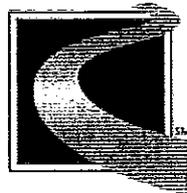


MARYLAND TRANSPORTATION AUTHORITY

Baltimore, Maryland

Invitation for Bids

FORT MCHENRY TUNNEL



Maryland
Transportation
Authority

Contract No. FT 2036-000-002

**MISCELLANEOUS STRUCTURAL REPAIRS INSIDE
THE FORT MCHENRY TUNNEL - (A)**

Baltimore City

JUNE 2010

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IMPORTANT INFORMATION REGARDING MBE UTILIZATION AND BIDDING REQUIREMENTS

The Maryland Transportation Authority (MDTA) 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 bid/proposal book.

Please read all of the instructions 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 subgoals, 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

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

- Prime Contractor's name, address and phone number.
- Project description



Maryland Transportation Authority

MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT MCHENRY TUNNEL – (A)

SPECIAL PROVISIONS

Contract No. FT 2036-000-002

- Project number/Solicitation number.
- List the minority firm name (column 1), certification number and MBE Classification (column 2), NAICS Codes of the services to be performed or products to be supplied (column 3) and total subcontract dollar amount (column 4).
- 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 SIC/NAIC Codes through MDOT and can perform the proposed work 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 work and your contract falls short of the established MBE goal, your firm will be considered **non-responsive or not reasonably susceptible of being selected for award**.
- Prime Contractors are strongly encouraged to check the MDOT database at www.mbe.mdot.state.md.us to see if the subcontractor(s) is certified to perform the services and to make sure the subcontractor(s) has not graduated from the listed NAICS codes. If you have questions after checking the data base, you may contact the MDTA MBE Office at 410-537-7832 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 4) (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 (column 1). Please note: 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. 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 MDTA 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 MDTA. 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 10 days, the Procurement Officer may determine that the apparent low bidder is not responsible and therefore not eligible for contract award.



Maryland Transportation Authority

**MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT MCHENRY TUNNEL – (A)**

SPECIAL PROVISIONS

Contract No. FT 2036-000-002

NOTICE TO BIDDERS/OFFERORS

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 acknowledgment pages.
- 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 FORMS, 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 One Hundred Thousand Dollars (\$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



Maryland Transportation Authority

**MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT MCHENRY TUNNEL – (A)**

SPECIAL PROVISIONS

Contract No. FT 2036-000-002

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.

eMaryland Marketplace Fee

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

For registration requirements, visit www.eMarylandMarketplace.com.



MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT MCHENRY TUNNEL – (A)

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Maryland Transportation Authority

**MISCELLANEOUS STRUCTURAL REPAIRS
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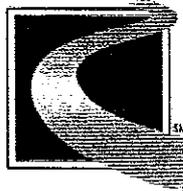
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MARYLAND TRANSPORTATION AUTHORITY

Baltimore, Maryland

Invitation for Bids

FORT McHENRY TUNNEL



Maryland
Transportation
Authority

Contract No. FT 2036-000-002

MISCELLANEOUS STRUCTURAL REPAIRS INSIDE THE FORT MCHENRY TUNNEL – (A)

Baltimore City

JUNE 2010

NOTICE TO BIDDERS

A “Pre-Bidding Session” for the purpose of answering or obtaining answers to questions of parties interested in constructing the work will be conducted **at 9:00 am on July 6, 2010**, in the Conference Room at the Maryland Transportation Authority, Division of Procurement and Statutory Program Compliance, 300 Authority Drive, 1st Floor, Engineering Building, Baltimore, MD 21222. While attendance at the Pre-Bid conference is not mandatory, this is the bidders/offeror’s opportunity to raise questions and/or issues of concern regarding the Project.



**MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT MCHENRY TUNNEL – (A)**

CONTRACT PROVISIONS
(NCHRP) REPORT 350 IMPLEMENTATION SCHEDULE

Contract No. FT 2036-000-002

1 of 2

CONTRACT PROVISIONS

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) and Trailer Truck Mounted Attenuators (TTMAs) .

(b) Temporary Barrier.

(1) Concrete Barrier.

(2) Traffic Barrier W Beam and Water Filled Barrier.

(3) Steel/Aluminum Barrier.

(c) Temporary End Treatments.

Category 4 Devices

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



**MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT MCHENRY TUNNEL – (A)**

Contract No. FT 2036-000-002

**CONTRACT PROVISIONS
(NCHRP) REPORT 350 IMPLEMENTATION SCHEDULE**

2 of 2

WORK ZONE DEVICES	IMPLEMENTATION SCHEDULE TO CONFORM TO NCHRP REPORT 350 CRITERIA
<p>CATEGORY 1 Cones, tubular markers, flexible delineator posts, and drums (all without any accessories or attachments)</p>	<p>All devices shall conform to NCHRP Report 350 criteria.</p>
<p>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)</p>	<p>All devices shall conform to NCHRP Report 350 criteria.</p>
<p>CATEGORY 3 (a) Truck Mounted Attenuators (TMAs); Trailer Truck Mounted Attenuators (TTMAs) (b) Temporary Barriers (1) Concrete Barrier (2) Traffic Barrier W Beam and Water Filled Barrier (3) Steel/Aluminum Barrier (c) Temporary End Treatments</p>	<p>All devices shall conform to NCHRP Report 350 criteria.</p>
<p>CATEGORY 4 Portable trailer mounted devices including area lighting supports, arrow panels, and changeable message signs</p>	<p>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.</p>



**MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT MCHENRY TUNNEL – (A)**

CONTRACT PROVISIONS
HIGH VISIBILITY SAFETY APPAREL POLICY

Contract No. FT 2036-000-002

1 of 2

**NOTICE TO ALL HOLDERS OF THIS CONTRACT DOCUMENT
HIGH VISIBILITY SAFETY APPAREL POLICY**

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

STATEMENT OF POLICY.

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

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

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



**MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT MCHENRY TUNNEL – (A)**

CONTRACT PROVISIONS

Contract No. FT 2036-000-002

HIGH VISIBILITY SAFETY APPAREL POLICY

2 of 2

REFERENCES.

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

DEFINITIONS.

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



**MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT MCHENRY TUNNEL – (A)**

CONTRACT PROVISIONS
HIGH VISIBILITY SAFETY APPAREL POLICY

Contract No. FT 2036-000-002

1 of 1

NOTICE TO CONTRACTOR

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

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

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

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

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



MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT MCHENRY TUNNEL – (A)

CONTRACT PROVISIONS
APPRENTICESHIP TRAINING FUND

Contract No. FT 2036-000-002

1 of 5

CONTRACT PROVISIONS
APPRENTICESHIP TRAINING FUND

Effective October 1, 2009, State Law requires all contractors and subcontractors working on State prevailing wage projects with prevailing wage determinations to register (Apprenticeship Training Fund Site) with the Division of Labor and Industry Prevailing Wage Unit prior to the commencement of work and to make certain contributions toward improving and expanding apprenticeship programs in the State. In addition, registered apprenticeship programs and organizations that have registered apprenticeship programs that have been selected by contractors and subcontractors for contributions also are required to register with the Division of Labor and Industry Prevailing Wage Unit.

