitted for Railroad approval shall be certified by a Professional Engineer registered in the State of Maryland with expertise in the area of work to be performed.

No work shall be performed until the Working Drawings are approved by the Engineer and the Railroad. Approval of the Working Drawings by the Engineer and the Railroad shall not relieve the Contractor's responsibility for errors in dimensions, elevations, or design calculations and for performance of the work in a safe manner without endangering the safety of the Railroad personnel, equipment, or the Contractor's workmen.

The Working Drawings shall clearly show all dimensions, sizes of members, types of materials, and all other pertinent information as may be required by the Engineer and the Railroad to permit proper checking for such working drawings. The Contractor shall also submit along with the Working Drawings, copies of the Design Calculations.

Where required, Working Drawings shall be prepared and submitted for Railroad approval indicating the location of all cranes with respect to the tracks, capacity of cranes, boom length and the estimated lifting loads. All cranes and associated hardware used in the individual picks shall be rated for 150% of the service weight of the pick (i.e., F.S. = 1.5).

100-01.03.02 Insurance. The Contractor shall purchase and maintain for the length of the project the following Insurance Policies in addition to those required in the Specifications and in other sections of these Special Provisions.

1. **Contractor's Public Liability and Property Damage Insurance:** Limits not less than $3,000,000 per occurrence for Bodily Injury and $3,000,000 per occurrence for Property Damage.

2. **Contractor's Protective Public Liability and Property Damage Insurance:** If any part of the work is to be performed by a Subcontractor, the prime Contractor shall carry in the Contractor's own behalf, insurance of same limits as set forth in Paragraph 1, above.

3. **Railroad Protective Public Liability and Property Damage Insurance:** This Policy shall name the respective "Railroad" as "The Insured" and shall be written on the form prescribed by the U.S. Department of Transportation, Federal Highway Administration, in the Federal Air Highway Program Manual, Volume 6, Chapter 6, Section 2, Subsection 2, Railroad-Highway Insurance Protection Required for Contractors.

Limits of Liability shall be in the amount of $5,000,000 for bodily injury and property damage per occurrence with an aggregate of $10,000,000 per Annual Policy Period.

The limits stated herein have been established after reviewing the work listed in the Contract. Should the Contractor be otherwise using Railroad property (e.g., temporary grade crossing) he or she may be subject to other requirements. The Contractor is required to communicate with the Railroad and provide for complying with all their requirements.

The original of Policy **(3)** must be furnished to and approved by the Railroad.

For Policy **(1)** and **(2)**, Certifications are to be furnished to the Maryland Transportation Authority and to the Railroad on request. In all instances, the Contractor must furnish evidence to the Maryland Transportation Authority and Railroad that the insurance has been purchased and is in force until the Contract is completed and accepted.

The Contractor will not be permitted on Railroad property until Insurance Policy(s) have been approved. Policies, notices of cancellation or change, etc., are to be sent by the Contractor directly to the Engineering Officer of the Railroad. Contractor and the Contractor's Insurance Representatives must reconcile all Policy requirements to the satisfaction of the Railroad and the Engineer.

100-01.04 MEASUREMENT AND PAYMENT. Work on Railroad property during the life of the Contract and all incidental costs imposed on the Contractor due to the operations of the Railroad will not be measured for payment, but the cost thereof shall be included in the Contract Unit Prices for the various construction items affected by these requirements.

An allowance of $75,000.00 has been established for this item in the Schedule of Prices. This item, Miscellaneous Reimbursable Expenses, will provide compensation to the Contractor for the costs of Railroad Insurance and Permits. The costs of the Contractor's time utilized to secure the Permits and Insurance will not be paid under this item, but costs thereof will be incidental to other items in the Contract. There is no guarantee that any or this entire item will be used during the term of the Contract.

CATEGORY 100
PRELIMINARY

SECTION 101 — CLEARING AND GRUBBING

ADD TO Sect 101.01.01(c) Limits

Vegetation that overhangs the bridges, sidewalks and roadways shall be removed or trimmed back to 3 feet away from the roadway. Vegetation growing within 3 feet of any bridge, wing wall, pier, parapet, drainage structure, etc. shall be cut off at the ground. Any vegetation growing out of a crack or joint in a structure, including the concrete slope protection, shall be removed to the extent possible without damaging the structure. Any limbs that grow in the 3 feet adjacent to any structure, including tree limbs within 3 feet of bridge parapets shall be cut off. Some areas of removal are identified on the Plans for the Contractor's convenience. Limits of removal are not limited to areas indicated on the Plans, but shall include all areas indicated in the above description and as ordered by the Engineer. If the Contractor chooses to remove additional vegetation for his ease of access, no additional payment will be made.

ADD TO Sect 101.04 Measurement and Payment

Use of Temporary Lane Closures in conjunction with Clearing and Grubbing, including Moving/Mobile Operations (Part-time Lane Closures), will not be measured and will be paid for as part of the Contract Lump Sum Price for Maintenance of Traffic.

CATEGORY 100
PRELIMINARY

SECTION 103 — ENGINEERS OFFICE

103.03 CONSTRUCTION.

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

INSERT: The following.

103.03.06 Microcomputer System for all Offices.

(a) Desktop Unit. (2 Units)

(1) IBM compatible with an Intel or AMD processor.

(2) Minimum microprocessor speed of 3.0 GHz.

(3) Minimum hard drive storage of 80 GB (gigabyte).

(4) Minimum of 1 GB RAM (Random Access Memory).

(5) Enhanced 101 key keyboard with wrist rest.

(6) Super Video Graphics Accelerator (SVGA).

(7) Modem 56K BPS, ITU V.92 compliant – required for remote dial-in to the computer to provide MCMS system administration.

(8) Mouse with mouse pad.

(9) One CD-RW drive [re-writable CD-ROM].

(b) Operating System for Both Units. Minimum Microsoft® Windows XP – all Microsoft Windows Critical Updates shall be installed prior to computer set up in the field office.

(c) Two (2) Video Monitors. Color Super VGA monitor conforming to Energy Star requirements with a minimum screen size of 17 in.

(d) Two (2) Printers. B&W Laser Jet Printer with a minimum resolution of 1200 DPI (dots per in.) and a minimum of 8 MB of RAM. Officejets and Bubblejets will not be accepted. Printer shall have a minimum print speed of 15 PPM (pages per minute).

(e) Software for Both Units.

(1) Microsoft® Office XP Professional for Windows™ or later.

(2) Symantec® pcAnywhere32 for Windows™ version 10.5 or later.

(3) Antivirus software shall be installed and configured to perform an automatic update when the microcomputer system connects to the internet. Antivirus software approved for SHA web email: *Norton, McAfee, Sophos, or ETrust.

(*Norton Internet Security includes both Antivirus and a Personal Firewall).

(f) **Internet Access for Both Units.** The microcomputer system shall be provided with unlimited Internet service approved by the Engineer. Where available internet high-speed service [DSL or cable] must be provided. With DSL or cable internet service an external Router device and firewall software are required to protect the computer from security intrusions. With DSL a Dual Outlet Modular Adapter [single-line RJ11] will be required to connect the DSL modem and the 56k dial-up modem to the same line.

(g) **Accessories for Both Units.**

(1) Uninterruptible power supply (UPS).

(2) Standard computer workstation with minimum desk space of 60 X 30 in. and a swivel type office chair, padded with arm rests.

(3) 8-1/2 X 11 in. xerographic paper to be supplied as needed.

(4) Toner or ink as needed for printer.

(5) Maintenance agreement to provide for possible down time.

(6) Physical security system to deter theft of computer components.

(7) Three 512MB USB Flash Drive storage devices.

(8) Blank recordable CD-R media for re-writable CD-ROM drive to be supplied as needed.

(h) **Notes.**

(1) The microcomputer system shall be completely set up ready for use on or before the day the Engineers office is to be occupied.

(2) All software stated above shall be supplied on original disks with manuals and be retained in the construction field office for the duration of the Contract.

(3) If for any reason the system fails to operate, the system shall be replaced or repaired within 48 hours.

When the microcomputer 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 external media: USB flash drives, CD-R's, ZIP disks, etc.) will be removed by the Engineer and delivered to the District Engineer and become the property of the Administration. The remaining microcomputer system shall remain the property of the Contractor.

148 **ADD:** The following after 103.03.08 Office Requirements

103.03.09 Recyclable Materials (Paper, Bottles, Cans, Etc.). The Administration's Environmental Stewardship Plan includes recycling initiatives at the Administration's construction sites and encourages recycling of all suitable material at all Engineers Offices and Contractor's site facilities.

While recycling is encouraged at all sites, the Administration is requiring recycling at the Type D Engineers Office as well as the Contractors facilities at the location of the Type D Engineers Office. The Contractor shall provide the containers as well as arrange for the removal of the recycled material from the site. Recycling will not be measured but the cost will be incidental to the Type D Engineers Office.

CATEGORY 100
PRELIMINARY

SECTION 104 — MAINTENANCE OF TRAFFIC

Refer to Section 104 of the Standard Specifications.

104.00 GENERAL.

INSERT: The following:

1) This project affects I-95 (Fort McHenry Tunnel) in Baltimore City and Baltimore County and eight (8) Baltimore City, Maryland State Highway Administration and Baltimore County roads.

   a) Work affecting I-95 within Baltimore City will require coordination with Maryland Transportation Authority.

   b) Work affecting Caton Avenue, Joh Avenue, Washington Boulevard, Benson Avenue, Patapsco Avenue, Hammonds Ferry Lane, Russell Street, and Bayard Street will require coordination with Baltimore City Department of Transportation.

   c) Work affecting I-95 south of the City/County Line will require coordination with the Maryland State Highway Administration.

AGENCY CONTACTS

Pre-Construction/Existing Contract Coordination

MARYLAND TRANSPORTATION AUTHORITY

CONTACT	TITLE	PHONE NUMBER
Mr. David Roehmer	Regional Administrator, Baltimore Harbor and Fort McHenry Tunnels	(410) 537-1310
Mr. Nafiz Alqasem	Project Manager	(410) 537-7821
Mr. Michael Darago	Maintenance Supervisor Fort McHenry Tunnel	(410) 537-1269

MARYLAND TRANSPORTATION AUTHORITY

(Continued)

CONTACT	TITLE	PHONE NUMBER
Ms. Roxane Mukai	Traffic Manager	(410) 537-7848

CITY OF BALTIMORE

CONTACT	TITLE	PHONE NUMBER
Mr. Frank Murphy	Traffic Engineering	(443) 984-2153

STATE HIGHWAY ADMINISTRATION

CONTACT	TITLE	PHONE NUMBER
Ms. Erin Kuhn	Assistant District Engineer, District #4	(410) 321-2780

BALTIMORE COUNTY DEPARTMENT OF PUBLIC WORKS

CONTACT	TITLE	PHONE NUMBER
Mr. Steve Weber	Chief, Division of Traffic Engineering	(410) 887-3554

104.01 TRAFFIC CONTROL PLAN (TCP)

104.01.01 DESCRIPTION.

DELETE: The first sentence of the last paragraph: "The Contractor…equipment and debris." in its entirety.

INSERT: The following:

The Traffic Control Plan (TCP) shall include the Maryland Standard Traffic Control Typicals (referenced in the Contract Drawings) as well as several multi-phase Maintenance of Traffic schemes (included in the Contract Drawings). This TCP will require various extensive lane shifts during each Construction Phase as well as ramp closures.

Moving/Mobile Operations (Part-time Lane Closures) shall be performed in accordance with SHA Typical Standards. Part-time temporary lane closures are

defined as closures other than those detailed in the Maintenance of Traffic plan sheets and Detour plan sheets for items including but not limited to lane closures for inspections; grinding and asphalt overlay; roadway patching; concrete crack repairs; installing roadway joint seals; drainage inspection and repairs; applying pavement markings; high mast light pole repairs; drilling ventilation holes into existing high mast light poles; installation of new high mast light poles; placement or relocation of signs, temporary barrier, crash cushions, arrow panels, etc.; pick-up and delivery of equipment or materials, and other similar activities. Signs may be portable. Temporary roll-up warning signs shall not be used on I-95. All signs must be removed or covered when not applicable. No Part-time lane closures can be made without prior written approval of the Project Engineer.

ALLOWABLE LANE CLOSURE SCHEDULES
FORT MCHENRY TUNNEL

April 1 through September 30:

TIME OF DAY	DAYS OF THE WEEK	ALLOWED CLOSURES
9:00AM – 2:00PM	Monday – Thursday	Single Lane Closure
7:00PM – 5:00AM	Monday – Thursday	Single Lane Closure
9:00AM – 12:00 Noon	Friday	Single Lane Closure
9:00PM – 9:00AM	Friday & Saturday	Single Lane Closure
9:00PM – 5:00AM	Sunday	Single Lane Closure
10:00PM – 5:00AM	Monday – Thursday	Double Lane Closure**

October 1 through March 31:

TIME OF DAY	DAYS OF THE WEEK	ALLOWED CLOSURES
9:00AM – 3:00PM	Monday – Thursday	Single Lane Closure
7:00PM – 5:00AM	Monday – Thursday	Single Lane Closure
9:00AM – 12:00 Noon	Friday	Single Lane Closure
7:00PM – 9:00AM	Friday & Saturday	Single Lane Closure
7:00PM – 5:00AM	Sunday	Single Lane Closure
10:00PM – 5:00AM	Sunday– Thursday	Double Lane Closure */**

* Double lane closures on Sundays, in areas with only three lanes, must be coordinate with and approved by the Administrator.

**A total closure may occur with approval from MdTA in one direction along the mainline in 15-minute intervals for installation of overhead sign structures and HMLP.

ALLOWABLE LANE CLOSURE SCHEDULE
I-95 SOUTH OF BALTIMORE CITY LINE

TIME OF DAY	DAYS OF THE WEEK	ALLOWED CLOSURES
9:00AM – 2:00PM	Monday – Thursday	Single Lane Closure
9:00PM – 5:00AM	Monday – Thursday	Single Lane Closure
9:00AM – 12:00 Noon	Friday	Single Lane Closure
9:00PM – 9:00AM	Friday & Saturday	Single Lane Closure
9:00PM – 5:00AM	Sunday	Single Lane Closure
10:00PM – 5:00AM	Sunday– Thursday	Double Lane Closure */**

* Double lane closures on Sundays, in areas with only three lanes, must be coordinate with and approved by the Assistant District Engineer.

**A total closure may occur with approval from SHA in one direction along the mainline in 15-minute intervals for installation of overhead sign structures and HMLP.

ALLOWABLE LANE CLOSURE SCHEDULES
BALTIMORE CITY STREETS

TIME OF DAY	DAYS OF THE WEEK	ALLOWED CLOSURES
9:00 AM – 4:00 PM	Monday – Friday	Single Lane/ Shoulder Closure
6:00 PM – 7:00 AM	Monday – Friday	Single Lane/ Shoulder Closure

No lane closures are permitted on Holidays, or the day preceding and following the Holidays indicated below unless otherwise indicated:

New Years Day
Good Friday
Easter Sunday
Memorial Day
Independence Day
Labor Day
Thanksgiving Weekend (Tuesday through Monday)
Christmas Day (December 23 through December 27)

If a Holiday happens to fall on a Thursday, Friday or Monday, no closures will be permitted during that weekend.

On Monday of each week, the Contractor shall provide Engineer with a complete list of anticipated lane closures for the following fourteen (14) calendar day period and must allow the MdTA fourteen (14) calendar days advanced notification of lane and ramp closures.

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 be in writing and shall require written approval from the Engineer at least seventy-two (72) hours prior to implementing the change. The Contractor shall submit a copy of the original work restrictions with the written request.

No lane or shoulder closures will be permitted without written approval of the Engineer. No lane or shoulder closures other than those identified on the Maintenance of Traffic plan sheets will be permitted in either direction from two hours before to two hours after a scheduled event at M & T Bank Stadium (Ravens) and/or at Oriole Park at Camden Yards and/or other events that may attract high volumes of traffic to Baltimore City along the I-95 corridor. For estimating purposes the number of MOT impacting events shall be assumed as 10 home games at M & T Bank Stadium per year, 82 home games at Oriole Park at Camden Yards per year, and 5 events total per year at other locations. The Contractor shall verify event schedules with Baltimore City and the Maryland Stadium Authority.

The Contractor will not be permitted to use any portions of the existing roadway or interfere with or impede the free flow of traffic in any manner (in addition to the lane closures, lane shifts, etc. shown on the plans)
during prohibited hours. All existing tunnel bores and lanes of traffic must be completely open during these hours.

Temporary lane/ramp closures will not be permitted during periods of falling precipitation, in heavy fog or otherwise poor visibility, or in the event of emergencies such as serious traffic accidents or unusually severe traffic congestion, as directed by the Engineer.

When a lane or shoulder closure is in effect, except for long term closures involving temporary concrete barrier, work shall begin within one hour after the lane or shoulder is closed. Any delay longer than one hour with no work in progress shall require the Contractor to remove the lane or shoulder closure at no additional cost to the Authority. The Contractor's Certified Traffic Manager

shall attend pre-construction meetings and shall discuss traffic control and the Traffic Control Plan including procedures to be implemented for lane closures.

All lane closures shall be in conformance with the approved TCP and under the direction of the Contractor's Certified Traffic Manager and the Engineer. All lane and shoulder closures shall be restored at the end of the closure period and no travel lanes shall be reduced to less than eleven (11) feet along I-95 or I-695 ramps from I-95, 10.5 feet along Caton Avenue and Joh Avenue, not including buffers. All other roadways shall be maintained at 10.5 feet or as directed by the Engineer. Prior to opening the closed lane or shoulder, the Contractor shall clear the lane or shoulder of all material, equipment, and debris.

No equipment, material or debris shall be stored or permitted to stand in open areas closer than thirty (30) feet from where traffic is being maintained unless protected by traffic barriers. The Contractor's employees shall not park their vehicles within the right-of-way of the through highway, unless written permission for an exception is given by the Engineer.

Failure to restore 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.

ELAPSED TIME, MINUTES	DEDUCTION
1-5	$75.00
Over 5	$75.00 per minute (in addition to the original 5 minutes)

Lanes shall be closed in a 15:1 ratio of width to height when signs or HML or other material is raised off of the ground and not secured to a base. Thus a 100' HMLP held vertically will require a 15' wide closure on all sides of the HMLP from its lift position and its permanent base until it is secured.

Work along the Northbound C-D road shall be staged such that in the event of an emergency requiring the use of the Truck Inspection Station, the work area may be covered with steel plates and the C-D road opened immediately to traffic. The C-D road shall remain open to traffic for as long as the emergency exists. Steel plates shall be of sufficient thickness to support the loads without excessive or permanent bending. They shall be securely fastened to the existing pavement so that they shall not move. Asphalt wedges shall be provided to reduce the edge bump. Temporary asphalt patches shall be provided and maintained as needed so that traffic can maintain speed.

104.02.04 MEASUREMENT AND PAYMENT.

ADD: The following:

All Maintenance of Traffic costs for installation, maintenance, removal of traffic control and for materials and labor associated with Part-time temporary lane closures shall be incidental to the "Maintenance of Traffic" pay item. Part-time temporary lane closures are defined as closures other than those detailed in the Maintenance of Traffic plan sheets and Detour plan sheets.

(a) DELETE: The entire section.

INSERT: The following:

All equipment, devices, labor, tools, material, and incidentals necessary for Part-time Lane Closures and/or Moving/Mobile Operations will not be measured but will be paid for at the Contract Lump Sum price. If Contract pay items are provided, they shall only be used for items required for long term MOT as shown on the plans.

ADD: The following:

104.02.04.03 Temporary C-D Road Openings will be measured and paid for at the Contract unit price per each. The payment will be full compensation for all steel plates, asphalt, temporary pavement markings, MOT devices, materials, labor, equipment, tools, and incidental items necessary to complete the work.

SECTION 104 — MAINTENANCE OF TRAFFIC

104.08 TEMPORARY TRAFFIC SIGNS (TTS)

162 **DELETE:** 104.08.02 MATERIALS in its entirety.

INSERT: The following.

Wood Sign Supports	921.05 and 921.06
Reflectorization	950.03
Signs	950.08
Portable Sign Supports, Composite Aluminum Signs, Plastic Signs, and Flexible Roll Up Signs	As approved by the Office of Traffic and Safety

104.08.03 CONSTRUCTION.

163 **DELETE:** The fourth paragraph on this page, "Fabricated wood signs...of 0.125 in. thick." in its entirety.

INSERT: The following.

Fabricated aluminum signs to be mounted on wood posts shall have the following minimum thickness.

LONGEST DIMENSION OF SIGN in.	MINIMUM THICKNESS in.
≤ 12	0.040
12+ to 24	0.063
24+ to 36	0.080
36+ to 48	0.10
> 48	0.125

Composite aluminum, plastic, or flexible roll up signs shall only be used on those portable supports that are approved to hold that sign material by the Maryland State Highway Administration (SHA), Office of Traffic and Safety. The minimum thickness of composite aluminum signs, supported on portable sign supports, shall be 0.08 in.

TTS for this project shall be fabricated with fluorescent orange high performance wide angle retro-reflective sheeting as specified in Sections 950.03.02. Fabricated wood signs

shall not be used. Sheet aluminum signs shall not be used on portable sign supports. Signs on portable sign supports may be fabricated from flexible roll-up, Alpolic or Dibond backing material.

All TTS backing material used on this project shall be on the SHA, Office of Traffic and Safety's Approved Products List for temporary traffic control devices and miscellaneous items

For TTS mounted on existing or temporary concrete barrier, the Contractor shall design and build barrier/parapet mounted supports for TTS. Temporary support designs shall be submitted to the Engineer for approval prior to fabrication and use.

104.08.04 MEASUREMENT AND APYMENT

INSERT: The following

Use of Temporary Traffic Signs (TTS) in conjunction with Temporary Lane Closures, including Moving/Mobile Operations (Part-time Lane Closures), will not be measured for payment but will be paid for as part of the Contract Lump Sum Price for Maintenance of Traffic.

SECTION 104 – MAINTENANCE OF TRAFFIC

DELETE: Section 104.12 DRUMS FOR MAINTENANCE OF TRAFFIC in its entirety.

INSERT: The following.

104.12 DRUMS FOR MAINTENANCE OF TRAFFIC.

104.12.01 DESCRIPTION. This work shall consist of furnishing and placing drums and maintaining in like new condition. The drums shall be located as specified in the Contract Documents or as directed by the Engineer.

104.12.02 MATERIALS.

Reflectorization	950.03.04
Plastic Drums	As approved by the Office of Traffic and Safety

Drums shall be manufactured of low density polyethylene (PE) to withstand impact without damage to themselves or vehicles. The drum shall have a height of 36 in. and a minimum diameter of 18 in. Drums may have one or more flat sides as long as the minimum 18 in. diameter is satisfied. The reflective stripes shall be horizontal, circumferential, orange and white, 6 in. wide, two each of white and orange alternating with the top stripe being orange.

High performance wide angle white and fluorescent orange sheeting shall be used on drums.

All drums shall conform to NCHRP Report 350 criteria for test Level 3.

104.12.03 CONSTRUCTION. Drums shall be adequately weighted with bags of sand or sand filled bases to keep them from moving. Sandbags, with no other attachments, shall rest on the base of the drum.

The Contractor will be permitted to neatly stencil their name or identification mark at the bottom of the nonreflective portion of the drum in maximum 2 in. high letters. No other markings or writings will be permitted on the vertical side of the drum.

Drums shall always be placed to form the taper and the tangent on roadways that have a posted speed of 55 MPH for nighttime lane or shoulder closures where no overhead lighting is present, unless otherwise approved by the Project Engineer.

Drums damaged by traffic shall be replaced within four hours after the Contractor is notified.

104.12.04 MEASUREMENT AND PAYMENT. Drums for Maintenance of Traffic will be measured and paid for once at the Contract unit price per each. The payment will include reflectorization, setting, resetting, removing, sandbags, maintenance, cleaning of drums to
like new condition, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Where drums have been set and are subsequently damaged by traffic, and the Engineer determines that they are not repairable, they shall be replaced and will be measured and paid for at the Contract unit price.

Use of Drums for Maintenance of Traffic in conjunction with Temporary Lane Closures, including Moving/Mobile Operations (Part-time Lane Closures), will not be measured and will be paid for as part of the Contract Lump Sum Price for Maintenance of Traffic.

SECTION 104 – MAINTENANCE OF TRAFFIC

104.18 TRAFFIC MANAGER (TM).

104.18.03 CONSTRUCTION.

DELETE: The third sentence of the third paragraph, "When the TCP…"

INSERT: The following:

When the TCP is in place, the TM shall be responsible for making daily inspections during hours of operations, a minimum of one night inspection per week, and shall be available by cell phone 24 hours a day, 7 days a week, with a maximum response time of one (1) hour. The TM shall be present for all set-up and removal of temporary lane closures, including Moving/Mobile Operations (Part Time Lane Closures).

CATEGORY 100
PRELIMINARY

SECTION 104 — MAINTENANCE OF TRAFFIC

104.23 PROTECTION VEHICLE (PV).

104.23.01 DESCRIPTION. This work shall consist of furnishing PVs as specified in the Contract Documents or as directed by the Engineer.

The PV shall consist of a work vehicle with approved flashing lights (per Standards MD 104.01-18 and 104.01-21), 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. The size of the work vehicle and the method of attachment shall be as specified in the TMA/TTMA manufacturer's specifications, as tested under NCHRP Report 350 at Test Level 3.

No part of the TMA/TTMA shall be designed to intrude under the support vehicle during impact or require a safety clearance under the support vehicle which extends forward of the rear axle.

Provide an arrow panel (arrow mode for multilane roadways and caution mode on two-lane, two-way roadways) in accordance with specification 104.07.03.

General. The work vehicle shall have the proper ballast as recommended by the TMA/TTMA manufacturer. The ballast shall be firmly secured to prevent movement during impact.

All TMA/TTMA exposed steel shall be primed and painted yellow. The undercarriage and support frame may be primed and painted black. All welding shall be done by or under the direct supervision of a certified welder.

The standard rear facing surface of the TMA/TTMA shall have an inverted "V" chevron pattern formed by alternating 4 in. wide black and yellow stripes as shown in Standard No. MD 104.01-21. The sides of the TMA/TTMA shall be bordered by a 4 in. red and white reflective tape as shown on Standard No. MD 104.01-18.

The TMA lighting system shall include brake lights, tail lights, turn signals, and ICC bar lights. The TTMA trailer shall conform to Maryland Motor Vehicle Law governing trailers. All wiring shall be protected and adequately supported.

Impact Performance. TMA/TTMAs manufactured prior to January 1, 2005 shall have passed NCHRP Report 350 Tests 50 and 51 Level 3. TMA/TTMAs manufactured after January 1, 2005 shall have passed NCHRP Report 350 Tests 50, 51, 52, and 53 Level 3.

Dimensions.

(a) Road clearance for the TMA/TTMA shall be 12 ± 1 in. or as specified by the manufacturer.

(b) Total weight of the TMA, exclusive of the work vehicle, shall not exceed 2100 lb unless it is trailer-mounted.

Durability. The manufacturer shall ensure that travel vibration, in either a vertical (for TMA) or horizontal position, will not affect the performance of the work vehicle or the TMA/TTMA.

Certifications. The Contractor shall provide a certification that the TMA/TTMA is in good working order, has not been damaged, and conforms to the requirements of the manufacturer's specifications (model number, roll ahead distance, truck weight, etc.) and the date of manufacture.

The TMA/TTMA shall be certified by the manufacturer that any moisture penetration will not impede the energy impact absorption properties, or add significantly to the weight of the TMA/TTMA.

Tilting. An electrically powered tilt system shall be provided to facilitate the tilting of the TMA cartridge to a 90 degree position from horizontal. The unit shall have a locking device to secure the TMA system in the vertical position. The completed tilt system shall be factory assembled.

104.23.02 MATERIAL. Not applicable.

104.23.03 CONSTRUCTION. Not applicable.

104.23.04 MEASUREMENT AND PAYMENT. Protection Vehicles will be measured and paid for at the Contract price per unit day. A unit day shall consist of any approved usage within a 24 hour calendar day period. If a protection vehicle is used for part of a day, it will be measured as a unit day, regardless of how many times it is relocated. The payment will be full compensation for the complete protection vehicle, including the truck mounted attenuator/trailer truck mounted attenuator and arrow panel, licensed work vehicle operator, connecting and disconnecting the attenuator to from the work vehicle, transporting and relocating the protection vehicle, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

CATEGORY 100
PRELIMINARY

SECTION 106 — HOT MIX ASPHALT (HMA) FOR MAINTENANCE OF TRAFFIC

Refer to Section 106 of the Standard Specifications.

106.01 Description.

ADD: The following:

This item shall be used for all temporary patching (bridge and roadway) throughout the project.

106.04 Measurement and Payment.

ADD: The following:

Use of Temporary Lane Closures in conjunction with Hot Mix Asphalt (HMA) for Maintenance of Traffic, including Moving/Mobile Operations (Part-time Lane Closures), will not be measured and will be paid for as part of the Contract Lump Sum Price for Maintenance of Traffic.

CATEGORY 100
PRELIMINARY

184 **DELETE:** SECTION 106 — HOT MIX ASPHALT (HMA)FOR MAINTENANCE OF TRAFFIC in its entirety.

INSERT: The following.

SECTION 106 — HOT MIX ASPHALT (HMA) FOR MAINTENANCE OF TRAFFIC

106.01 DESCRIPTION. This work shall consist of utilizing HMA pavement for maintenance of traffic within the existing facilities as specified in the Contract Documents or as directed by the Engineer.

106.02 MATERIALS.

Tack Coat (Rapid Setting)	904.03
HMA	904.04
Crack Filler	911.01 & 911.01.01
Production Plant	915

106.03 CONSTRUCTION. Refer to the applicable portions of 504.03.

106.04 MEASUREMENT AND PAYMENT. Hot Mix Asphalt for Maintenance of Traffic will be measured and paid for at the Contract unit price per ton. The payment will be full compensation for all tack coat, crack filler, hauling, placing, compacting, maintaining, removal, rehandling, reworking and disposal, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

When hot mix asphalt is part of any base or pavement course used for the construction and maintenance of temporary detours, approaches, crossings, and widenings, the item of work will be measured and paid for in conformance with 504. Refer to 504.04, which states that "placement and removal of the temporary tie-in where hot mix asphalt is being applied to the traveled way carrying traffic will not be measured but the cost will be incidental to the Contract unit price for Hot Mix Asphalt".

Hot mix asphalt for maintenance of traffic when used for temporary and permanent patching at pipe culverts and utilities will not be measured but the cost will be incidental to the Contract unit price for Pipe Culvert or Utility item.

CATEGORY 100
PRELIMINARY

SECTION 107 — CONSTRUCTION STAKEOUT

Refer to Section 107 of the Standard Specifications.

107.03.06 Utilities.

DELETE: The second paragraph in its entirety.

INSERT: The following:

Intersection Utility Stakeout. The Contractor shall notify the appropriate agencies listed below to ensure all necessary utility stakeouts and a walk-through are performed a minimum of three (3) weeks prior to the Contractor's anticipated beginning of any underground work.

INSERT: The following to the last paragraph:

The Contractor is responsible for maintaining the layout prior to the walk-through.

107.04 Measurement and Payment.

ADD: The following:

Use of Temporary Lane Closures in conjunction with Construction Stakeout, including Moving/Mobile Operations (Part-time Lane Closures), will not be measured and will be paid for as part of the Contract Lump Sum Price for Maintenance of Traffic.

CATEGORY 100
PRELIMINARY

SECTION 107 — CONSTRUCTION STAKEOUT

107.03 CONSTRUCTION.

107.03.04 Control Stakes.

186 **ADD:** The following as the second paragraph.

The Engineer as specified in 107.03.01 will provide control stakes and preserve those stakes for the correct layout and inspection activities. When the Contractor utilizes construction equipment guided by Global Positioning System (GPS) and Robotic Total Station (RTS), the Contractor shall set additional stakes directed by the Engineer for horizontal and vertical controls as necessary for the correct layout and inspection of the work.

107.03.08 Subgrade, Subbase and Base Controls.

187 **ADD:** The following after the second paragraph.

(a) Automated Machine Control. The Contractor may elect to use construction equipment guided by a Global Positioning System (GPS) or Robotic Total Station (RTS) equipment in the placement of subgrade, subbase, base courses, and other roadway materials.

(1) The Contractor utilizing this approach shall develop and submit a Digital Terrain Model (DTM) to the Engineer for review. The Contractor using the Contract Documents and any Administration furnished DTM data, if available, shall independently develop the DTM. To use any Administration furnished DTM data, the Contractor shall release the Administration and its designers from all liability for the accuracy of the data and its conformance to the Contract Documents furnished by the Administration.

(2) The Contractor shall establish primary control points at appropriate intervals and at locations along the length of the project and outside the project limits and where project work is performed by the Contractor beyond the project limits as required at intervals not to exceed 1000 ft. The horizontal position of these points shall be determined by static GPS sessions or by traverse connection from the original base line control points. The elevation of these control points shall be established using differential leveling from the project benchmarks, forming closed loops where practical. A copy of all new control point information shall be provided to the Engineer prior to construction activities. The Contractor shall be responsible for all errors resulting from their efforts and shall correct the deficiencies to the satisfaction of the Engineer and at no additional cost to the Administration.

(3) The Contractor shall provide control points and conventional grade stakes at critical points such as, but not limited to, all PC's, PT's and super elevation points begin full super, half-level plane inclined, etc., along with other critical points required for the construction of structures and utility relocation or coordination. The Engineer will determine whether additional control points and stakeout are necessary.

(4) The Contractor shall provide adequate control points, stationing and stakes for coordination activities involving environmental agencies, utility companies and Contractors on adjacent projects at no additional cost to the Administration.

(b) **Real-Time Kinematic (RTK) GPS.** RTK GPS may be utilized to control equipment and shall be within tolerances of $\pm$0.1 ft.

(c) **RTS Positioning.** RTS positioning shall be utilized where grade tolerances are less than $\pm$0.1 ft. The index error of the vertical circle of the RTS shall be checked and adjusted as necessary prior to each day's operations. Each work session shall begin and end by checking between adjacent control points.

(d) **Grade Busts.** Grade busts and all associated quantity adjustments or errors resulting from the Contractor's activities shall be corrected by the Contractor to the satisfaction of the Engineer at no additional cost to the Administration.

(e) **Utilizing Automated Controlled Equipment.** When the Contractor chooses to utilize automated controlled equipment, the Contractor shall furnish a GPS Rover instrument for Administration use during the project, along with 8 hours of formal training on GPS/RTS and the Contractor's systems. The Contractor shall provide a surveyor to perform verification when discrepancies arise.

(f) **Test Sections.** The Contractor shall perform test sections with both GPS and RTS systems to demonstrate they have the capability, knowledge, equipment, and experience to properly operate the systems and achieve acceptable tolerances. If the Contractor fails to demonstrate this ability, the Contractor shall conform to the requirements for the conventional stakeout.

CATEGORY 100
PRELIMINARY

SECTION 111 — DIGITAL CAMERA

111.01 DESCRIPTION. This work shall consist of furnishing a new or like new digital camera with a Color Inkjet Printer for use by Administration personnel. The digital camera 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.