The following information concerning the requirements of the apprenticeship training fund program are being provided for informational purposes only. It is the contractor's responsibility to contact the Maryland Department of Labor, Licensing and Regulation (DLLR), prior to commencement of any work, to determine how these provisions are being implemented and enforced by DLLR.

Definitions. The following terms have the meanings indicated.

(a) Terms Defined.

- (1) "Approved apprenticeship program" means an apprenticeship program or an organization with an apprenticeship program which has been registered with, and approved by, the Maryland Apprenticeship and Training Council or the United States Department of Labor.
- (2) "Commissioner" means the Commissioner of Labor and Industry.
- (3) "Covered craft" means a classification of workers listed in the prevailing wage determination applicable to a prevailing wage project.
- (4) "Fund" means the State Apprenticeship Training Fund.
- (5) "Monthly Certified Verification Report" means the monthly report that details contractor and subcontractor contributions for that month available on the Division of Labor and Industry's website.
- (6) "Public body" means a unit of State government as defined in § 17-201(1), State Finance and Procurement Article, Annotated Code of Maryland.



MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT MCHENRY TUNNEL – (A)

CONTRACT PROVISIONS
APPRENTICESHIP TRAINING FUND

Contract No. FT 2036-000-002

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(7) “Unit” means the Division of Labor and Industry, Prevailing Wage Unit and the public body that awarded the procurement contract.

(8) “Yearly Certified Verification Report” means the yearly report that details contractor and subcontractor contributions for the preceding year available on the Division of Labor and Industry’s website.

Contractor/Subcontractor Registration. Contractors and subcontractors awarded a procurement contract on a public work contract subject to the Maryland Prevailing Wage Law shall register on the Division of Labor and Industry’s website at www.dllr.state.md.us/labor prior to the commencement of work.

Contractor/Subcontractor Project Management. Upon registration under Contractor/Subcontractor Registration of this Chapter, contractors and subcontractors are required to provide information to the Division of Labor and Industry on its website at www.dllr.state.md.us/labor about each public work contract including the following:

- (a) The prevailing wage project number for each prevailing wage project the contractor or subcontractor is performing work on; and
- (b) The contract value for each prevailing wage project the contractor or subcontractor is performing work on.

Contractor/Subcontractor Notification to Subcontractors. Contractors and subcontractors who hire subcontractors on a public work contract subject to the Maryland Prevailing Wage Law shall provide all subcontractors with written notice of the following requirements:

- (a) Subcontractors are required to register on the Division of Labor and Industry’s website at www.dllr.state.md.us/labor prior to the commencement of work;
- (b) After registration, subcontractors are required to enter certain information about each prevailing wage project on the Division of Labor and Industry’s website; and
- (c) Subcontractors performing work on a prevailing wage project valued at \$100,000 or more are required to make payments to approved apprenticeship programs or to the Fund for workers in classifications listed on the prevailing wage determination, or both.



MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT MCHENRY TUNNEL – (A)

CONTRACT PROVISIONS
APPRENTICESHIP TRAINING FUND

Contract No. FT 2036-000-002

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Contractors and subcontractors shall retain a copy of the written notice required in §A of this Regulation that was provided to all subcontractors for inspection and review by the Commissioner for three years.

Contributions to the Fund. *Currently not being enforced*

Contributions to Approved Apprenticeship Programs. *Currently not being enforced*
Contractor/Subcontractor Obligations Relating to Approved Apprenticeship Program.

- (a) Contractors and subcontractors are required to complete and to file on the Division of Labor and Industry’s website at www.dllr.state.md.us/labor the Monthly Certified Verification Report which shall include the following:
- (1) A list of the contributions to each approved apprenticeship program during the last month;
 - (2) A statement signed by the contractor or subcontractor that the information is correct and that the contractor or subcontractor has complied with the requirements of Subtitle 6, Title 17, State Finance and Procurement Article, Annotated Code of Maryland.
- (b) Contractors and subcontractors are required to submit the Monthly Certified Verification Report by the 30th calendar day of each month for the previous month.
- (c) Contractors and subcontractors are required to complete and to file on the Division of Labor and Industry’s website at www.dllr.state.md.us/labor the Yearly Certified Verification Report which shall include the following:
- (1) A summary of monthly contributions with total annual contributions; and
 - (2) A statement signed by the contractor or subcontractor that the information is correct and that the contractor or subcontractor has complied with the requirements of Subtitle 6, Title 17, State Finance and Procurement Article, Annotated Code of Maryland.
- (d) Contractors and subcontractors shall post a copy of their Yearly Certified Verification Report in a prominent and easily accessible place in the workplace near where work is performed.

Notification to Division of Labor of Changes to Designated Approved Apprenticeship Programs or Fund. Contractors and subcontractors shall provide the Commissioner with written notice of each approved apprenticeship program or the Fund to which it will make contributions. If a contractor or subcontractor changes their designation, it shall notify the Division of Labor and Industry 30 days prior to the change in designation.



MISCELLANEOUS STRUCTURAL REPAIRS INSIDE THE FORT MCHENRY TUNNEL – (A)

CONTRACT PROVISIONS APPRENTICESHIP TRAINING FUND

Contract No. FT 2036-000-002

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Approved Apprenticeship Program Obligations. Upon notification from the Division of Labor and Industry that the approved apprenticeship program has been designated for contributions by a contractor or subcontractor, the approved apprenticeship program shall register on the Division of Labor and Industry's website at www.dllr.state.md.us/labor.

After registering under §A of this Regulation, an approved apprenticeship program will receive a summary of contractor and subcontractor contributions from the Division of Labor and Industry on a monthly basis and shall comply with the following:

- (a) Review and certify that the contribution amounts are correct;
- (b) Certify that all funds received are used solely for the purpose of improving or expanding apprenticeship training in the State; and
- (c) File a response within 30 days of receipt of the Division of Labor and Industry's summary.

Enforcement Procedures.

- (a) The Commissioner may investigate whether Subtitle 6 of Title 17 of the State Finance and Procurement Article, Annotated Code of Maryland, has been violated:
 - (1) On the Commissioner's own initiative;
 - (2) On receipt of a written complaint; or
 - (3) On referral from another State agency.
- (b) The Commissioner may require a contractor, subcontractor, or an approved apprenticeship program to produce records as part of its investigation.
- (c) The Commissioner may enter a place of business to:
 - (1) Interview individuals; or
 - (2) Review and copy records.



**MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT MCHENRY TUNNEL – (A)**

**CONTRACT PROVISIONS
APPRENTICESHIP TRAINING FUND**

Contract No. FT 2036-000-002

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- (d) If after an investigation, the Commissioner determines that there is a violation of Subtitle 6, Title 17 or a regulation adopted to carry out the title, the Commissioner shall issue a citation that shall:
- (1) Describe in detail the nature of the alleged violation;
 - (2) Cite the provision of law or regulation that is alleged to have been violated; and
 - (3) State the penalty, if any.
- (e) Within a reasonable amount of time after the issuance of the citation, the Commissioner shall send a copy of the citation to the alleged violator by certified mail with notice of the opportunity to request a hearing.
- (f) Within 15 days after the alleged violator receives the citation, the employer may submit a written request for a hearing on the citation and proposed penalty.
- (g) If a hearing is not requested within fifteen days, the citation, including any penalties, shall become a final order of the Commissioner.
- (h) If there is a request for a hearing, the Commissioner may delegate the hearing to the Office of Administrative Hearings in accordance with Title 10, Subtitle 2 of the State Government Article, Annotated Code of Maryland.
- (i) A proposed decision of an administrative law judge shall become a final order of the Commissioner unless, within 15 days of the issuance of the proposed decision:
- (1) The Commissioner orders review of the proposed decision; and
 - (2) The alleged violator submits to the Commissioner a written request for review of the proposed decision.
- (j) After review of the proposed decision under Subsection I, with or without a hearing on the record, the Commissioner shall issue an order that affirms, modifies or vacates the proposed decision.



MISCELLANEOUS STRUCTURAL REPAIRS
INSIDE THE FORT MCHENRY TUNNEL – (A)

CONTRACT PROVISIONS

Contract No. FT 2036-000-002

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SPECIAL PROVISIONS

SP 1-1 PROJECT DESCRIPTION

CONTRACT NO.: FT 2036-000-002

TITLE: Miscellaneous Structural Repairs inside the Fort McHenry Tunnel-(A)

FACILITY: Fort McHenry Tunnel

COUNTY: Baltimore City

ADVERTISED: June 22, 2010

PRE-BID MEETING: 9:00 a.m. on July 6, 2010
in the Conference Room at the Maryland Transportation Authority, Division of Procurement and Statutory Program Compliance 300 Authority Drive, 1st Floor, Engineering Building, Baltimore, MD 21222

PROJECT CONTACT: Project Manager: Mr. Abey Tamrat at (410) 537-7822
Contract Administration: Ms. Maggie Johnson at (410) 537-7807

BIDS DUE: **12 Noon, July 29, 2010**, in the Bid Box on the 1st floor of the Maryland Transportation Authority, Engineering Building, 300 Authority Drive, Baltimore, MD 21222

CLASSIFICATION: Class - F (\$5,000,001 to \$10,000,000)

CONTRACT TIME: 365 Calendar Days

LIQUIDATED DAMAGES: **\$2,500.00 per Calendar Day**

MINIMUM MBE GOALS: Overall 22% (No Sub-Goals)

BID DOCUMENTS: \$25.00 Bid documents can be purchased between 8am and 6pm, Monday – Friday at the Ticket Office located at the Francis Scott Key Bridge, Maryland Transportation Authority, Administration Building, 303 Authority Drive, Baltimore, MD 21222.



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SPECIAL PROVISIONS

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PROJECT DESCRIPTION

The work to be performed under this contract is located at the Fort McHenry Tunnel on I-95 in Baltimore City. The work location is the Southbound roadway designated as Bore 1 & 2.

The scope of work includes, but not limited to the following items:

- 1) Perform concrete repairs to the underside of the roadway slab and slab side walls supporting the roadway slabs. Work will be performed inside the fresh air supply duct. Work will include pressure injected epoxy crack repair, selective demolition of concrete spalls by hydro-demolition, cleaning and coating existing reinforcing steel, installation of reinforcing steel and welded wire fabric and repair of concrete spalls using pneumatically applied mortar.
- 2) Cleaning and painting of existing structural steel. Work will be performed inside the fresh air supply duct.
- 3) Miscellaneous structural repairs throughout the Fort McHenry Tunnel Facility as directed by the Engineer.



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SPECIAL PROVISIONS

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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 July, 2008, "Standard Specification" revisions thereof, or additions thereto, and the Special Provisions included in this Invitation for Bids. In addition, all terms and conditions of the standard specifications for construction and materials dated July 2008, revisions thereof or addition thereto shall apply to this Invitation For Bids unless otherwise specified herein.

All reference to the Maryland State Highway Administration's offices and/or positions shall be construed to mean the Maryland Transportation Authority's corresponding offices and/or positions. Prior to any submittal or contact specified, the Contractor shall have the Construction Project Manager verify that the current office and/or position are shown in the specifications. The Authority will not be responsible for any loss resulting from the Contractor not verifying the current office and/or position.

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. Abey Tamrat Project Manager at (410) 537-7822. Parties interested in visiting the site should contact Ms. Martara Hannah, Deputy 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



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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 Authority'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 Authority 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 Authority's Project Engineer when payment is made. After the Authority's Project Engineer verifies that payment has been made to the Subcontractor the Authority shall release withheld progress payments.

Nothing in this Special Provision shall be construed to prevent the Subcontractor from pursuing 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 and shoulder closures. Refer to Section 104 Maintenance of Traffic for Fort McHenry Tunnel bore closures. Work inside the tunnel roadway and fresh ducts will be allowed only during bore closures.

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 insured the Maryland Transportation Authority and the State of Maryland.



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2. The Contractor shall purchase and maintain such insurance as is specified herein which will protect 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 for which any of them may be held 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.



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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:

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 (Authority) with a list of Minority Businesses with whom the Contractor negotiated, including price quotes from Minority and Non-minority firms.



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Third Tier Subcontracting:

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. The Contractor's written request must be submitted with the bid 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 MDOT MBE FORM 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 Subtitle 2, Title 7 of the Corporations and Associations Article of the 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 the Maryland Department of Assessment and Taxation web site at: www.dat.state.md.us.



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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 time.

While working in the Tunnels or on one of the major bridges 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 begin 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.



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SP 1-11 PROGRESS PHOTOGRAPHS

On or about the last day of each month, at important stages of the work, and upon final completion, the Contractor shall take color photographs of the work under construction as directed by the Engineer. An average of 18 views per month will be required for the Contract.