111.02 MATERIALS.

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

(1) Windows 2000, ME, XP compatible operating system

(2) Photo Suite, Photo Deluxe, Picture Works, Photo Shop, or similar Photo Managing Software

(3) 4.0 megapixel image resolution (minimum)

(4) 3X optical zoom (minimum)

(5) Two (2) sets of rechargeable batteries

(6) SmartMedia Card or memory stick (512 MB minimum)

(7) Pop-up or built-in flash modes

(8) All items required for quick downloading

(9) Auto-quick focus

(10) Lens Cover, Shoulder Strap, and Carrying Case

(11) AC adapter and Battery Charger

(b) **Color Inkjet Printer.** The printer shall conform to the following minimum requirements;

(1) Resolution of 2400 x 1200 DPI (dots per inch).

(2) Print speed of 17 PPM (pages per minute) for black and white and 13 PPM for color.

(3) Memory 8 MB.

(4) Duty cycle of 5,000 pages/month.

Office-jets and Bubble-jets will not be accepted.

111.03 CONSTRUCTION. Not applicable.

111.04 MEASUREMENT AND PAYMENT. The digital camera will not be measured but the cost will be incidental to the Contract price for Maintenance of Traffic unless otherwise specified in the Contract Documents. If the 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 within eight hours after the Engineer notifies the Contractor.

Ownership of the camera and printer will remain with the Contractor. The Administration assumes neither responsibility nor liability for the condition of the camera when returned.

CATEGORY 100
PRELIMINARY

198 **DELETE: SECTION 111 THRU 119 — RESERVED**

INSERT: SECTION 111 AND 112 — RESERVED

199 **ADD:** The following.

SECTION 113 — SAMPLING DEVICES AND TESTING EQUIPMENT

113.01 DESCRIPTION. This work shall consists of furnishing and maintaining Sampling Devices and Testing Equipment with accessories that are required to sample and test all materials used on the project. The Sampling Devices and Testing Equipment shall be of the quality, quantity and type required to perform the sampling and testing requirements of the Administration's Materials Manual, including all inserts, Sample Frequency Guide and Special Provisions, including policies, directives and all other revisions made unless otherwise directed by the Engineer. The sampling and testing equipment will be used by Administration employees as directed by the Engineer. The Contractor shall be responsible for maintaining the testing equipment in good working condition and all equipment will be approved by the Administrations' Office of Materials and Technology (OMT). The sampling devices and testing equipment shall be furnished to the Engineer a minimum of five days prior to commencement of work on the project and shall remain in the Engineers' possession until all sampling and testing on the project is completed. At the completion of the project all sampling devices and testing equipment shall be returned to the contractor. For questions concerning this equipment contact OMT Materials Management Division at 410-321-4100.

113.02 MATERIALS. Sampling devices and containers required by the Administrations' Materials Manual, including all inserts, Sample Testing and Frequency Guide and this Specification. The quantity will be designated by the Engineer at the preconstruction meeting.

113.03 CONSTRUCTION.

Testing Equipment Requirements. The Contractor shall furnish and maintain equipment and accessories required to perform the tests required for the items of work in the Contract Documents as specified in the most recently published cited standards. The Contractor shall maintain the equipment in good working condition and a written certification shall be submitted to SHA stating when the testing equipment was last calibrated and/or inspected by an Administration approved testing agency. Equipment shall then be calibrated at the frequency required for that type of equipment as specified in the test method and AASHTO R18.

Unless otherwise specified, all testing equipment and accessories furnished by the Contractor shall remain the property of the Contractor at the completion of the project.

If any testing equipment or accessories become defective, are stolen, or for any other reason do not function as intended, it shall be replaced with an equal or better unit at no additional cost to the Administration within eight hours after the Contractor is notified by the Engineer.

113.03.01 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. The Contractor may contact OMT Materials Management Division at 410-321-4100 for 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 (ability to hold min. of 35 lb).

(2) Screw top cans - 1 qt.

(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.

(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 minimum capacity of 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 minimum surface of 1 yd^2.

(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 ft^3.

(2) Compaction rammers, 5.5 and 10 lb.

(3) 12 in. straightedge.

(4) Scale or balance conforming to M 231, Class G 100, having 100 lb minimum capacity.

(5) Two 10 in. pie pans.

(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.

(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) Measuring tape, 25 ft minimum.

(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.

(7) Masonry nails or equivalent.

(8) Thermometers (50 to 550°F).

(9) Square end shovel or 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
Slump	T 119
Air Content - Pressure Method	T 152,
Air Content - Volumetric Method	T 196
Sampling	T 141
Temperature	T 309

(1) Air meter, pressure type for conventional concrete and 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 scoop.

(8) Trowel.

(9) 3/8 in. rod for latex cylinder.

(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) 6 x 12 in. cylinder molds.

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

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

SECTION 114 THRU 119 — RESERVED

CATEGORY 300
DRAINAGE

SECTION 300-01 — INSPECTION OF ROADWAY DRAINAGE STRUCTURES

300-01.01 DESCRIPTION.

Locations of roadway drainage structures to be inspected are those shown on the Plans within the limits of the closed roadway section along I-95 and its ramps as shown within the limits of work on the Plans. This Special Provision outlines the procedure for a Roadway Drainage Structure Inspection. Typical repairs that may be recommended are indicated in "Section 300-02 – Roadway Drainage Structure Repairs". The purpose of the inspection is to evaluate the structural integrity of the roadway drainage structures, recommend rehabilitation procedures and/or provide documentation for future reference. The Contractor shall submit to the Engineer for his approval a Structure Identification Number System for the roadway drainage structure. If a structure is not located on the plans, the Contractor will assign an appropriate number for inspection records.

300-01.02 SCHEDULE OF OPERATION.

The Contractor shall provide labor and equipment to the Engineer for Roadway Drainage Structure Inspection. The Engineer (Inspector) will be furnished by the Authority and the Contractor's personnel shall assist him (her). The Contractor shall schedule the inspection work in continuous periods to efficiently utilize the Engineer assigned for the inspections. All inspections shall be completed prior to beginning repairs.

During the inspection, the Engineer will list the repairs. The Engineer will advise the Contractor as to the method of repair.

The Contractor shall submit the following Task Plan seven (7) days in advance of work performance for the Engineer's approval during weekly meetings with the Engineer.

The Task Plans shall include, but not limited to:

1. Weekly Meeting Agenda that identifies issues.

2. Roadway Drainage Structure Locations with identification numbers that will be inspected and repaired.

3. Approved Maintenance of Traffic Permits, which will include the Contractor's selected Plan for Traffic Control.

4. A list containing type and priority of repairs.

5. Time Schedule.

300-01.03 LABOR, EQUIPMENT, AND TOOLS FOR INSPECTION.

At a minimum, the following labor, tools, and equipment needed for inspection shall be provided by the Contractor for the use by the Engineer.

Labor:
One (1) Mason and one (1) Laborer.

Equipment:
Suitable equipment to remove the grates.
Pump to drain the inlet.
Suitable equipment to clean the inlet.

Tools for Cleaning:
Wisk broom - for removing loose dirt and debris.
Wire Brush - for removing loose mortar.
Flat Bladed Screwdriver - for general cleaning.
Shovel - for removing dirt and debris from inlet.

Tools for Inspection:
Pocket Knife.
Chipping Hammer - for loosening dirt and mortar.
Tool Belt - for convenient holding and access of small tools.

Tools for Visual Aid:
Flashlight and Quartz portable halogen work lamps with necessary extension cords.
Inspection Mirrors - for inaccessible areas.

Tools for Measuring:
Pocket Tape - (25 foot).

300-01.04 INSPECTION PROCEDURES.

Inspections will be performed by the MdTA Engineer or his representative.

Inspection will include, but is not limited to, the following items: frames, grates, pipe ends, inlet walls, ladder rungs, and concrete around the inlet.

A set of Inspection Forms shall be used to document the inspection for use in each structure. The Contractor shall submit a form to the Engineer for his approval and shall furnish blank forms for the Engineer to use.

Based on the Inspection Report and the Repair Schedule, the Engineer will direct the Contractor as to what repairs are to be done and the payment item(s). See Section 300-02.

300-01.05 MEASUREMENT AND PAYMENT.

The Method of Measurement shall be based on the actual number of structures inspected by the MdTA Representative for the pay item:

"Inspection of Roadway Drainage Structure"

The above item will be measured and paid for at the Contract Unit Price Bid per Each Structure Inspected. Payment will be full compensation for all labor, equipment, and incidentals necessary to complete the work.

Maintenance of Traffic this item will not be measured but the cost will be incidental to the Lump Sum price for "Maintenance of Traffic".

CATEGORY 300
DRAINAGE

SECTION 300-02 — ROADWAY DRAINAGE STRUCTURE REPAIRS

300-02.01 DESCRIPTION.

Locations and type of Roadway Drainage Structures to be repaired shall be as indicated in the Plans, will be determined from the Roadway Drainage Structure Inspection Reports or as directed by the Engineer. Repairs may include, but are not limited to, replacement of grates and frames, adjustments to grates and frames, replacing bricks and/or mortar, pneumatically applied mortar to inlet walls, repair of concrete collar, repair of inlet walls or floors, or grouting. Replacement of inlets shall be paid for under the appropriate new inlet or replace inlet item. More than one type of repair may be needed for an inlet. In addition, the elevation of the grate may have to be adjusted to match the new pavement. This Section also includes placing brick or other approved plugs at both ends of storm drain pipes and completely filling the pipe with flowable backfill.

300-02.02 SCHEDULE OF OPERATION.

The Contractor shall provide to the Engineer a Schedule for the repairs for Roadway Drainage Structure(s) based on the Inspection Report.

The Contractor shall submit the following Task Plan seven (7) days in advance of work performance for the Engineer's approval during weekly meetings with the Engineer.

The Task Plans shall include but are not limited to:

1. Weekly Meeting Agenda that identifies issues.

2. Roadway Drainage Structure locations to be repaired with identification numbers that will be inspected and repaired.

3. Approved Maintenance of Traffic Permits, which will include the Contractor's selected Plan for Traffic Control.

4. A list containing type and priority of repairs.

5. Time Schedule.

300-02.03 MATERIALS.

All materials used for the Repair of Roadway Drainage Structures shall be in accordance with the latest SHA Standards or as approved by the Engineer.

In addition:

Flowable Backfill for Utility Cuts	314.02
Brick	903.02
Mortar	903.06

300-02.04 CONSTRUCTION.

300-02.04.01 Removal. Blasting will not be permitted without the written approval of the Engineer. Adjacent foundations (signs, lighting, structures, etc.) shall be protected from under cutting and loss of lateral support. If the Contractor encounters a situation where he will be excavating in the vicinity of an existing foundation, he shall notify the Engineer prior to starting excavation and receive direction from the Engineer on how he should proceed. Removal of inlet shall include removal of the pipe to the nearest section joint.

300-02.04.02 Use of Removed Masonry. Masonry material may be broken and used in the work. The broken material shall be considered as rock in conformance with 204.02.01. Material determined to be unsuitable by the Engineer shall be disposed of as excess or unsuitable material at no additional cost to the Authority.

300-02.04.03 Adjustment of Grate Elevations. Adjustments of elevations of grates on the shoulders of the mainline or ramps (potential traffic bearing areas), shall be adjusted to match new pavement surface elevations by concrete (cast-in-place or precast) collars.

300-02.04.04 Clean Existing Inlets. Cleaning of existing inlets shall include removal and disposal of all debris, dirt, etc. from within the structure and all adjacent pipe sections for a length of 4 feet along the pipe. The Contractor may have to perform this work prior to "Inspection of Roadway Drainage Structures". Care shall be taken to not damage the structure during removal operations. Water may have to be pumped from some structures to facilitate this work. Contractor shall only be paid once for cleaning each inlet. If inlet becomes clogged or has to be cleaned again for access, all costs will be incidental to the initial cleaning.

300-02.04.05 Repair Concrete Around Inlet. Deteriorated concrete aprons around the inlet will be removed and patched or replaced at the direction of the Engineer.

300-02.04.06 Repair Existing Inlet. Deteriorated portions of the existing inlet will be removed and the inlet will be patched with either cast-in-place concrete or pneumatically applied mortar as directed by the Engineer.

300-02.04.07 Bulkhead and Abandon Existing Pipe. All storm drain pipes indicated in the plans or as directed by the Engineer to be abandoned in place shall be bulk headed in a neat manner. Pipe ends shall be cleaned to ensure proper bond between pipe and masonry. Any standing water shall be removed from the pipe.

Both ends of a pipe measuring 24 inches in diameter or larger, shall be plugged with a double course of brick mortared in place. Both ends of a pipe measuring 22 inches in diameter or smaller shall be plugged using Concrete Mix No. 2 or brick masonry.

A hole shall be cut or formed near the top of the high end of the pipe and flowable fill pumped into the pipe until it is as full as practicable. If the high end of the pipe is in an inlet that is being removed/abandoned, the bulkhead may be omitted and the inlet filled with flowable fill to the subgrade of the roadway.

300-02.04.08 Secure Inlet Grates. All grates that will have traffic on them as a temporary condition during MOT, or within three (3) feet of traffic, shall have the grates temporarily attached to the frame. Attachment shall be secure and tight. Grate will not move under traffic or become loose over time. Method of attachment shall be submitted by the Contractor and approved by the Engineer prior to installation of attachment and traffic placed on the grate. Attachment must be removed after traffic will no longer run over the inlet or may be left in place at the discretion of the Engineer. An attachment that prevents access into the inlet for future maintenance will not be accepted. Attachment of grates will not be measured and all costs will be incidental to other pertinent items.

300-02.05 MEASUREMENT AND PAYMENT.

"Adjust Existing Inlet" will be measured and paid for at the Contract Unit Price per Each. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

"Repair Concrete Around Inlet" will be measured and paid for at the Contract Unit Price per Square Yard. The payment will be full compensation for all disposal, material, curing, labor, equipment, tools, and incidentals necessary to complete the work.

"Repair Existing Inlet" will be measured and paid for at the Contract Unit Price per Square Foot. The payment will be full compensation for all disposal, material, curing, labor, equipment, tools, and incidentals necessary to complete the work.

"Bulkhead and Abandon Existing Pipe" will be measured and paid for at the Contract Unit Price per Linear Foot. For Bidding purposes, the pipes shall be assumed to be 18 inches in diameter. The payment will be full compensation for masonry, bulkheads, flowable fill, pumps, material, curing, labor, equipment, tools, and incidentals necessary to complete the work. No additional payment will be made if the Contractor for his convenience eliminates the plug and fills the inlet with flowable fill.

Maintenance of Traffic for this item will not be measured but the cost will be incidental to the Lump Sum price paid for the "Maintenance of Traffic" pay item.

CATEGORY 300
DRAINAGE

SECTION 300-03 — CLEANING EXISTING INLETS, CONCRETE LINED DRAINAGE CHANNELS, CULVERTS, AND PIPES

300-03.01 DESCRIPTION. This work shall consist of cleaning drainage inlets, natural channels, grass lined channels, rip rap channels, concrete lined channels, culverts and pipes as specified in the Contract Documents or as directed by the Engineer.

300-03.02 MATERIALS. Materials for cleaning shall be as follows:

Potable water under pressure. No chemical cleaners will be permitted.

300-03.03 CONSTRUCTION. The Contractor shall remove all rubbish, leaves and sediment from inlets, pipe end sections, natural channels, grass lined channels, rip rap channels, and concrete drainage channels indicated in the Contract Drawings. Vegetation and sediment between joints of concrete drainage channel sections, between inlet frames, and concrete apron shall be completely removed to permit resealing of the joints.

During cleaning, of inlets, pipe end sections, and concrete drainage channels, the Contractor shall exercise utmost care to prevent damage to the existing structure surface. Pressure wash shall not be used to dislodge the debris and drive it into the pipes or channel, but shall only be used to dislodge any sediment remaining from the cleanup work and for final cleaning. The Contractor shall erect adequate debris shield to prevent runoff and debris from entering the roadway, median area, or the flow in the channel.

All debris, sediment, and vegetation removed during the cleaning process shall become the property of the Contractor and shall be disposed of in accordance with TC-6.11.

The Contractor shall install and maintain Erosion and Sediment Control Measures as indicated in the Erosion and Sediment Control Drawings for the project and the Project Specifications.

300-03.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for complete removal of all waste, sediment, and vegetation from inlets, drainage channels, joints between drainage sections and between inlet frame and concrete, hauling to the disposal site, disposal fees, all materials, labor, equipment, debris shield, tools, and incidental necessary to complete the work. This section shall be used for all types of waterways indicated in the Description and the following pay items shall apply.

300-03.04.01 Clean Existing Inlet will be measured and paid for at the Contract Unit Price per Each. This pay item shall **NOT** include the inlets cleaned for inspection under Section 300-01. Cleaning of those inlets shall be paid for under that bid item.

300-03.04.02 Clean Concrete Channel will be measured and paid for at the Contract Unit Price per Linear Foot measured along the center-line of the channel.

CATEGORY 300
DRAINAGE

SECTION 300-04 — STREAM DIVERSION

300-04.01 DESCRIPTION. Stream Diversion shall be maintained as detailed on the contract drawings, at locations directed by the Engineer to divert flow around the construction area. The stream diversion shall be used throughout the duration of the construction as required. When directed by the Engineer, stream diversion measures including Sand Bags and pumps shall be installed prior to construction and removed at the end of the work day.

300-04.02 MATERIALS. None.

300-04.03 CONSTRUCTION. The Contractor shall provide pumps with adequate capacity to divert the stream flow around the work area during construction and maintain a dewatered condition within the stream reach during construction.

300-04.04 MEASUREMENT AND PAYMENT. No measure of this item will be made, but payment will be made at the lump sum bid price. The lump sum bid price shall be full compensation for furnishing and installing all the materials and include all labor, tools, equipment and incidentals necessary to construct the diversion. The lump sum bid price shall also include all labor, tools, equipment and incidentals necessary for the removal of the diversion at the end of the work day.

CATEGORY 300
DRAINAGE

300-05 STORMWATER MANAGEMENT FACILITY

300-05.01 DESCRIPTION. The Contractor shall construct the Stormwater Management Facility in accordance with the Contract Documents and in compliance with MDE regulations and direction.

300-05.02 MATERIALS. Materials shall comply with pertinent sections of the Contract Documents.

300-05.03 CONSTRUCTION. The excavation, embankment, borrow, access road, weir wall, cutoff trench, dikes, pipes, rip rap, ditches, seeding, mulching and other items necessary for the facility shall be constructed as indicated in the Contract Documents, as directed by the Engineer, and as directed by MDE.

300-05.04 MEASUREMENT AND PAYMENT. The stormwater management facility will be measured and paid for under the pertinent pay items indicated in the Schedule of Prices. Any material, labor, or incidentals not specifically listed shall be considered incidental to the items listed in the Schedule of Prices.

CATEGORY 300
DRAINAGE
SECTION 300-06 IMPERVIOUS BACKFILL FOR CORE TRENCH

300-06.01 DESCRIPTION. This work shall consist of excavating a core trench along the length of the stormwater management pond embankments and constructing impervious core for stormwater management ponds as specified in the Contract Documents or as directed by the Engineer.

300-06.02 MATERIALS.

Pond Embankment Borrow	916

300-06.03 CONSTRUCTION. A cutoff trench shall be excavated under the proposed location of the stormwater management pond embankment. The trench shall have a minimum depth of 4 feet below existing grade and the principal spillway, have sides no steeper than 1:1, and have a minimum bottom width of 4 feet. The trench shall be located at the centerline of the stormwater management pond embankment.

An impervious clay core shall be placed in the cutoff trench and extend up to the specified elevation on the Contract Drawings. The clay core shall extend the full length of the pond embankment along the centerline. The top of the clay shall be level and a minimum of 4 feet wide with side slopes no steeper than 1:1. Additional dimension requirements shall be as specified in the Contract Documents. The impervious backfill material shall be placed in layers not exceeding 8 in. uncompacted depth continuous over the entire length of the fill. The minimum required density shall not be less than 95% of maximum dry density with a moisture content within plus or minus 2% as specified in T-99. The impervious clay core shall be placed concurrently with the outer shell of the embankment and the principal spillway.

300-06.04 MEASUREMENT AND PAYMENT. Impervious Backfill for Core Trench will not be measured but the cost will be incidental to other specified embankment items.

CATEGORY 300
DRAINAGE

300-07 STORMWATER MANAGEMENT (SWM) AS-BUILT CERTIFICATION

300-07.01 DESCRIPTION. An As-Built Certification by a Professional Engineer or Professional Land Surveyor licensed in the State of Maryland shall be submitted by the Contractor to the Authority to certify that the constructed Stormwater Management Facilities comply with the Contract Documents.

300-07.02 MATERIALS. Not applicable.

300-07.03 CONSTRUCTION. Upon completion of the Stormwater Management Facilities as specified in the Contract Documents, the Contractor shall submit to the Authority a signed As-Built Certification and As-Built Plan certifying compliance with the Contract Documents for the completed Stormwater Management Facilities. The submission of the As-Built Plan shall include a completed As-Built Check List, a copy of the Grading Plans, along with any and all sheets associated with the Stormwater Management Facilities (i.e. details, profiles, landscaping, structures, etc.). The As-Built Certification shall be signed by a registered Professional Engineer or Professional Land Surveyor with experience in designing Stormwater Management Facilities. The Professional Engineer or Professional Land Surveyor shall be an agent of the Contractor. The As-Built Plan shall include all information necessary to compare the actual constructed Stormwater Management Facilities to the Contract Documents. The As-Built Certification including the aforementioned attachments shall be sent to:

Mr. Doug Novocin, PE
Environmental Manager
Engineering Division
300 Authority Drive
Baltimore, Maryland 21222

A copy shall be sent to the MdTA Construction Project Engineer.

300-07.04 MEASUREMENT AND PAYMENT. Stormwater Management As-Built Certification shall not be measured but will be paid for at the Contract Lump Sum Price. The payment shall be full compensation for all necessary surveys, staking, documentation, drafting, and certification of As-Built Plans and for all material, labor, equipment, tools, instruments, and incidentals necessary to complete the work.

CATEGORY 300
DRAINAGE

SECTION 305 — MISCELLANEOUS STRUCTURES

305.03.05 Drainage Structures.

ADD to End of Section:

No. 57 aggregate will be used to fill excavation when an existing inlet is replaced with a new inlet. New pipe will be provided to attach the new inlet to the existing pipe that has been removed to a section joint. Cost of No. 57 aggregate and attachment pipe shall be incidental to the cost of the New Inlet.

It is anticipated that all concrete drainage structures shall be precast. Cast-in-place structures may only be used with the permission of the Engineer.

All new frames and grates that will be in traffic bearing areas (either permanent or temporary for MOT operations) shall be Ductile Iron and comply with ASTM A-536. Other castings (steps, covers, etc.) can comply with either A-536 or A-48 (Grey Iron Castings).

305.04 MEASUREMENT AND PAYMENT.

ADD to End of Section:

305.04.07 Replace Brick Inlet with Concrete Inlet shall be measured and paid for at the Contract unit price per each. The replacement inlets shall be assumed to be Standard Type S Inlet, Double Grate Tandem, minimum depth. The payment shall be full compensation for all concrete, masonry, precast units, frames, grates, pipe, joint filler material, excavation, disposal, No. 57 aggregate, all materials, tools, equipment, labor, and incidentals required to complete the work.

CATEGORY 300
DRAINAGE

SECTION 308 — EROSION AND SEDIMENT CONTROL

308.01 DESCRIPTION.

242 **DELETE:** The third paragraph, "The Contractor shall...Control Manager (ESCM)."

242 **DELETE:** 308.01.01 Standards and Specifications in its entirety.

243 **DELETE:** 308.01.02 Quality Assurance Ratings in its entirety.

INSERT: The following.

308.01.01 Erosion and Sediment Control Manager. Prior to beginning any work, the Contractor shall assign an employee to the project to serve in the capacity of Erosion and Sediment Control Manager (ESCM). The ESCM and the superintendent shall have successfully completed the Administration's Erosion and Sediment Control Certification Training for Contractors and Inspectors. This certification shall be current at all times. If the certification is expired or revoked for either person, the Contractor shall immediately replace the person with an appropriately certified person acceptable to the Administration. No work may proceed without the appropriate certified personnel in place.

308.01.02 Standards and Specifications. Erosion and sediment control measures shall be constructed and maintained 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. The Contractor shall keep a copy of the latest MDE Standards and Specifications for Soil Erosion and Sediment Control on the site at all times. Where details differ from the MDE Standards and Specifications and the SHA Field Guide, use the details from then Field Guide.

308.01.03 Quality Assurance Ratings. All Administration projects requiring Erosion and Sediment Control measures will be inspected by a Quality Assurance Inspector to ensure compliance with the approved Erosion and Sediment Control Plan. Projects will be inspected at least every 2 weeks and the scores reported on Form No. OOC61, Erosion and Sediment Control Field Investigation Report.

The Quality Assurance Inspector will use the scores to determine the following ratings:

RATING	SCORE
A	≥90
B	80 - 89.9
C	70 - 79.9
D	60 - 69.9
F	< 60

Rating A. The project is in compliance. Minor corrective action may be necessary.

Rating B. The project is in compliance; however, corrective action is needed

Rating C. The project is in compliance; however, deficiencies noted require correction. Shutdown conditions as described elsewhere herein could arise quickly. Project will be reinspected within 72 hours.

Rating D. The project is in non-compliance. The Administration will shut down all earthwork operations. All work efforts shall focus on correcting erosion and sediment control deficiencies. The project will be reinspected within 72 hours. All required corrective actions shall be completed 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 better rating will result in the project being rated an 'F'. Liquidated damages will be imposed for each day the project has a 'D' rating. Refer to Shutdowns herein for additional requirements.

Rating F. The project is in non-compliance. A 'F' rating indicates a score less than 60, or that the appropriate permits and approvals have not been obtained, or that limit of disturbance has been exceeded, or that wetlands, wetland buffers, jurisdictional waters, floodplains, and tree protection areas as specified in Section 107 have been encroached upon or that work is not proceeding in conformance with 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. All work efforts shall focus on correcting erosion and sediment control deficiencies. Liquidated damages will be imposed for each day the project has an 'F' rating.

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

If consecutive 'C' ratings are received, the Contractor will be alerted that their overall effort is marginal and a shut down 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 have not been satisfactorily corrected or other deficiencies are identified by the Quality Assurance Inspector that results in a score of less than 80 and not below 60 on Form No. OOC61, a 'D' rating will be given and all earthwork operations will be shut down until the project receives a 'B' or better rating.

If disregard for correcting these deficiencies is evident, an 'F' rating will be given and the entire project will be shut down until the project receives a 'B' or better rating. When degradation to a resource could occur, or if the Contractor is unresponsive to direction to take corrective action, 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.

Incentive Payments. When specified in the Contract Documents, the Administration may include incentive payments to the Contractor. 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 Quality Assurance Inspector and an average score equal to or greater than 85.0 for the entire rating quarter is given to the project by the Quality Assurance Inspector the quarterly incentive payment will be made to the Contractor 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. A rating quarter consists of three months. The first quarter begins at the Notice to Proceed. When a project does not receive any 'D' or 'F' ratings and the overall average score given to the project by the Quality Assurance Inspector is equal to or greater than 85.0 the final incentive payment will be made to the Contractor at final project close-out. If a time extension is granted to the Contract, additional quarterly incentive payments will be drawn from the final incentive payment.

Liquidated Damages. When a project is rated 'D' for any inspection; the Administration will assess liquidated damages on the Contractor. Payment of the liquidated damages shall be made within thirty days from the date of notification to the Contractor Payments shall not be allowed to accrue for consideration at final project close-out.

When the project receives two 'F' ratings the Erosion and Sediment Control Training Certificate issued by the Administration shall be revoked from the project superintendent and the Erosion and Sediment Control Manager for a period of not less than six months and until successful completion of the Administration's Erosion and Sediment Control Certification Program. Neither the project superintendent nor the Erosion and Sediment Control Manager shall be allowed to oversee the installation and maintenance of erosion and sediment controls during the period the certification is revoked on any project of the Administration. The Contractor shall immediately provide certified personnel to replace the project superintendent and the Erosion and Sediment Control Manager. Work may not commence until the certified personnel are in place.

308.01.04 Incentive/Liquidated Damages Payments. The Contract Documents will specify the amounts of incentive payments and liquidated damages that apply for each project.

308.03 CONSTRUCTION.

245 **DELETE:** 308.03.01 Contractor Responsibilities its entirety.

INSERT: The following.

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

(a) Demarcate all wetlands, wetland buffers, floodplains, tree protection areas, and the Limit of Disturbance (LOD) as specified in Section 107.

(b) Have all demarcated wetlands, wetland buffers, floodplains, tree protection areas, and LOD inspected and approved by the Engineer.

(c) Construct all erosion and sediment control measures in conformance with 308.01.02.

(d) Have all control measures inspected and approved by the Engineer.

All runoff from disturbed areas shall be directed to the sediment control measures. Ensure that dewatering practices do not cause any visible change to stream clarity.

No erosion or sediment control measure shall be removed without the approval of the Engineer and MDE. Refer to GP-7.12 for unforeseen conditions.

It is the Contractor's responsibility to ensure that dewatering practices do not cause any visible change to stream clarity.

246 **DELETE:** 308.03.04 Schedule in its entirety.

INSERT: The following.

308.03.04 Schedule. Within 14 days after the Notice of Award, the Contractor shall submit an Erosion and Sediment Control Schedule to implement the E & S Plan to the Administration and the MDE. The schedule shall indicate the sequence of construction, implementation and maintenance of controls, temporary and permanent stabilization, and the various stages of earth disturbance. After the schedule is approved by the Administration, it will be forwarded to MDE for approval. The schedule shall, at least include the following:

(a) Demarcation of all wetlands, wetland buffers, 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 shall be used or blocked after construction.

(g) Final grading, landscaping, and stabilization.

(h) Removal of perimeter controls.

No work shall be started on-site or off-site until the Erosion and Sediment Control schedules and methods of operation have been accepted by the Administration and MDE.

248 **INSERT:** The following after **308.03.08 Stabilization Requirements.**

308.03.08a Dewatering. Dewatering is considered an elective practice. Dewatering activities shall not cause any visible change to stream clarity. If a sediment plume is visible, the Contractor shall immediately cease the dewatering activity.

303.03.13 Removal of Controls.

249 **DELETE:** The second paragraph "All control devices shall be ...."

INSERT: The following.

All control devices shall be removed, except as specified in the contract documents.

308.03.19 Pipe Slope Drain.

250 **DELETE:** The second sentence "The geotextile apron shall be ...."

INSERT: The following.

The geotextile apron shall be keyed 6 in. into the ground.

308.03.27 Portable Sediment Tank.

251 **INSERT:** After the second sentence the following.

The Contractor shall locate and operate portable sediment tanks in a manner that results in no visible sediment release to waterways. If there is any change to waterway clarity due to dewatering operations the contractor shall immediately cease the operation until an acceptable alternative is found.

DELETE: 308.03.28 Silt Fence in its entirety.

INSERT: The following.

308.03.28 Silt Fence. The geotextile shall be embedded a minimum of 8 in. vertically into the ground and extend a minimum of 22 in. above ground. The fence post shall be driven a minimum 16 in. into the ground and extend a minimum 26 in. above the ground.

Silt fence shall be removed and reset when and as directed by the Engineer. All of the requirements for the original placement of the silt fence shall be strictly adhered to when the fence is reset.

308.03.31 Super Silt Fence

INSERT: The following after subsection (b).

(c) Posts are to be line posts only.

(d) A 7 gage top tension wire shall run continuously between line posts.

308.03.35 Maintenance of Stream Flow.

253 **ADD:** The following after the second paragraph "Upon completion of...to the Engineer."

The Contract Documents may include stream diversion details for maintenance of stream flow. These details show the locations of the stream diversion system and a system that is approved by the Maryland Department of the Environment.

The Contractor is alerted that the stream diversion system as shown may not be capable of blocking the flow of water through the soil beneath the stream diversion system. The Contractor shall be responsible for designing and providing an effective means of diverting the water away from the designated areas, even though it may require more elaborate diversion systems. The Contractor shall also ensure that all excavation within the stream diversion area shall be maintained in a dewatered condition, which may require additional pumps, sheeting, shoring, cofferdams, etc. Should the proposed system not perform satisfactorily or additional material and equipment be required to dewater the site and excavated areas, the Contractor shall remedy the stream diversion system at no additional cost to the Administration.

The Contractor shall securely anchor the stream diversion system in place to prevent movement during high water events. Prior to placing the stream diversion system, the Contractor shall submit the proposed method of anchoring to the Engineer and the MDE

field inspector for approval. Anchors shall not go beyond the limits of disturbance shown on the Plans or infringe on the channel area available for stream flow. Placing the stream diversion system in the stream without the approval of both the Engineer and the MDE inspector is prohibited. All cost associated with the anchoring of the stream diversion system shall be incidental to the Maintenance of Stream Flow item.

The Contractor shall have the option of proposing an alternate stream diversion system. All conditions stated in the Contract Documents shall apply to the alternate stream diversion system. Any alternate stream diversion system shall be submitted to the Maryland Department of the Environment through the Administration for approval prior to implementation.

255 **INSERT:** The following.

308.03.36 Diversion Fence. The double 6 mil polyethylene sheeting shall be trenched a minimum of 6 in. into the ground, shall cover a minimum of 4 ft. from the trench line to the fence posts, shall extend a minimum of 20 in. above the ground, and shall wrap over the fence posts to grade.

308.03.37 Temporary Gabion Outlet Structure. Gabions shall be constructed in conformance with Section 313. The area beneath shall be graded and stabilized immediately after the removal of temporary gabion outlet structures.

308.03.38 Dewatering Bag. The Contractor shall furnish the required bags, straw bales, pump, hoses, and connections to adequately dewater the construction site for construction activities. The dimensions of the dewatering bags shall be determined by the Contractor to provide adequate volume for the associated pump discharge and the soil conditions. The Contractor shall locate and operate dewatering bags in a manner that results in no visible sediment release to waterways. If there is any change to waterway clarity due to dewatering operations the contractor shall immediately cease the operation until an acceptable alternative is found.

308.04 MEASUREMENT AND PAYMENT.

308.04.16 Portable Sediment Tank.

257 **INSERT:** After the second sentence the following.

No adjustments will be made for resizing or relocating portable sediment tanks to meet stream clarity discharge requirements.

DELETE: 308.04.26 in its entirety.

INSERT: The following.

308.04.26 Maintenance of Stream Flow will not be measured but will be paid for at the Contract lump sum price. The payment will also include designing and providing diversion structures regardless of the type required to satisfactorily divert the stream flow, excavation, backfill, dewater the site and excavated areas within the stream

diversion area, maintenance of the diversion system, sandbags, polyethylene sheeting, diversion pipes, pumps, hoses, connections, and portable sediment tanks. This price will not be adjusted when consideration is given to an alternative stream diversion system 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.

258 **INSERT:** The following.

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

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

308.04.38 Dewatering Bags will be measured and paid for at the Contract unit price per each and will include pump, hose, connections, straw bales locating, relocating, disposal and any other incidentals necessary. No adjustments will be made for resizing or relocating bags to meet stream clarity discharge requirements.

CATEGORY 400
STRUCTURES

SECTION 400-01 — REMOVAL OF PORTIONS OF EXISTING STRUCTURES

400-01.01 DESCRIPTION. This work shall consist of the removal and disposal or removal and salvage of portions of existing bridge structures and related features to the limits indicated on the Plans, in accordance with the requirements of these Special Provisions and as may be directed by the Engineer.

400-01.02 MATERIALS.

Steel Reinforcement Bars	908.01
Steel Shear Studs	909.05

400-01.03 CONSTRUCTION. Before removal operations commence, the Contractor shall prepare and submit to the Engineer for review and approval a complete list of all equipment to be utilized in the removal of portions of existing structures including the proposed method of removal as an Official Shop Drawing Submittal. Materials obtained from the removal operations shall become the property of the Contractor and shall be removed promptly off site.

If any damage results to portions of the existing structure to remain as a result of the Contractor's operations, areas damaged shall be repaired or replaced as required by the Engineer in an acceptable manner at no additional cost to the Authority. If the damage is a result of the Contractor's Method of Removal, the Contractor shall submit a revised Method of Removal to the Engineer for review and approval. In this event, all removal operations may be temporarily discontinued until such approval of his alternate method is submitted and approved. No extension in Contract time will be given to the Contractor for delays caused by the repair of damage to existing portions of the structure to remain or during a temporary work stoppage resulting from unacceptable removal methods and/or the required submittal of an alternate removal method.

400-01.03.01 Removal of Portions of Bridge Deck Slab and Parapet. The Contractor shall protect the public against injury and damage from demolition operations when removing portions of the existing bridge deck slabs and parapets. When deck and/or parapet removal is performed over or near roadways, railroads or waterways, the Contractor shall furnish and erect temporary protective shields to prevent any material or debris from entering these areas. The Contractor shall adhere to the applicable underclearance restrictions specified in TC-6.12.

Working Drawings for the protective shields shall be submitted in conformance with TC-4.01(b). Flooring and siding shall have no cracks or openings through which material particles may pass.

The shields shall be able to support over their entire area 150 lb/ft^2 in addition to their own dead weight. The 150 lb/ft^2 requirement for protective shields will be waived when the portion to be removed is not over any of the following, or within range of rolling debris reaching any of the following:

(a) Roadway, pedestrian walkway, bikeway, parking area, navigable water, Railroads and Railroad property, or other traveled way.

(b) Exposed utilities that are either aerial utilities crossing under the span or utilities located between stringers.

When the 150 lb/ft^2 in addition to its own dead weight requirement is waived and the Contractor elects to remove the existing bridge deck slab by saw cutting sections and removing them by lifting from above, then the Contractor shall provide protection to prevent any loose particles from reaching the ground or waterway below. In addition, a temporary construction fence shall be placed under the area of demolition to prohibit accidental access by employees and possible pedestrians.

After the Engineer determines that the protective shields have served their purpose, they shall be removed and become the property of the Contractor.

During the removal operations, it is imperative that the existing structure to remain is protected from damage.

At locations where the Contractor elects to support the protective shields from the steel, all connections to the protective shields shall be made by means of clamps or other approved devices. The drilling of holes in the existing steelwork, or welding to the steelwork for this purpose, is prohibited. Protective shields may also be temporarily supported from above by the use of a crane. In this case, the Working Drawing Submittal shall include Crane Capacity Charts and the Design Loads for review and approval by the Engineer. Crane supported demolition protective shields may not be used when the portion to be removed is over any of the following, or within range of rolling debris reaching any of the following:

(a) Roadway, pedestrian walkway, bikeway, parking area, navigable water, Railroads and Railroad property, or other traveled way.

(b) Exposed utilities that are either aerial utilities crossing under the span or utilities located between stringers.

Prior to removing a portion of the existing slabs and parapets, the Contractor shall take survey measurements to include, at a minimum, elevations at locations along the roadway flow line, tops of parapets and at other locations as necessary to ensure that the reconstructed deck slab, parapet and associated new sign support bracket are constructed to the proper elevations. The reconstructed deck slab shall match the existing deck profile and cross slope. At this time survey measurements of the roadway crown shall also be taken to ensure that the proposed sign structure has adequate vertical roadway clearance. All of this information shall be included on the Contractor's pertinent Working Drawing Submittal for the work.

Before any removal equipment is allowed onto the structure, the locations of the existing girder top flanges shall be marked clearly on the bridge deck. The flange locations shall be delineated by drilling 1" diameter pilot holes upwards beginning from the deck underside. Once the flanges are located, their outlines shall be painted on the deck with brightly colored red or orange paint using a roller or brush. The area to be painted includes the location of the top flange plus 6" on either side. Only hand tools or power driven hand tools conforming to 426.03.01(c) and (d) may be used within the painted areas when removing the concrete deck. Where saw cutting is shown on the plans, only 1" deep saw cuts will be permitted when located within the painted area. The painted areas shall be clearly visible at all times during the removal operation and shall be re-painted when, in the opinion of the Engineer, the markings have sufficiently deteriorated. The Contractor shall ensure that all workers performing removal operations do not encroach on the painted areas with any full-depth saw cuts or heavy equipment during the removal operations.

Upon completion of drilling the 1" diameter pilot holes to delineate the flange locations, the Contractor shall measure the minimum deck thickness present and furnish this information to the Engineering Division of the Authority. A minimum of one measurement shall be taken at each new sign structure support.

A neat 1" deep saw cut shall be made at all removal locations to separate the removal operations from the concrete portions which are to remain. Existing reinforcement steel that is required to be incorporated into the proposed structure shall be protected and conform to 421.03.07.

400-01.03.02 Steel Shear Studs. The existing girders contain steel shear studs that are to remain. Exposed studs shall be cleaned of all concrete as part of this work. Abrasive blast cleaning shall also be used to clean studs; striking the heads of studs for the purpose of removing concrete shall not be used. If any stud is broken off during the removal operations, a new stud of similar size and length shall be installed adjacent to the existing broken stud in accordance with 431.03.

400-01.03.03 Existing Utility Conduits. The Plans indicate the presence of utility conduits located in the existing parapets. Prior to removing a portion of the existing slabs and parapets, the Contractor shall verify that there are no existing utilities present in the parapet conduits. In the event that there are utilities present in the parapet conduits, the Contractor shall immediately contact the Engineering Division of the Authority. No demolition of the concrete parapet shall proceed until directed.

400-01.03.04 Existing Drainage System. The limits of scupper downspout pipe removal shall only be to the extent necessary to remove the existing scupper and facilitate re-attachment of new downspout piping. Reference the Special Provisions for New Sign Structure Supports for additional information.

400-01.03.05 Removal and Disposal of Existing Features. In addition to the removal of portions of the existing bridge deck slab and parapets, other associated existing features shall be removed and disposed of as indicated on the plans including conduits, junction boxes, barrier delineators, and regulatory and mile post signs. After removal, these features shall become the property of the Contractor and removed promptly off the site and properly disposed. The hardware used to attach these features to the existing structure shall be discarded.

400-01.03.06 Coordination with CSXT Railroad. The Contractor is hereby notified that portions of this work may be located adjacent to or over active CSXT Railroad Tracks. The Contractor shall coordinate with CSXT to ensure that all requirements are met when working adjacent to or over any track. Any temporary scaffolding or demolition shields required for this work shall be prepared as a Working Drawing and submitted to CSXT for review in accordance with the Special Provisions included elsewhere herein.

400-01.04 MEASUREMENT AND PAYMENT. The Removal of Portions of Existing Structures will be measured and paid for at the Contract Unit Price per Each for the various pertinent Removal of Portions of Existing Structure items specified in the Contract. The payment will be full compensation for the removal of portions of existing structure to the limits shown on the Plans including the concrete parapet, deck slab, and stay-in-place forms.

Also included within the payment for this item is saw cutting, installation and removal of the protective shielding and any temporary construction fence, cleaning and straightening of existing reinforcement bars to remain, cleaning of existing steel shear studs, replacement of damaged steel shear studs and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

The installation of steel reinforcement bars, including installing welded or approved mechanical splices, to replace existing reinforcement exhibiting section loss of 20 percent or more will be measured and paid for at the Contract Unit Price per Linear Foot for the Repair Bar for Deck Reinforcement item specified in the Contract. Steel reinforcement bars installed to replace bars cut off or damaged during the removal operations will not be measured or paid for, but the cost for this work will be borne strictly by the Contractor.

The removal and disposal of regulatory and mile point signs will be measured and paid for under the Remove Existing Bridge Mounted Signs and Supports and Remove Existing Bridge Mounted Sign Supports Only (No Sign) items specified in the Contract.

The removal and replacement of the woven aluminum wire safety fence will be measured and paid for under the Replacement of Woven Aluminum Wire Safety Fence item specified in the Contract.

CATEGORY 400
STRUCTURES

SECTION 400-02 — NEW SIGN STRUCTURE SUPPORTS

400-02.01 DESCRIPTION. This work shall consist of the construction of new sign structure supports on existing bridges as detailed on the Plans and in accordance with the requirements of these Special Provisions and as may be directed by the Engineer. This work may also include the installation of barrier delineators.

400-02.02 MATERIALS.

Concrete – Mix No. 6	902.10.03 – Table 902 A
Microsilica	902.10.03 – Table 902 B, Option 3
Reinforcement	908.01
Fusion Bonded Epoxy	917.02
Preformed Fabric Pads	910.02.03
Steel Plates	A709 Grade 36, Galvanized
Resilient Laminated Fabric Pads and Washers	MIL-C-882E
Preformed Fabric Bearing Pad	910.02.03
Anchor Bolts (sign structures)	F1554, Grade 55, S1
Anchor Bolt Nuts and Washers	909.08
Curing Materials	902.07
Form Release Compound	902.08
Junction Boxes and Associated Hardware	Type 304 Stainless Steel
Conduits	921.07.01 ANSI C80.1 and 921.07.02 UL 651
Epoxy Bonding Compound	921.04
Steel Forms (to remain in place)	909.11
Water	921.01
Admixtures	420.02.01
Grout	902.11 (c)
Production Plants	915

All sign structure anchor bolts and associated hardware shall be galvanized in accordance with A153. All steel plates shall be galvanized in accordance with A123.

All accessories shall meet the requirements as specified under 420.02.02.

Steel reinforcement bars remaining in the existing structure to be incorporated into the New Sign Structure Supports shall not be field epoxy coated or touched-up if originally epoxy coated.

Junction boxes shall be fabricated to meet the dimensions and sizes as specified on the Plans.

400-02.03 CONSTRUCTION. The construction of New Sign Structure Supports shall be in accordance with applicable portions of 420.03 except as noted herein. Slip forming of the parapets will not be allowed.

420.03.03 Anchor Bolt Placement.

DELETE: The Subsection in its entirety.

INSERT: The following.

Anchor bolts shall be cast into the New Sign Structure Support. Sleeves may be cast into the concrete if approved by the Engineer. The Contractor shall prepare and submit a Working Drawing Submittal detailing his Method of Installation, as well as the size of the proposed sleeves. Either method is acceptable, but only one method shall be used at each New Sign Structure Support location. No additional compensation will be made to the Contractor for whichever method is selected and used. If anchor bolts sleeves are used, completely fill the annular space around the inserted anchor bolt with grout. Anchor bolt holes placed in the new concrete via coring or drilling will not be allowed under this Contract.

420.03.04 Concreting.

DELETE: The third Paragraph under Subparagraphs (c)(2) in its entirety.

INSERT: The following.

Superstructure concrete shall not be placed when the temperature of the concrete surface is less than 45 °F or greater than 75 °F. Superstructure concrete may also not be placed when the combination of wind velocity, humidity, air temperature and the fresh concrete temperature produces an evaporation rate of 0.15 pounds per square foot of surface per hour as determined from ACI 308, Standard Practice for Curing Concrete.

If the theoretical rate of evaporation is above 0.10 pounds per square foot per hour, the Contractor shall take all necessary precautions to reduce the probability of plastic shrinkage cracking, such as:

(a) Misting the surface of the concrete immediately behind the finishing machine with an approved fogger. If misting is used, it shall be applied continuously up until the placement of the wetted burlap covers.

(b) Covering the surface with polyethylene sheeting between the finishing and texturing operations.

(c) Reducing the temperature of the concrete mix.

420.03.07 Finishing Concrete Surfaces.

ADD: The following after the second paragraph under (d)(1).

Deck slab grooving shall be coordinated with the grooving to be performed on the latex modified concrete overlay.

420.03.15 Loads on Concrete Structures.

DELETE: The Subsection in its entirety.

INSERT: The following.

Loads shall not be applied to any new portion of the bridge deck and parapet until the final section of that unit of the deck has completed its specified curing period.

Vehicles, including the Contractor's, and heavy equipment are not permitted on any new portion of the bridge deck until the concrete cylinder breaks for the bridge deck have attained a minimum compressive strength of 4500 psi. However, loads such as stored materials, lightweight equipment, forms for concrete parapets, etc. may be placed upon the concrete deck via cranes or other lifting devices when the concrete deck has attained a minimum compressive strength of 3000 psi.

The towers for the cantilever sign structures are not permitted to be installed on the new parapet until the concrete cylinder breaks for the new portion of the deck and parapet have attained a minimum compressive strength of 4500 psi.

ADD: The following.

420.03.19 Junction Boxes.

New junction boxes shall be fabricated in conformance with the dimensions shown on the existing plans. All junction boxes shall be fabricated using Type 304 stainless steel.

400-02.04 MEASUREMENT AND PAYMENT. New Sign Structure Supports will be measured and paid for at the Contract Unit Price per Each for the various pertinent New Sign Structure Support items specified in the Contract.

The payment will be full compensation for all concrete, forms and form removal, steel reinforcement bars, welded splices for steel reinforcement bars, anchor rods or bolts, steel clamp plates, resilient laminated fabric pads and washers, preformed fabric pads, curing and misting, conduits, junction boxes, floodlighting, and for all material, labor, equipment, tools, and incidentals necessary to complete the work as specified herein and on the Plans.

The installation of barrier delineators, parapet control joints and drains for conduits and junction boxes, mechanical grooving (if necessary) and placement of epoxy bonding compound will be incidental to the pertinent New Sign Structure Support items specified in the Contract.

The removal of portions of the existing deck and parapet will be measured and paid for under other pertinent items in the Contract.

For the purposes of Bidding, the installation of anchor bolts for sign structures shall be cast into the New Sign Structure Support.

The installation of cantilever sign structures will be measured and paid for under other pertinent items in the Contract. Steel base plates affixed to the tower poles will be incidental to the pertinent Sign Structure items.

CATEGORY 400
STRUCTURES

SECTION 400-03 — BRIDGE MOUNTED SIGN SUPPORTS

400-03.01 DESCRIPTION. This work shall consist of furnishing, fabricating, transporting and erecting new bridge mounted sign supports (Type I, II, and III) as detailed on the Plans, in accordance with the requirements of these Special Provisions and as may be directed by the Engineer.

400-03.02 MATERIALS.

Structural Tubing	ASTM A500 Grade B
Structural Shapes and Plates	ASTM A709 Grade 50
Steel Plates	A709 Grade 50, Galvanized
Anchor Bolts (sign structures)	Hilti HVA, HAS or Approved Equal
High Strength Bolts	909.07
Sign Panel Bolts, U-Bolts	ASTM A307
Welding Materials	909.03

All anchor bolts and associated hardware shall be galvanized in accordance with A153. All steel tubing, shapes and plates shall be galvanized in accordance with A123.

400-03.03 CONSTRUCTION. The construction of Bridge Mounted Sign Supports shall be in accordance with the requirements of 430.03 and these Special Provisions.

Prior to drilling or placing new anchors for the Bridge Mounted Sign Supports, the Contractor shall confirm the presence, location, type and status of the existing utilities at each proposed sign structure support location within the existing parapets. These utility conduits shall not be damaged by the Contractor's operations and may require the relocation of the Bridge Mounted Sign Supports to avoid conflict or damage. Any damage to the existing utility conduit to remain as a result of the Contractor's operations will be borne by the Contractor and repaired to the satisfaction of the Engineer all at no cost to the Authority. If the location of any Bridge Mounted Sign Support is required to be moved, it shall be relocated only when written authorization is provided by the Engineer.

400-03.04 MEASUREMENT AND PAYMENT. Bridge Mounted Sign Supports will be measured and paid for at the Contract Unit Price per Each for the various pertinent Bridge Mounted Sign Supports items specified in the Contract. The payment will be full compensation for fabricating, furnishing and installing the Bridge Mounted Sign Supports at the designated locations and for all material, labor, equipment, tools, and incidentals necessary to complete the work as specified herein and on the Plans.

New signs will be paid for under the Sheet Aluminum Signs and Extruded Aluminum Signs items as specified in Section 813.04.

CATEGORY 400
STRUCTURES

SECTION 400-04 — CRACK REPAIR BY EPOXY INJECTION

400-04.01 DESCRIPTION. This work shall consist of furnishing all materials and equipment and repairing cracks in concrete structures by an Epoxy Injection System as specified in the Contract Documents and directed by the Engineer. Epoxy injection shall only be used to repair cracks from 0.005 inch to 0.25 inch in width. This work is at bridges.

400-04.02 MATERIALS. The epoxy shall be able to be injected in the cracks under low pressure and shall consist of a non-sag epoxy bonder to seal the surface cracks, and epoxy to penetrate and fill the cracks, and bond the crack surfaces together.

The Epoxy Injection System shall be one of the following:

MARK-8 Non-sag Epoxy Bonder and Mark 10 Injection Epoxy Manufactured by POLY-CARB;

No. 22 Epoxy Paste and No. 4 Eva-Pox Manufactured by E-poxy Industries, Inc.;

Duralcrete Gel and Duralcrete LV Injection Epoxy Manufactured by Dural International Corporation;

or Approved Equal.

400-04.03 CONSTRUCTION. The Contractor shall furnish a copy of the Comprehensive Preparation and Application Instructions to the Engineer prior to the start of work. The Contractor shall arrange to have a Manufacturer's Representative at the job site to familiarize the Contractor and the Engineer with the Epoxy Materials and Application Procedures. The Representative shall direct the repair of at least one complete crack with epoxy bonder and epoxy injection, to assure that personnel are adequately informed to satisfactorily perform the remaining repairs. There shall be no separate payment for such arrangements and the cost shall be incidental to this item.

The Contractor shall follow the Manufacturer's recommendations for surface preparation, mixing of the components of the bonder epoxy and injection epoxy system, surface sealing and applications and all other work. If there is a conflict between the Contract Documents and the Manufacturer's recommendations, the Manufacturer's recommendations shall prevail.

Concrete surfaces adjacent to the cracks to be sealed shall be cleaned to the extent necessary to achieve an adequate bond with the epoxy bonder and only by approved methods that will not allow abrasive grit or concrete dust to get into the crack(s).

The use of solvent or thinners in cracks or on the bonding surfaces will not be permitted. Port holes shall be dust free.

Depth and spacing of holes at injection ports shall be established with due consideration of the crack widths and depths and injection pressure to ensure that no further damage will be done to the member being repaired. Substrate temperatures shall be greater than 45° F during the epoxy application.

The Contractor shall be responsible for cleaning and disposal of spills and excess material.

400-04.04 MEASUREMENT AND PAYMENT. Epoxy Pressure Injection shall be measured and paid for at the Contract unit Price per Linear Foot measured along the approximate centerline of the crack and from end to end of crack or from the points on the crack where the width is less than 0.005 inch whichever is less. The payment will be full compensation for surface preparation, application, drilling, injection, furnishing, equipment, tools, labor, materials (including both bonder and injection epoxy), and incidentals to perform the work.

CATEGORY 400
STRUCTURES

SECTION 400-05 — PATCH SPALLED AND DETERIORATED CONCRETE

400-05.01 DESCRIPTION. This work shall consist of the preparation and furnishing of all materials required to patch existing spalls and areas of deteriorated concrete where specified in the Contract Drawings and as ordered by the Engineer. The patch shall be Portland cement concrete or non-shrink grout. These repairs are on various bridge structures and at various locations. Spall locations may be horizontal, vertical, or overhead.

400-05.02 MATERIALS. Plasticized concrete shall be Mix No. 3 conforming to Section 902 of the Standard Specifications, with the exception that the coarse aggregate shall have 100-percent passing 3/8-inch sieve and the slump after adding a water reducing high range admixture shall not exceed 8-inches. Concrete shall be obtained from a plant conforming to Section 915 of the Standard Provisions.

The Contractor may substitute a manufactured non-shrink grout bag mix. The grout shall be combined with water and any other items (including pea gravel) in accordance with the Manufacturer's recommendations. Contractor shall submit to the Engineer for approval documentation on the Manufacturer and product to be used.

400-05.03 CONSTRUCTION. The Contractor shall inspect the concrete surfaces to be repaired in the presence of the Engineer to determine the exact limits and locations of all areas to be repaired.

The Contractor shall make a 3/4-inch deep saw cut around the perimeter of the repair area. The concrete shall be removed to sound concrete with a 30-pound maximum size hammer or hand tools. The Contractor shall thoroughly blast and vacuum the newly exposed area prior to forming. All resulting debris shall be removed from the site.

The Contractor shall remove concrete material in a manner to facilitate uniform placement of fresh concrete; slope upper area of excavated voids to preclude entrapping air and forming hollow spots in the freshly placed concrete. Within 1-inch of the surface, the upper outline shall be essentially normal (perpendicular) to the surface. All surfaces of exposed concrete and reinforcing steel shall be cleaned of oil, solvent, grease, dirt, dust, bitumen, rust, loose particles, and foreign matter.

The Contractor shall use caution where reinforcing steel is uncovered so as not to damage the steel or its bond in the surrounding concrete. Do not use pneumatic tools in direct contact with reinforcing steel. Use a 30-pound maximum size hammer for chipping behind reinforcing steel. Clean exposed reinforcing steel in accordance with SSPC-SP-6, Commercial Blast Cleaning, to remove all contaminants, rust, and rust scale.

In areas where reinforcing steel is surrounded by deteriorated concrete, has at least one-half its surface area exposed, or has less than 1-inch cover, the depth of removal shall be such as to include all deteriorated concrete but not less than 1-inch below or behind the reinforcing steel. Where the existing reinforcing steel is severely corroded or damaged, cut out reinforcing steel and replace with new reinforcing steel of the same sized and spacing. If the existing reinforcing steel is epoxy coated, the new reinforcing steel shall be epoxy coated. The new reinforcing steel may be lapped, welded or mechanically attached to the existing reinforcing steel. If epoxy coated reinforcing steel is welded, all areas of the coating that are damaged by the welding process must be repaired to the satisfaction of the Engineer at no cost to the Authority. Where existing steel is determined by the Engineer to have insufficient cover, either replace reinforcing steel or adjust as directed. Remove concrete to a minimum depth of 1-inch behind the new steel. If the epoxy coating on the reinforcing steel is damaged by the Contractor's actions, it shall be repaired to the satisfaction of the Engineer at no cost to the Authority.

The Contractor shall form excavated areas on vertical surfaces of concrete members by securing the forms in place. Design forms so that placement access will be at the top of each formwork assembly. The Engineer shall approve attachment of forms to the existing structure.

The Contractor has the option of using non-shrink grout or plasticized concrete to repair all concrete spalls or delaminated areas. The plasticized concrete shall be batched at a plant, unless written approval from the Engineer has been received to hand mix at the site. To batch at the site, the Contractor shall submit to the Engineer for approval, the procedures and methods for measuring and batching, including quality control methods.

The non-shrink grout shall be mixed and placed according to the Manufacturer's recommendations. The plasticized concrete shall be placed according to Subsection 420.03.04 of the Standard Specifications.

Use of bonding compounds for placement of plasticized concrete shall only be permitted by the written approval of the Engineer. The Contractor shall provide documentation that the bonding compounds and the plasticizer are compatible. Dampen exposed concrete surfaces immediately prior to placement of fresh concrete. Small holes may be drilled into forms to permit air to escape during pouring and consolidation. After curing and stripping of forms, blend the patched area to match the physical appearance of the adjacent area as close as possible.

The Contractor shall not place any repair material if the temperature is predicted to fall below 38° F during the curing period. If the temperature does fall below freezing during the curing period, the Contractor shall take appropriate actions to protect the material to the satisfaction of the Engineer. Failure to protect the material during freezing temperatures to the satisfaction of the Engineer shall result in the repair being rejected and redone by the Contractor at no additional cost to the Authority.

400-05.04 MEASUREMENT AND PAYMENT. "Patch Spalled and Deteriorated Concrete" shall be measured and paid for at the Contract Unit Price per Square Foot. The measurement shall be made in the plane of the concrete surface that is being repaired.
In the event that the repair contains portions of two intersecting planes, the measurement shall be in the plane that results in the larger area. The payment will be full compensation for all labor, equipment, tools, disposal, saw cutting, curing, materials, and incidentals necessary to perform the work.

There are four pay items for Patch Spalled and Deteriorated Concrete. Types A, B, and C are detailed on the Plans. Type A is for spalls where the reinforcing bars are exposed when the unsound concrete is removed and the removal is up to 2" below the reinforcing mat. Type B is for shallow spalls where the removal is less than 4" or less than the concrete cover on the reinforcement which ever is less. Type C is for corner spalls where the Contractor will have to form two faces. In addition the Contractor will be paid an additional amount for Type A or C if the removal is greater than 2" below the bottom reinforcing mat. If that condition occurs the volume of void below the 2" plane will be measured in cubic feet and the Contractor will be paid per cubic foot of Patch Spalled & Deteriorated Concrete – Excess depth. The payment will be full compensation for all labor, equipment, tools, disposal, curing, materials, and incidentals to perform the work.

CATEGORY 400
STRUCTURES

SECTION 400-06 — CLEANING AND PAINTING CONCRETE PARAPET WALLS

400-06.01 DESCRIPTION. This work shall consist of the surface preparation and painting of concrete parapets, sidewalks and medians mounted on structures and ground mounted. The concrete parapet walls are on Caton Avenue (BCW 523) and Joh Avenue (BCW 519). This shall include the sidewalks, medians, and curbs.

400-06.02 MATERIALS. The coatings for concrete surfaces shall be waterborne acrylic paint meeting the following Specifications:

Solids by Weight, % min.	56
Dry Opacity Contrast Ratio 0.005 in. (0.13 mm) wet film, min.	0.98
Freeze-Thaw Resistance, Parabolic Dish Surface, C672, Modified Ratings	0-Rating @100 cycles
Color	Federal Standard 595 White 17875

Control and acceptance of the paint shall be based on the following limits:

Weight in lb/gal	Original Sample ± 0.2
Infrared Spectrogram	Match Original Sample

All paint shall be from the same Manufacturer.

Sand shall be free of organic and clay materials.

400-06.03 CONSTRUCTION. Surfaces to be cleaned and painted are: vertical face of curbs, tops of curbs, tops of sidewalks, tops of median, and street side vertical faces of parapets. All surfaces to be painted shall be water blast cleaned with abrasive and shall be allowed to dry prior to the application of the coating. Nozzle pressure of the water blast cleaning equipment shall be 3000-3500 psi. Removed materials, scrap, or waste material and debris shall be removed from the project and properly disposed of.

Two coatings shall be applied by brushing or rolling. The inside faces of the parapets, the top of the sidewalk, the top of the median, and the top and inside face of the curbs shall be painted and the top of deck shall be masked.

The paint shall have a minimum dry film thickness of 3 mils per each coat.

Each segment of the parapet shall be completely cleaned and inspected by the Engineer prior to any application of paint. Any areas not inspected prior to painting shall not be paid for. Should an area, which has been previously cleaned, become soiled or otherwise not meet the approval of the Engineer, the Contractor shall clean it at no additional cost to the Authority.

The Contractor shall take every precaution to protect motor vehicles, pedestrians and other components of the bridge or roadway from contact with the paint. The Contractor shall be responsible for all damage done by his operations and shall take all necessary actions to protect property. The Contractor will be allowed a thirty (30) day period, from receipt of a damage complaint by any party, to satisfy said complaint or the Authority shall have the right to satisfy the complaint at the expense of the Contractor.

Thinning of the paint shall not be permitted unless specifically approved in writing by the Engineer. Approval to thin paint shall not relieve the Contractor of his responsibility to obtain the required dry film thickness. The Paint Manufacturer's Representative must be available to visit the job site upon the request of the Engineer to oversee the application of their product. The paint for the use on this project shall be stored at a central location near or on the project site elevated off of the floor for ventilation safety and stored for the protection of freezing and/or excessive heat according to the Manufacturer's Data Sheet Specifications.

At the Caton Avenue and Joh Avenue Bridges, after the application of the last coat of paint, fine white sand shall be broadcast over the top of the sidewalks and medians while the paint is still wet. Sand shall be broadcast uniformly at a rate of 0.25 lb/square foot. After the paint is dry, any loose sand shall be swept off the sidewalks and disposed of.

400-06.04 MEASUREMENT AND PAYMENT. Cleaning and Painting Parapet Walls shall be measured and paid for at the Contract Unit Price per Square Foot. The payment will be full compensation for surface preparation, paint, broadcasting sand, removing loose sand, furnishing equipment, tools, labor, materials, and incidentals to perform the work.

CATEGORY 400
STRUCTURES

SECTION 400-07 — CONCRETE CRACK REPAIR BY CUTOUT AND PACK

400-07.01 DESCRIPTION. This work shall consist of furnishing all materials and equipment and repairing cracks in concrete structures by cutting out the crack and packing it with a trowel grade epoxy as specified in the Contract Documents and as directed by the Engineer. Cutout and pack shall only be used to repair cracks greater than 0.25 inch in width. This work is at bridges and in the concrete drainage ditch adjacent to the Caton Avenue ramp.

400-07.02 MATERIALS. The epoxy shall be able to be placed using a trowel and dispense into narrow slots and/or holes. The epoxy shall not shrink and be non-sagging on vertical or overhead surfaces. The material must be able to bond to damp or dry surfaces.

The epoxy shall be one of the following:

FX-763 Low Modulus Hydro-Ester Trowel Grade Epoxy manufactured by Fox Industries.

Sikadur 23 Lo-Mod Gel manufactured by Sika Corp.

Euco #352 Epoxy System manufactured by Euclid Chemical Company.

Or Approved Equal.

If the Manufacturer of the epoxy selected also recommends the use of a bonding agent, that bonding agent will also be provided.

400-07.03 CONSTRUCTION. The Contractor shall furnish a copy of the comprehensive preparation and application instructions to the Engineer prior to the start of work. The Contractor shall arrange to have a Manufacturer's representative at the job site to familiarize the Contractor and the Engineer with the material and application procedures. The representative shall direct the repair of at least one complete crack to assure that personnel are adequately informed to satisfactorily perform the remaining repairs. There shall be no separate payment for such arrangements and the costs shall be incidental to this item.

The Contractor shall follow the Manufacturer's recommendations for surface preparation, mixing of the components and application of the materials and all other work.

The crack will be cleaned out with power and/or hand tolls to remove any loose material. Saw cutting or routing of the crack may be required to permit the epoxy to penetrate the crack. Feather edges of the crack will be removed to a minimum depth of ¾". Sandblasting, water blasting, or wire brushing of the crack surfaces will be required. Surfaces shall be free of any laitance, grease, oil, or any other contaminate that could inhibit the bond.

Manufacturer's recommendations for temperature shall be followed except that application of the epoxy to surfaces below 45° F shall not be permitted.

The Contractor shall be responsible for cleaning and disposal of spills and excess material.

400-07.04 MEASUREMENT AND PAYMENT. Crack Repair by Cutout shall be measured and paid for at the Contract Unit Price per Linear Foot and Pack Material for Crack Repair shall be measured and paid for at the Contract Unit Price per Gallon. The payment for Crack Repair by Cutout will be full compensation for surface preparation, cutting out the crack, cleaning, furnishing, equipment, tools, labor, and incidentals to prepare the crack for application of the epoxy. The payment for Pack Material for Crack Repair will be full compensation for furnishing, applying, materials (including bonding agent if recommended), curing, equipment, tools, labor, and incidentals to fill the crack. Pack Material for Crack Repair will be measured after mixing and prior to application of the material to the crack. Material that in the opinion of the Engineer was wasted due to careless application, spillage or material not used by the end of its pot life shall be deducted from the payment quantity.

CATEGORY 400
STRUCTURES

SECTION 400-08 — REPLACEMENT OF BRIDGE MOUNTED SAFETY FENCE

400-08.01 DESCRIPTION. This work shall consist of removal and replacement of portions or all of existing Bridge Mounted Safety Fence as specified in the Contract Documents or as directed by the Engineer. This work may also include the removal and reinstallation and/ or replacement of the existing posts. New anti-climb shields will be provided where indicated.

400-08.02 MATERIALS.

Non Shrink Grout	902.11(c)
Chain Link Fence Fabric	914.01
Tie Wires, Line Post Clips, Tension Wires and Tension Wire Clips	914.02
Posts, Braces, Fittings and Hardware	914.03

400-08.02.01 Type. The Contractor shall use the Safety Fence to match the existing fence in kind or Approved equal unless Chain Link is specified. Contractor shall submit to the Engineer for approval documentation on the Manufacturer and product to be used and working drawings.

400-08.03 CONSTRUCTION. Replacement of Safety Fence. The Contractor shall cut off and remove the damaged panels of the Safety Fence as directed by the Engineer. Removal shall be of the complete panel. Some of the removal shall be of sections necessary for the construction of the new sign supports. The Contractor shall install a new panel that is mechanically connected to the existing parapet and/or posts. The Contractor shall submit for approval details of the mechanical connection and any new attachments to the existing bridge.

Fence Lines and damaged area locations in the Contract Documents are only a guide and the exact location of fence and limits of damaged areas on the fence shall be determined in the field by the Engineer. The bottom of fabric shall be placed to match the existing in the field.

The fence shall be true and taut. All work shall exhibit good craftsmanship per industry standards.

Any material that is salvaged and is in good condition in the opinion of the Engineer can be reused.

New chain link fence at BCW 519 and BCW 523 shall conform to Section 607 – Chain Link Fence. Existing anchor studs may be reused if they are in good condition in the opinion of the Engineer. If new anchor studs are required they shall be drilled and grouted into the top of the existing concrete parapet. Care shall be taken to locate existing reinforcement in the parapet and avoid it while drilling. See BR-SS(3.02)-75-22 for additional details. When working over traffic on I-95 or ramps, an approved screen shall be provided to protect traffic from falling debris, tools, parts, etc.

New Anti-Climb Shields. New anti-climb shields shall be provided at the locations indicated on the plans or as directed by the Engineer. See BR-SS(3.05)-75-25 for additional details.

400-08.04 Coordination with CSXT Railroad. The Contractor is hereby notified that portions of this work may be located adjacent to or over active CSXT Railroad Tracks. The Contractor shall coordinate with CSXT to ensure that all requirements are met when working adjacent to or over any track. Any temporary scaffolding or demolition shields required for this work shall be prepared as a Working Drawing and submitted to CSXT for review in accordance with the Special Provisions included elsewhere herein.

400-08.05 MEASUREMENT AND PAYMENT.

"Replacement of Reticular Grid Safety Fence" and "Replacement of Woven Aluminum Wire Safety Fence" shall be measured and paid for at the Contract Unit Price per Linear Foot. The length shall be measured from post to post between which the panels have been replaced. Replacement of Recticular Grid Safety Fence with Type I Chain Link Safety Fence shall be measured and paid for at the Contract Unit Price per Linear Foot. Anti-Climb Shield for Chain Link Safety Fence shall be measured and paid for at the Contract Unit Price for Each. Payment shall be full compensation for all detail and working drawings preparation and submittals, coordination with the railroad, removal, disposal, protective screens, material, labor, equipment, tools and incidentals necessary to complete the work.

"Replacement of Fence Posts" will not be measured and shall be incidental to the other fence items.