The Contractor shall use a digital camera and furnish to the Engineer a CD and three prints of each photograph, linen mounted, to a uniform standard size of approximately 8 inches by 11 inches with at least one inch margin for binding on the left hand side. Each print shall show inconspicuously on the face, the name of the contract, followed by the Contract number, subject of the photograph, date of the exposure, "Maryland Transportation Authority," and the name of the Contractor. The furnishing of the progress photograph prints, including disks will not be measured for payment, but cost thereof shall be included under various pay items appearing in the Proposal.

SP 1-12 ACCESS TO PROJECT SITE

The Authority may deny access to any or all of the bores on any day without prior notice. The Contractor shall assume that access may be denied up to 25 nights during the duration of the contract. The schedule submitted for the project shall include 25 days of denied access. Denial of access for a maximum of 25 nights shall not be cause for an extension of Contract Time. Denial of access for maximum of 25 nights shall be at no additional cost to the Authority.

The Contractor may work in only one bore at a time. All work shall be completed in that bore before starting work in the second bore.



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**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 the “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 Engineering Divisions and positions such as Bridge, Traffic, Highway, and Environmental Sections.



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SPECIAL PROVISIONS

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**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.



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**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.



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SPECIAL PROVISIONS

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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.



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Sample forms shall be submitted to:

Ms. Linda McGill, CPPB
Chief Procurement Officer
Maryland Transportation Authority
300 Authority Drive
Baltimore, MD 21222



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**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.



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**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.



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SPECIAL PROVISIONS

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**GENERAL PROVISIONS
GP - SECTION 5
COOPERATION BETWEEN CONTRACTORS**

GP-5.06 COOPERATION BETWEEN CONTRACTORS

Section GP-5.06 of the Standard Specifications shall be replaced with the following provisions:

A. The Contractor shall cooperate and coordinate with Authority contractors and any other adjoining work performed by outside agency contractors. The Miscellaneous Structural Repairs inside the Fort McHenry work will entail two concurrent adjacent contracts. Such cooperation and coordination shall include, and be not limited to, the following:

1. Arrangement, staging, and conduct of work;
2. Storage and disposal of materials, etc., in such a manner as to not interfere with, limit access, or hinder the progress of the work being performed by other Contractors. Contiguous work shall be joined as required in the Contract Documents.
3. Keeping apprised of other contractors' activities, sharing information, working collaboratively, attending corridor coordination meetings and conforming to all other activities requiring cooperation and coordination efforts between contractors as identified in these special provisions.

B. The Authority shall have the right, at any time, to Contract for and perform other work on, near, over or under the work covered by this Contract. In addition, other work may be performed under the jurisdiction of another Administration or State agency. In cases when a dispute arises among Contractors, the Authority's decision shall be final and binding on the contractors. The Contractor shall cooperate fully with such other Contractors and carefully fit his own work to such other work as may be directed by the Authority.

C. The Contractor agrees to make no claims against the Authority for any inconvenience, delay or loss experienced by them because of the presence and operations of other Contractors, except when such a delay is not due to any fault or negligence of the Contractor. All such justifiable and approved delays may be considered for an extension of time only in accordance with the requirements of Section TC-5.05 of the Standard Specifications.



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When the failure to gain access is not due to any fault or negligence of the Contractor, an extension of the contract time may be allowed on a day to day basis for the amount of time delayed. The impact on Contractor's schedule shall be justifiable and supported by mutually corroborative facts, figures, and documentation. Except for provided herein, the Authority will not assume any responsibility for acts, failures, or omissions of other contractors that delay the work. The Contractor shall assume all liability in connection with his contract and shall protect and save harmless the Authority from any and all damages and claims that may arise because of any inconvenience, delay, or loss experienced as a result of the presence and operations of other contractors working in or near the work covered by his contract.

Staging or storage areas are not available for the exclusive and long-term use by any contractor within the project limits, except as approved by the Authority and for the necessary work which each Contractor is responsible of constructing. Temporary storage of equipment and materials may be permitted by the Authority close to the tunnel in the vicinity of Keith and Leland Ave. This location will be confirmed by the Engineer prior to the pre-construction meeting and will be subject to the nature, magnitude, timing of the intended use as well as other laws, regulations, and community concerns. A formal request shall be made to the Authority for use of the above facility, and the request shall accompany all necessary drawings; permit requirements; schedule for use; materials and equipment housing/storage details; and any other information to complete the submittal for Authority's review. The use of the above West Ventilation Building parking lot, and other Authority-owned property, shall be limited to the approval constraints and be at the Contractor's own risk. The Authority shall not be held liable for damage to or loss of materials or equipment located within these areas.

The Contractor shall remove the equipment, materials, and rubbish from the work areas and other Authority-owned property which the Contractor occupies and shall leave the areas in a presentable condition, in conformance with the provisions in Section GP-4.09, Final Clean Up, of the Standard Specifications. The Contractor shall secure, at the Contractor's own expense, areas required for storage of plant, equipment, and materials or for other purposes if sufficient area is not available to the Contractor within the contract limits.

D. Access/Work Area Limitations

In planning the sequence of work, the Contractor shall be aware that certain areas or portions of work within the Contract may not be available until a certain time after the contract has commenced, or certain portions of work may need to be completed by a certain time and the designated work areas vacated. If so indicated, the Contractor shall specifically include all relevant activities and limiting dates in the logic and CPM schedule as a measure of acknowledgement of such restriction in planning for Contract work.

Further reference shall be made to the requirements in "CONTRACT TIME AND BONDING" of these Special Provisions.



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Access to the tunnel roadway and fresh air ducts will be from the ventilation buildings and the tunnel portals or as directed by the engineer. In addition, existing manholes as described on the Plans can be used for access if approved by the engineer.

E. Measurement and Payment

Cooperation and coordination between contractors shall be incidental to the various contract bid items provided for in this Contract, and no additional payment shall be made to the Contractor.



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**GENERAL PROVISIONS
GP - SECTION 5
CONTROL OF THE 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 comply with 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 COMPLETE CORRECTIONS SO AS TO CONFORM TO THE PROVISIONS OF GP 5.11 within four (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 comply with GP 5.11 within four (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.