CATEGORY 400
STRUCTURES

SECTION 400-09 — PROTECTION OF EXISTING STRUCTURES

400-09.01 DESCRIPTION. This work shall consist of the evaluation, preparation and submittal of engineering evaluations, calculations and working drawings as necessary when heavy equipment is placed onto any portion of the existing bridge deck roadway for the purpose of completing the various items of work specified in this contract including, but not necessarily limited to, removal of portions of existing structures, new sign structure supports, bridge mounted sign supports, remove existing bridge mounted sign supports, remove existing overhead sign structures (bridge mounted) and the installation of overhead and cantilever sign structures. This work shall also consist of utilizing appropriate protective measures as stipulated herein when heavy equipment is placed onto the existing bridge deck.

400-09.02 MATERIALS. None.

400-09.03 CONSTRUCTION. Heavy equipment is defined as lifting equipment (i.e., crane or similar lifting equipment) proposed for use by the Contractor to assist in the completion of various Contract items that may produce a net loading effect greater than that imparted by a standard HS-20 and/or military design loading (i.e. threshold load). Military design loading is defined as two (2) 24,000 pound axles spaced 4' center-to-center. Prior to mobilizing any heavy equipment, the Contractor shall verify that the net live load effect produced by his proposed equipment and associated pick weight is less than this threshold load and provide any necessary calculations and supporting equipment catalog cuts and/or Equipment Manufacturer brochures for review and approval by the Engineer. If the Contractor's proposed equipment and associated pick weight produces a live load effect greater than the threshold load, calculations shall be prepared and submitted to the Engineer for review and approval demonstrating that this load effect does not overstress the existing structure (when compared to the operating stress level for each member effected). Elements to be checked include the steel girder superstructure and deck. All calculations shall be prepared, signed and sealed by a professional engineer registered in the State of Maryland who possesses experience in the field represented by the submittal. Appropriate plan drawings shall also accompany the calculations and shall depict the proposed maintenance of traffic set-up, the sequence of staging and the size/weight/location of the pick(s) for the work as well as catalog cuts and/or equipment manufacturer brochures.

Regardless of the net loading effect as it compares to the threshold load, any equipment that utilizes outriggers for stability and/or support shall not bear directly on the existing concrete bridge deck. Timber crane distribution mats or similar blocking shall be placed underneath all outriggers during their use.

Crawler mounted cranes operated from the bridge deck are strictly prohibited from being used on this project unless authorization is granted by the Engineer in writing.

Similar to working drawings, all submittals shall be forwarded to the following person for subsequent distribution and review:

Maryland Transportation Authority
Engineering Division
300 Authority Drive
Baltimore, Maryland 21222-2200
ATTN: Mr. Nafiz Alqsaem

Working drawings are not to be sent to the consultant engineering firm shown on the Plans.

To expedite the checking and distribution of the submitted calculations and working drawings, the Contractor's representative may send this information directly to the Authority with copies of all correspondence to the Contractor. If the Contractor requests that all information be routed through the Contractor's office, then the establishment of that procedure should be the first order of work so as to avoid possible misunderstandings as to the processing. An alternate submittal process may be developed following the project Notice to Proceed pending approval by the Director of Engineering – Maryland Transportation Authority.

The Contractor, or his representative, shall furnish to the Maryland Transportation Authority ten (10) sets each of all calculations, working drawings, etc. for primary review. Once the primary review is complete the Contractor, or his representative, shall furnish the Authority additional prints (number to be furnished by primary reviewer) for stamping and forwarding for secondary review and distribution.

All calculations and working drawings for the project will not be considered accepted until they bear the acceptance stamps of both the consultant engineering firm and the Maryland Transportation Authority.

The Contractor is hereby notified that construction located over active Railroad tracks shall require the submission of identical information to the Railroad when such work is located aerially and/or within 25 feet horizontally of the centerline of track. In addition, all cranes and associated hardware used in the individual picks shall be rated for 150% of the service weight of the pick (i.e., F.S. = 1.5). Reference the Special Provisions located elsewhere herein for more information and requirements.

400-09.04 MEASUREMENT AND PAYMENT. This item will not be measured or paid for, but the cost for the evaluation, preparation and submittal of engineering evaluations, calculations and working drawings as necessary will be incidental to other pertinent items specified in the Contract.

CATEGORY 400
STRUCTURES

SECTION 400-10 — REPLACEMENT OF SCREEN DRAINS

400-10.01 DESCRIPTION. This work shall consist of replacements of screens on pipe drains where indicated in the Plans and as directed by the Engineer. The intent is to allow some air circulation while keeping out pigeons and other animals.

400-10.02 MATERIALS.

Copper or Stainless Steel Screen	18x14 mesh or finer
Steel Plates	909.02
Bolts and Washers	909.06
Galvanizing	A153

400-10.03 CONSTRUCTION. Screens on pipe drains shall be replaced at locations indicated in the Plans and as directed by the Engineer. If the existing screen is damaged, it shall be removed and the Contractor will properly dispose of it. The contractor shall use plates to secure the screens to the existing drains. The screens and galvanized or stainless steel plates are to be bolted to the ends of the existing wrought iron pipe. The existing threaded connections shall be reused if possible. If not, holes shall be drilled into the existing concrete and anchor inserts used to secure the screens. If there is existing conduit running through the opening, the contractor shall install the screen as best as possible.
If conduit has been run through drain, the Contractor shall install a plate cut to fit around the conduit and to close off the opening to birds. Plate edge may be burnt or cut and any sharp edges or burrs will be removed or ground.

400-10.04 MEASUREMENT AND PAYMENT. Replacement of Screen Drains will be measured and paid for at the Contract Unit Price for Each. The payment will be full compensation for all removal, disposal, fabrication, drilling, material, labor, equipment, tools, and incidentals necessary to complete the work.

CATEGORY 400
STRUCTURES

SECTION 400-11 — SLOPE PROTECTION REPAIRS

400-11.01 DESCRIPTION. This work includes breaking up portions of existing concrete slope protection, installing geotextile fabric, dismantling existing gabions, furnishing and placement of additional Class I stone, furnishing and placing joint filler and combinations of this work.

400-11.02 MATERIALS.

Riprap	901.02
Geotextile	921.09 SD Type I, Woven
Joint Material	911.01and 911.02
Concrete	902.10 Mix No. 1

400-11.03 CONSTRUCTION. The limits of removal shall be approved by the Engineer. Refer to Sections 312 and 402 of the Standard Specifications, the Contract Drawings and the following:

Existing Concrete Slope Protection: The Contractor shall saw cut 1" deep along existing joints, the Contractor shall then break up the damaged/undercut sections of concrete slope protection into pieces approximately the size of Class II Riprap and place it in the void. The Contractor shall furnish and place any additional Class I Riprap required to bring the surface up to the level of the adjacent area. The Contractor shall provide a toe wall at the bottom and the sides of the slope as shown in the Contract Drawings if none exists. All repairs shall be full height from the toe of the protection to the area of undermining/repair.

Existing Gabion Slope Protection: The Contractor shall take the stone out of the existing gabions that have settled and properly dispose of the baskets. If the baskets can be removed with the stone in them, geotextile shall be installed in accordance with the Standard Specifications, and the stone from the gabion baskets shall be placed in the void. If in the opinion of the Engineer, the baskets cannot be removed with the stone in them, the Contractor shall remove only the wire basket and not be required to place geotextile. The Contractor shall furnish and place any additional Class I Riprap required to bring the surface up to the level of the adjacent area. The Contractor shall provide a toe wall at the bottom and sides of the slope as shown in the Contract Drawings if none exists.

Replacement of Joint Material: If a joint with void exists between an existing substructure unit and concrete slope protection the void will be filled with Mix No. 1 Concrete and a Preformed Joint Filler installed as shown on the plans. If more than 3 square foot of the concrete slope protection is unsupported in a 3 foot length of joint the repair shall be as for Existing Concrete Slope Protection rather than Joint Replacement. If no void exists or for joint failures between adjacent concrete slope protection slabs, the joint shall be cleaned and Joint Sealer and Crack Filler shall be used.

400-11.04 MEASUREMENT AND PAYMENT. Repairs to "Slope Protection Repair (Existing Concrete Slope Protection)" and "Slope Protection Repair (Existing Gabion Protection)" will be measured and paid for at the Contract unit price per square yard. The payment shall be full compensation for saw cutting, removing and resetting the existing stone from the gabions, breaking up the existing concrete slope protection to match Class II Riprap, furnishing and installing geotextile, and furnishing and installing additional Class I Riprap to raise the level of the slope protection to match the adjacent surface and for all labor, equipment, tools, and incidentals necessary to complete the work.

"Replacement of Joint Material Type I" and "Replacement of Joint Material Type II" will be measured and paid for at the Contract unit price per linear foot. Type I Replacement will be when only Joint Sealer and/or Crack Filler are used. Type II Replacement will be when there is a void and concrete is required to fill the void. The Engineer shall decide where Type I and Type II Replacements are to be used. The payment will be full compensation for all cleaning, concrete, joint material, placement, labor, equipment, tools, and incidentals necessary to complete the work.

CATEGORY 400
STRUCTURES

SECTION 400-12 — LOOSE NUTS AND BOLTS

400-12.01 DESCRIPTION. This work shall consist of tightening nuts and bolts at the locations indicated in the Plans and as directed by the Engineer. Several items of work are indicated that relate to the type of connection.

400-12.02 MATERIALS.

General Use Bolts, Nuts, and Washers	909.06
Traffic Sign Anchor Bolts	909.08
Mechanical Anchors	Shall have been tested per ASTM E 488 and certified to have similar strength as original anchors.

400-12.03 CONSTRUCTION. Work shall only be performed at locations indicated in the plans. Prior written approval from the Engineer shall be required to perform work at other locations.

Tighten/Replace Loose Bolts at Approach Rail Connections: Where the attachment of the approach rail/barrier is loose at the bridge parapet the attachment will be tightened by placing new nuts/washers on the existing bolts if the existing bolts are still securely attached. If they are not, new mechanical anchors shall be installed and used for the attachment. New anchors shall have the same or greater strength as the original anchors.

Tighten Loose Anchor Bolt Nuts: Where the existing nuts have come loose they shall be tightened to their original position and the threads burred so they cannot come loose again. The Contractor may use oil on the threads to facilitate the tightening of the nuts. If the existing threads are too badly corroded to permit the nuts to be tightened to their original position the Contractor shall tighten them as far as possible and burr the threads above the nut if possible. A separate pay item exists for furnishing and placing anchor bolt nuts.

Tighten Loose Sign Nuts: At existing sign base plates the existing nuts shall be tightened and double nutted. If the nuts are missing then new nuts will be furnished. Care shall be taken to not over-tighten the anchor bolt and break it. If the Contractor breaks the anchor bolt, a new mechanical anchor will be installed at no cost to the Authority.

400-12.04 MEASUREMENT AND PAYMENT. Three separate pay items have been established for this work. Tightening of nuts shall be measured and paid for at the Contract unit price for Each. Furnishing barrier or sign nuts, washers and mechanical anchors shall be incidental to these pay items. The payment will be full compensation for all removal, furnishing, material, labor, equipment, tools, and incidentals necessary to complete the work.

CATEGORY 400
STRUCTURES

SECTION 400-13 — CONDUIT AND JUNCTION BOX REPAIRS

400-13.01 DESCRIPTION. This work shall consist of repairs to existing conduits and junction boxes.

400-13.02 MATERIALS.

Metallic Conduit and Fittings	921.07.01
Nonmetallic Conduit and Fittings	921.07.02
Steel Plate	909.02
Cast Iron	909.04

400-13.03 CONSTRUCTION. Work shall be performed at locations indicated in the plans; in accordance with Section 805 – Electrical Conduit and Fittings; Section 811 – Electrical Hand Holes, Manholes, Pull and Junction Boxes; and as directed by the Engineer. The Contractor shall replace existing conduit by disconnecting the service and sliding new conduit over the existing wiring. Service disconnections shall only be scheduled with the approval of the Engineer and the disconnections made by properly trained personnel. All wiring shall be tested after being re-connected to confirm performance. New anchors/clips/hooks shall be provided as necessary to securely attach the conduit to its support. New conduit fittings shall be provided where the conduit attaches to existing conduit and/or hand boxes. Conduit shall be rigid and the same size as existing conduit or larger at the Contractor's option. If larger conduit is provided all fittings shall be provided for the size transitions. Any required bends/radii shall be per code/industry standards. New electrical wiring is not part of this work. If the Contractor discovers damaged or frayed wiring that he believes should be replaced/repaired, he shall contact the Engineer and if such work is authorized, it shall be paid for separately.

New metallic junction box covers with new bolts and/or attachments shall be provided. New covers shall be the same approximate size as the original covers and shall have matching bolt hole locations. They shall provide a reasonably water tight fit. A watertight gasket shall be provided. Attachment shall be with stainless steel screws. If a cover is not available for a certain box, the Contractor has the option of replacing the box.

400-13.04 MEASUREMENT AND PAYMENT. "Replacement of Electrical Conduit" shall be measured and paid for at the Contract unit price per linear foot. The payment will be full compensation for all removal, fittings, attachments, anchors, bending, testing, furnishing, material, labor, equipment, tools, and incidentals necessary to complete the work. The Contractor shall only be paid for the portions of the conduit that the Engineer indicates should be replaced. If the Contractor chooses to remove additional conduit to reach an existing fitting/hand box, he shall not be paid for the additional length. The limit of replacement shall be extended to an existing fitting/hand box if the limit would be within 2 feet of the fitting/hand box.

"Replacement of Junction Box/Cover" shall be measured and paid for at the Contract unit price per each. The payment will be full compensation for all attachments, measurements, fabricating, furnishing, material, gasket, screws, labor, equipment, tools and incidentals necessary to complete the work.

CATEGORY 400
SECTION 400.14–MISCELLANEOUS REPAIRS

400.14.01 DESCRIPTION

An allowance of $500,000.00 has been included in the proposal book to perform miscellaneous repairs assigned by the Engineer within the project site or any location within the Fort McHenry Tunnel Facility. The scope of repairs will be determined by the Engineer.

400.14.02 MATERIALS N/A

400.14.03 CONSTRUCTION

This contingent item of work shall be used at the discretion of the Engineer.

400.14.04 MEASUREMENT AND PAYMENT

All work performed under this item will be measured and paid for in accordance with GP-9.02 of the Specifications. If the Contractor and the Engineer can agree upon unit prices or other method of payment, the agreed upon method of measurement and payment shall then be used.

CATEGORY 400
STRUCTURES

SECTION 405 — REMOVAL OF EXISTING STRUCTURES

275 **DELETE:** This Section in its entirety and replace with 400-02 included elsewhere in these Special Provisions.

CATEGORY 400
STRUCTURES

SECTION 421 — REINFORCEMENT FOR CONCRETE STRUCTURES

334 **DELETE:** 421.03.07 in its entirety.

INSERT: The following.

421.03.07 Existing Steel Reinforcement Bars. The Plans indicate the locations and extent of existing steel reinforcement bars to remain. Following the removal of the deck slab and parapet concrete, all existing bars to remain shall be straightened and abrasive blast cleaned to remove all dirt, concrete, rust, etc. Wire brush cleaning will not be permitted under this Contract.

For any exposed existing reinforcement steel that is to be incorporated into the final structure:

(a) That has lost 20 percent or more of its original cross sectional area as determined by the Engineer, shall be cut out. A new bar of the same diameter shall be provided and placed so as to have the minimum required lap, or modified as per (c).

(b) Where the required bar lap length is available, it shall be used as a dowel.

(c) Where the required bar lap is not available or limits of concrete removal to achieve bar lap are too great, a welded or approved mechanical splice shall be provided. The welded or approved mechanical splice shall be used only where the minimum required concrete cover can be achieved. The use of dowels to achieve the required bar lap is prohibited on this Contract unless so authorized by the Engineering Division of the Authority.

If the expected steel reinforcement bar pattern is different than what is shown on the Plans, the Contractor shall stop work in this area and contact the Engineering Division of the Authority for further evaluation.

335 **DELETE:** 421.03.08 in its entirety.

INSERT: The following.

421.03.08 Substitution. Substitution of different size bars will be permitted only when approved by the Engineering Division of the Authority. No additional compensation will be allowed for substituting larger size bars in lieu of the bars specified. If a larger bar is substituted, the required longer lap length and/or development length as specified on the Plans shall be provided. The minimum concrete cover on the larger bars shall be maintained as required per the Plans.

CATEGORY 400
STRUCTURES

SECTION 426 — LATEX MODIFIED CONCRETE OVERLAY FOR BRIDGE DECKS

426.01 DESCRIPTION.

345 **DELETE: Restrictions.** In its entirety.

INSERT:

The Contractor is advised that concrete overlay placement operations are subject to Authority lane closure restrictions and ACI 548.4-3 limitations for evaporation rates.

426.02 MATERIALS.

346 **INSERT:**

Epoxy Protective Coatings Touch Up System 917.02.01

The Contractor shall furnish certification that all materials meet all specified requirements. The Contractor shall use the same type of material for both partial and full depth repairs and shall use the same overlay mix design within a continuous span section.

426.03 CONSTRUCTION.

346 **INSERT:** At the beginning of the section:

The Contractor is advised that many of the existing decks may have existing latex or concrete overlay. If such overlays exist, they shall be considered part of the existing concrete surface and shall not be considered a wearing surface.

Prior to beginning the deck surface removal, the Contractor shall survey the bridge deck to establish its profile and cross slope geometry. The finished surface of the overlaid deck shall match the existing deck elevations, except for the areas where the new surface must be raised to provide a minimum of two inches cover over the top layer of reinforcement. The Contractor shall determine the depth of reinforcement especially at the joints and take care to not damage the reinforcement during the removal operations.

The Contractor shall adjust the deck surface with the approval of the Engineer, to meet this requirement. When adjusting the deck surface is required, the Contractor shall taper the deck adjacent to existing transverse deck joints so the deck surface transitions smoothly into the joint armor at a maximum vertical transition rate of 300:1 on the mainline and 150:1 on the ramps.

At all bridges, the Contractor shall smoothly transition the deck surface into shoulder scuppers.

Deck Surface Removal shall have a maximum depth to the top of the reinforcing bars. The only removal below the top of the reinforcing bars shall be deck removal for repairs. Unless the reinforcing is encountered at a shallower depth, the minimum removal depths shall be 1" for BCW 519 and BCW 523 Bridges. For all bridges, the Contractor must demonstrate to the satisfaction of the Engineer that he has completely removed all existing overlays and that the remaining deck is sound.

The Contractor shall be responsible for containment and proper disposal of all waste water/slurry generated by the high pressure water jet equipment. The Contractor is responsible for obtaining any and all permits required for the disposal of this water/slurry. Failure to contain and or dispose of the water/slurry to the satisfaction of the Engineer and/or any permitting agencies shall be cause to stop these operations. Contractor shall not be permitted to resume work until he has demonstrated to the satisfaction of the Engineer/Permitting Agencies that he has addressed the problems and can proceed with the work without problems.

The Contractor is informed that most, if not all, of the existing deck reinforcement is epoxy coated. If the epoxy protective coating is damaged during the concrete removal or deteriorated, all loose and damaged portions of the coating shall be removed and the reinforcement cleaned per the Touch Up System Manufacturer's Recommendations. See Sections 465 and 917.02.01 except that the color of the touch up material does not have to match the color of the existing epoxy coating. Epoxy coated reinforcement bars shall be used for replacement reinforcement if the existing reinforcement bars are epoxy coated.

All traffic (Contractor's and Public) is prohibited on the newly placed concrete overlay until curing of the material is completed and compressive strength tests indicate the concrete has reached 2500 psi.

352 **426.03.06 Curing**

In the 6th line of the section:
DELETE: 24
INSERT: 48
At 2 locations in the line.

426.04 MEASUREMENT AND PAYMENT.

354 **INSERT:**

When "Epoxy Protective Coatings Touch Up System" is required; supplying, cleaning reinforcement, and application will not be measured, but the cost will be incidental to other pertinent items specified in the Contract Documents.

If an asphalt overlay or patch is encountered in the field, its removal and disposal costs shall be considered incidental to other items in the Contract.

Removal of integral latex or concrete overlay surfaces shall be considered part of the deck removal when determining the removal depths.

DELETE: 426.04.01 in its entirety.

INSERT: At the end of Section 426.04.02:

Four separate pay items are provided in this contract for removal of portions of the concrete deck. Two of them (Scarify 2" of Existing Concrete Deck and Scarify 1" of Existing Concrete Deck) are based on the nominal depths of removal indicated in the Contract Documents and may be performed by either mechanical methods or high pressure water jet. A separate pay item (Hydrodemolition of Portions of Existing Concrete Deck), shall only be required to be used to remove portions of the existing concrete deck closer than ½" from the top of the existing reinforcement (see Subsection 426.03.01(b)(1) of this section). All of the above items will be measured and paid for at the Contract Unit Price per Square Yard for the pertinent removal of existing concrete deck. Only when the Contractor is being paid for Hydrodemolition of Portions of Existing Concrete Deck shall he be paid for Mobilization for Hydrodemolition. Mobilization for Hydrodemolition will be measured and paid for at the Contract Unit Price per Each. The pay item shall include a single mobilization and de-mobilization of the equipment for Hydrodemolition of Portions of Existing Concrete Deck.

Mobilization and de-mobilization must be approved in writing by the Engineer prior to the operation.

When milling to a different depth at a transition for deck joints and/or scuppers, the additional or reduced depth will be incidental to the rest of the work. The pay item will not be adjusted for minor/localized changes to the depth.

INSERT: At the end of Section 426.04.04:

A pay item is provided in this Contract for deck overlays --"1.5 inch Latex Modified Concrete Overlay for Bridge Decks". It is based on the nominal thickness of the LMC overlay as indicated in the Contract Documents.

Where localized/minor differences in depth occur because of scupper or deck joint transitions, the depth change shall be considered incidental to the rest of the work and the pay item shall not be changed to reflect similar changes to the depth.

CATEGORY 400
STRUCTURES

SECTION 436 — CLEANING AND PAINTING EXISTING STRUCTURAL STEEL

436.01.01 (a) Zone Painting

INSERT: The following Paragraphs at the end of the Section:

Cleaning and painting shall be done at the following locations:

BCW 523 West Abutment – Masonry Plates at bearings 6, 11, 12, & 13

Spot painting of structural steel is not a part of this Contract.

CATEGORY 400
STRUCTURES

SECTION 460 — EXPANSION JOINTS IN STRUCTURES

460.02 MATERIALS.

422 **ADD:** Closed Cell Neoprene Sponge Elastomer 911.10
or MetaZeal manufactured by Capital Services in Schenectady, NY
or Approved Equal.

For Repair Type 1A where shown in the Contract Documents, the replacement seals can be Preformed Polychloroprene Elastomeric Compression Joint Seals, or Closed Cell Neoprene Sponge Elastomer, or MetaZeal, or Approved Equal.

For Repair Type 1B where shown in the Contract Documents, the replacement seals can be Closed Cell Neoprene Sponge Elastomer, or MetaZeal, or Approved Equal.

Proseal #37 Non Shrink Epoxy Paste or Approved Equal.

Concrete Mixes	902.10 and 420.02.04
Grout	902.11
Reinforcement	908.01
Epoxy Bonding Compound	921.04
Non Shrink Grout	902.11(c)

460.03 CONSTRUCTION.

423 **ADD:**

New seals, no matter the type or Manufacturer, shall be in compression at 0 degrees Fahrenheit and shall not exceed Manufacturer's Allowable Specifications at 120 Degrees Fahrenheit.

Portions of new concrete headwalls and portions of deck slabs shall be constructed in conformance with Section 420.03.

For Drainage troughs see also Section 460-01 and shall be paid for as indicated in that section. Except that the Contractor shall repair/replace any existing drainage troughs to the satisfaction of the Engineer, which are damaged/removed by the Contractor's operations under this section at no additional cost to the Authority.

At BCW 523, Caton Ave Bridge the existing unarmored longitudinal joint between the two structures shall be cleaned out and a new 1 ¾" compression seal shall be installed.

The existing joint shall be removed/cleaned by hand tools, compressed air, water jet, or as determined by the Contractor but removal of the adjacent concrete is not desired. Any spalled and/or chipped concrete shall be repaired with grout and after curing the new seal shall be installed with adhesives. No testing shall be required for this joint.

460.03.01 In-Place Testing.

424 **ADD:**

In-Place Testing of mainline bridge joints shall not be required. In-Place Testing of ramp bridge joints shall be required.

CHANGE:

In the first line of the second paragraph change the period from "...for a period of **five** hours..." to '...for a period of **two** hours...".

460.04 MEASUREMENT AND PAYMENT.

425 **ADD:** At the end of Section 460.04.02:

There shall be seven separate payment items for Expansion Joints as indicated in the Contract Documents. The items are: Bridge Roadway Seal Replacement Type 1A, Bridge Roadway Seal Replacement Type 1B, Joint Armor Replacement, Modifying Existing Bridge Roadway Joints, Longitudinal Joint Replacement, Modifying Existing Bridge Median Joints, and Repair Finger Dam Joints. All seven items shall be measured and paid for as indicated in this Subsection. If seal replacement and joint armor replacement are required at a single location, the Contractor shall be paid for both items at that location. Cleaning and preparing existing joint armor for seal replacement shall be incidental to the seal replacement and shall not be paid for separately.

CATEGORY 400
STRUCTURES

SECTION 460-01 — DRAINAGE TROUGH FOR EXISTING BRIDGE

460-01.01 DESCRIPTION. This work shall consist of removing damaged, torn, and unattached drainage troughs and their attachments and installing new material to provide functioning troughs.

460-01.02 MATERIALS. See Subsection 460.02 of the Standard Specifications.

460-01.03 CONSTRUCTION. Where indicated on the Contract Documents or as directed by the Engineer, the Contractor shall remove loose or damaged portions of the existing drainage troughs. Any material that in the opinion of the Engineer is reusable may be reinstalled. Material that in the opinion of the Engineer is not reusable or that the Contractor chooses not to use, shall become the property of the Contractor and shall be properly disposed of. The reinstalled/new drainage trough shall be installed in conformance with Subsection 460.03 of the Standard Specifications. The Contractor may provide joints in the troughs where new material matches against existing material. The joints shall be watertight.

The Contractor may be required to repair in-place portions of the existing drainage troughs as directed by the Engineer.

460-01.04 MEASUREMENT AND PAYMENT. Drainage Trough for Existing Bridge shall be measured and paid for at the Contract Unit Price per Linear Foot. Measurement shall be made parallel to the deck joint. The payment shall be full compensation for removal, disposal, drilling, bolting, fabricating, placing, material, labor, equipment, tools, cleaning, and incidentals necessary to perform the work. In-place repairs of the drainage trough will also be measured and paid for under this item. The minimum payment length per repair shall be 2 feet.

CATEGORY 400
STRUCTURES

SECTION 499 — WORKING DRAWINGS

DELETE SECTION 499 IN ITS ENTIRETY AND REPLACE WITH:

499.01 DESCRIPTION. This work shall consist of the scheduling, preparation and distribution of Working Drawings as described in TC-1.02 and TC-4.01. The Working Drawings shall exhibit good drafting practice and represent the original work of the Contractor, Fabricator, or Supplier. Submitting duplicated portions of the Plans as Working Drawings is prohibited. The Contractor shall also submit backup calculations for Working Drawings when so requested by the Authority including those for formwork and protective shields. Calculations shall be prepared, signed and sealed by a Professional Engineer registered in the State of Maryland who possesses experience in the field represented by the submittal.

499.02 MATERIALS. None.

499.03 CONSTRUCTION.

499.03.01 Schedule. As a first order of work, the Contractor shall prepare and submit a Schedule for the Submission of Working Drawings in conformance with these Special Provisions. The Schedule shall be coordinated with and be in full accord with the Progress Schedule submitted to the Procurement Officer under GP-8.04 and TC-5.02. The Contractor is hereby notified that due to the nature of the work required and the potentially long material and fabrication lead times for many of the work items specified under this Contract, it is paramount that Working Drawings are submitted in a timely fashion. Working Drawings that are submitted late or in an amount that precludes providing a reasonable review period by the Authority will not be cause for a time delay claim by the Contractor. The Contractor is further alerted to the fact that delays in the Schedule caused by the delinquent Submittal of Working Drawings will not provide sufficient cause for an extension in Contract Time.

The Working Drawing Schedule shall include each type of Working Drawings (e.g., form plans, reinforcing steel, etc.), the approximate number of Drawings to be reviewed, estimated Date of First Submission and estimated Rate of Submission of Drawings (e.g., 5/Week). Where possible, the most critical Drawings shall be submitted first with enough time for review so as to minimize delays during construction.

499.03.02 Working Drawing Submittals. Working Drawings shall be submitted to the following person for subsequent distribution and review:

Maryland Transportation Authority - Engineering Division
300 Authority Drive
Baltimore, Maryland 21222-2200
ATTN: MR. Nafiz Alqsaem

Working Drawings are not to be sent to the Consultant Engineering Firm shown on the Plans.

The anticipated shop drawings include, but are not limited to the following: ground mounted and bridge mounted overhead and cantilever sign structures, bridge mounted sign supports, demolition shields, formwork for concrete, reinforcement steel for deck, modified parapet and sign supports, fencing, and temporary support of utilities. The Contractor shall allow up to 4 weeks for the review of each shop drawing submittal. This review time does not include the review of the pertinent submittals by CSX Transportation, Inc. (Railroad). Reference the Special Provisions located elsewhere herein for more information and requirements regarding the review of shop drawing submittals by the Railroad.

To expedite the checking and distribution of Working Drawings, Fabricators or Suppliers may send prints directly to the Authority with copies of all correspondence to the Contractor. If the Contractor requests that all Plans be routed through the Contractor's Office, then the establishment of that procedure should be the first order of work so as to avoid possible misunderstandings as to the processing. An alternate Submittal Process may be developed following the Project's Notice to Proceed pending approval by the Director of Engineering – Maryland Transportation Authority.

The Contractor, Fabricator, or Supplier shall furnish to the Maryland Transportation Authority ten (10) prints each of all Working Drawings, etc. for Primary Review. Once the Primary Review is complete the Contractor, Fabricator, or Supplier shall furnish the Authority additional prints (number to be furnished by Primary Reviewer) for stamping and forwarding for Secondary Review and distribution.

All Working Drawings for the project will not be considered accepted until they bear the acceptance stamps of both the consultant Engineering Firm and the Maryland Transportation Authority.

The Contractor is hereby notified that construction located over active CSX Transportation, Inc. (Railroad) Tracks shall require the Submission of Working Drawings to the Railroad when such work is located aerially and/or within 25 feet horizontally of the centerline of track. Reference the Special Provisions located elsewhere herein for more information and requirements.

Working Drawings shall not be submitted for approval as a Request For Information (RFI).

499.03.03 Revisions and Substitutions. All modifications shall be sent to the Authority for approval. Any modifications implemented, without written approval from the Authority, shall be subject to the requirements of GP-5.02.

499.04 MEASUREMENT AND PAYMENT. "Working Drawings" will not be measured or paid for, but the cost for this work will be incidental to other pertinent items specified in the Contract.

CATEGORY 500
PAVING

SECTION 500-01 — PORTLAND CEMENT CONCRETE SPALL REPAIR

500-01.01 DESCRIPTION. This work shall consist of the repair of spalled areas located at various locations within the limits of this project. The locations of the spalled areas shall be as shown on the plans or as directed by the Engineer. Spalling is small areas of cracking, breaking, chipping, or fraying of PCC slabs that typically accrue within 2' of the edge of joints. Some spalling may accrue in the middle of the slab away from any joint.

500-01.02 MATERIAL.

Rapid Hardening Cementitious Materials for Concrete Pavement Repair	902.14
Portland Cement Concrete Modified Mix # 6	522.02.01

500-01.03 CONSTRUCTION.

. Spalled areas shall be repaired according to the following:

Repair Guidelines:

1. When spalled areas are less than 4 ft^2 and less than 1.5 in. deep, the Contractor may use either an approved rapid hardening cementitious material or portland cement concrete modified mix # 6.
2. When the spalled areas are 4 ft^2 or greater, or are 1.5 in. deep or deeper, the Contactor shall use only portland cement concrete modified mix # 6.
3. The maximum repair width shall not be greater the one third of the travel lane.
4. When repairs are greater in width than one-third of the travel lane, or deeper than one-third of the slab thickness, or reinforcing steel is exposed, then the area shall be considered a Type I or II full-depth patch repair as per section 522 of the specifications.

Spall Repair Procedure:

1. Repairs shall be made in accordance with section 522 of the specifications or as modified in this special provision.
2. The area around the repair shall be sounded with a light hammer to locate the extent of the repair. The perimeter shall be marked beyond the delamination marks by 3 inches.
3. Repairs shall not be done on spalls less than 6 in. long and less than 1.5 in. wide.

4. When any two spalled areas are less than 2 ft apart, the repair shall be combined into one area of repair.
5. A vertical saw cut shall be done along the outside perimeter of the repair area, using a diamond-bladed saw set to a depth of approximately 2 in.
6. A chipping hammer fitted with a spade bit having a maximum weight of 30 lbs. shall be used to remove the unsound concrete until sound and clean concrete is exposed along the entire bottom of the repair area, to a depth of no more than 1/3 the slab thickness. When more chipping is required, or when any reinforcing steel is exposed, then the repair area shall become a full depth pavement patch as per Section 522 of the specifications.
7. Removal of spalled or delaminated concrete may be done by carbide milling rather than sawing and chipping, to a depth of no more than 1/3 the slab thickness. When more milling is required, or any reinforcing steel is exposed, then the repair area shall become a full depth pavement patch as per Section 522 of the specifications.
8. The bottom of the repair area shall be sounded with a light hammer to locate any remaining weak spots.
9. The repair area shall be thoroughly cleaned of all loose and foreign material by abrasive blasting.
10. The repair area shall be coated with an epoxy bonding compound in accordance with C 881 Type II.
11. The repair material shall be placed as one continuous operation. The concrete shall be consolidated by the use of spud vibrators or as recommended by the manufacturer. The repair shall be finished in accordance with section 522.03.10 of the specifications. Trowel the repair outward, to push the repair material against the walls of the repair.
12. The repair shall be cured in accordance with section 522.03.11 of the specifications.

500-01.04 MEASUREMENT AND PAYMENT. Portland Cement Concrete Spall Repair will be measured and paid for at the Contract unit price per square yard or by the bag for the pertinent Portland Cement Concrete Pavement item. The payment will be full compensation for all saw cutting, carbide milling, chipping, concrete, rapid harding cementitious materials, epoxy bonding compound, clean up of the patched areas, forms, reinforcement steel, chairs, epoxy coating, finishing, curing, joints, joint construction, joint saw cutting, and joint sealing and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Maintenance of Traffic for this item will be paid for as part of the Lump Sum Item "Maintenance of Traffic" and/or other pertinent Traffic items.

CATEGORY 500
PAVING

SECTION 500-02 — CORING MAINLINE ASPHALT PAVEMENT FOR OVERLAY

500-02.01 DESCRIPTION. The Contractor shall core the existing asphalt overlay on the mainline I-95 roadway to the existing concrete pavement to determine the existing asphalt overlay thickness. These cores shall be used to determine thicknesses to be used in the Grinding and Overlay Plan.

500-02.02 SCHEDULE OF OPERATION. The Contractor shall take cores in the center of the travel lane adjacent to the median and the travel lane adjacent to the outside shoulder. The cores shall be taken approximately 300 feet apart and no closer than 50 feet to a bridge structure. The cores shall be taken at approximately the same mainline station so the average depth can be determined at that highway cross section.