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GENERAL PROVISIONS

GP - SECTION 7

LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

GP-7.05 CONSTRUCTION SAFETY AND HEALTH STANDARDS

40 ADD:

After the last paragraph. All Contractor personnel shall comply with the following at a minimum, unless otherwise determined unsafe or inappropriate in accordance with the regulations referenced in the Specifications: 1. Hard hats shall be worn while participating in or observing all types of field work when outside of a building or outside of the cab of a vehicle, and exposed to, participating in or supervising construction. 2. Respiratory protective equipment shall be worn whenever an individual is exposed to any item listed in the referenced regulations. 3. Adequate eye protection shall be worn in the proximity of grinding, breaking of rock and/or concrete, while using brush chippers, striking metal against metal or when working in situations where the eyesight may be in jeopardy. 4. Safety vest shall be worn by all personnel exposed to vehicular traffic and construction equipment. 5. Standards and guidelines of the current Maryland State Highway Administration's work zone safety shall be used when setting, reviewing, and removing traffic controls. 6. No person shall be permitted to position themselves under any raised load or between hinge points of equipment without first taking steps to support the load by the placing of a safety bar or blocking. 7. All electrical tools shall be adequately grounded or double insulated. Ground Fault Circuit Interrupter (GFCI) protection must be installed in accordance with the National Electrical Code (NEC) and current Maryland Occupational Safety and Health agency (MOSH). If extension cords are used, they shall be free of defects and designed for their environment and intended use. 8. No person shall enter a confined space without training, permits and authorization. 9. Fall protection devices shall be used in accordance with the referenced regulations.

1.1 Initial Safety Plan

Within fifteen (15) calendar days after the Notice to Proceed date, the Contractor shall submit a written initial project site specific safety plan (Initial Safety Plan) that complies with the requirements of the Specification. The Initial Safety Plan shall address all on-site activities anticipated within the first ninety (90) calendar days of the contract time.

1.2 Safety Plan

Within sixty (60) calendar days of the written Notice to Proceed date, the Contractor shall submit a written project site-specific Safety Plan (Safety Plan) that covers all contract work and which complies with the requirements of the Specifications. Incomplete or generic Safety plan submittals are not acceptable and will be returned without review. The



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Contractor is responsible for the review of the specific safety requirements, as inherent in the scope of the contract work or implied by the Contract, for the analysis of planned methods of operation, and for the incorporation of any additional specific or unique safety requirements or measures in the Safety Plan. The Safety plan shall be project site-specific and address eliminating or controlling hazards, exposures and risks endemic to the site and the contract work to be performed. Note that the ventilation fans will not be operated during the nighttime working hours in the closed bores. Therefore, the fresh air ducts are considered confined space under these conditions. The Contractor shall prepare his safety plan accordingly.

The Engineer is under no obligation to detect safety issues or issue a notice of deficiency or non-complaint condition, in the Safety Plan or during performance of contract work by the Contractor, Subcontractor(s), Suppliers, or any other Contractor's agents. Under no circumstances shall the Contractor (or Subcontractor(s), Suppliers, or any other Contractor's agents) consider relieved of the obligations, pursuant to any applicable law or regulatory requirements, to provide a safe work place and comply fully with the safety laws and regulations.

The Safety Plan shall:

- a) Acknowledge that the Contractor is responsible to be in compliance with all Federal and State requirements and other applicable rules and orders that require employers to provide a safe and healthy workplace.
- b) Outline administrative responsibilities for implementing the Safety Plan, and identify and define the personnel accountable for incident prevention. Incidents include, but are not limited to, employee injuries, equipment and property damage, fires, and injury to the public. Include the name of the Contractor's Primary Safety Representative, delineating his/her authority to direct work stoppage and cause the elimination or correction of hazardous conditions.
- c) Establish performance objectives for all line supervisors for the achievement of a zero incident goal.
- d) Develop the means for coordinating and controlling work activities of contractors, subcontractors, and suppliers. e) Provide for on-going safety inspections of work sites, material, and equipment to ensure compliance with the Safety Plan. All Safety Plans shall include at a minimum the requirements set forth in Appendix A, included herein.



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1.3 Safety Operations

- a) The Contractor shall post the following in a jobsite location visible to all personnel:
 - i. Emergency procedures.
 - ii. Emergency phone numbers.
 - iii. Job safety and health poster.
 - iv. Notice of workers' compensation carrier.
 - v. OSHA 200 Summary (during February of each year).
 - vi. Location of Material Safety Data Sheet (MSDS) documents.
- b) Assign a dedicated Contractor's Primary Safety Representative. Non-exempt subcontractor(s) shall appoint a Subcontractor's Primary Safety Representative. A Contractor's Primary Safety Representative (and Subcontractor's Primary Safety Representative, if applicable) shall be assigned to each shift of construction, and be responsible for the administration of the Safety Plan. The Contractor's Primary Safety Representative (and Subcontractor's Primary Safety Representative, if applicable) shall have no other duties that could inherently conflict with his/her abilities to fulfill these safety related duties. Duties that would inherently conflict include production supervision and production management.
- c) A non-exempt subcontractor is defined as one that has a subcontract value in excess of one million dollars and who is otherwise exempted under subsection 1.4 below.
- d) Designate a competent person for each shift.
- e) Develop a Job safety Analysis (JSA) for high-risk operations prior to their commencement, and review specific JSA requirements with their employees. High risk operations include such activities as shoulder or lane closure; any excavation greater than 6 ft. in depth; pile driving; rebar placement; falsework erection; concrete placements involving cranes or pumps; and setting structural steel or precast elements, overhead sign structures, signals, high-mast lighting, etc. A copy of the JSA form is herewith included in Appendix B. Copies of completed JSA forms shall be kept on file at the Contractor's field office and made available to the Engineer upon request.
- f) Ensure that all subcontractor and suppliers are provided with a copy of Contractor's project site-specific Safety Plan and are informed of their obligations with regard to safety.
- g) Immediately address noted deficiencies upon observation. Where deficiencies cannot be corrected immediately, the Contractor shall develop a corrective action plan outlining the procedures and schedule for completion.
- h) Notify the Authority of all written or oral warnings of safety violations/citations within 24 hours upon their receipt.



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- i) Employ any additional measures that are necessary for project safety.

1.4 Exemptions

The following are exempt from the requirements of providing a Safety Plan:

- (a) General Contractors or subcontractors who are certified by the International Organization for Standardization ("ISO certified") at the time of receipt of bids and who continuously maintain ISO certification for the duration of the contract.
- (b) In the case of a joint venture, each joint venture partner must be ISO certified. Should a Contractor or subcontractor lose the ISO certification during contract performance, the Contractor or subcontractor will lose the exemption. Once lost, an exemption cannot be reinstated. In the event the Contractor or subcontractor loses the exemption, the Contractor or subcontractor shall immediately submit the project site-specific Safety Plan, in no case later than 15 calendar days from losing the ISO certification.
- (c) Off site fabrication and suppliers.
- (d) If the Contractor is exempt and one or more of its subcontractors are non-exempt, then each non-exempt subcontractor shall prepare and submit a Safety Plan that is acceptable to the Contractor. The Contractor shall forward a copy of each Contractor-approved subcontractor Safety Plan to the Department for information and file, within thirty (30) calendar days of the Contractor's issuance of Notice to Proceed to the non-exempt subcontractor.