The Contractor shall also take two cores in the ramp areas adjacent to the mainline and one core approximately 50 feet from the end of the existing overlay on the ramps.

Core locations may be adjusted in the field to avoid existing patches, drainage structures, utilities, etc. The Engineer and Contractor may move core locations to account for field conditions. The Engineer will have final approval of all core locations.

The following mainline roadway areas have been identified as having existing asphalt overlay:

NB I-95 Mainline:

- Sta. 112+00.00 to Sta. 154+15.86
- Sta. 200+96.50 to Sta. 211+64.75

SB I-95 Mainline:

- Sta. 112+00.00 to Sta. 153+98.55
- Sta. 200+96.50 to Sta. 212+50.00

NB Collector Road:

- Sta. 112+00.00 to Sta. 117+02.80
- Sta. 41+22.00, Ramp B (Approach Slab BCW 534) to Sta. 43+21.90, Ramp B

Ramp A (Caton Ave) Mainline:

- Sta. 12+41.00 to Sta. 15+08.63

500-02.03 LABOR, EQUIPMENT AND TOOLS FOR CORING. The Contractor shall provide the necessary labor, equipment, and tools to do the Coring Program.

500-02.04 MEASUREMENT AND PAYMENT. The cores shall be paid for at the Contract Unit Price per Each Core. The payment will be full compensation for taking the core; filling the cored hole with material approved by the Engineer; providing Maintenance of Traffic; preparing the Grinding and Overlay Plan; and furnishing all equipment, tools, labor, and materials required to complete the work as specified.

CATEGORY 500
PAVING

SECTION 500-03 — GRINDING AND OVERLAY PLAN

500-03.01 DESCRIPTION. The Contractor shall submit to the Engineer for his approval, a grinding and overlay plan for the mainline and shoulders of the I-95 Roadway, northbound and southbound collector roads, and adjacent ramps included within the project limits. Areas with an existing asphalt overlay shall have a minimum thickness of 5-1/2 inches of asphalt overlay. 1

500-03.02 SCHEDULE OF OPERATION. Based on the cores the Contractor has taken in the center of the travel lane adjacent to the median and the travel lane adjacent to the outside shoulder, the Contractor shall submit to the Engineer for approval a grinding and overlay plan.

EXISTING ASPHALT OVERLAY – GRINDING & OVERLAY:

It is the intent of this contract to construct an asphalt overlay that will result in a total of 5-1/2 inches of asphalt overlay on the existing concrete pavement for mainline I-95, wherever an existing asphalt overlay exists.

At the end of the grinding process, there should be 3-1/2 inches of existing asphalt overlay remaining. This would then be overlaid with 2 inches of new asphalt pavement.

If there is an area that has less than 4-1/2 inches of existing asphalt overlay before grinding, in these areas the Contractor shall grind 1 inch to prepare the surface and then provide enough overlay thickness to obtain a total overlay depth of 5-1/2 inches. At bridge approaches it may not be possible to obtain the total overlay depth of 5-1/2 inches and conform to the transition details provided in the Contract Plans. The transition details shall control.

500-03.03 MEASUREMENT AND PAYMENT. There will be no separate payment for this item. This work shall be incidental to the pertinent grinding, overlay, and coring items.

CATEGORY 500
PAVING

SECTION 500-04 — SAW CUTTING

500-04.01 DESCRIPTION. This work shall consist of saw cutting existing concrete deck slabs, parapets, concrete structural members, sidewalks, concrete and asphalt pavements and other materials where indicated on the Plans, in accordance with the requirements of these Special Provisions and as may be directed by the Engineer.

500-04.02 MATERIALS. None.

500-04.03 CONSTRUCTION. The equipment used shall be a saw cutting machine capable of cutting Portland cement concrete slabs. The saw cutting machine shall consist of a suitable motor driven circular diamond blade cutter with a control device mounted to a sturdy frame. The machine shall be capable of cutting a groove in a straight line to the depth required on the Plans so that a neat and even joint can be cut to allow the removal of the deck slab and parapet without damage to portions to remain. A continuous water supply shall be supplied to the cutting element, if needed.

500-04.04 MEASUREMENT AND PAYMENT. "Saw Cutting" will not be measured or paid for, but will be incidental to the pertinent Removal of Portions of Existing Structure, sidewalk, or pavement items specified in the Contract.

CATEGORY 500
PAVING

SECTION 500-05 — CORING ASPHALT SHOULDERS

500-05.01 DESCRIPTION. This Special Provision outlines the procedure for determining the location of non-traffic bearing shoulders with an existing asphalt overlay within the project limits and performing full depth asphalt shoulder replacement where the existing shoulders are found to be non-traffic bearing. The purpose of this special provision is to provide traffic bearing shoulders throughout the project limits for Maintenance of Traffic purposes.

500-05.02 SCHEDULE OF OPERATION. The Contractor shall take cores in the center of all shoulders, inside and outside, that have existing asphalt overlay within the project limits. The cores shall be taken approximately 300 feet apart and no closer than 50 feet to a bridge structure. The cores shall be for the full pavement depth, in order to determine the existing shoulder pavement section.

Core locations may be adjusted in the field to avoid existing patches, drainage structures, utilities, etc. The Engineer and Contractor may move core locations to account for field conditions. The Engineer will have final approval of all core locations.

The following shoulder areas have been identified as having existing asphalt overlay:

NB I-95 Outside Shoulder:

- Sta. 150+00.00 to Sta. 154+15.86
- Sta. 200+96.50 to Sta. 201+90.62

NB I-95 Inside Shoulder:

- Sta. 134+00.00 to Sta. 154+15.86
- Sta. 200+96.50 to Sta. 211+64.75

SB I-95 Inside Shoulder

- Sta. 134+00.00 to Sta. 153+98.55
- Sta. 200+96.50 to Sta. 212+50.00

SB I-95 Outside Shoulder:

- Sta. 124+46.99 to Sta. 153+98.55

NB Collector Shoulders:

- Sta. 158+82.96, Lt (Approach Slab BCW 524-1) to Sta. 159+62.83, Lt
- Sta. 27+63.15, Ramp B, Lt (Approach Slab BCW 531) to Sta. 31+22.00, Ramp B, Lt (Approach Slab BCW 534)

SB Collector Shoulders:

- Sta. 36+53.65, Rt to Sta. 43+12.32, Rt
- Sta. 38+19.58, Rt to Sta. 0+39.93, Ramp E (Caton Ave), Rt

Ramp A (Caton Ave) Shoulders:

- Sta. 1+18.32, Rt to Sta. 15+08.63, Rt
- Sta. 1+18.32, Lt to Sta. 4+07.39, Lt
- Sta. 4+86.38, Lt to Sta. 13+84.36, Lt

Ramp B (Caton Ave) Shoulders:

- Sta. 1+87.35, Rt to Sta. 9+47.11, Rt
- Sta. 2+50.13, Lt to Sta. 9+47.11, Lt

Ramp C (Caton Ave) Shoulders:

- Sta. 1+21.92, Lt to Sta. 11+84.37, Lt

Ramp D (Caton Ave) Shoulders:

- Sta. 1+40.78, Lt to Sta. 12+99.64, Lt

Ramp E (Caton Ave) Shoulders:

- Sta. 0+39.93, Lt to Sta. 12+14.57, Lt

Ramp F (Caton Ave) Shoulders:

- Sta. 3+00.00, Rt to Sta. 16+86.46, Rt
- Sta. 2+66.98, Lt to Sta. 16+50.30, Lt

Ramp G (Caton Ave) Shoulders:

- Sta. 1+18.06, Rt to Sta. 15+96.64, Rt
- Sta. 1+18.06, Lt to Sta. 14+92.84, Lt

Ramp H (Caton Ave) Shoulders:

- Sta. 1+82.94, Rt to Sta. 4+09.88, Rt
- Sta. 1+82.94, Lt to Sta. 4+86.31, Lt

Ramp F (Washington Blvd) Shoulders:

- Sta. 9+35.13, Rt to Sta. 9+90.00, Rt (Approach Slab BCW 532)
- Sta. 14+98.00, Rt (Approach Slab BCW 532) to Sta. 19+00.00, Rt

The Contractor shall analyze the cores taken to determine whether or not the existing pavement section of the shoulder is traffic bearing. Cores that the Authority has previously taken and analyzed for traffic bearing capacity are included as an Appendix to these Documents. This information can be used by the Contractor to supplement the coring requirements stated above.

The Contractor shall use the results of the traffic bearing capacity analysis to verify and/or revise the limits of full depth shoulder replacement as shown on the roadway plans. The Contractor shall submit to the Engineer for approval a plan for the limits of full depth asphalt shoulder replacement.

500-05.03 LABOR, EQUIPMENT AND TOOLS FOR CORING. The Contractor shall provide the necessary labor, equipment, and tools to do the Coring Program.

500-05.04 MEASUREMENT AND PAYMENT. "Coring Full Depth Asphalt Shoulders" shall be paid for at the Contract Unit Price per Each Core. The payment will be full compensation for taking the core; filling the core hole with material approved by the Engineer; providing Maintenance of Traffic; verifying the limits of full depth asphalt shoulder replacement and preparing a plan; and furnishing all equipment, tools, labor, and materials required to complete the work as specified.

CATEGORY 500
PAVING

SECTION 504 — HOT MIX ASPHALT PAVEMENT

504.04 MEASUREMENT AND PAYMENT.

478 **DELETE:** 504.04.01 Price Adjustment for Asphalt Binder in its entirety.

INSERT: The following.

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 this purpose, the Administration will maintain a monthly price index.

The prevailing base index price of PG 64-22 Asphalt Binder is $506.00 per ton. When a grade other than PG 64-22 is specified, any cost differential shall be reflected in the price bid per ton for Hot Mix Asphalt.

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:

$$\text{Percent Change} = ((Pp - Pb)/ Pb) \times 100$$

$$PA = T \times Q \times ((Pp - (D \times Pb))$$

Where:

PA = Price Adjustment for the current month
T = Design target asphalt content expressed as a decimal
Q = Quantity of Hot Mix Asphalt placed for the current month
Pp = Index price of 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 of 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.

CATEGORY 500
PAVING

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

INSERT: The following.

SECTION 504 — HOT MIX ASPHALT PAVEMENT

504.01 DESCRIPTION. This work shall consist of constructing hot mix asphalt (HMA) pavement as specified in the Contract Documents.

504.02 MATERIALS.

Performance Graded Asphalt Binders	904.02
Tack Coat	904.03
Hot Mix Asphalt Mixes	904.04
Crack Filler	911.01
Production Plant	915

504.03 CONSTRUCTION.

Quality Control Plan. At least 30 days prior to the placement of any HMA pavement, the Contractor shall submit in writing a Plant Quality Control Plan to the representative for the Division Chief of the Asphalt Technology Division and a Field Quality Control Plan to the District Engineer's representative for approval. The Quality Control Plans shall contain a statistically based procedure of random sampling and shall show how the Contractor proposes to control the equipment, materials, production, and paving operations to ensure conformance with these Specifications. A master Plant and Field Quality Control Plan shall be submitted for this prior to approval. When a master Field Quality Control Plan is submitted and approved, an addendum shall be submitted for each specific Contract. The Contractor shall discuss the QC plan requirements in the pre-construction, pre-pave and progress meetings.

The Field Quality Control Plan shall contain:

(a) Production plants, location of plants with respect to the project site, personnel qualifications, inspection and record keeping methods, and minimum frequencies of sampling and testing as specified in MSMT 735, Table 2.

(b) Corrective actions that will be taken for unsatisfactory construction practices and deviations from the material Specifications.

(c) A Quality Control Plan for the plant, which addresses all elements necessary for quality control.

Plan Administrator and Certified Technicians. The Quality Control Plan shall designate a Plan Administrator, who shall have full authority to institute any action necessary for the successful operation of the Plan. The Plan Administrator may supervise the Quality Control Plan on more than one project, if that person can be in contact with the job site within one hour after being notified of a problem.

As identified in the Mid-Atlantic Region Technician Certification Program (MARTCP) and the Maryland Technician Certification Program, the Quality Control Plan shall also designate a Certified HMA Plant Technician – Level 2, a Certified HMA Field Technician, a Certified Inertial Profiler Operator, and if used, a Certified HMA Plant Technician – Level 1, a Certified HMA Materials Tester/Field Technician or any Trainee Technicians. A Certified Plant Technician shall be present at the plant during production and shipment of HMA for the Administration, unless otherwise approved in the Field Quality Control Plan. The technician shall perform the quality control sampling, testing and documentation in conformance with the approved quality control plan and Contract Documents.

A Certified Field Technician shall be present at the job site unless otherwise approved in the Field Quality Control Plan. The certified technician shall be responsible for the required field quality control sampling and testing in conformance with the approved quality control plan and contract documents. Any deviation from the approved quality control plan, not approved by the Engineer, shall be cause for immediate suspension of the production and paving operations.

In addition to quality control testing, the Contractor's or Producer's technician certified by the Administration shall perform sampling for quality control, sampling for quality assurance, sampling for acceptance, and sampling for verification. Quality control test results shall be submitted to the Engineer when requested. When a certified technician becomes deficient in their duties as defined in MSMT 731 and the Mid-Atlantic Region Technician Certification Program policy manual, the technician's certification will be rescinded. The Contractor shall replace the deficient technician with another certified technician before resuming production and paving operations for the Administration.

Records. The Contractor shall maintain and make available to the Engineer upon request complete records of sampling, testing, actions taken to correct problems, and quality control inspection results. Copies of the reports shall be provided when requested by the Engineer.

The Contractor shall maintain linear control charts or may elect to use other types of control charts such as standard deviation, range, etc. Control charts may be maintained by production, by mix, or by mix per project. Current control charts shall be maintained in the quality control laboratory in a manner satisfactory to the Engineer. As a minimum, the control charts shall identify the mix design number, each test result, and the upper and lower Specification limits applicable to each test.

Quality Assurance (QA). The Administration will perform QA by conducting independent sampling, testing and inspection activities separate from the Contractor and Producer. The Engineer will perform the following to assure the quality of the HMA pavement:

(a) Periodically observe tests performed by the Producer or Contractor,

(b) Monitor required control charts,

(c) Direct the producer or contractor to take mix samples behind the paver prior to compaction,

(d) Direct the producer or contractor to take mix samples at the plant site,

(e) Direct the producer or contractor to take core samples from the compacted pavement,

(f) Monitor conformance with the approved quality control plan(s), and

(g) Evaluate quality control sampling and testing procedures and quality control sampling and testing equipment by an Independent Assurance (IA) program.

The Contractor shall protect the pavement against damage from all causes. Any part of the pavement that is damaged shall be repaired or replaced by the Contractor at no additional cost to the Administration.

504.03.01 Equipment. All equipment including the production plant and paving equipment shall be subject to approval by the Engineer. The plant shall be ready for inspection by the Engineer at least 48 hours prior to the start of construction operations.

(a) Hauling Units. Refer to 915.02(f).

(b) Pavers. The Engineer's inspection and approval of pavers will be based upon the manufacturer's specification manual (copy to be provided by the Contractor on request). The paver shall be equipped with means of preventing the segregation of the coarse aggregate particles when moving the mixture from the paver hopper to the paver augers. The means and methods used shall be in accordance with the paver manufacturer's instructions and may consist of chain curtains, deflector plates, or other such devices, or any combination of these. The Contractor shall demonstrate to the Engineer prior to use that the modifications to the paving equipment have been implemented on all pavers to be used on the project. The mainline paver shall be a Highway Class, 25,000 pounds or greater, self-contained, self-propelled unit. For non-mainline paving, a paver less than 25000 pounds may be used. The paver shall:

(1) Produce a finished surface of the required smoothness and texture without tearing, shoving, or gouging the mixture.

(2) Be operated in a manner, which delivers a homogeneous mixture the full width of the pavement.

(3) Have automatic controls capable of maintaining the grade and transverse slope within the required tolerances set forth in the contract documents.

When screed extensions are used, auger extensions shall be used with a distance no greater than 18 in. from the end of the auger to the end gate.

Manual operation will be permitted to make grade changes, in the construction of irregularly shaped and minor areas, or where directed by the Engineer.

Whenever a breakdown or malfunction of any automatic control occurs, the equipment may be operated manually for the remainder of the workday as directed by the Engineer.

Reference lines or other suitable markings to control the horizontal alignment shall be provided by the Contractor, subject to the approval of the Engineer.

(c) Rollers. All rollers shall be inspected by the Contractor and approved by the Engineer before use. Rollers shall be self-propelled, reversible, and steel wheeled or pneumatic tired. The roller shall be operated:

(1) In conformity with the manufacturer's recommendations.

(2) In a manner that does not damage the mat.

(3) In a manner that delivers the optimal combination of densification requirements and ride requirements.

504.03.02 Weather Restrictions. HMA mixtures used as the final surface shall only be placed when the ambient air and surface temperature is at least 40 F. Mixtures used as intermediate and base layers shall only be placed when the ambient air and surface temperatures are at least 32 F and polymer-modified surface mixes shall only be placed when the ambient air and surface temperatures are at least 50 F. The pavement surfaces shall be clean, dry, and approved by the Engineer before HMA paving begins. When weather conditions differ from these limits, or when it begins raining while the work is underway, the material en route from the plant to the job site may be used at the Contractor's risk. The Engineer shall reserve the right to perform any testing necessary to ensure the quality of the pavement. All testing and associated cost, including maintenance of traffic, shall be at the Contractor's expense.

When placement of the material is stopped by the Engineer, all material en route shall be wasted at no additional cost to the Administration.

Placing HMA on a frozen graded aggregate base is prohibited.

504.03.03 Foundation Preparation. Prior to placement of paving material, the foundation shall be constructed as specified in the Contract Documents and as approved by the Engineer. When paving over existing pavement, all excess crack filling or patch material, shall be removed and all spalls and potholes shall be cleaned, tack coated, filled with HMA, and tamped before placement of paving material. Manholes, valve boxes, inlets, and other appurtenances within the area to be paved shall be adjusted to grade as directed by the Engineer.

504.03.04 Tack Coat. Prior to application of the tack coat, the surface shall be cleaned of all loose and foreign materials. The tack coat shall be uniformly applied to the surface by full circulation spray bars that are laterally and vertically adjustable and provide triple fanning and overlapping action so that the resulting coating shall be residual asphalt applied at a rate of 0.01 to 0.05 gal/yd^2 as directed by the Engineer.

504.03.05 Hot Mix Asphalt Placement. Delivery of the mixture by the hauling units and placement should be continuous. At the time of placement, the temperature of the mixture shall be at least 225 F, or as identified in the approved Quality Control Plan for Field Operations. HMA shall be placed by the paver. Broadcasting of loose mixture over the new surface is prohibited.

504.03.06 Compaction. Immediately following placement of the HMA, the mixture shall be compacted by rolling to the proper in-place density specification and ride smoothness requirement. Incentive or disincentive price adjustment for density will be as specified in 504.04.02. Incentive or disincentive price adjustment for ride smoothness will be as specified in 535.04.03. Steel wheel rollers shall be used for the first rolling of all joints and edges, the initial breakdown rolling, and the finish rolling.

When base widening is too narrow to permit the use of conventional rollers, a power driven trench roller shall be used. When the trench must be excavated wider than the proposed width of the widening, an earth berm or shoulder shall be formed against the loose HMA as soon as it is placed. The two materials shall be rolled and compacted simultaneously. Roller marks shall not be visible after rolling operations.

After rolling is completed, no traffic of any kind will be permitted on the pavement until the pavement has cooled to less than 140 F or as directed by the Engineer.

504.03.07 Joints. Both longitudinal and transverse joints in successive courses shall be staggered so that one is not above the other. Transverse joints shall be staggered by the length of the paver. Longitudinal joints shall be staggered a minimum of 6 in. and shall be arranged so that the longitudinal joint in the top course shall be within 6 in. of the line dividing the traffic lanes. Joints shall be constructed to provide a continuous bond between the old and new surfaces. Longitudinal joints constructed adjacent to existing HMA pavements shall overlap the existing pavement 1-inch to 1.5-inches. The initial longitudinal roller pass shall be on the un-compacted hot mat and 6-inches to 1-foot from the joint. The successive roller pass shall compact the overlapped material and the 6-inch to 1-foot material simultaneously.

Joints shall be coated with tack coat as directed by the Engineer. When placing a surface course, the edge of the existing pavement shall be cut back for its full depth at transverse joints to expose a fresh surface, which shall be coated with tack coat material as directed by the Engineer. Before placing the mixture against curbs, gutters, headers, manholes, etc., all contact surfaces shall be coated with tack coat.

504.03.08 Edge Drop-off. Where HMA paving is being applied to highways carrying traffic, all compacted pavement courses exceeding 2-1/2 in. in depth shall be matched with the abutting lane or shoulder on the same working day. Where compacted pavement courses of 2-1/2 in. or less are placed, the Contractor shall have the option of paving the abutting lane or shoulder on alternate days. The abutting lane or shoulder shall be paved regardless of the depth of the compacted pavement course prior to weekends and temporary shutdowns. When uneven pavement joints exist, the Contractor shall provide advance warning traffic control devices in conformance with the Contract Documents.

504.03.09 Tie-In. When HMA paving is being applied to the traveled way carrying traffic with a posted speed $\leq$40 mph the Contractor shall construct a temporary tie-in a minimum of 4 ft in length for each 1 in. of pavement depth. When HMA paving is being applied to the traveled way carrying

traffic with a posted speed >40 mph the Contractor shall construct a temporary tie-in a minimum of 10 ft in length for each 1 in. of pavement depth. Temporary tie-ins shall be constructed before traffic is allowed to cross the transverse joint. Temporary tie-ins 10ft or greater shall be constructed using a paver meeting the requirements of section 504.03.01.

The final tie-in shall include the removal of a transverse portion of the existing pavement to a depth so the design thickness of the final surface course is maintained. The length of the final tie-in shall be equal to the posted speed per 1 in. depth of the design thickness of the final course with a minimum length of 25 ft per 1 in. depth and a maximum length of 50 ft per 1 in. depth.

504.03.10 Sampling & Testing for Mixture. Quality Control **(QC)** sampling and testing shall be the responsibility of the Producer or Contractor. The Field QC Plan shall identify the QC sampling location (plant site or project site). Quality Assurance **(QA)** sampling shall be performed by the Contractor as directed and witnessed by the Administration. QA samples shall be obtained behind the paver prior to compaction. QA testing shall be the responsibility of the Administration.

(a) QC Sampling for Mixture at the Plant Site. Plant site mixture sampling shall be completed in conformance with MSMT 451, Method A. The samples shall be obtained randomly. A minimum of one mixture sample per day's shipment per mix or one per 1000 tons of shipment per mix, whichever yields a higher frequency, shall be obtained. The producer shall sample the mixture at the plant site. The sample shall be obtained or witnessed by the Certified Technician. QC plant site mixture shall not be used in the pay factor calculation.

(b) QC Sampling for Mixture at the Project Site. Project site mixture sampling shall be completed in conformance with MSMT 457. The samples shall be obtained randomly and independent of QA mixture samples. QC and QA samples shall not be split samples. A minimum of one mixture sample per paving day per mix or one per 1000 tons of paving per mix, whichever yields a higher frequency, shall be obtained. The Contractor's Certified Technician shall sample the mixture at the project site. A mixture sublot size should not exceed 1000 tons. A sublot size up to 200 tons can be combined with the previous 1000 ton sublot placed on the same day. A mix lot constitutes all sublots of a mix created during the production of required tonnage for a lot as defined herein. A new lot number for a mix will be given when there is a change in the approved job mix formula. QC project site mixture sample results may be used in the pay factor calculation.

(c) QA Sampling for Mixture at the Project Site. Project site mixture sampling shall be completed in conformance with MSMT 457. The samples shall be obtained randomly. A minimum of one mixture sample per paving day per mix or one per 1000 tons of paving per mix, whichever yields a higher frequency, shall be obtained from behind the paver prior to compaction. The Contractor's Certified Technician shall sample the mixture at the project site as witnessed by the Administration. The Administration will immediately take possession of the QA mixture sample and deliver the sample to the Laboratory for testing. A mixture sublot size should not exceed 1000 tons. A sublot size up to 200 tons can be combined with the previous 1000 ton sublot placed on the same day. A mix lot constitutes all sublots of a mix created during the production of required tonnage for a lot as defined herein. A new lot number for a mix will be given when there is a change in the approved job mix formula.

(d) Mixture Acceptance Determination. An HMA mixture acceptance lot size is approximately equal to 6000 tons of a mix per project. A mix acceptance lot ends on the day when 6000 tons is reached. A mixture sublot size should not exceed 1000 tons. A sublot size up to 200 tons can be combined with the previous 1000 ton sublot placed on the same day. A mix lot constitutes all sublots of a mix created during the production of required tonnage for a lot as defined herein. A new lot number for a mix will be given when there is a change in the approved job mix formula. The Administration will test a minimum of three behind the paver mixture samples per acceptance lot in conformance with MSMT 735 for asphalt content and gradation. When QC samples are taken randomly from behind the paver, the QC results and QA results from behind the paver will be compared based on the analysis in conformance with MSMT 733 (F test and t test method) for each pay factor property in MSMT 735. 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 in accordance with MSMT 735 and 504.04.02. When F test and t test methods, indicate a QC and QA pay factor property is from different populations, the pay factor property will be determined using QA results only. The Administration will determine the acceptance evaluation procedure when less than three QA behind the paver samples are obtained for an acceptance lot. The Administration's Laboratory will make the results of the individual days paving available to the SHA Project Engineer and the HMA Producer no later than five working days.

504.03.11 Sampling & Testing for Density Determination. Quality Control **(QC)** sampling and testing shall be the responsibility of the Producer or Contractor. Quality Assurance **(QA)** sampling shall be performed by the Contractor as directed and witnessed by the Administration. QA testing shall be the responsibility of the Administration. The Engineer is responsible to select at random the core sampling locations for each sublot in conformance with MSMT 459. The Contractor shall sample the QC and QA cores in conformance with MSMT 458 as witnessed by the Engineer. A minimum of 10 cores per day's paving per mix or two per 500 tons of paving per mix, whichever yields the higher frequency of cores, shall be taken. A density lot is defined as a day's paving per mix. A sublot shall not exceed 500 tons. The Engineer shall designate one core sample for QC and one for QA for each sublot. A paving day shall begin with a new lot and sublots. Control strips shall be divided into five equal sublots. The diameter of the cores shall be 6 in., except that a 4 in. core may be used for mixes smaller than 25 mm. The Engineer will note any density waivers on the daily field density forms with remarks for the waivers.

(a) Quality Control (QC) for Density. The Contractor shall obtain and test one core per sublot for Quality Control. The QC Laboratory will test core samples in conformance with MSMT 452. 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%. When more than one mixture 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. The Contractor shall retain core samples until notified of the results of the F& t test.

(b) **Quality Assurance (QA) for Density.** The Administration shall obtain and test one core per sublot for Quality Assurance. The Engineer will take immediate possession of the core samples and deliver the cores to the Administration's Laboratory for testing. The Laboratory will test core samples in conformance with MSMT 452. 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%. When more than one mixture 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 SHA Project Engineer and the HMA Producer no later than five working days.

(c) **Acceptance.** Each HMA 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 shall be analyzed in conformance with MSMT 733 (F test and t test method). When test results are determined to be from the same population, QC and QA sublot results will be averaged to calculate the density pay factor in accordance with and 504.04.02. When results are determined not from the same population, the pay factor will be calculated using QA sublot 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. When 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. When they do not compare within 0.026, QA maximum specific gravity results shall be used to determine each core density. Sublot density and lot density shall be between 92.0 and 97.0. Pay reduction or incentive for the pavement compaction lot will be calculated in conformance with 504.04.02. The process for determining statistical outliers will be in conformance with MSMT 734. An HMA 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 sublot shall not be greater than 500 tons. When a paving day's production per mix is greater than 2500 tons, then each sublot size shall be 500 tons or fraction thereof. On Contracts requiring less than 500 tons of HMA or when HMA is used in nontraffic areas or on bridge decks, acceptance will be determined by the use of a thin layer density gauge tested in conformance with the manufacturer's recommendations.

504.03.12 Thin Lifts and Wedge/Level Courses. Pavement density shall be determined by using density gauge readings. When the HMA course is determined by the Engineer to be a thin lift in accordance with the "Thin Lift Mix Design Identification Table" in Section 904.04.03, a 400 to 500 ft control strip shall be constructed on the first day of paving. Readings shall be taken in five (5) random locations with a thin layer density gauge in accordance with the manufacturer's recommendations to determine roller patterns and the number of coverages to obtain optimum density. Optimum density is defined as when the average density does not change by more than 1.0 percent between successive coverages and the percent density is between 90.0 and 97.0. This optimum density shall be used to determine HMA acceptance after approval by the Engineer. Any lot average 2.0 percent or more below

optimum density shall require a new control strip to be constructed, tested and approved by the Engineer before paving continues. Readings shall be taken in a minimum of 10 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 sublot shall not exceed 500 tons. A paving day shall begin with a new lot and sublots.

Wedge/Level courses placed at variable thicknesses shall be tested and accepted in accordance with this Thin Lift specification.

504.03.13 Control Strip. When mixes are not determined to be Thin Lifts, the Contractor may opt to construct a control strip for guidance in determining roller patterns to achieve optimum density. When a control strip is constructed, it shall be placed on the first workday in which HMA is placed and shall be between 400 and 500 ft in length. Based on the Contractor's evaluation of the initial control strip, paving may continue at the Contractor's risk.

The Contractor will not be assessed a density pay adjustment for the amount of material required for construction of the control strips. Should the removal of any control strip be necessary, the Contractor shall remove it at no additional cost to the Administration.

The Engineer may require the Contractor to construct a control strip any time during placement of HMA based on the evaluation of compaction results.

504.03.14 Pavement Surface Checks. The Contractor shall have available, at all times, a 10 ft straightedge approved by the Engineer. After final compaction of each course, the surface of each pavement course shall be true to the established line and grade and shall be sufficiently smooth so that when tested with a 10 ft straightedge placed upon the surface parallel with the center line, the surface shall not deviate more than 1/8 in. The transverse slope of the finished surface of each course when tested with a 10 ft straightedge placed perpendicular to the center line, shall not deviate more than 3/16 in.

Transverse joints on each course shall be checked with a 10 ft straightedge immediately after the initial rolling. When the surface of each course varies more than 1/8 in. from true, the Contractor shall make immediate corrections acceptable to the Engineer so that the finished joint surface shall comply.

Areas that are tested and reported in accordance with Specification 535 are not applicable to 504.03.14.

504.03.15 Curbs, Gutters, Etc. Where permanent curbs, gutters, edges, and other supports are planned, they shall be constructed and backfilled prior to placing the HMA, which shall then be placed and compacted against them.

504.03.16 Shoulders. Shoulders abutting the HMA surface course of any two-lane pavement that is being used by traffic shall be completed as soon as possible after completion of the surface course on that lane. Shoulder construction shall be as specified in the applicable portions of the Specifications and the Contact Documents.

504.03.17 Pavement Profile. Refer to the Pavement Surface Profile requirements specified in the Contract Documents.

504.04 MEASUREMENT AND PAYMENT. Hot Mix 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 hot mix asphalt is being applied to the traveled way carrying traffic will not be measured but the cost will be incidental to the pertinent Hot Mix 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 hot mix asphalt for the final tie-in will be measured and paid for at the Contract unit price for the pertinent Hot Mix 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 Hot Mix 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 Hot Mix 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. An adjustment will be made to the final Contract unit price for Hot Mix Asphalt if the price of asphalt binder fluctuates significantly from the prevailing price as quoted in the Contract Documents to the date of placement. This includes HMA patching material converted to tons. The Contract unit price will be adjusted by the amount of fluctuation above 5 percent for Contracts scheduled to be paved during more than one construction season or having an estimated mix quantity of 10 000 tons or more. For Contracts completed within one construction season and having an estimated mix quantity of less than 10 000 tons, the adjustment will be based upon the amount of fluctuation above 15 percent. Only the differential percent change beyond the above noted 5 and 15 percent will be used.

For the purpose of making these calculations, a monthly price index will be maintained by the Administration.

The adjusted Contract unit price for Hot Mix Asphalt will be computed monthly by using the following formula:

$$F = (PP - Pb)/ Pb \times 100$$

where:

F = Percent price increase/decrease of asphalt binder.
PP= Index price of asphalt binder per ton at placement date.
Pb= Prevailing index price of asphalt binder per ton as specified in the Invitation for Bids.

Adjusted Contract unit price due Contractor when price of asphalt binder increases:

$$A = B + (D \times T \times Pb)$$

Adjusted Contract unit price due Administration when price of asphalt binder decreases:

$$A = B - (D \times T \times Pb)$$

where:

A = Adjusted Contract unit price per ton of Hot Mix Asphalt.
B = Contract unit price per ton of Hot Mix Asphalt.
D = Differential percentage expressed as a decimal (F – 5 percent or F – 15 percent as defined above).
T = Design target asphalt content expressed as a decimal.
Pb = Prevailing index price of asphalt binder per ton as specified in the Invitation for Bids.

504.04.02 Payment Adjustments for Pavement Density and Hot Mix Asphalt Mixture. Payment adjustments for pavement density will be based on individual sublot 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 mixture will be made by adjusting the payment for Hot Mix Asphalt. Incentive payments will be made using the Contract items for HMA Density Incentive and HMA Mix Design Incentive. The item amounts will be established by the Administration and shall not be revised by the Contractor. Payment reductions for density will be waived for portions of the pavement where the Engineer determines that inadequate density is due to a poor foundation.

TABLE 504A		
Dense Graded HMA Mixes – Percent of Maximum Density		
Lot Average % Minimum	No Individual Sublot Below %*	Pay Factor
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
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: When any test data is above 97.0, the lot may be rejected per the Engineer. When not rejected, the lot will receive a pay adjustment in accordance with the following:
(a) When the density lot average is above 97.5, the pay factor = 0.750
(b) When 3 sublot densities are above 97.0, the pay factor = 0.950
(c) When 4 or more sublot densities are above 97.5, the pay factor = 0.750

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 sublot values and lot average value will be used in acceptance decision.

*Note 4: The average sublot values and the lot average will be used in acceptance decision.

Acceptance of a mixture lot will be in conformance with 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 as computed using the quality level analysis in conformance with MSMT 735.

Payment adjustments will be computed as follows:

Density Lot Payment Adjustment = (DF – 1) x (CP) x (TL)

Mix Design Lot Payment Adjustment = (MF – 1) x (CP) x (TL)

where:

DF = Density pay factor from Table 504A
MF = Mixture pay factor [0.55 + (0.5 x CMPWSL)]
Refer to MSMT 735 for CMPWSL.
CP = Contract unit price
TL = Applicable tonnage per lot

An in-place density lot containing material with a pay factor of less than 1.000 may be accepted at the reduced pay factor, provided the pay factor for density is at least 0.800 and there are no isolated defects.

A mixture 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.

An 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. Any lot that is rejected shall be replaced.

When less than five Quality Control or Quality Assurance samples per in-place density lot have been obtained, the lot will not be evaluated for incentive payment.

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 Control Strip Price Adjustment. The cost of the control strip, if constructed, will not be measured but the cost will be incidental to the pertinent Hot Mix Asphalt item.

504.04.04 Dispute Resolution. This is a general procedure to resolve conflicts resulting from discrepancies between test results from the Engineer and Contractor, and non-test related disputes of sufficient magnitude to impact payment. When a dispute arises, the producer or Engineer will file a written complaint to the Chief Engineer describing the nature of the dispute along with the pertinent information. The Chief Engineer will appoint a panel of three members to resolve the conflict. The panel will include a member selected by the asphalt industry. The panel will make recommendations to the Chief Engineer. The Chief Engineer will decide the disposition of the dispute based on the panel's recommendations. A written report from the panel describing all subsequent actions and final disposition of the dispute shall be included in the project records.

If subsequent disputes arise on the same issue, the written report will be included as a resource during the resolution process.

CATEGORY 500
PAVING

SECTION 504 — HOT MIX ASPHALT PAVEMENT

504.04 MEASUREMENT AND PAYMENT.

477 **DELETE**: 504.04.02 Payment Adjustments for Pavement Density and Hot Mix Asphalt Mixture in its entirety.

INSERT: The following.

504.04.02 Payment Adjustments for Pavement Density and Hot Mix Asphalt Mixture. Payment adjustments for pavement density will be based on individual sublot 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 mixture will be made by adjusting the payment for Hot Mix Asphalt. Incentive payments will be made using the Contract items for HMA Density Incentive and HMA Mix Design Incentive. The item amounts will be established by the Administration and shall not be revised by the Contractor. Payment reductions for density will be waived for portions of the pavement where the Engineer determines that inadequate density is due to a poor foundation.

TABLE 504A		
Dense Graded HMA Mixes – Percent of Maximum Density		
Lot Average % Minimum	No Individual Sublot Below %*	Pay Factor
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
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: When any test data is above 97.0, the lot may be rejected per the Engineer. When not rejected, the lot will receive a pay adjustment in accordance with the following:

(a) When the density lot average is above 97.5, the pay factor = 0.750
(b) When 3 sublot densities are above 97.0, the pay factor = 0.950
(c) When 4 or more sublot densities are above 97.5, the pay factor = 0.750

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 sublot values and lot average value will be used in acceptance decision.

*Note 4: The average sublot values and the lot average will be used in acceptance decision.

Acceptance of a mixture lot will be in conformance with 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 as computed using the quality level analysis in conformance with MSMT 735.

Payment adjustments will be computed as follows:

Density Lot Payment Adjustment = (DF – 1) x (CP) x (TL)

Mix Design Lot Payment Adjustment = (MF – 1) x (CP) x (TL)

where:

DF = Density pay factor from Table 504A
MF = Mixture pay factor [0.55 + (0.5 x CMPWSL)]
Refer to MSMT 735 for CMPWSL.
CP = Contract unit price
TL = Applicable tonnage per lot

An in-place density lot containing material with a pay factor of less than 1.000 may be accepted at the reduced pay factor, provided the pay factor for density is at least 0.800 and there are no isolated defects.

A mixture 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.

An 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. Any lot that is rejected shall be replaced.

When less than five Quality Control or Quality Assurance samples per in-place density lot have been obtained, the lot will not be evaluated for incentive payment.

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.

CATEGORY 500
PAVING

SECTION 505 — HOT MIX ASPHALT PATCHES

505.03 CONSTRUCTION.

464 **DELETE:** 505.03.02 in its entirety.

INSERT: The following.

505.03.02 Existing Pavement. Each shift the Contractor shall complete all repairs for which excavation has been completed. Open excavated areas at the end of the work shift are prohibited.

465 **DELETE:** The last sentence in the first paragraph of 505.03.03.

INSERT: The following.

The existing pavement materials that are removed shall be disposed of off site immediately by the Contractor.

466 **DELETE:** 505.03.06 in its entirety.

467 **DELETE:** The words "steel plates" from the first and second paragraphs.

CATEGORY 500
PAVING

SECTION 505 — HOT MIX ASPHALT PATCHES

466 **DELETE:** 505.03.09 — Testing and Acceptance in its entirety.

INSERT: The following.

505.03.09 Testing and Acceptance. Acceptance shall be determined by in place density gauge test data and witnessed by the Engineer. The density gauge shall be calibrated per the manufacturer's recommendation. The Contractor shall take one test from each lift of each patch. Test locations shall be randomly selected within the patch.

In place density gauge test data shall be expressed 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.

CATEGORY 500
PAVING

486 **DELETE:** SECTION 506 — GAP-GRADED HOT MIX ASPHALT in its entirety.

INSERT: The following.

SECTION 506 — GAP-GRADED STONE MATRIX ASPHALT

506.01 DESCRIPTION. Place gap-graded stone matrix asphalt surface (GGSMA) as specified. GGSMA shall conform to Section 504, except as specified herein.

506.02 MATERIALS.

Gap-Graded Stone Matrix Asphalt	904.05
Production Plant	915

506.03 CONSTRUCTION.

506.03.01 Demonstration. Before proceeding with the actual work, the Contractor shall demonstrate to the Engineer that a satisfactory mix can be produced, placed, and the compactive effort determined. A minimum of 100 tons of GGSMA shall be placed outside the project limits for the demonstration. A new strip will be required if a project carries over to a new season. Paver and rollers shall conform to 504.03.01. A material transfer vehicle may be used as part of the demonstration strip.

506.03.02 Hauling Units. Dry soap powder, as approved by the Engineer, may be used with the release agent specified in 915.02(f). Truck beds shall be raised to drain excess water before being loaded with GGSMA.

A light dusting of No. 10 aggregate coated with 1 percent asphalt may be used in lieu of the liquid release agent.

The time between plant mixing and shipment shall not exceed one hour (storage time may vary depending upon gradation, type of binder and/or stabilizer. Storage material shall consistently have results of no less quality than mixtures discharged directly into hauling vehicles). Each load shall be completely covered with a full tarp extending a minimum of 6 in. over each side of the truck body and securely fastened.

506.03.03 Weather Restrictions. Placement of GGSMA will be permitted only when the ambient and surface temperatures are at least 50 F and in accordance with 504.03.02.

506.03.04 Material Transfer Vehicle (MTV). Use a material transfer vehicle to apply the final surface course. The MTV shall perform additional mixing of the Gap-Graded SMA material and then deposit the mixture into the paver at a uniform temperature and consistency.

506.03.05 Mix Temperature. The minimum temperature of the mixture at the time of placement shall be established during the mix design procedure.

506.03.06 Pavement Thickness. The thickness of the pavement shall be as specified in the Contract Documents. Thin Lift specification 504.03.12 is not applicable to GGSMA.

506.03.07 Tack Coat. Refer to 504.03.04 except that, the resulting coating shall be residual asphalt applied at a rate of 0.03 to 0.05 gal/yd^2.

506.03.08 Compaction. Compaction shall be performed using a minimum of three steel-wheeled rollers, each weighing 10 to12 tons. The rollers shall follow the paver within 500 ft. or roll as approved in the QC Plan. Rolling shall start immediately after placement. In place density shall conform to 504.03.11 (c), except that the density shall be 94 to 97 percent of maximum density. Sampling and testing shall be performed as specified in 504.03.11.

The rollers shall be equipped with a watering or soapy watering system that prevents material from sticking to the rollers.

506.03.09 Control Strip. The Contractor may opt to construct a control strip for guidance in determining roller patterns to achieve optimum density. When a control strip is constructed, it shall be placed on the first workday in which SMA is placed and shall be between 400 and 500 ft in length. Based on the Contractor's evaluation of the initial control strip, paving may continue at the Contractor's risk.

The Contractor will not be assessed a density pay adjustment for the amount of material required for construction of the control strips. Should the removal of any control strip be necessary, the Contractor shall remove it at no additional cost to the Administration.

The Engineer may require the Contractor to construct a control strip any time during placement of SMA based on the evaluation of compaction results.

506.03.10 Pavement Profile. Refer to the Pavement Surface Profile requirements specified in the Contract Documents.

506.03.11 Sampling and Testing for Density and Mixture. For sampling and testing for density and mixture refer to 504.03.10 and 11.

506.04 MEASUREMENT AND PAYMENT. Stone Matrix Asphalt Gap-Graded will be measured and paid for at the Contract unit price per ton, complete and in place. The payment will be full compensation for furnishing, hauling, placing all materials, material transfer vehicle, antistripping additive, tack coat, control strips, setting of lines and guides where specified, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Material produced for the demonstration will not be measured but the cost will be incidental to the item GGSMA.

506.04.01 Price Adjustment for Stone Matrix Asphalt Mixture and Pavement Density. Refer to 504.04 except as follows:

GAP GRADED STONE MATRIX ASPHALT MIXES		
PERCENT OF MAXIMUM DENSITY		
LOT AVERAGE MINIMUM (%)	**NO INDIVIDUAL SUBLOT BELOW (%)**	**PAY FACTOR (%)**
95.0	95.0	105.0
94.9	94.8	104.5
94.8	94.6	104.0
94.7	94.4	103.5
94.6	94.2	103.0
94.5	94.0	102.5
94.4	93.8	102.0
94.3	93.6	101.5
94.2	93.4	101.0
94.1	93.2	100.5
94.0	93.0	100.0
93.8	92.7	99.0
93.6	92.4	98.0
93.4	92.1	97.0
93.2	91.8	96.0
93.0	91.5	95.0
92.8	91.2	94.0
92.6	90.9	93.0
92.4	90.6	92.0
92.2	90.3	91.0
92.0	90.0	90.0
91.8	89.7	89.0
91.6	89.4	88.0
91.4	89.1	87.0
91.2	88.8	86.0
91.0	88.5	85.0
Less than 91.0	—	75.0 or rejected per Engineer

Note 1: When any test data is above 97.0, the lot may be rejected per the Engineer. When not rejected, the lot 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 sublot densities are above 97.0, the pay factor = 95%.
(c) When 4 or more sublot 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 sublot values and lot average value will be used in acceptance decision.

Note 4: The average sublot values and the lot average will be used in acceptance decision.

506.04.02 Dispute Resolution. Refer to 915.02.01, Responsibilities of the Administration, (e).

CATEGORY 500
PAVING

SECTION 523 — JOINT SEALING OF PORTLAND CEMENT CONCRETE PAVEMENT

523.04 MEASUREMENT AND PAYMENT.

DELETE: 523.04 MEASUREMENT AND PAYMENT in its entirety.

INSERT: The following.

Joint Sealing of Portland Cement Concrete Pavement will be paid for at the Contract unit prices for Concrete Pavement Crack Repair and Concrete Pavement Joint Repair, and shall be measured per linear foot. The payment will be full compensation for cleaning existing joints and existing cracks, furnishing, hauling, placing all materials including preformed joint filler, joint sealer, backer rod, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Maintenance of Traffic for this work will be paid for as part of the Lump Sum Item "Maintenance of Traffic" and/or other pertinent Traffic items.

CATEGORY 600
SHOULDERS

SECTION 600-01 — DETECTABLE WARNING SURFACES

600-01.01 DESCRIPTION. This work shall consist of furnishing and installing Detectable Warning Surfaces at all new sidewalk ramps as shown in the Contract Documents or as directed by the Engineer. This will only be done where new sidewalks are being constructed and will not require retrofitting of existing sidewalk ramps. At any location where an existing sidewalk ramp exists and new sidewalk is being installed, a new sidewalk ramp with Detectable Warning Surfaces shall be installed whether it is specifically indicated on the Plans or not. At any location where an existing sidewalk is being replaced and an existing sidewalk ramp does not exist, but the Engineer directs a sidewalk ramp to be installed, the ramp shall have Detectable Warning Surfaces.

600-02.02 MATERIALS. The Pedestrian Warning Surface shall conform to the latest Americans with Disabilities Act (ADA) Guidelines for outdoor Facilities. The Contractor shall select the surface from the Pre-approved list maintained by the Office of Highway Development. The Contractor shall submit the source of the proposed System to the Engineer for approval.

(a) **Composition:** The surface shall be either of flexible or rigid composition.

(b) **Size:** The Pedestrian Warning Surface shall be 24 in. wide in the direction of pedestrian travel and extend the full width of the curb ramp, landing, or blended transition.

(c) **Shape:** The System shall consist of a surface of truncated domes aligned in a square grid pattern as specified in the Contract Documents or as directed by the Engineer.

(d) **Color:** The color of the surface shall match Federal Color Number Yellow-33538. The color shall be homogeneous throughout the surface.

The surfaces shall have a minimum coefficient of friction of 0.8 when tested per ASTM C 1028.

600-01.03 CONSTRUCTION. The Pedestrian Warning System may be either surface applied or cast-in-place. The Contractor shall install the System in conformance with the Manufacturer's Recommendations. These recommendations shall address the conditions of the concrete surface on which the System will be applied: surface finish, presence of curing compound, length of cure, etc. The recommendations shall also address ambient temperature, moisture conditions, adhesive pot life, set time, tools required, and other details about the technique of System installation.

The vertical edges of the installed System shall be no higher than 0.25 in. above the adjacent surfaces. When the difference in height is between 0.25 and 0.50 in., the Contractor shall bevel the edge with a slope no steeper than 2 to 1.

600-01.04 MEASUREMENT AND PAYMENT. "Detectable Warning Surface" shall not be measured, but the cost will be incidental to the "5" Concrete Sidewalk" item.

CATEGORY 800
TRAFFIC

800-01 — CATALOG CUTS AND WORKING DRAWINGS

800-01.01 DESCRIPTION. This work shall consist of the Contractor preparing and transmitting submittals to demonstrate the performance of the work will be 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. Stakeouts of the sign locations shall be submitted for all sign structure locations as specified in the Contract Documents.

800-01.02 MATERIALS. Not Applicable.

800-01.03 CONSTRUCTION.

Submittal Requirements. Submittals shall be scheduled and coordinated with the Contractor's Construction Schedule. A complete Submittal Schedule and list of required submittals shall be submitted with the first submittal, but no later than three days after the Pre-Construction Conference. The Schedule for submission of submittals shall be arranged so that related equipment items are submitted concurrently.

The Engineer may require changes to the Submittal Schedule to permit concurrent review of related equipment. Shop Drawings for closely related items such as a sign and its support structures shall be submitted together.

Submittal Documents. Contractor's Drawings shall be neat in appearance, legible and explicit to enable proper review to ensure Contract compliance. 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 the Contractor's Drawings deviate from the Contract Documents, the Contractor shall so advise the Engineer in writing with the submittal and state the reason therefore.

No portion of the work requiring a Contractor's Drawing shall be started nor shall any materials be fabricated, delivered to the site, or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved Contractor's Drawings shall be at the Contractor's risk. The Maryland Transportation Authority 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.

In case of fixed mechanical and electrical equipment, Layout Drawings drawn to scale, shall be submitted to show required clearances for operation, maintenance and replacement of parts. Manufacturer's certified performance curves, catalog cuts, pamphlets, descriptive literature, installation and application recommendations, shall be provided 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.

Manufacturer's catalog, product and equipment data shall be certified and shall include 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.

Catalog cuts for sign luminaires shall have 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.

The Contractor shall 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 Authority 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 therefore.

Submittal Process. Each Contractor's Drawing submitted by the Contractor shall have affixed to it the following Certification Statement, signed by the Contractor:

"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, submit a Contractor's 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 for approval:

Each submittal shall have a Transmittal Page that indicates the Contractor's and Sub-Contractor's address and phone numbers. Submittals containing multiple items need the identification only on the exterior of each package. For original submittals, and each subsequent resubmittal that may be required, nine (9) copies will be submitted. 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, Revision Number, and date of drawing and revision.
(b) Applicable Contract Drawing Numbers and Specification Section and Paragraph Numbers.

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 TRANSPORTATION AUTHORITY

SUBMITTAL PACKAGE #_____ DATED _____

CONTRACT # _____ LOCATION_____

PROJECT DESCRIPTION _____

_____

ITEM # _____ THIS ITEM CONTAINS PAGES_____

ITEM DESCRIPTION _____

_____

☐ ACCEPTED

☐ ACCEPTED AS NOTED

☐ REJECTED - REVISE & RESUBMIT

REVIEWERS NAME _____ DATE_____

The Contractor shall 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 Contractor's Drawings will be returned to the Contractor.

Each submittal shall be in accordance with the Contractor's Submission Schedule. Allow thirty (30) days for checking and appropriate action by the Engineer.

Contractor's 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 (30) thirty days for checking and appropriate action by the Engineer.

800-01.04 MEASUREMENT AND PAYMENT. Catalog Cuts, Manufacturer's 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

800-02 — FIELD EQUIPMENT CABINETS

800-02.01 DESCRIPTION

This work shall consist of furnishing and installing base or pole mounted field equipment cabinets at locations shown on the plans. This work shall include all materials, labor, necessary hardware and electrical connections. The contractor will be required to coordinate and schedule with the Authority delivery of the equipment to the site.

All components furnished under this functional specification shall be current production equipment and of recent manufacture. To ensure overall system compatibility, all field equipment cabinets shall be from the same manufacturer.

800-02.02 MATERIALS

Electrical/electronic equipment, cabinets, and all component parts shall meet the requirements as specified in Section 820.02 and the standards as set forth in these special provisions.

1) Anchor bolts/Bolts/Nuts/Washers
2) Cabinets and doors
3) Mounting hardware
4) Conduit
5) Power service conditioning and distribution equipment
6) Electrical wires, harnesses and connectors
7) Environmental control equipment

800-02.03 CONSTRUCTION

800-02.03.01 Electronic Equipment

Any additional electronic equipment (controllers, multiplexers, etc.) to be installed in the field cabinets shall be as specified.

800-02.03.02 Cabinets - General

1) Serial numbers and model numbers, if available, shall be permanently engraved on all removable components and hardware.

2) The serial number and model number shall be etched, stamped, or molded.

   a. The use of adhesive backed labels is not acceptable.

   b. Mainframe serial numbers and model numbers shall be readable without disassembly or removal of any part of the cabinet or components located within the cabinet and located on the front face of the mainframe unit.

3) All cabinets shall meet or exceed the requirements of a NEMA 3R rating and shall be UL listed.

4) All cabinets and doors shall be fabricated from 5052-H32 sheet aluminum alloy with a minimum one eighth of an inch (1/8 in.) thickness.

5) All mounting hardware and cabinet bracing shall also be made from aluminum.

6) All external welds shall be made using the Tungsten Inert Gas (TIG) welding method.

7) Detailed cabinet drawings and material catalog cuts shall be submitted to the Authority for review and approval prior to ordering cabinets. Drawings shall include, at a minimum, dimensions, equipment placement layout, and cabinet wiring schematics.

800-02.03.03 Cabinets – Electrical

1) All conductor wire runs shall be continuous with no splices.

2) All wiring harnesses shall be encased in a continuous sheath. The use of cable ties to arrange wiring harnesses is not acceptable. The use of adhesive backed wire holders is also not acceptable.

3) All cabinet back and panel harness wiring shall be soldered at its destination point as specified.

4) All conductors shall be labeled. Labels shall be either attached to each end of the conductor and indicate the destination of the other end of the conductor, or shall be a continuous, permanent identification of the conductor's function and located every six inches along the conductor.

5) All conductors used in the controller cabinet wiring shall conform to the following color code requirements.

   a. AC Neutral conductors shall be identified by a continuous white color.

   b. AC Ground conductors shall be identified by a continuous green color.

   c. AC Positive conductors shall be identified by a continuous black or red color depending on phase.

   d. All other conductors shall be identified by any color not previously specified.

6) All bolts used for electrical connections shall be fabricated from stainless steel.

7) All hardware used for electrical connections and terminal facilities shall be fabricated using cadmium-plated brass.

8) All fuse holders shall be of the encased type.

9) All switches shall be encased, environmentally sealed, and rated for one hundred and twenty-five percent of capacity. Switches and thermostats shall break the "hot" side of the line

10) All welds shall be neatly formed and free of cracks, blow holes and other irregularities.

11) All inside and outside edges of the cabinet shall be free of burrs.

12) All access door openings shall have a double flange on all four sides.

800-02.03.04 Cabinets - Mechanical

1) Size.

   All cabinets shall be base or pole mounted NEMA TS-2, size 6. The size 6 cabinets shall be a minimum of fifty-five inches in height by thirty-eight inches in width by twenty-six inches in depth (55 in. H x 38 in. W x 26 in. D). The top of the cabinet shall have a depth of twenty-eight inches to provide the necessary ventilation opening.

2) Equipment Racks.

   The Contractor shall furnish and install a removable E.I.A. 19-rack-mount assembly in all NEMA size 6 cabinets furnished and installed under this contract. The rack(s) shall

be installed on the left side of the cabinet, facing the door. All power distribution equipment shall be mounted on the right inside wall, opposite the rack assembly. The Contractor shall provide all hardware associated with the mounting of equipment in the rack assembly.

a. Features:

i. Forty-two (42) inches vertical space (24 rack spaces)
ii. All welded 16 gauge carbon steel tubing construction.
iii. Four point leveling
iv. Modular construction
v. ASA 61 Gray color

b. Accessories:

i. One (1) Patch Panel Frame 48" High (Color Gray)
ii. Two (2) 48-inch, 14-gauge, zinc-plated carbon steel mounting rails
iii. Three (3) sliding, ventilated shelves: gray color.

3) Fan-Forced Ventilation

A thermostatically controlled cooling fan shall be provided for all cabinets.

a. The fan and thermostat shall be mounted at the top of the cabinet.

b. The fan and thermostat shall be rated for one hundred and twenty-five percent of capacity.

c. The thermostat shall be manually adjustable, within a ten degree range, from seventy degrees Fahrenheit to one hundred and sixty degrees Fahrenheit.

d. The fan bearing mechanism shall be of ball bearing design.

e. The fan shall have a minimum rated capacity of one hundred cubic feet per minute (100 CFM) air flow.

f. The fan shall have a minimum rated design life of one hundred thousand hours (100,000 hrs).

4) Natural Ventilation

The cabinets shall be designed for continuous operation over an outside temperature range of -13 degrees F to +113 degrees F (-25 C to +45 C) without requiring fans, in the event the cabinet cooling system fails.

a. All cabinets shall be provided with louvered vents in the front door with a removable air filter. Louvers shall satisfy the NEMA Rod Entry Test for a 3R rated ventilated enclosure.

b. Three extra filters shall be supplied for each cabinet installed.

c. The filter shall cover the vents and be held firmly in place with top and bottom brackets and a spring loaded upper clamp.

d. Exhaust air shall be vented out of the cabinet between the top of cabinet and the main access door.

e. The exhaust area shall be screened with a material having a maximum hole diameter of one eighth of an inch (1/8").

5) Water Runoff

All cabinets shall have a sloped top surface to prevent the accumulation of water on the cabinet.

6) Finish

All outside surfaces of the cabinets shall have a smooth, uniform, natural aluminum finish.

7) Access Door

All cabinets shall have a single access door located on the front of the cabinet.

a. The door opening shall be a minimum of eighty percent of the front surface area of the cabinet.

b. All doors shall be provided with a gasket conforming to the physical properties listing in UL508 Table 21.1 and be such that the gasket forms a weather tight seal between the door and the cabinet.

c. All doors shall be hinged on the right side as viewed facing the cabinet.

d. Hinges shall be of a single, continuous design utilizing a fixed hinge pin.

e. All hinging shall be bolted to the cabinet and door utilizing ¼-20 stainless steel carriage bolts and nylon lock nuts.

f. All hinge pins shall be capped at the top and bottom by weld to render the pin tamper proof.

g. All cabinets shall have hinges fabricated from 0.093 in. stainless steel using a 0.250 in. diameter stainless steel hinge pin and shall provide a three inch open width.

h. All cabinets shall include a door restraint to restrict the door to a maximum one hundred and thirty-five degrees of swing.

i. The restraint mechanism shall provide latching positions at ninety degrees and at one hundred and thirty-five degrees.

j. All cabinets shall be equipped with a lock compatible with the State's existing cabinet locks, (dead bolt type) and key hole cover and be keyed for a number 1 key. The Offeror shall provide the State with a minimum of one key each per cabinet.

8) Interior Lighting

A seventy-five watt rough service bulb with a non-corrosive metal cage shall be mounted to the inside top front portion of the cabinet. A door-activated switch shall be installed to turn the cabinet light on when the front door is opened. The door switch shall be on a separate circuit by itself and used only to turn on the cabinet light.

9) Internal Heating

If required, the cabinet may be equipped with a 250 watt resistance type heater. The heating element shall be controlled by a thermostat, the set point of which shall be manually adjustable.

10) Electrical Power

The control cabinet shall be equipped with a metal-encased, split-phase load center, equipped with main breakers rated at 60 amperes for all cabinets.

a. Main Breakers

The main breakers shall be double-pole type, so that an overload on either phase will disconnect the entire cabinet from the line.

b. Branch Circuit Breakers

All branch circuit breakers shall be molded case single or double-pole, 120/240 volts AC, 10 000-ampere interruption capacity, supplied in a Q.O.U. mounting system. Circuit breakers shall be provided in all panel spaces as follows:

i. 15-ampere single pole circuit breakers shall be provided for each side of the load center.

ii. Cabinets shall have one double-pole 40-ampere breaker, and four 15-ampere single-pole breakers (two per phase).

c. GFI

One convenience Ground Fault Interrupter dual electrical outlet shall be provided on the cabinet power panel. This outlet shall be wired to remain energized at all times.

d. Grounding

The cabinet shall be furnished with ground bars, capable of accepting 4 to 14 gauge stranded wire, to provide the following:

i. Two AC to Neutral - Minimum of thirty-six positions.

ii. Chassis ground - Minimum of eighteen positions.

e. Wiring Harnesses and Terminals

All wiring harnesses shall be of sufficient length to allow for the placement of the electronic equipment as specified on the Plans.

i. The cabinet shall be wired to permit the utilization of all of the specified functions and capabilities of all electronic equipment contained therein.

ii. All back panel or rack wiring is to be complete such that no additional hardware or wiring shall be necessary to utilize all functions of the electronic equipment.

iii. All terminal facilities shall be readily accessible for field connection without requiring the removal of any of the equipment installed inside the cabinet.

iv. All wires not utilized shall be terminated and labeled as a terminal strip. The practice of tying back of unused wires is unacceptable.

11)Certification

The following must accompany all electrical and mechanical components supplied:

a. Instruction manuals.

b. Maintenance manuals.

c. Descriptive parts list with industry standard part numbers where applicable.

d. Three complete sets of wiring and schematic diagrams. Schematics shall include a list of tests points with the following information provided for each point:

   i. Nominal operating voltage.
   ii. Wave form and all pertinent information regarding the wave form at each test point.
   iii. Integrated circuit schematics.
   iv. Connection and I/O diagrams.

800-x.04 FIELD EQUIPMENT CABINET INSTALLATION

The Contractor shall install the new base or pole mounted cabinets as shown on the Plans. If an alternate mounting arrangement is required for mounting the new field equipment cabinet, the Contractor shall design and implement an alternative mounting arrangement. Shop drawings detailing the alternative mounting arrangement shall be submitted by the Contractor to the Authority for approval prior to the installation of the field equipment cabinet. The existing cabinets shall be transported by the Contractor to a storage site, as directed by the Authority.

800-02.05 MEASUREMENT AND PAYMENT

Furnishing and installing Field Equipment Cabinets will be measured and paid for at the contract unit price. Work will include all labor, materials, including all lenses, housing, door, gasket, visor, reflector, wiring, and lamp socket complete and operational and incidental connections and testing in order to assure operation, as approved by the Authority, and development of shop drawings as required.

Payment shall be full compensation for all materials, labor, equipment and all other incidentals including removable racks, electronic equipment, including all incidentals necessary to complete the work necessary to complete this work. The Authority will make payment for the following items only upon completion of the installation and commissioning of the Field Equipment Cabinets acceptance by the Authority.

CATEGORY 800
TRAFFIC

800-03 — OPEN AND CLOSE TRENCH FOR CONDUITS

800-03.01DESCRIPTION. This work shall consist of excavating and backfilling trenches to the width required to receive multiple conduits in the same trench for traffic control devices as specified in the Contract Documents or as directed by the Engineer.

800-03.02 MATERIALS.

Backfill 950.05

800-03.03CONSTRUCTION. Trenches shall be excavated to the dimensions and lines specified and shall conform to Section 402.

In areas where conduit is trenched, a detector tape shall be placed in the trench at a depth of 6 inches below the finished grade. The color of the tape shall be red. The tape shall be imprinted with a continuous warning message the reads **"CAUTION: SHA ELECTRICAL LINE BURIED BELOW"**, repeated every 36 inches. The tape shall be inductively and conductivity traceable using a pipe and cable locating device.

Backfill: The trench shall be backfilled and compacted as specified in Section 801 and restored to its original condition, including replacing topsoil, reseeding, and resodding when directed by the Engineer.

All excess or unsuitable material shall be disposed of as specified in Section 402.

800-03.04 MEASUREMENT AND PAYMENT. "Open and Close Trench for Conduits" will be measured and paid for at the Contract Unit Price per Linear Foot measured along the center line of the trench from end to end. The payment will be full compensation for all excavation, backfill, conduit installation, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

"Furnishing Conduits" to be installed in the trench will be measured and paid for at the Contract Unit Price per Linear Foot.

CATEGORY 800
TRAFFIC

800-04 — SIGN INSTALLATION DATE STICKERS

800-04.01 DESCRIPTION. This work shall consist of furnishing and installing a sign installation date sticker to identify the date of installation for every proposed sign.

800-04.02 MATERIALS. The sign installation date sticker shall be a self-adhesive label, which displays the year and month (see example below), and would allow the sign installer to hole-punch the month, to indicate date of installation. The sign installation date sticker shall be provided by the sign Sheeting Manufacturer. The sticker shall be a minimum size of 2" wide by 1" high, and shall not exceed 8" wide by 4" high.

800-04.03CONSTRUCTION. The sign installation date sticker shall be installed, on the date of installation on the lower reverse corner of the sign, closest to traffic. The sign installation date sticker shall be directly applied to the aluminum sign as per the Manufacturer's Specifications. The Contractor shall prepare the surface as required by the Manufacturer's Specifications.

800-04.04 MEASUREMENT AND PAYMENT. Sign Installation Date Sticker will not be measured, but the cost will be incidental to the appropriate furnish and install sheet aluminum and extruded aluminum signs items in the Contract.

Example:

1	2	3	4	5	6
			05		
7	8	9	10	11	12

Note: Numbers shown for display purposes only.

CATEGORY 800
TRAFFIC

800-05 — WOOD POLES - CLASS II

800-05.01DESCRIPTION. This work shall consist of furnishing and installing Class II wood poles as specified in the Contract Documents or as directed by the Engineer.

All poles shall be in accordance with the American National Standard titled Specifications and Dimensions for Wood Poles (ANSI 05.1-1972) and American Wood-Preservers Association (AWPA) Standards as indicated herein, except as modified or supplemented in the following paragraphs.

800-05.02 MATERIALS. The poles shall comply with the minimum quality and dimension requirements for furnishing Southern Pine Poles, 40' in length, which are to be preservative-treated by pressure processes.

(a) **Definitions:**

(1) The following definitions shall apply to this Specification and are either additions, or modifications, to ANSI 05.1-1972.

(a) **Bark Knot:** A knot that is undergrown and partially encased with outer bark.

(b) **Groundline Section:** That portion of a pole between 1' above and 2' below the groundline (6' above the pole bottom).

(c) **Knot Cluster:** Two or more knots grouped together as a unit with the fibers of the wood deflected around the entire unit.

(d) **Ring Knots:** A ring of knots consisting of four or more knots in a 3" section of the pole.

(e) **Short Crook:** A localized deviation from straightness which, within any section 5' or less in length, is more than 1/4 the mean diameter of the crooked section.

(b) **Material Requirements:**

(1) Poles shall be Southern Pine as per ANSI 05.1-1972 Treatment Group C (steam conditioned) or treatment Group D (kiln-drying).

(2) All surfacing and trimming shall be done prior to treatment. Some minor trimming is allowed after treatment.

(3) Poles shall be flat roofed.

(4) **Pole Seasoning:**

(a) Air-seasoning, kiln-drying, steaming, heating in the preservative, or a combination is permitted.

(b) Air-seasoned poles shall be held in storage in the stacks until the amount of moisture in the wood will not prevent adequate penetration and retention of the preservative as described in section (6) Pole Treatment.

(c) Boulton drying is not permitted.

(5) **Pole Conditioning:**

(a) Poles shall not be cut more than ninety (90) days prior to time of treating.

(b) Poles shall be conditioned in accordance with the standard "All Timber Products - Preservative Treatment by Pressure Processes" (AWPA Cl-79, latest revision).

(c) The steam temperature employed in steam conditioning for Southern Pine Poles shall not exceed 245° F. The time duration (the total of initial plus final steaming) shall not exceed 17 hours for poles with specified circumferences smaller than 37.5" at 6' from the butt, and 20 hours for poles with specified circumferences larger than 37.5" at 6' from the butt.

(6) **Pole Treatment:**

(a) Preservative materials shall meet either of the following Standards.

(1) Standards for Oil-Borne Preservatives (AWPA P8, Pentachlorophenol, latest revision).

(2) Standard for Hydrocarbon Solvents for Organic Preservative Systems (AWPA P9, Hydrocarbon Solvent, Type A, latest revision).

(b) Poles can be heated in oil-type preservatives at atmospheric pressure to facilitate penetration of preservative.

(c) Poles to be impregnated with the preservative by application of the standard empty cell (Rueping) process shall be performed in accordance with the standard "Poles - Preservative Treatment by Pressure Processes" (AWPA C4, latest revision).

(d) No material other than poles shall be treated with poles.

(e) Only one group of poles is permitted to be treated in any given charge, that is; Group A poles are not to be treated with Group B poles.

(f) The minimum net retention of Pentachlorophenol, as determined from 20 boring samples taken from any charge, shall not be less than the following.

Minimum Retention: (lbs. Penta/cu. ft.)

Zone Assayed	0.5 - 2.0 in.
Retention	.45

Retention of Pentachlorophenol shall be determined by the Standard Methods for Analysis of Oil-Borne Preservatives (AWPA A5, latest revision).

(g) Penetration shall be determined by an increment borer core which shall be taken from each pole at a point approximately 8' from the butt on all poles. The preservative shall penetrate at least 3", unless 90% of the sapwood is penetrated.

(1) If 4 or more of the first 20 poles bored fail to meet the requirements, all poles in the charge may be rejected at the option of the SHA.

(2) If more than 15% of the poles fail to meet the penetration requirement, poles that have met the penetration requirement shall be rotated 180° and re-bored. Those poles which fail to meet the second penetration test shall be rejected.

(h) The defects after treatment (checks, shakes and splits) in excess of those permitted in Section 4 of ANSI 05.1-1972 shall be cause for the rejection of treated poles.

(i) Poles not conforming to the stipulated minimum penetration and retention requirements may be retreated only once and may be re-offered for acceptance.

(j) Re-treatable poles in a charge of untreated poles shall not exceed 5% of the total quantity in the charge. In the computation of the required minimum net retention of preservative, all material in the charge shall be considered as untreated.

(k) Identification of Re-treated Poles: Each re-treated pole shall be identified in the top of the pole by means of a marking nail (galvanized, aluminum or copper) with the letter "R" on the head of the nail.

(l) The surface appearance of all poles shall be reasonably free of exudate and surface deposits.

(7) The following defects are prohibited.

(a) Cross Breaks (cracks).

(b) Decay, except as permitted under "decayed knots".

(c) Dead streaks.

(d) Holes, open or plugged, except holes for test purposes, which shall be plugged.

(e) Hollow butts or tops, except as permitted under hollow pith centers and defective butts.