1.5 Measurement and Payment

The price for safety requirements under this Special Provision will be incidental to the entire work, and shall not be measured for pay items. The Contractor's submittal of a compliant Safety and Health Plan is a condition precedent to 25% payment of the Contractor's mobilization payment.



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APPENDIX A

MINIMUM BASIC OUTLINE FOR PROJECT SITE-SPECIFIC SAFETY PLAN

1. SIGNATURE SHEET

Title, signature and phone number of the following:

- a. Plan preparer (for example, corporate safety person or project safety person)
- b. Plan approver, who shall be an officer of the company
- c. Plan concurrer, who shall be the most senior Contractor representative that the Contractor intends to assign full time to the project.

2. BACKGROUND INFORMATION

- a. Contractor
- b. Contract number
- c. Project name
- d. Brief project description, description of work to be performed, and location (map)
- e. Contractor accident experience (provide information such as EMR, OSHA 200/300 Forms)

3. STATEMENT OF SAFETY AND HEALTH POLICY

In addition to the corporate policy statement, a copy of the corporate safety program may provide a significant portion of the information required by the accident prevention plan.

4. RESPONSIBILITIES AND LINES OF AUTHORITIES

- a. Identification and accountability of personnel responsible for safety at both the corporate and project level

5. SUBCONTRACTORS AND SUPPLIERS

Provide the following:

- a. Identification of subcontractors and suppliers
- b. Means for controlling and coordinating subcontractors and suppliers
- c. Safety responsibilities of subcontractors and suppliers



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6. TRAINING

- a. List subjects to be discussed with employees in the safety indoctrination
- b. List mandatory training and certifications which are applicable to this project [for example, explosive-actuated tools, confined space entry, crane operator, diver, vehicle operator, Hazardous Waste Operations and Emergency Response (HAZWOPER) training and certification, personal protective equipment, etc.] and any requirements for periodic retraining / recertification
- c. Identify requirements for emergency response training.
- d. Outline requirements (who attends, when given, who will conduct, etc.) for supervisory and employee safety meetings

7. SAFETY AND HEALTH INSPECTIONS

Provide details on when inspections will be conducted, how inspections shall be recorded, deficiency tracking system, follow-up procedures, etc.

8. SAFETY AND HEALTH EXPECTATIONS, INCENTIVE PROGRAMS, AND COMPLIANCE

- a. The company's written safety program goals, objectives, and accident experience goals for this contract should be provided
- b. A brief description of the company's safety incentive programs (if any) should be provided
- c. Policies and procedures regarding noncompliance with safety requirements (to include disciplinary actions for the violation of safety requirements) should be identified
- d. Provide written company procedures for holding managers and supervisors accountable for safety

9. ACCIDENT REPORTING

The Contractor shall identify who shall complete the following, how and when:

- a. Exposure data (personnel hours worked)
- b. Accident investigations. Reports and logs
- c. Immediate notification of major accidents

10. MEDICAL SUPPORT

Outline on-site medical support and off-site medical arrangements.



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11. PERSONAL PROTECTIVE EQUIPMENT

Outline procedures (who, when, how) for conducting hazard assessments and written certifications for use of personal protective equipment.

12. PLANS (PROGRAMS, PROCEDURES) REQUIRED BY THE APPLICABLE REGULATIONS

The Contractor shall provide information on how the requirements of major sections of Title 29 CFR 1910 and 1926 in the project site-specific Safety Plan will be met. Particular attention shall be paid to excavations, fall protection, scaffolding, medical and first aid requirements, sanitation, personal protective equipment, fire prevention, machinery and mechanized equipment, electrical safety, public safety requirements, and chemical, physical agent and biological occupational exposure prevention requirements. Detailed site-specific hazards and controls shall be provided in the job safety analysis for each phase of the operation, not in the program.



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APPENDIX B

JOB SAFETY ANALYSIS

Activity: _____ Analysis by/Date: _____

PRINCIPAL STEPS	POTENTIAL SAFETY/HEALTH HAZARD	RECOMMENDED CONTROL
Identify the principal steps involved and the sequence of work activities.	Analyze each principal step for potential hazards	Develop specific Controls for each potential hazard

EQUIPMENT TO BE USED	EQUIPMENT INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
List equipment to be used in the work activity.	List equipment inspection requirements for the type of equipment utilized for the work activity.	List training requirements, including hazard communication.



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**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.



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**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.



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**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.



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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.



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**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 9 percent per annum beginning on the 31st day.



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**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:

Mr. Abey Tamrat
Maryland Transportation Authority
Engineering Division
300 Authority Drive
Baltimore, MD 21222

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:



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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 its 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.



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TERMS AND CONDITIONS

**TC SECTION 4
CONTROL OF WORK**

TC-4.02 FAILURE TO ADEQUATELY MAINTAIN PROJECT.

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

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

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

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

The deduction established by using the working days (based upon calendar dates when required) divided into the total value of the bid item will be equal to the daily prorated share of the lump sum price bid for Maintenance of Traffic or \$1,000.00 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.



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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 One Million Dollars (\$1,000,000.00) per occurrence/\$ One Million Dollars (\$1,000,000.00) 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 thirty (30) days notice of cancellation or non-renewal to:

Director of Construction
Maryland Transportation Authority
300 Authority Drive
Baltimore, Maryland 21222



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TERMS AND CONDITIONS
TC SECTION 7
PAYMENT

TC-7.05 PROGRESS PAYMENT

DELETE: TC-7.05 PROGRESS PAYMENTS Subsection (a) (2) 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 work, the evaluation of the Contractor changes, retainage reduction may be reconsidered.

After 15 percent project completion and upon request, Contractors with "A" evaluations for the last two years may be reduced from 5 percent to 2 percent. Project completion percentage will be based upon actual work completed (excluding monies paid for stored materials). An interim evaluation of the current project would need to be completed and 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. Release of full retainage will be at the discretion of the Construction Manager. Retainage will continue at 2.0 percent until the next milestone or completion of the contract.

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

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

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

New Bidders. Contractors who have not been previously rated by the 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.



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



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CATEGORY 100
PRELIMINARY

SECTION 103 – ENGINEERS OFFICE

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

INSERT: The following.

103.03.06 Computer System. Furnish 2 desktop computers and 0 laptop computers.

General Requirements.

- (a) IBM compatible with an Intel or AMD processor.
- (b) Minimum hard drive storage of 80 GB (gigabyte).
- (c) One CD-RW drive (re-writable CD-ROM).
- (d) Operating System. Minimum Microsoft® Windows XP PRO SP2. Must be a 32-bit operating system. (A 64-bit operating system is not compatible with some SHA software.) The computer system will not be acceptable unless all Microsoft Windows Critical Updates are installed.
- (e) Printer. When an Engineers Office is specified, furnish a B&W laser jet printer with a minimum resolution of 1200 DPI (dots per in.), at least 8 MB of RAM, and a print speed of at least 15 PPM (pages per minute). Inkjets will not be accepted. (Note: A separate color inkjet printer shall be required if a digital camera is specified, refer to SP-Section 113).
- (f) Software. Supply all manuals and software on original disks for retention in the Engineers Office or Administration facility for the duration of the Contract.
 - (1) Microsoft® Office 2007 Professional for Windows™ or later.
 - (2) Install and configure antivirus software to perform an automatic update when the microcomputer system connects to the internet. Antivirus software approved for Administration web email: *Norton, McAfee, Sophos, or ETrust.

(*Norton Internet Security includes Antivirus and a Personal Firewall).
- (g) Internet Access. Provide unlimited internet service approved by the Engineer. Where available, provide internet high-speed service (DSL or cable). With DSL or cable internet service, provide an external router device. Provide firewall software to protect the computer from security intrusions.



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(h) Accessories.

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

Desktop Specific Requirements.

- (a) Minimum processor speed of 3.0 GHz.
- (b) Minimum of 2 GB RAM (Random Access Memory).
- (c) Enhanced 101 key keyboard with wrist rest.
- (d) Super video graphics accelerator (SVGA).
- (e) Mouse and mouse pad.
- (f) Flat-panel LCD monitor (19 in. minimum) meeting Energy Star requirements.
- (g) Uninterruptible power supply (UPS).

Laptop Specific Requirements.

- (a) Must meet military standard of durability MIL-STD 810G
- (b) Minimum processor speed of 2.4 GHz.
- (c) Minimum 2 GB SDRAM.
- (d) Minimum 15" 1024x768 (XGA), daylight-readable, 500nits (cd/m²) LCD display.



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- (e) Power Supply. Two lithium ion battery packs with overcharge protection, an AC adaptor, and a vehicle DC power adaptor that operates the laptop and simultaneously charges the laptop's internal battery.
- (f) Carrying Case.
- (g) Printer. When an Engineers Office is not specified, furnish a portable printer that meets the requirements specified above.
- (h) Internet Service. If an Engineers office is not specified, furnish the laptop with an internal wireless broadband card and broadband internet service.

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

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

When the computer system is no longer required, the Construction Management software system including original user/operator guide manuals, program disks, and all data files (including those stored on USB flash drives, CD-R's, etc.) will be removed by the Engineer and delivered to the District Engineer and become the property of the Administration. The remaining computer systems shall remain the property of the Contractor.

103.04 MEASUREMENT AND PAYMENT.

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

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

Type "C" and Type "D" Engineer's office shall have two (2) complete microcomputer systems



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CATEGORY 100
PRELIMINARY

SECTION 103 – ENGINEERS OFFICE

103.03 CONSTRUCTION.

103.03.05 Requirements for all Offices.

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

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

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

INSERT: The following.

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

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

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



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**CATEGORY 100
PRELIMINARY**

SECTION 104 – MAINTENANCE OF TRAFFIC (GENERAL)

Refer to Section 104 of the standard specifications.

104.01 TRAFFIC CONTROL PLAN (TCP)

104.01.01 DESCRIPTION

DELETE: The forth paragraph sentence “Refer to contract documents for work restrictions” in its entirety.

INSERT: The following:

- 1) The work in this Contract affects the following roads and will require coordination with the Maryland Transportation Authority:
 - a) Fort McHenry Tunnel (I-95 in Baltimore City)

AGENCY CONTACTS

Pre-construction/Existing Contract Coordination

Maryland Transportation Authority

Facility	Contact	Phone Number
Fort McHenry Tunnel	Martara Hannah, Deputy Facility Administrator	(410) 537-1310
Fort McHenry Tunnel	Chris Allison, Maintenance Supervisor	(443) 829-3095
Engineering Division - Structures	Abey Tamrat	(410) 537-7822
Engineering Division - Traffic	Roxane Y. Mukai	(410) 537-7848

Work Restrictions. On Monday of each week, the Contractor shall provide the Engineer with a complete list of anticipated lane and shoulder closures for the following two weeks, allowing the Authority a minimum of fourteen (14) calendar days or ten (10) working days notification. The Engineer shall then notify the affected facilities, the Engineering Division’s Traffic Section and other appropriate offices. No lane closures shall be made without prior written approval of the Engineer in the form of an Authority lane/shoulder closure permit. The Authority is not responsible for lost workdays resulting from the Contractor failing to submit schedules or providing notification of maintenance of traffic requirements in a timely manner. Other contractors may be actively working in or around the vicinity of this project. The Contractor shall cooperate with and coordinate work activities with contractors in adjoining or overlapping work areas.



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The Contractor is responsible for obtaining lane/shoulder closure or other Permits from all affected agencies that require permits for work on their right of way, including those listed in this Special Provision. The Contractor shall make contact with the representative from the affected agency, through the Project Engineer and provide a copy of all coordination correspondence to the Authority. Sufficient time shall be allowed for review and approval of the permit application.

ALLOWABLE WORK HOURS

FORT McHENRY TUNNEL (FMT) - Tunnel Bore Closures

Table with 3 columns: Time of Day, Days of the Week, Allowed Closures. Rows include 8:30 PM - 4:30 AM (Monday - Thursday, I-95 Northbound) and 7:30 PM - 4:30 AM (Monday - Thursday, I-95 Southbound).

Maintenance of Traffic for FMT tunnel bore closures are furnished and installed by MdTA maintenance personnel. Only one bore in each direction may be closed at any given time.

No lane/shoulder closures are permitted 2 hours before, during or 2 hours after a stadium event or other major traffic generating event in downtown Baltimore.

No lane closures are permitted on Holidays, or the day preceding and following:

Work is not permitted on the day before, the day of, and the day after the Holidays indicated below on all facilities. For detailed Fort McHenry Tunnel holiday closure restrictions, see table below:

- New Year's Day, January 1
- Easter Weekend
- Memorial Day, the last Monday in May (Including that Weekend)
- Independence Day, July 4
- Labor Day, the first Monday in September (Including that Weekend)
- Thanksgiving Day, the fourth Thursday in November, including Friday through Monday
- Christmas Day, December 25

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



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As directed by the Engineer, temporary lane and shoulder closures will not be permitted during periods of falling precipitation, in heavy fog or otherwise poor visibility, or in the

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event of emergencies such as serious traffic accidents or unusually severe traffic congestion. In the event that a temporary lane or shoulder must be reopened as directed by the Engineer or authorized Authority staff, the Contractor shall evacuate all equipment, materials and personnel from the lane within thirty (30) minutes.