(f) Marine borer damage.

(g) Nails, spikes, and other metal not specifically authorized by this specification. All other foreign material is prohibited.

(h) Ring knots.

(i) Bark knots, in excess of 3" diameter.

(j) Knot cluster.

(8) The following defects shall be accepted, given the below indicated limitations are met.

(a) **Knot:** The diameter of any single knot and the sum of knot diameters in any 1' section shall not exceed the limits of Table 2.

(b) **Decayed Knots:** Type II "decayed Knots" are permitted provided that the depth of decay does not exceed 1/2". In the event the decayed knot is explored to determine its type, the depth of exploration is limited to 1/2", and the trimmed area shall not exceed 20% the circumference of the pole at a maximum length of 12" to provide drainage.

(c) **Shape:** Poles shall be free from short crooks (redefined). A pole may have sweep, where sweep is in one plane and one direction only for all pole lengths, a straight line joining the surface of the pole at the groundline and the edge of the pole at the top shall not be distant from the surface of the pole at any point by more than 1" for each 10' of length between these points.

(d) **Spiral Grain:** Spiral grain (twist grain) is permitted and not to exceed one complete twist in any 20'.

(c) **Dimensions:**

(1) The minimum circumferences at 6' from the butt and at the top, for each length and class of pole, are listed in ANSI 05.1-1972, Table 8. The circumference at 6' from the butt of a pole shall not be more than 7" or 20% larger than the specified minimum, whichever is greater. The top dimensional requirement shall apply at a point corresponding to the minimum length permitted for the pole. The circumference at this point on the pole shall not be more than 25% larger than the specified minimum.

(2) Classification shall be determined by the true circumference as follows: Measure the circumference at 6' from the butt. This dimension will determine the true class of the pole, provided that its top (measured at the minimum length point) is large enough. Otherwise, the circumference at the top will determine the true class provided that the circumference at 6' from the butt does not exceed the specified minimum by more than 20% or 7", whichever is greater.

800-05.03 CONSTRUCTION.

(a) **Manufacturing Requirements:**

(1) Outer bark shall be completely removed.

(a) No patch of inner bark more than 1" wide shall be left on the pole surface between the butt and 2' below the groundline.

(b) No patch of inner bark larger than 1" wide and 6" long shall be left on the pole surface between the top and 2' below the groundline.

(c) Bark associated with bark inclusions as permitted in (b)(8)(C) shall not be dug out or disturbed.

(2) Shaving of All poles shall be full-length machine-shaved, and the depth of cut shall not be more than necessary to remove inner bark. There shall be no abrupt changes in the contour of the pole surface between the groundline and the aboveground sections. The lower 2' of poles may be trimmed to remove wood fibers causing butt flare, provided sufficient sapwood remains to obtain the minimum penetration requirements.

(3) Pole branding shall be arranged as illustrated in the standard "Brands Used on Forest Products" (AWPA M6, latest revision).

(a) The following marking and code letter information shall be legibly and permanently burn branded with characters not less than 5/8" high. The markings shall be placed squarely on the face of the pole at 10' - 0" above the pole butt end and in the butt end of each pole.

(1) Supplier's Brand.

(2) Plant Designation.

(3) Month and Year of Treatment.

(4) Code Letters; "SP" denoting Southern Pine and the Preservative Code, such as "P" for Pentachlorophenol in Petroleum (AWPA M-6).

(5) Retention and Assay, such as "45-A".

(6) Class and Length.

(b) The arrangement and order of the code letters and figures shall be as follows.

INTERPRETATION:

SHA ——— Supplier's Brand

HAN ——— Plant Designation

10-90 —— Month and Year

SPP ——— Species and Preservative Code

45 A ——— Retention and Assay Code

240 ——— Class and Length

(b) **Storage and Handling:**

(1) When it is necessary to hold poles in storage prior to treatment, they shall be stacked on treated or other non-decaying skids of such dimensions, and so arranged, as to support the poles without producing noticeable distortion in any of them. The height of the piles shall be limited to avoid damage to poles on the bottom layers.

(a) Poles shall be piled and supported in such a manner that all poles are at least 1' above the general ground level and any vegetation growing thereon. No decayed or decaying wood shall be permitted underneath stored poles.

(b) In the event the poles are not treated within ten (10) days after inspection, every pole shall be reinspected by the designated representative of the SHA immediately before treatment. Every pole which does not then conform shall be immediately rejected.

(2) Poles shall not be dragged along the ground. Cant hook, pole tongs, or other pointed tools shall not be applied to the groundline section of any pole.

(a) Poles are not acceptable, both before and after treatment, if they contain indentations, attributed to loading or handling slings, that are 1/4" or more deep over 20% or more of the pole circumference. Other indentations or abrasions which result from careless handling shall not be more than 1/2" deep at any point. Edging, cutting or trimming of damaged poles after treatment are subject to the above-mentioned limitations.

800-05.04 MEASUREMENT AND PAYMENT. "Class II Wood Poles" shall be measured and paid for at the Contract Unit Price per Each. The payment will be full compensation for the poles, all guy cables and connectors, labor, tools, materials, and incidentals necessary to complete this work.

CATEGORY 800
TRAFFIC

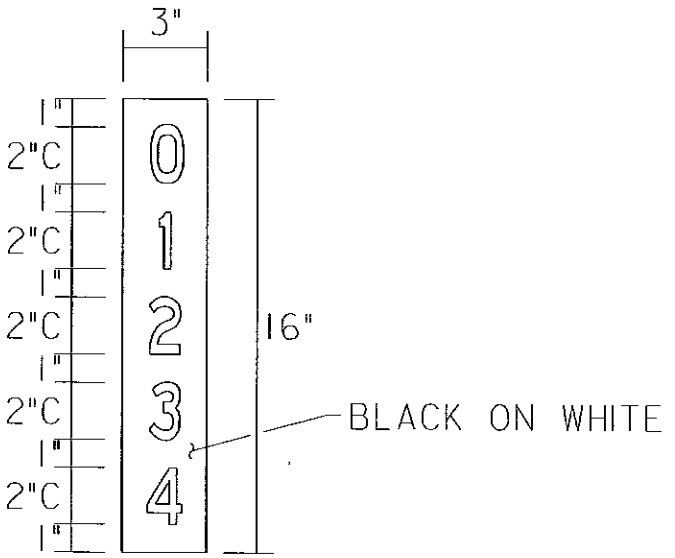
800-06 — SIGN STRUCTURE IDENTIFICATION NUMBER LABEL

800-06.01 DESCRIPTION. This work shall consist of furnishing and installing a Sign Structure Identification Number Label on all Authority owned sign structures (overhead and cantilever) within the limits of the project. The Contractor shall contact the Authority's Bridge Engineer to coordinate identification numbers for each sign structure that are owned and maintained by the Maryland Transportation Authority as detailed on the Plans. Sign structures not owned and maintained by the Maryland Transportation Authority, as detailed on the Plans, will not require labels.

800-06.02 MATERIALS. Sign Structure Identification Number Labels shall be fabricated of the same sheeting material for other signs in the Contract as specified on Drawing No. SN-1. Reflective Sheeting per 950.03.

800-06.03 CONSTRUCTION. The Sign Structure Identification Number Label shall be installed perpendicular to traffic, at 7'-0" from top of roadway to bottom of Identification Number. The sheeting only shall be directly applied to the sign structure as per the Manufacturer's Specifications. The Contractor shall prepare the surface as required by the Manufacturer's Specifications.

800-06.04 MEASUREMENT AND PAYMENT. Sign Structure Identification Number Labels will not be measured, but the cost will be incidental to the appropriate furnish and install sign structure items in the Contract. For existing sign structures, the costs will be incidental to other pertinent items in the Contract.



Note: Numbers shown for display purposes only.

CATEGORY 800
TRAFFIC

800-07 — SQUARE PERFORATED TUBULAR STEEL POSTS

800-07.01 DESCRIPTION. This work shall consist of furnishing and installing 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.

800-07.02 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 inch die punched circular holes or perforated knock-outs, at one inch centers along their entire length.

The Tubular Steel Posts shall be two inch square tubes 12 foot long.

Square Tubular Steel Anchor Bases shall be comprised of two telescoping tubes. The first shall be 2 ¼ inch square, three foot long, formed from 12 gauge steel and shall snugly fit over the sign post. The second section shall be a 2 ½ inch square, 18 inch long, formed from 12 gauge steel, and shall snugly fit over the
2 ¼ inch section.

800-07.03 CONSTRUCTION.

The Square Tubular Steel Anchor Base assembly shall be constructed by placing the 18 inch base section over the three foot base section so that they are flush at the top and the holes are aligned. The entire unit shall be driven into the ground so that one or two rows of holes in the Square Perforated Tubular Steel Base are exposed. The base shall be driven so that it remains plumb and to provide the final sign assembly with the correct orientation.

Finished length of the Tubular Steel Posts shall be determined by adding the total height of the signs to 8 foot, 2 inch. The sign post shall be cut to the correct length, and cold spray galvanizing shall be applied to the cut end. The signs shall be bolted to the top of the post, using tamper proof bolts or drive rivets. The Square Tubular Steel Posts shall be lowered 8 inch into the base, and the post secured to the base using two corner bolts designed for this purpose.

800-07.04 MEASUREMENT AND PAYMENT. "Square 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.

"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

SECTION 800-08 — ELECTRICAL INSPECTION AND REPAIRS OF HIGH MAST LIGHT POLES

800-08.01 DESCRIPTION.

This item of work includes electrical inspection and repairs of high mast light poles shown in Appendix A. All work shall be performed as per these Special Provisions, the Standard Specifications, and as directed by the Engineer.

The Contractor shall provide equipment, tools, and operators to provide access for all inspection items. The Contractor shall provide access equipment and operator, digital volt meter, and other tools and equipment as needed to provide the inspection personnel with reasonable access to the devices and appurtenances, which require inspection. The Contractor shall provide all safety equipment as required and recommended by OSHA regulations. The Inspector shall be a certified master electrician.

The following inspection items shall be completed by the Contractor in the presence of the Engineer.

1) Operate the lighting system and note any failed luminaries.

2) Check the operation of the circuit breaker (if installed). Operate the breaker(s) into the off and on state and verify proper operation. A digital volt meter should be available for use to verify operation where the luminaries failed to respond due to luminaire failure. Visually inspect the cable yoke, adjustment devices, electrical connections and other items accessible from the access hole in the pole.

   Operate the lowering device by lowering the luminaire ring.

3) With the luminaire ring in the fully lowered position, use a "bucket truck" or other lifting device to visually inspect the lowering cables and power cables. Check the power cable for bare spots, cuts, frayed insulation, cracked or deteriorating insulation, excessive stretch indications (longitudinal stretch marks) or other damage. Check the lowering cables for excessive rust, broken or splintered portions of cable, or other damage.

4) Inspect the luminaire ring at ground level. Note any excessive rust, broken or missing bolts, nuts or other fasteners. Note any damage or missing parts of luminaries (if damaged, note manufactured and part number of luminaire if available).

5) Inspect the lowering assembly at the top of the pole. Note any damaged parts. Operate the lowering device over a small distance and note operation of all parts. Assure that no pulleys are frozen. Assure that all cables operate within acceptable guidelines within the sheaves and guide devices. Note any parts with excessive wear or other poor working conditions.

6) With lowering device at ground level, operate the lighting system and verify working condition of luminaries. Note any failed luminaires. If any luminaires fail to operate, replace bulb and recheck. If luminaire still does not operate, determine the defect and correct the deficiency. Replace all remaining bulbs. Operating bulbs shall be turned over to the Authority without damage as directed by the engineer. Non-functioning bulbs shall become the property of the Contractor who will be responsible for their disposal.

The Contractor shall raise and lower the luminaire assembly and clean the reflectors, refractors, and lens of the luminaire with an approved cleaner. The Contractor shall provide the "bucket truck" and operator, digital volt meter, and other tools and equipment as needed to provide the inspection personnel with reasonable access to the devices and appurtenances which require inspection. The Contractor shall provide necessary clearing and grubbing to gain a reasonable access to the high mast pole. Provide all safety equipment as required and recommended by OSHA regulations.

800-08.02. MEASUREMENT AND PAYMENT.

Electrical Inspection of the high mast light poles will be measured and paid for at the Contract price bid per each pole under the pay item "Electrical Inspection of High Mast Poles".

At the conclusion of the inspection, the Engineer, at his opinion, may require that the Contractor make repairs to the High Mast Pole lighting system. Those repairs will consist of one or more of the following:

"Each of Free Up Stuck Latches": This item will be paid per high mast pole where the top latches have become frozen. The work shall consist of using a lifting machine to allow a workman to access the top of the pole and utilize whatever tools may be necessary to unlatch the luminaire ring. Payment shall constitute compensation for all costs for all labor, materials, tools, machines, etc. as required to complete the item of work.

"Each of Replace Lowering Device Gear Box": This item shall consist of furnishing and installing a new lowering device gear box within the high mast pole. The Contractor shall completely remove the existing lowering device gear box, remove all loose debris from the inside of the pole, and install a new gear box. The cables shall be reinstalled, tested, adjusted and the lowering device completely functional when completed. Payment shall constitute compensation for all costs for all labor, materials, tools, machines, etc. as required to complete the item of work.

"Linear Feet of Replace Power Cables" and "Each of Terminate High Mast Power Cables": These items shall consist of removing and discarding the existing power cable, including power connector (lower end of pole). Replace cord with type SEO, extra flexible hard source cord, rated 105 degrees Celsius. Provide new power connector to match existing. Wiring shall be reconnected to match the existing circuit distribution. The new cable shall be paid per linear foot. The replacement power connector, and terminations shall be paid per each pole. Payment shall constitute compensation for all costs for all labor, materials, tools, machines, etc. as required to complete the item of work.

There are several unknowns involved with power cable replacement. Therefore this item will require returning to the pole after power cable problems are discovered and a new power cable can be ordered. During the inspection, the Engineer will notify the Contractor of power cable problems that require replacement cables. The Contractor shall immediately inspect the pole and determine the necessary parameters such as, cable length required, type of power connector etc. and order the replacement parts.

"Each of Replace Existing 400W High Pressure Sodium Lamp" and "Each of Replace Existing 1000W High Pressure Sodium Lamp": Shall not be measured and shall be paid for at the Contract bid price for lump sum. These items shall consist of replacing the existing lamp where directed by the Engineer. This item of work shall occur during the inspection while the luminaire ring is in the lowered position and shall not require extra lowering of the luminaire ring, or mobilization to the site. The Contractor must maintain a supply of replacement bulbs at all times in order to facilitate this work. Payment shall constitute compensation for all costs for all labor, materials, tools, machines, etc. as required to complete the item of work.

"Each of Adjust Lowering Device Cables": This item shall consist of adjustments to the lowering cables to bring the length of each cable into specification. This item of work will be required where the cables have stretched or otherwise gone out of adjustment and cause the luminaire ring to exhibit noticeable tilt, to fail to latch or unlatch correctly, or if the cable yoke is too close to the lowering device gear box. Payment shall constitute compensation for all costs for all labor, materials, tools, machines, etc. as required to complete the item of work.

"Linear Feet of Replace Lifting Cables": This item shall consist of replacing the existing lifting cables with new cables. All three hoist cables as well as the winch cable shall be replaced. This item shall be paid per linear foot of cable necessary to replace all the cables as specified. All cables shall be 3/16" minimum diameter stainless steel cables. Payment shall constitute compensation for all costs for all labor, materials, tools, machines, etc. as required to complete the item of work.

CATEGORY 800
TRAFFIC

800-09 — HIGH MAST POLES - SLIP JOINTS REPAIR

800-09. 01 DESCRIPTION.

This work shall consist of cleaning, heating and sealing the external joints at the overlapping tube sections on high mast lighting poles as directed by the Engineer. For poles that will require crack repairs this work shall be performed after repairing the cracks as described in sub-sections 800-03 and 800-04 of this document.

800-09.02 MATERIALS.

Sealant shall be of gun grade, flexible, non-shrinking and resistant to weathering. Sealant may be supplied as a single package or a two-component sealant. Two-component sealant shall be packaged so that only enough material need be mixed at one time to complete all joints on a single pole. No carryover of two-component material will be allowed.

Sealant shall meet the following physical test requirements.

Test	Requirements
Pot Life @ 75°F (two component)	1 Hr. Minimum
Sag Resistance @ 75°F	None after 24 Hrs.
Tack Free Time @ 75°F	24 Hrs. Maximum

Test	Requirements
Flexibility:	
24 Hrs. @ 40°F 24 Hrs. @ 75°F	No cracking at either temperature when wrapped around a one (1) inch mandrel
Adhesion to Steel:	
24 Hrs. @ 40°F 24 Hrs. @ 75°F	No loss of adhesion when applied to a steel plate and subjected to the test temperatures

Color of sealant shall be compatible with the weathered finish of the steel used in fabricating the poles. A sample of the colored sealant must be submitted to the Office of Materials and Research for color acceptance at least one week prior to the start of sealing operations.

800-09. 03 CONSTRUCTION METHODS.

Joint Preparation: An area of three (3) inches on either side of the lower end of outside tube joint shall be abrasive blast cleaned to conform to a SSPC-SP-10 finish. Water blasting will not be allowed.

Visual Inspection: Examine the outer sleeve for any tearing or cracking. Should either condition be found, the overall length shall be determined by blast cleaning. The pole location, joint, and overall tear length shall be immediately reported to the Engineer. The Engineer's evaluation may change the applicable method of repairs.

Heat Treatment: After blast cleaning, if the pole doesn't require crack repair the cleaned area shall be heated to at least 200°F. The steel temperature shall be verified by temperature indicating crayons or other means approved by the Engineer. The metal shall be allowed to cool to a temperature acceptable for sealer application as recommended by manufacturer of sealant.

Sealer Application: The blast cleaned joint shall be dry and clean from all surface contaminants prior to sealing. Do not apply sealant if surface temperature is less than manufacturer's recommendation, but in no case shall surface temperature be less than 5°F above the dew point. All joints blast cleaned shall be sealed with sealant within three (3) hours. If the joint is not sealed within three (3) hours the joint shall be re-blasted before applying sealant. Tears or cracks may be required to be sealed as determined by the Engineer. Tears or cracks shall be given the same heat treatment as joints. Any visible void between the two overlapping sections shall be completely sealed. Care shall be exercised to assure the sealant does not form a shelf or pocket where water will accumulate. Should it be necessary to build-up the sealant, the final profile should be tapered in a downward direction as directed by the Engineer.

800-09.04 MEASUREMENT AND PAYMENT.

Joint Blasting and Sealing, including completed blasting, heating and sealing, will be measured for payment on a per each basis.

Payment will be made at the contract unit price bid per each of "High Mast Poles – Slip Joints Repair" item at each slip joint. Payment will be full compensation for any costs incurred to provide access to joints, blasting, heating, joint sealant, all labor, tools and incidentals necessary to complete the item.

CATEGORY 800
TRAFFIC

800-10 — HIGH MAST POLES – REPAIRS TO CRACKS LESS THAN 6 INCHES LONG

800-10.01 DESCRIPTION.

This work shall consist of determination of the extent of the crack by Magnetic Particle Testing and/or Ultrasonic Testing (MT and/or UT), drilling 15/16" diameter retrofit holes at crack tips, grinding surface of the pole and welding steel band as directed by the Engineer. The steel band may require a 2-piesce assembly to get it around the pole.

800-10.02 MATERIALS.

All new structural steel shall meet the requirements of ASTM A 709, Grade 50W. All welding shall be in accordance with Maryland Standard Specifications for Construction and Materials, American Welding Society AWSD1.1-2000. Welding electrodes shall be E8018-B2 or C3.

800-10.03 CONSTRUCTION METHODS.

The following procedures shall be performed in the presence of MD SHA Metals Team or its representative:

1. Determine the extent of crack by at least two methods of nondestructive testing. If the crack is longer than 6", refer to subsection 800-02.04.03 of these Special Provisions.

2. Drill 15/16" diameter hole at the crack tip. Holes shall be deburred and internally polished to a minimum 64 RMS, finish with edges rounded.

3. Remove crack by grinding. Grind until internal tube has been reached. The crack grinding to be done at a 45° wedge.

4. Check by MT to determine if the crack has been completely removed. If crack has continued to the second tube, stop the operation and notify the Engineer.

5. If the crack has not continued into the second tube, preheat the tube to 225°F to remove moisture.

6. Weld the root, and MT the root weld. Electrode shall be 1/8" diameter.

7. Weld remaining portion using the same electrode and MT finished weld.

8. Grind surface of pole as directed by the Engineer.

9. Install and weld the band as directed by the Engineer.

800-10.04 MEASUREMENT AND PAYMENT.

"Repairs to Cracks Less Than 6" Long" will be measured and paid for at the Contract unit price bid per each crack repair on the pertinent "High Mast Poles - Repairs to Cracks Less Than 6 Inches Long" item, which price will be full compensation for all labor, equipment and all incidentals necessary to test and complete the work at each crack location.

CATEGORY 800
TRAFFIC

800-11 — HIGH MAST POLES - REPAIRS TO CRACKS FROM 6 INCHES TO 12 INCHES LONG

800-11.01 DESCRIPTION.

This work shall consist of determination of the extent of the crack by MT or UT method, removal and repair of the pole, and installation of the repaired high mast light poles as directed by the Engineer. This item shall apply to poles with cracks from 6 in. to 12 in. in length.

800-11.02 MATERIALS.

All new structural steel shall meet the requirements of ASTM A709 GR 50W. All welding shall be in accordance with Maryland Standard Specifications for Construction and Materials, and American Welding Society AWSDA1.1-2000. Welding electrodes shall be E8018-B2 or C3.

800-11.03 CONSTRUCTION METHODS.

1. In the presence of the MD SHA Metal Team or its representative, determine the extent of the crack by at least two methods of nondestructive testing. If the crack is shorter than 6 in., refer to subsection 800-03.03 of these Special Provisions. If the crack is over 6 in., remove the pole as described below.

2. Labor, Equipment & Materials: All labor, equipment and materials required to lower light poles including lowering light fixtures, removing electrical cable and lowering device, disconnecting electricity without cutting-off electricity to the poles which are not being removed, protection of electrical cables, removing poles without damaging the anchor bolts and pole foundations, and hauling poles, hardware etc. shall be supplied by the Contractor.

3. Protection of Electric Cables: The disconnectors shall be sealed water tight using electrical tape. Electrical cables shall be capped with a plastic barrel fastened to the existing pole anchor bolts by steel straps, if cables are to be exposed for more than two days.

4. Repairs to high mast light poles after they have been lowered shall be made as directed by the Engineer and according to the following:

   a) All seam welds in the pole shall be Magnetic Particle (MT) inspected for a minimum of 10 feet at each slip joint. Any linear indications shall be reported to the Engineer.

   b) Make a cut six (6) feet from the splice end on outer tube section.

   c) Abrasive blast clean the cut edge, and areas within 12 in. thereof, to a minimum SSPC-SP10 finish.

   d) Back Gouge and re-weld a minimum 12 in. of the existing seam weld as directed by the Engineer.

   e) Fabricate a new six (6) foot pole section as directed by the Engineer. The new pole section seam shall be 100% complete penetration weld using joint BU2 to BL1. Wall (plate) thickness shall match the existing pole thickness.

   f) NOTE: Material dimensions must match the existing slope and fit for slip back into inner tube section. Minimum slip length shall be 1.5 dia. +12 inches.

   g) Magnetic Particle (MT) 100% of weld prep area in accordance with American Welding Society Specifications (AWS D1.1 Section .6 and .9).

   h) Fit up and tack weld new pole section as directed by the Engineer. The backing ring shall be seal-welded on the upside of the pole section.

   i) Weld root pass.

   j) Magnetic Particle (MT) 100% of root pass in accordance with American Welding Society Specifications.

800-11.04 MEASUREMENT AND PAYMENT.

"Repairs to Cracks from 6" to 12" Long" will be measured and paid for at the contract unit price bid per each crack repair for the "High Mast Poles - Repair to Cracks from 6" to 12" Long" item. The payment will be full compensation for all labor, equipment, removal, erection, transport and all incidentals necessary to test and complete the work at each crack location.

The removal of the pole from the site to the fabrication shop and resetting the pole back to its original location after performance of the repairs, will be measured and paid for at the contract price bid per each for the item "Remove and Reset High Mast Light Poles" for each pole removed and reset.

CATEGORY 800
TRAFFIC

SECTION 800-12 — NEW HIGH MAST LIGHT POLES

800-12.01 DESCRIPTION.

This work shall consist of furnishing and installation of new high mast light poles. These poles will replace previously removed poles and will be installed on existing foundations with existing anchor bolts. Location of the poles will be directed by the Engineer.

800-12.02 PRE-CONSTRUCTION WORK.

The Contractor shall measure the pole foundation such as pole diameter, anchor bolts sizes, bolt circles, etc. to fabricate the pole base before ordering poles, to ensure a proper fit.

Top of foundation shall be cleaned before installing pole. Remove grout for water drainage and ventilation.

800-12.03 MATERIALS.

Pole shafts shall be fabricated from rolled steel with chemical and physical properties of ASTM A595 Grade C or equal. Mill certificates showing the actual test results shall be forwarded to the Engineer. Shafts shall be symmetrical and shall have a circular or dodecagonal cross-section. Weld material shall meet or exceed the strength requirements of the base metal. Certification will be required for welders and operators welding high strength steels.

All welding shall be performed by welding operators certified using the procedures from the latest edition of the American Welding Society Structural Welding Code AWS D1.1.

All welding shall be done by the shielded metal-arc, gas shielded fluxcore, gas metal-arc, or submerged-arc process.

There shall be a maximum of one longitudinal weld in the tapered sections of the shaft, which shall be made by automatic seam welding. The longitudinal weld seams shall have at least 60 percent penetration, except in the areas where the shaft section telescopes over another. In overlapping areas, the weld penetration shall be 100 percent. No transverse butt welds will be acceptable in fabricating the shaft sections.

Longitudinal seams within 6 inches of a slip joint area shall be complete penetration. Base plate, circumferential weld joining base plate, and bottom tube sections shall be complete penetration. All other welds shall have 60 percent minimum weld joint penetration.

Weld quality shall conform to current AWS D1.1 Section 8. Records of welding procedure and welding operator test results shall be kept by the supplier and shall be available for review by the Purchaser.

All welds shall be examined visually to insure compliance with the quality requirements of AWS D1.1, Section 8. Fillet welds shall be examined by magnetic particle inspection at a rate of 1' per 5' or portion thereof, of each size and location.

The female tube ends in the area of overlapping joints shall be welded with full penetration butt weld, AWS D1.1-84, B-Lb or B-L1a-S and shall be ground smooth.

Steel used in fabricating the base plate and other miscellaneous parts shall be fabricated from ASTM A709 Grade 50W.

The 10" by 30" reinforced handholes shall be fabricated from the same grade of steel as the pole shaft. The cover plate shall be fabricated from mild steel.

A steel winch mounting plate shall be welded inside the pole shaft, opposite the handhole.

A steel plate shall be welded to the top of the pole, for the purpose of directly bolting the lowering device unit headframe to the pole. Note: This attachment is not to be made by means of set screws.

After welding, poles shall be either mechanically or hot dipped galvanized. The coating shall conform to the thickness, adherence, and quality requirements of A 123. Base plates, reinforced handholes, and covers shall all be galvanized. Hardware shall be galvanized to meet the requirements of A 153. Stainless steel hardware need not be galvanized.

Poles shall be designed in accordance with the latest American Association of State Highway and Transportation Officials (AASHTO) Specification criteria for a 90 mph wind plus 30 percent gust factor. The Standard Specification for Structural Supports for Highway Signs, Luminaries, and Traffic Signals will apply.

The pole manufacturer shall furnish the Purchaser with certified inspection reports. The manufacturer shall also maintain a "Traveler" on all major components. The "Traveler" will list material identification, welder identity, test results and Inspector identity.

Pole drawings and pole calculations shall be provided and certified by a registered Professional Engineer.

The Contractor shall provide certificate of compliance to prove that all products meet or exceed the specified ASTM and AASHTO requirements.

800-12.04 SUPPORT ASSEMBLY LOWERING DEVICE AND ELECTRICAL EQUIPMENT.

1. All structural and sheet metal parts shall be of zinc coated or hot dipped galvanized steel meeting the same structural requirements as the shafts. All bolts, nuts, washers, and lock washers shall be stainless steel or bronze.

2. The luminaries' frame shall be fabricated from structural steel and galvanized per ASTM A123. It shall serve as a raceway for electrical wiring to the luminaries. The frame shall be suspended from and held in place by three stainless steel suspension cables of 3/16 inch minimum diameter. These cables shall be permanently affixed through a weight equalizing spring assembly to a single sustaining raising-lowering winch. The three suspension cables securing the frame shall pass over pulleys of non-corrosive material fitted with permanently lubricated ball bearings, cable guides and cable retainers. The suspension cables, weight equalizing spring assembly, and winch shall be installed within the shaft. A means shall be provided within the shaft to prevent the three suspension cables from fouling the power cable when raising and lowering the luminaries' frame. The raising-lowering winch shall be suitable for manual as well as power driven operation.

3. The self sustaining winch shall provide a positive support of the lowering ring in its lowered position. Raising and lowering the luminaries frame assembly at a minimum speed of 10 feet per minute through 10 successive cycles with no more than one minute considered satisfactory operation. The winch mounting assembly shall provide for operational support of the motorized drive mechanism during the raising and lowering operations.

4. The downward travel of the lowering ring shall lower the lights to a position 5 feet above the base of the standard. Cushioned bumpers or similar devices shall be provided to absorb any shock resulting from contact between the lowering ring and pole during the up and down travel of the ring.

5. A mechanical locking or latching device in the bottom of the pole shall be provided to take the weight of the lowering device and luminaries off the hoisting cables while the lowering device is in its operating position. A system shall be provided to insure that the lowering device will lock in place if the driving mechanism becomes disconnected from the winch input shaft during the raising or lowering operation.

6. Maintenance requirements shall be kept to a minimum. Scheduled maintenance with the lowering devices shall be at 36 month intervals and all components shall be designed to coordinate with this schedule. Components requiring more frequent maintenance are not acceptable.

7. The electric drive assembly shall be a reversible continuous heavy duty electric drill with a 240 volt universal motor, a torque clutch, a remote control station with a 20 foot long extension cord, and a mounting bracket to firmly hold the drive in place when it is engaged with the hoisting winch. The drive unit shall be provided with a socket to fit the 1/2 inch square input shaft of the winch. The drive shall produce the necessary torque to raise and lower the lowering ring with eight luminaries through 12 successive cycles with no more than one minute between each cycle, and without producing excess heating or overloading the drive unit.

8. The drive unit shall raise or lower the luminaries at a rate of not less than 10 feet per minute. As part of the drive assembly, the Contractor shall provide a buck-boost transformer to step down the voltage from 265 to 240V single phase 60HZ AC. The transformer shall be weatherproof and shall include a primary fuse of proper rating, a 10 foot long 3/C, 600V heavy duty portable cable with plug to match a receptacle in the base of the lighting standard. Provide a grounded weatherproof receptacle on the load side to match the plug on the drive unit.

9. Each high mast light standard shall be provided with an identification marker fabricated from 1/16" thick, clear anodized aluminum formed to fit the standard, with rounded edges and corners. Markers shall be secured with four 1/8" diameter, 18-8 stainless steel, round head drive screws or self tapping screws. Markers shall be mounted 6 feet above the pole base and on the pole quadrant facing oncoming traffic. Provide two markers for standards located in medians.

10. Electrical equipment for Lighting Masts:

    (a) Terminal board shall be rated 30 Ampere, 600 Volts, fabricated from non-tracking materials and equipped with covers. Boards shall be similar and equal to General Electric Company Type EB-5, Square D class 9080 Type S, or Westinghouse Type TBA.

(b) Plugs and receptacles shall be heavy duty, weather resistant, rated 15 Amperes, 480 Volts AC, 60Hz, and grounded type. Receptacle shall have weatherproof cap and matting plug.

(c) Junction boxes shall be galvanized cast iron with hubs and hinged covers.

(d) Permanently ground all metal parts. Provide a ground rod at each high mast pole and bond the ground wire to the lighting standard.

11. Luminaries shall be placed in a symmetrical pattern about the vertical axles on all high mast lighting standards unless specifically directed by the Engineer. The angle between two adjacent fixtures can be calculated by dividing 360 degrees by the total number of fixtures on the high mast pole. The lighting design criteria is 0.6 foot candles average (or better) maintained with 0.81 light loss factor and 4 to 1 or better uniformity (average to minimum) in merge/diverge lanes, all interior (loop ramps), and curved sections of outer ramps. The pacing and pole height is based on Cooper lighting model number HMX9MC72NW which is a 1000W Metal Halide luminaries with type 5 wide open optics package. Substitute luminaries may be provided which meet the design lighting criteria without change to pole height, spacing, or nominal power requirements. Provide photo metric calculations and IES data files on 3 1/2" floppy disk independent for verification by the Engineer.

800-12.05 CONSTRUCTION METHODS.

1. Prior to setting new poles, the existing foundations shall be inspected and necessary repairs performed as specified elsewhere in these Special Provisions.

2. Telescoping sections shall be forced into place and thoroughly wedged to produce the required engagement. The assembled standard with internal electrical wiring, equipment and hoist cable assembly mounted in place shall then be lifted into place. Standards shall be plumbed by using two transits set 90 degrees apart and plumbing shall be done in the early morning hours or on cloudy days to avoid deflection from radiant heat from the sun. Acceptable out of plumb tolerance shall be 0.25 percent of the length of the standard (3" for 100' standard). New galvanized nuts and washers shall be furnished for both leveling and tightening sides. Nuts on anchor bolts shall be tightened as indicated in NCHRP Report 469, Section 2.6 and Appendix A. That is the nuts shall be tightened in a star pattern and tightened 1/6 of a turn past snug for bolts greater than 1 ½" diameter and 1/3 turn for bolts 1 ½" in diameter or smaller.

3. The surfaces of steel are to kept clean and free of dirt, oils, grease, concrete, spatter, chalk marks, crayon marks etc. Shafts and components shall be stored on platforms, skids, or other supports above the surface of the ground, and shall be covered until assembled in place. Care shall be taken to prevent scratching of surfaces. Any scratches of the protective coating shall be repaired to the satisfaction of the Engineer. Any foreign matter that gets on the surface after blast cleaning shall be removed as soon as possible and the area soiled shall conform to a finished condition equal to Maryland Pictoral Standards, Maryland "Near White." The height of profile of the anchor material pattern shall not exceed 3.0 mils when determined in accordance with the MSMT for height of profile in shot blast cleaned structural steel.

4. Upon completion of erection and following the installation of the luminaries and all electrical components, and prior to acceptance, the lowering device shall be tested on each standard. The test shall consist of two complete operations starting with the latching or unlocking, lowering, raising, and latching or locking. The test shall be considered satisfactory when 80 percent of the operations required no second attempt, and 20 percent required no third attempt. Should the equipment fail this test, the equipment shall be repaired, or modified by the Contractor as needed, and all standards shall be retested.

800-12.06 MEASUREMENT AND PAYMENT.

The method of measurement shall be based on quantity of each pole of the same height complete in place, tested, ready for operation supplied by the Contractor for the item "New High Mast Light Poles on Existing Foundations".

The above item will be measured and paid for at the Contract price for each, which price shall be full compensation for furnishing, coating, assembling, erecting, the support assembly, lowering device, electrical equipment, all labor, equipment, tools, materials, supervision, testing, and incidentals necessary to complete.

CATEGORY 800
TRAFFIC

800-13 — DRILLING OF VENTILATION HOLES

800-13.01 DESCRIPTION.

This item includes all work necessary to drill 2" diameter ventilation hole and installation of protective screen mesh on the existing high mast light poles in accordance with the Specifications and as directed by the Engineer.

800-13.02 MATERIALS.

Refer to Standard Specifications Section 908.05.

The adhesive used to attach the mesh to the poles shall meet the requirements of Section 921.04.

800-13.03 CONSTRUCTION METHODS.

Ventilation holes shall be drilled only at the high mast poles where grout between top of the foundation and the base plate is present and where a ventilation hole does not exist. The location and number of holes will be as directed by the Engineer. Work shall be done in accordance with the Standard Specifications Section 430.03.12.

800-13.04 MEASUREMENT AND PAYMENT.

"Drilling the Ventilation Holes" and "Installing the Protective Screen", including all labor, materials, equipment and incidentals, etc. complete in place will be measured and paid for at the contract unit price per each for the "High Mast Poles - Drilling Of Ventilation Holes" item.

CATEGORY 800
TRAFFIC

800-14 — INSTALLATION OF DYNAMIC MESSAGE SIGNS AND CONTROLLERS

800-14.01 DESCRIPTION.

This work shall consist of installing the Dynamic Message Signs (DMS) and Controllers at locations shown on the plans. This equipment has been purchased by the Authority under separate contract and will be provided to the contractor as required. The contractor will be required to coordinate and schedule with the Authority delivery of the equipment to the site. There is a minimum 6 month lead time for delivery of the equipment to the site. The contractor will be responsible for coordinating and working with the DMS Manufacturer Representative during the installation of the DMS and controllers.

800-14.02 GENERAL REQUIREMENTS

This item consists of installing new Dynamic Message Signs and Sign Controllers to replace the existing DMS and controllers, respectively, in accordance with the Plans and Special Provisions, or as directed by the Engineer. The DMS and Controllers shall operate as part of an integrated Traffic Control System, including the central system, new communications network, and field cabinets.

The DMS Manufacturer will be responsible for providing the following:

- Dynamic Message Sign (ready for installation)
- Controller with appropriate software/firmware
- Control and power cables from the controller cabinet to the DMS
- Final connections and testing of communications and control wiring

The Contractor will be responsible for providing the following:

- Deliver existing signs and controllers to designated storage area to be determined by the Authority
- Installation of New DMS Signs (Excluding work items identified above for DMS Manufacturer)
- Installation of control and power cables from the controller cabinet to the DMS

- Connection of the utility power to the DMS
- All coordination with Authority and DMS Manufacturer
- Provide the Authority with a minimum 2 weeks written notice prior to starting construction so the Authority can locate utilities

800-14.03 DYNAMIC MESSAGE SIGN INSTALLATION

The Contractor shall install new Dynamic Message Sign on proposed overhead sign structure. The DMS Manufacturer will provide Z-bar mounting hardware. If the Z-bar mounting hardware is not suitable for mounting the new DMS, the Contractor shall design and implement an alternative mounting arrangement. Shop drawings detailing the alternative mounting arrangement shall be submitted by the Contractor to the Authority for approval prior to the installation of the DMS. The contractor shall notify the Authority seven days in advance of the installation.

800-14.04 ELECTRICAL DISTRIBUTION

The power distribution shall be through a panel board with overload protection consisting of thermal magnetic circuit breakers. Power shall be supplied through the ground mounted control cabinet utilizing 15 and 20 amp branch circuits to connect devices.

Within the sign, the following minimum loads shall be identified and provided:

1) Heating loads shall be on separate circuits.
2) The ventilation system shall be on separate circuits.
3) The DMS power supplies shall have dedicated circuits.
4) Any communications devices, interface boards, or other microprocessor-controlled devices shall have a dedicated circuit.
5) A circuit shall be provided for sign convenience outlets.
6) A circuit shall be provided for interior lighting, and other miscellaneous devices.

All panels shall have 200% neutral busses due to the heavy use of switching power supplies common to the DMS design. The neutral conductor from the ground-mounted cabinet to sign shall be 200% rated. A cover plate shall be provided and installed on panel boards. It shall not be possible to make inadvertent contact with the bus bars. All circuits must be labeled and the phases of the electrical circuit shall be balanced. Devices that introduce harmonic distortion or sudden load changes shall be located on one phase and microprocessor-controlled devices on the other phase of the 240V/120V circuit.

800-14.05 MEASUREMENT AND PAYMENT.

Installation of Type I Modified Dynamic Message Signs with Integrated Controllers will be measured per each. Work will include all incidentals, development of shop drawings, and all incidentals as required.

The payment shall be full compensation for all materials, labor, equipment and all other incidentals necessary to complete this work. The Authority will make payment for the following items only upon completion of the installation and commissioning of the DMS and acceptance by the Authority.

CATEGORY 800
TRAFFIC

SECTION 800.15 - DYNAMIC MESSAGE SIGN - ISDN COMMUNICATIONS

800.15.01 DESCRIPTION. This work consists of coordinating, obtaining, connecting and maintaining ISDN telephone service to the AMAG Access Control Panel and Dynamic Message Signs (DMS's) indicated on the Plans. The communication line shall allow MdTA's Authority Operations Center (AOC) and Maryland's SHA's Emergency Operations Centers (SOC) to communicate with and control the DMS's. The integration of the signs into the control systems will be done by others and is not part of this contract.

800.15.02 MATERIALS. Not applicable.

800.15.03 CONSTRUCTION. The Contractor shall coordinate with the local telephone provider (Verizon) to obtain dedicated ISDN telephone lines to the AMAG Access Control Panel and DMS equipment cabinets; one line per cabinet. The Contractor shall be responsible for all charges for the application of services, changes to install service, and monthly recurring costs until the Contract is complete.

The Contractor must provide the access numbers and other configuration information necessary for the Maryland Agencies to configure the Emergency Operations System to communicate with the AMAG Access Control Panel and DMS via the ISDN service.

The service accounts shall be transferred to the MdTA upon final approval of the DMS system.

800.15.04 MEASUREMENT AND PAYMENT. ISDN Service shall be paid per each complete service connection. The price shall include coordinating with the local telephone provider for service for two AMAG Access Control Panel locations and to each DMS equipment cabinet, connecting the lines to the communications terminals and control equipment, and final testing the connections. The monthly service charges shall be paid separately.

Monthly ISDN Service Charges shall be paid per month of service. Payment will be based on the actual invoiced amounts from the ISDN provider. The Contractor shall submit copies of the invoices and proof of payment to the Engineer for reimbursement. Profit, overhead, or any other additional charges or fees above and beyond those assessed by the ISDN provider are not to be included in this item.

CATEGORY 900
MATERIALS

SECTION 902 — PORTLAND CEMENT CONCRETE AND RELATED PRODUCTS

612 **DELETE:** 902.03 PORTLAND CEMENT in its entirety.

INSERT: The following.

902.03 PORTLAND CEMENT. Portland cement shall conform to M 85, with the fineness and the time of setting determined in conformance with T 153 and T 131, respectively.

902.10.03 Portland Cement Concrete Mixtures.

616 **DELETE:** Table 902 A in its entirety.

INSERT: 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/yd³	M 43	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	1-1/2 — 3	5 — 8	70 ± 20
8	4000	600	4180	750	7	0.42	2 — 5	5 — 8	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 a 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 in conformance with 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-1.02 shall be 70 ± 0 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.

621 **DELETE:** 902.10.08 TESTING in its entirety.

INSERT: The following.

902.10.08 Testing. Sampling shall conform to T 141. Testing shall be performed 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 yd^3 or fraction thereof.

CATEGORY 900
MATERIALS

629 **DELETE:** SECTION 904 — PERFORMANCE GRADED ASPHALT BINDERS AND HOT MIX ASPHALT in its entirety.

INSERT: The following.

SECTION 904 — PERFORMANCE GRADED ASPHALT BINDERS AND HOT MIX ASPHALT

904.01 CERTIFICATION. The manufacturer and hauler shall furnish certifications as specified in TC-1.02 and the following:

The manufacturer shall also 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.

(g) Mixing and compaction temperatures.

The hauler shall also 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. Performance graded asphalt binders for mixes containing all virgin materials, recycled asphalt pavement materials, or roofing shingles from manufacturing waste shall conform to M 320, Table 1, for the specified performance grade. The asphalt binder recovered from the final plant mixed material will be considered Rolling Thin Film Oven (RTFO) material and shall conform to M 320, Table 1 for the specified performance grade.

The performance graded binder shall be preapproved by the Administration. The Contractor shall submit a certificate of analysis showing conformance with the Performance Graded Binder Specification M 320 and the critical cracking temperature in conformance PP 42, Standard Practice for Determination of Low-Temperature Performance Grade (PG) of Asphalt Binder, for the binders specified in the Contract Documents.

The PG binder for HMA mixes shall be achieved by the use of Neat Asphalt with elastomer polymer modifications when needed.

904.03 EMULSIFIED ASPHALTS. Emulsified asphalts shall conform to M 140 or M 208 with the following exceptions:

(a) Cement mixing tests are waived.

(b) Grade SS-1 viscosity shall be 50 to 400 seconds at 77 F.

(c) Maximum of 3.0 percent by volume of oil distillate.

(d) The sieve test requirement for field samples shall be a maximum of 0.4 percent.

904.04 HOT MIX ASPHALT (HMA). Mixes shall be produced in a plant as specified in Section 915.

904.04.01 Aggregates. Aggregates shall conform to Section 901, and M 323 with the exception that the aggregate retained on the 4.75 mm sieve shall be tested for flat and elongated particles in conformance with D 4791. When recycled asphalt pavement is used in an HMA mix as defined in MSMT 412, it shall be considered an aggregate source.

904.04.02 Mix Design. The Contractor shall develop a Superpave mix design in conformance with R 35 except that "Table 1, Superpave Gyratory Compaction" shall be replaced with the following table:

DESIGN LEVEL	20-Year Design Traffic, ESALs	Ndesign
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

HMA Superpave mixes shall conform to the specification for Superpave Volumetric Mix Design, M 323, and shall be designed for the Equivalent Single Axle Loading (ESAL) range specified in the Contract Documents.

The Contractor may elect to use crushed, recycled asphalt pavement (RAP) material and a maximum of 5 percent roofing shingles from manufacturing waste. The allowable percentage and its suitability for use shall be determined in conformance with MSMT 412 and AASHTO M 323. When using less than 20 percent RAP, binder grade adjustments are not required.

Surface mixes using 20 percent or more RAP and base mixes using more than 25 percent RAP shall be tested and evaluated in accordance with AASHTO TP62: Determining Dynamic Modulus of Hot-Mix Asphalt Concrete Mixtures, to determine plant mixing capabilities. A demonstration strip or mix verification may be required before SHA project placement.

The use of RAP, not to exceed 10 percent, may be considered for applications where higher polish value aggregates are required and in mixes requiring elastomer type polymer binder. Approval for use shall be on an individual project basis by the Office of Materials Technology (OMT). Placement areas within the project limits shall be designated by OMT. These applications shall require isolated RAP stockpiles from an identified single source. Documentation of RAP stockpile management, quality, and traceability shall be submitted to the Engineer for approval prior to use.

Crushed glass shall not be used in surface mixes. Roofing shingles shall not be used in gap-graded mixes or mixes requiring elastomer type polymer binder.

904.04.03 Mix Design Approval. Documents containing the data from the Contractor's laboratory study shall be submitted to the Engineer for tentative approval at least 30 days prior to paving operations. The mix designs shall be submitted in a format approved by the Engineer and 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 HMA 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.

(j) Tensile strength ratio and worksheets.

(k) The bulk specific gravity at N_{design} 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.

Mix designs submitted to the Division Chief for approval shall be accompanied by a quantity of job mix formula aggregate and appropriate amount of required PG binder for ignition oven calibration.

If previous construction or performance experience has shown the proposed mix design to be unsatisfactory, the Division Chief may require the Contractor to submit a more suitable design.

If the Contractor proposes to change the source of aggregate used in the mix, a revised mix design shall be submitted with the information required above and in 904.04.02. If a change in the Performance Grade binder source becomes necessary, a stripping test shall be conducted in conformance with MSMT 410, prior to approval. The Administration may require an antistripping additive test in conformance with D 4867 before giving the final approval.

Field Verification of Mix Design. After receiving the tentative approval for the mix design from the Asphalt Technology Division Chief representative, the Contractor shall conduct a field verification of the mix at the beginning of production in each plant. Field verification shall be performed by the certified personnel as specified in 504.03. The verification samples shall be prepared as specified in R 35. The Contractor shall notify the Engineer at least two working days in advance of the scheduled verification.

Verification Evaluation.

(a) Initial verification shall consist of four samples tested for the parameters listed in MSMT 735, Table 2. These samples shall be randomly drawn from the first day's

production. If the first day of production is less than 2000 tons, the Contractor may choose to spread verification testing over the number of days needed to accumulate 2000 tons. A verification sample and test is required on any day that exceeds 2000 tons of production. The verification testing shall be completed no later than on the day when production has reached the 2000 tons. The Contractor shall evaluate the verification tests results as specified in MSMT 735.

(b) If the mix produced by the plant conforms to the parameters listed in MSMT 735, Table 2 with the Percent Within Specification Limit (PWSL) a minimum of 85, production may proceed without any changes. If the Contractor has submitted mixes with identical aggregate combinations and differing asphalt contents associated with changes in ESAL loads, verification will be limited to volumetric analysis at the Engineer's discretion.

(c) If the mix produced by the plant does not conform to the parameters listed in MSMT 735, Table 2 with PWSL a minimum of 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 is 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.

When an adjustment is made to the mix design, a second verification shall be performed to ensure that the modified mix conforms to all design requirements. The time and tonnage limitations shall be as specified in (a) above.

If the adjusted mix conforms to the PWSL, production may proceed. If the mix does not conform to these requirements, production for the mix shall be suspended and a new mix design shall be submitted to the Engineer for approval. The new mix shall be designed as specified in MSMT 412 or R 35.

If subsequent designs submitted due to nonconformance do not conform to (b) above during the intial verification, production for the mix shall be suspended until corrective action is taken as approved by the Engineer.

Thin Lifts. When specified lift thickness 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, the lift thickness shall be designated as a thin lift. Fine graded and coarse graded mix designs shall be determined in accordance with AASHTO M 323, Table 4, Gradation Classification and 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 > or = 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 > or = 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 > or = 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) is > or = 40%, a thin lift is a specified pavement thickness < 3 inches	When the 4.75mm (#4) is < 40%, a thin lift is a specified pavement thickness < 4 inches
37.5mm	When the 9.50mm (3/8) is > or = 47%, a thin lift is a specified pavement thickness < 4 1/2 inches	When the 9.50mm (3/8) is < 47%, a thin lift is a specified pavement thickness < 6 inches

904.04.04 Antistripping Additives. HMA shall have a minimum Tensile Strength Ratio (TSR) of 0.85 when tested in conformance with D 4867. The freeze-thaw conditioning cycle is required. HMA mixes not conforming to the minimum TSR requirement shall include an antistripping additive. When an antistripping additive is needed, the exact quantity shall be determined by the producer in conformance with D 4867 based on a minimum TSR of 0.85.

When a heat stable antistripping additive is used, the minimum dosage rate shall be 0.20 percent of the total weight of asphalt. The additive shall be introduced at the plant by line blending, metering, or otherwise measuring to ensure accurate proportioning and thorough mixing.

When hydrated lime is used, it shall be added in slurry form at the rate of 1.0 to 1.5 percent by weight of total aggregate. The hydrated lime shall conform to C 1097. Lime slurry shall be sprayed uniformly on the damp, cold aggregate on the feed belt prior to entry into the HMA plant dryer.

Plant control and acceptance of the mix shall be based on MSMT 410 with respect to its stripping potential.

904.04.05 Plant Control. The following tolerances shall apply:

TABLE 904 A – MIX TOLERANCES

PHYSICAL PROPERTY	TOLERANCE: PLANT SITE OR HAULING UNIT SAMPLES (b)	TOLERANCE: PROJECT SITE BEHIND THE PAVER SAMPLES (b)
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 versus 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, G_{mb}, %	± 0.022	± 0.022
G_{mb} at N_{max}, %	+ 0.5	+ 0.5

(a) Not applicable to 4.75 mm.
(b) For mixes other than Gap Graded HMA.

PWSL computations shall be performed for maximum specific gravity, voids in the total mix, voids in the mineral aggregate, and voids filled with asphalt. This computation shall be performed as specified in 504.04.02 using the moving average of the last three consecutive test values for each parameter. If the PWSL for the three test values fall below 85, corrective action shall be taken to bring the PWSL to at least 85. If the PWSL drops below 68, production shall be suspended until corrective action is taken as approved by the Engineer.

904.05 GAP GRADED STONE MATRIX ASPHALT (GGSMA).

904.05.01 Aggregates. Refer to 904.04.01.

904.05.02 Mix Design. Refer to 904.04.02 and the following table:

MIX TOLERANCES

PHYSICAL PROPERTIES	MIX DESIGN
VCA* Mix, %	Less than VCA_{drc}
VMA, %	18.0 min.
VTM, %	3.5
N_{design} Gyrations	100
AC% by volume	6.5 min.
Draindown, % max	0.3
Stabilizer, by weight of total mix, %	0.2 – 0.4

*VCA – voids in coarse aggregate.

904.05.03 Mix Design Approval. Refer to 904.04.03.

MIX SHIPMENT AND PLACEMENT TOLERANCES FOR GGSMA

PHYSICAL PROPERTY	TOLERANCE: PLANT SITE OR HAULING UNIT SAMPLES	TOLERANCE: PROJECT SITE BEHIND THE PAVER SAMPLES
Passing No. 3/8 (9.50 mm) sieve and larger, %	± 5	± 5
Passing No.4 (4.75 mm) sieve, %	± 4	±5
Passing No.8 (2.36 mm) sieve, %	± 4	±5
Passing No.16 (1.18 mm) sieve, %	± 4	± 5
Passing No.30 (0.60 mm) sieve, %	± 3	± 4
Passing No.50 (0.30 mm) sieve, %	± 3	± 4
Passing No.100 (0.15 mm) sieve, %	± 3	± 4
Passing No. 200 (75 µm) sieve, %	± 2	± 2
Asphalt content, %	± 0.4	± 0.5
Ratio of dust to binder material	NA	NA
Mix temperature leaving plant versus 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), %	3.5 ± 1.2	3.5 ± 1.2
Voids in coarse aggregate (VCA)	Less than VCA_{drc}	Less than VCA_{drc}
Voids in mineral aggregate, (VMA), %	17.0 min	17.0 min
Voids filled asphalt (VFA), %	NA	NA
Stabilizer, by weight of total mix, %	± 0.1	NA

NOTE: PWSL computations shall be performed for maximum specific gravity, voids in the total mix, and voids in the mineral aggregate. This computation shall be performed as specified in 504.04.02 using the moving average of the last three consecutive test values for each parameter. If the PWSL for the three test values fall below 85, corrective action shall be taken to bring the PWSL to at least 85. If the PWSL drops below 68, production shall be suspended until corrective action is taken as approved by the Engineer.

904.05.04 Stabilizer. GGSMA shall incorporate a stabilizer selected from a source previously approved by the Administration.

904.05.05 Stabilizer Supply System. A separate system for feeding shall be used to proportion the required amount into the mixture so that uniform distribution is obtained.

When a batch plant is used, the stabilizer shall be added to the aggregate in the weigh hopper and both dry and wet mixing times shall be increased. The stabilizer shall be uniformly distributed prior to the addition of asphalt cement into the mixture. The plant shall be interlocked so that asphalt can not be added until the stabilizer has been introduced into the mix.

When a drum plant is used, the stabilizer shall be added to the mixture in a manner that prevents the stabilizer from becoming entangled in the exhaust system.

The stabilizer supply system shall include low level and no-flow indicators, and a printout of the status of feed rate in lb/minute and shall have a 60 second plant shut down function for no flow occurrences.

The stabilizer supply line shall include a section of transparent pipe for observing consistency of flow or feed.

All stabilizer addition systems shall be as approved by the Engineer.

904.05.06 Antistripping Additives. Refer to 904.04.04.

CATEGORY 900
MATERIALS

SECTION 908 — REINFORCEMENT STEEL

645 **DELETE:** 908.01 DEFORMED REINFORCEMENT in its entirety.

INSERT: The following.

908.01 DEFORMED REINFORCEMENT. Unless otherwise specified, reinforcement bars and reinforcement bars used as anchoring devices shall be deformed bars conforming to A 615 or A 706, Grade 60. Deformed bars shall be epoxy coated when specified in the Contract Documents. Epoxy powder shall conform to 917.02.

646 **DELETE:** 908.02 PLAIN REINFORCEMENT in its entirety.

INSERT: The following.

908.02 PLAIN REINFORCEMENT. Unless otherwise specified, dowel bars and dowel bars used as ties in PCC pavement expansion and contraction joints shall be plain round steel bars conforming to A 615, Grade 60 or A 36. Bars shall be epoxy coated. Epoxy powder shall conform to 917.02. All dowel bars used for traverse joints shall have an maximum pullout strength in conformance with M 254.

DELETE: 908.08 WIRE FABRIC FOR PNEUMATICALLY APPLIED MORTAR in its entirety.

INSERT: The following.

908.08 WIRE FABRIC FOR PNEUMATICALLY APPLIED MORTAR. Wire fabric for pneumatically applied mortar and concrete encasement shall conform to A 185. It shall be fabricated either from size W1.4 wire on 3 in. centers in each direction or from W0.9 wire on 2 in. centers in each direction. It shall be galvanized as specified in 906.01.01.

CATEGORY 900
MATERIALS

SECTION 915 — PRODUCTION PLANTS

915.01 GENERAL. These specifications are applicable to all batching and proportioning plants.

668 **DELETE:** 915.01.01 Approval in its entirety.

INSERT: The following.

915.01.01 Approval. The plant from which the Contractor proposes to obtain material shall be approved by the Office of Materials Technology before starting deliveries.

667 **DELETE:** 915.01.02 Lead Time in its entirety.

INSERT: The following.

915.01.02 Lead Time. The Contractor shall notify the Office of Materials Technology at least two working days prior to the start of operations. The Office of Materials Technology shall be kept informed of plant operational procedures and notified when a change is planned. Inspectors shall have safe access to all areas of the plant for the performance of their duties. All equipment, tools, machinery, and parts of the plant shall be maintained in a satisfactory working condition at all times.

669 **DELETE:** 915.01.04 Measuring Devices in its entirety.

INSERT: The following.

915.01.04 Measuring Devices. Measuring devices shall conform to the current edition of the National Institute of Standards and Technology Handbook 44, except as modified by Table 915. The producer shall be responsible for providing all personnel and equipment for calibrating measuring devices.

Before any proportioning plant starts operation, and at least once each year thereafter, all measuring devices, meters, dispensers, test weights, and other measuring devices shall be inspected, tested, and certified to be in proper operating condition by competent testing agencies approved by the Engineer. During the period of operation, all measuring devices, meters, dispensers, and other measuring devices shall be tested monthly and certified for accuracy and operating condition by the producer or an approved testing agency. Any weighing device by which materials are sold by weight as a basis of payment shall be tested monthly and certified by an approved testing agency. The Engineer shall be notified at least two working days in advance of monthly scale inspections. The certifications shall state capacities, minimum graduations, loads applied, degree of accuracy, and magnitude.

Balance and zero conditions of scales shall be checked daily, and at any other time requested by the Office of Materials Technology. The Engineer may, at any time, direct that any measuring device be tested by the producer or an outside agency if there is any doubt about the accuracy of the measuring device. Certificates of inspection shall be posted in a prominent place in the plant, and a copy shall be promptly submitted to the Engineer.

Production plant tolerances shall conform to the following table:

TABLE 915

MATERIAL	*MAINTENANCE TOLERANCE	UNIT OF MEASURE
Aggregate	0.2%	Weight
Portland Cement or Blended Hydraulic Cement of Ground Iron Blast Furnace Slag or Fly Ash	0.2%	Weight
Asphalt	0.2%	Weight or Volume
Water	1.5%	Weight or Volume
Additives	0.5%	Weight or Volume

*Maintenance tolerance shall be the specified percent of the total capacity of the scale or the smallest scale graduation, whichever is greater.

If during the monthly check, the measuring devices are found to deviate from the allowable tolerance, they shall be suspended from use until recalibrated to the Specification requirements. A price adjustment will apply to materials sold and accepted by weight that are supplied during the measuring device malfunction period when the malfunction resulted in an overpayment. The measuring device malfunction period is defined as the elapsed time between the two successive monthly checks.

671 **DELETE:** 915.02 Hot Mix Asphalt (HMA) Plants in its entirety.

INSERT: The following.

915.02 HOT MIX ASPHALT (HMA) PLANTS. All plants shall conform to M 156, and be equipped with Automatic Batching and Recording of Batching, except as modified in 915.01 and the following:

(a) Dryer. The fuel used for drying aggregates shall be compatible with the plant manufacturer's recommendations.

(b) Hot Aggregate Bins. Plants shall conform to M 156.

(c) Mixer Unit for Batch Method. Minimum dry and wet mixing times shall be 5 seconds and 15 seconds, respectively.

(d) Truck scale weighing shall conform to the National Institute for Standards and Technology (NIST), except as follows:

(1) A plant summary shall be kept by the producer showing the Contract number, truck identification (I.D.) number, I.D. of the type of mix being produced, the number of truck loads, and the total tons of mix.

(2) The producer shall supply a delivery ticket with the I.D. number, Contract number, I.D. of the type of mix, date, truck I.D. number, time loaded, gross and tare weights, and net weight of the mix for each load. When requested by the Engineer, the temperature of the mix shall also be shown on the delivery ticket.

(e) Automatic Weighing and Printout. The producer shall use an approved plant automatic weighing and printing system. A printed delivery ticket for each load shall be provided with the cumulative total weighed into the truck, Contract number, time loaded, I.D. of the type of mix, and net weight of mix. When requested by the Engineer, the temperature of the mix shall also be shown on the delivery ticket. The temperature may be handwritten on the delivery ticket.

(f) Hauling Units. The mixture shall be transported to the work site in units previously cleaned of all foreign material and the contents of each load completely covered with suitable material of sufficient size to protect it from the weather. Each unit shall have convenient access from ground level to insert thermometers to determine mix temperature.

The inside surface of all hauling units shall be treated with an approved release agent that will not contaminate or alter the characteristics of the mixture. Petroleum derivatives shall not be used. Approval will be based on results from tests performed in conformance with MSMT 414.

(g) Drum mixer plants shall be calibrated per MSMT 453 and approved by the Engineer. A monitoring station for the purpose of controlling the entire operation shall be provided. If any part of this control system fails, an alternative control system approved by the Engineer may be used for a maximum of two working days.

The producer shall determine the moisture content of all aggregates per MSMT 251.

672 **DELETE:** 915.02.01 Certified Hot Mix Asphalt (HMA) Plant in its entirety.

INSERT: The following.

915.02.01 Certified Hot Mix Asphalt (HMA) Plant. The producer shall be responsible for quality control of plant operations to ensure that the material conforms to Specifications. The quality control process will be subject to unannounced periodic inspection by representatives of the Engineer when Administration projects are in progress. The plant's certified technician shall fully participate in the inspections.

Initial Inspection. Any plant initially setting up and starting production will be subject to a comprehensive inspection to determine whether the plant equipment and personnel conform to all applicable Specifications. The Administration will accept certification by a professional engineer registered in the State of Maryland that the plant facilities conform to all applicable Specifications; however, final acceptance will be determined by the Administration.

Responsibilities of the HMA Producer.

(a) **Notification.** The producer shall notify the Engineer one working day prior to producing materials for Administration projects. Total tons shipped to Administration projects shall be reported within one business day of completed daily shipments.

(b) **Quality Control.** The minimum sampling and testing frequencies and criteria necessary for quality control of the HMA is the responsibility of the producer. The producer shall develop and use a quality control plan acceptable to the Engineer which addresses all elements necessary for quality control in the plant.

The producer shall conduct the minimum sampling and testing as specified in MSMT 735, Table 2. The producer shall perform any additional sampling and testing when directed by the Engineer. The producer shall offer to the Engineer the opportunity to witness all sampling and testing.

(c) **Reports.** The producer's test results shall be furnished to the Engineer on documents approved by the Administration.

Responsibilities of the Administration.

(a) **Split Samples to Evaluate the Effectiveness of the Plant Quality Control Operation.** A minimum of once during five days of plant shipments that require behind the paver Quality Assurance (QA) mixture box samples, a required QA sample shall be properly split and used to evaluate the effectiveness of the plant Quality Control (QC) operation. The plant QC operation shall test and submit results to the Administration in accordance with MSMT 735, Table 2, within 48 hours after receiving and properly splitting the sample.

(1) **Effective Plant Quality Control Operation.** When QC and QA split sample results compare within AASHTO Acceptable Range of Two Test Results, Multi-Laboratory Precision parameters for binder content and percent passing the #4, #8, and #200 gradation sieves, the QC operation will be evaluated as effective.

(2) **Ineffective Plant Quality Control Operation.** When QC and QA split sample results do not compare within AASHTO Acceptable Range of Two Test Results, Multi-Laboratory Precision parameters for all the indicated tests, the QC operation will be evaluated as ineffective. Three consecutive ineffective evaluations shall be cause to discontinue shipments to Administration projects. An investigation will be conducted to determine the cause of the differences. After a cause is determined and three consecutive split samples are within the precision parameters, the QC operation shall be re-evaluated as effective and shipments may resume. If the plant QC operation disagrees with the Administration's decision, the dispute may be resolved as specified in (e) below.

(b) **Recertification of HMA Plant.** Documentation of corrective action shall besubmitted to the Engineer by a professional engineer registered in the State ofMaryland. When this documentation is approved by the Engineer, a comprehensiveinspection will be conducted to recertify the HMA plant.

(c) **Independent Assurance Audits (IAA).** The Administration will evaluate theproficiency and equipment of QC/QA Technicians through audits performed on arandom basis as outlined in the Quality Assurance Manual. The technician beingaudited shall cooperate with the IAA Technician in the evaluation of theirproficiency and equipment.

(d) **Technician Certification.** Technician certification will be in conformance with MSMT 731 and the Mid-Atlantic Region Certification Program (MARTCP).

(e) **Dispute Resolution System.** This is a general procedure to resolve conflicts resulting from discrepancies between test results from the Engineer and producer, and nontest related disputes of sufficient magnitude to impact payment.

When a dispute arises, the producer or Engineer will file a written complaint to the Chief Engineer describing the nature of the dispute along with the pertinent information. The Chief Engineer will appoint a panel of three members to resolve the conflict. The panel will include a member selected by the asphalt industry. The panel will make recommendations to the Chief Engineer. The Chief Engineer will decide the disposition of the dispute based on the panel's recommendations.

A written report from the panel describing all subsequent actions and final disposition of the dispute shall be included in the project records.

If subsequent disputes arises on the same issue, the written report will be included as a resource during the resolution process.

915.03 PORTLAND CEMENT CONCRETE PLANTS

675 **DELETE:** 915.03.03 Load Tickets in its entirety.

INSERT: The following.

915.03.03 Load Tickets. An Administration approved, computer generated batch ticket indicating the pertinent information as designated in M 157 shall be provided in duplicate for each load. The ticket shall also indicate maximum allowable water, and maximum water allowed for jobsite slump adjustment. Distribution shall be made as specified in 915.03.05 (c)(2). The producer's copy shall be readily available for inspection upon request by the Engineer. A completed Administration Form 116 shall be issued for each load in the event a computer generated batch ticket cannot be provided.

678 **ADD:** The following after 915.03.05 Certified Concrete Plant.

915.03.06 Moisture Probes. Moisture probe readings may be used in place of actual daily moisture testing of fine aggregate. When used, moisture probes shall be calibrated and maintained in conformance with the manufacturer's recommendations. Actual moisture tests for the fine aggregate shall be performed weekly and as directed by the Engineer. When the actual tests of the fine aggregate indicate a difference of greater than 0.5 percent free moisture than the moisture probe readings, a second actual test shall be performed immediately. When the second test indicates a moisture difference of greater than 0.5 percent, then the moisture probe shall be recalibrated in conformance with the manufacturer's recommendations and verified. Records of all calibrations and weekly tests shall be maintained and made available to the Engineer.

915.05 CERTIFIED PRECAST CONCRETE PLANTS.

681 **DELETE:** The first paragragh, "The producer shall...in the inspections."

INSERT: The following.

All plants producing precast concrete items shall be certified by the National Precast Concrete Association. The producer shall be responsible for quality control plant operations to ensure that the material conforms to Specifications. The quality control process will be subject to unannounced periodic inspection by representatives of the Concrete Technology Division. The plant's certified technician shall fully participate in the inspections.

915.05.01 Responsibilities of the Precast Concrete Producer.

683 **DELETE:** (d) Quality Control Technician, in its entirety.

INSERT: The following.

(d) Quality Control Technician. The Quality Control Technician may be approved if certified from at least one of the following:

(1) The Precast/Prestressed Concrete Institute Plant Certification Program, PCI Technician Level I, minimum.

(2) American Concrete Institute, ACI Field Technician Level I.

CATEGORY 900
MATERIALS

SECTION 950 - TRAFFIC MATERIALS

950.03 REFLECTORIZATION OF SIGNS AND CHANNELIZING DEVICES.

DELETE: 950.03 REFLECTORIZATION OF SIGNS AND CHANNELIZING DEVICES. in its entirety.

INSERT: The following.

950.03 REFLECTORIZATION OF SIGNS AND CHANNELIZING DEVICES. Unless otherwise specified in the Contract Documents, retroreflective sheeting for permanent signs shall conform to 950.03.01 and 950.03.03. Retroreflective sheeting for temporary signs and channelizing devices shall conform to 950.03.02 or 950.03.03, and 950.03.04.

950.03.01 Permanent Signs Retroreflective Sheeting. Retroreflective sheeting for permanent signs shall conform to ASTM D 4956-05, except as modified below:

MINIMUM REFLECTIVE INTENSITY VALUES FOR RETROREFLECTIVE SHEETING
Minimum Coefficient of Retroreflection (R_A) cd/(lx · m^2)
Per ASTM E-810 (Average of 0 and 90 degree orientation)

Observation Angle°	Entrance Angle°	White	Yellow	Fluor. Yellow	Fluor. Yellow-Green	Red	Green	Blue	Fluor. Orange
0.2	-4	570	425	340	455	114	57	26	170
0.2	30	215	160	130	170	43	21	10	64
0.5	-4	400	300	240	320	80	40	18	120
0.5	30	150	112	90	120	30	15	6.8	45
1	-4	120	90	72	96	24	12	5.4	36
1	30	45	34	27	36	9	4.5	2	14

950.03.02 Temporary Traffic Signs (TTS).

(a) All rigid temporary traffic signs shall be fluorescent orange and conform to ASTM D 4956-05, Type VII or 950.03.01.

(b) All temporary flexible rollup signs shall be fluorescent orange and conform to ASTM D 4956-05, Type VI.

950.03.03 Black Sheeting. Black sheeting shall be nonreflective.

950.03.04 Drums for Maintenance of Traffic. All drums for maintenance of traffic shall have retroreflective white and fluorescent orange reboundable sheeting and conform to ASTM D 4956-05 Type VII.