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

When closing or opening a lane on freeways, expressways, and roadways with posted speed ≥ 45 mph, a work vehicle shall be closely followed by a protection vehicle (PV) during installation and removal of temporary traffic control devices. The PV shall consist of a work vehicle with approved flashing lights, a truck-mounted attenuator (TMA) with support structure designed for attaching the system to the work vehicle, and arrow panel (arrow mode for multilane roadways and caution mode on two-lane, two-way roadways) The work vehicle size and method of attachment shall be as specified in the TMA manufacture’s specification as tested under NCHRP Test Level 3.

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

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

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

Temporary traffic control devices to be used for lane/shoulder closure may be placed on the shoulder of the roadway by workers no earlier than 15 minutes prior to actual time lane/shoulder closure or restriction is permitted. Temporary traffic signs may be displayed to traffic at this time.

Workers shall not enter a lane open to traffic. Workers may be present on shoulders to prepare for lane closure setup no earlier than 15 minutes prior to actual time lane/ shoulder closure or restriction is permitted.

All temporary lane or shoulder closures shall be restored at the end of the closure period and no travel lane shall be reduced to less than 11 ft. Prior to opening the closed lane or



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shoulder, the Contractor shall clear the lane or shoulder of all material, equipment, and debris.

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Failure to restore full traffic capacity within the time specified will result in a deduction being assessed on the next progress estimate in conformance with the following. This is in addition to the requirements specified in TC-4.02.

ELAPSED TIME, MINUTES	DEDUCTION
1 - 5	\$ 5,000.00
Over 5	\$ 1,000.00 per Minute (In addition to the Original 5 minutes)

104.01.04 MEASUREMENT AND PAYMENT.

INSERT: The following:

The work of this section will not be measured for payment. Maintenance of Traffic will be provided by the Authority. Work associated with the provisions of this section applicable to this contract is considered incidental to the Contract.



**CATEGORY 100
PRELIMINARY**

SECTION 113 – DIGITAL CAMERA

113.01 DESCRIPTION. Furnish 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.

113.02 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 5000 pages/month.

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



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113.03 CONSTRUCTION. Not applicable.

113.04 MEASUREMENT AND PAYMENT. The digital camera will not be measured but the cost will be incidental to the Contract price for the Engineers Office item. If an item for Engineers Office is not specified, payment for the digital camera will be incidental to the payment for Mobilization. In the absence of either item, payment will be incidental to the other items specified in the Contract Documents. If 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.



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**CATEGORY 400
STRUCTURES**

SECTION 400.03 — PRESSURE INJECTED EPOXY CRACK REPAIR

400-03.01 DESCRIPTION. Epoxy injection of cracks shall include the furnishing and placing of an epoxy at crack locations such as abutments, bents, deck slabs, pier columns, pier caps, and other locations as directed by the Engineer.

400-03.02 MATERIALS.

Epoxy grout 902.11(d)

The epoxy resin shall conform to C 881, Type I. The grade shall be submitted for the Engineer's approval after the Contractor's analysis of areas to be injected.

The system shall be moisture insensitive and shall not be used when the ambient or concrete temperature is 50 F or below, nor temperatures lower than recommended by the manufacturer.

The expiration date of acceptance of this material shall be one year after the date of manufacture. Any unauthorized tampering or breaking of the seals on the containers between the time of sampling and delivery to the job site will be cause for rejection of the material.

400-03.03 CONSTRUCTION. The locations for the pressure injection of cracks will be delineated by the Engineer.

The Contractor shall ensure that the epoxy manufacturer's technical representative will be present for the initial phases of the injection process, and shall submit details of the proposed method of repairs and the injection procedure for the Engineer's approval. The manufacturer's representative shall remain on site until satisfied that the Contractor is performing the work in accordance with the manufacturer's recommendation. The Contractor shall make the manufacturer's representative available to return to the site at the discretion of the Engineer.

The epoxy injection equipment shall be a positive displacement pump system. The system shall have a suitable mixing chamber where the epoxy components are accurately metered and thoroughly mixed immediately prior to injection. A clear, legible, and accurate pressure gauge shall be located in the supply line adjacent to the mixing chamber.

The equipment shall also be capable of providing a continuous and uninterrupted pressure head to continually force the injection of epoxy into the cracks. Epoxy flow shall be capable of being fully controlled by the operator controls at the mixing chamber.

All working personnel shall be familiar with the equipment, materials and procedures to be used during the operation.



MISCELLANEOUS STRUCTURAL REPAIRS
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All materials and equipment, including backup equipment, shall be at the work site before injection operations begin. All equipment shall be in proper calibration and in good working order as determined by the Engineer.

Epoxy shall be injected only by the use of the automatic mechanical pumping, metering, and mixing equipment described above. Pressure pot systems and caulking guns or grease guns will not be permitted.

The two components shall be mixed in conformance with the manufacturer's recommendations. The ratio of the components shall be maintained within a tolerance of five percent.

Acceptable solvents used for cleaning shall include mineral spirits, methyl ethyl ketone, acetone, low boiling naphtha, xylene, and any other nonchlorinated solvent.

400-03.03.01 Port Installation. Prior to injection of the epoxy in the crack, a surface seal material shall be applied to the face of the crack to prevent the liquid resin from leaking out. The surface seal material shall be useable on vertical, horizontal and overhead applications and shall completely bridge the crack when applied to the face of the crack.

Openings to inject the epoxy shall be established through the surface seal material along the entire length of the crack and entry ports shall be provided. The holes shall be 3/4 in. diameter, spaced 6 to 12 in. apart and be of sufficient depth to ensure maximum dissemination of the pressure of the epoxy throughout this area.

Inserts shall be set in drilled holes and the holes shall be cleaned to remove any dust or debris left by drilling operations. Special care shall be exercised to assure that oil or other contaminants are not introduced into the air feed hoses, or deposited on any air blown surfaces.

400-03.03.02 Injection. The epoxy shall be forced into the internal voids and cracks by means of hydraulic pressure to completely fill all internal voids. If the surface seal material has insufficient strength and adhesion to confine the injected epoxy until it has cured, the Contractor shall remove the surface seal material and furnish and place a new surface seal material at no additional cost to the Administration.

Before injecting any epoxy, the automatic mixing and metering pump shall be activated and approximately 1 pt of the epoxy shall be mixed and pumped into a disposable container. The Engineer will observe this trial operation to determine that the equipment is working properly. If the equipment is not working properly, it shall be immediately repaired to full working condition or replaced with the backup equipment. If the backup equipment is used, additional and fully operable equipment shall be provided as its backup equipment.

The feed line from the mixing equipment shall be securely held or properly attached to the port. The operator shall then initiate the epoxy injection in conformance with the manufacturer's recommendations.

Injection shall be started at the lowest row of holes and at the hole nearest the center line of structure. Injection shall continue at the first port until the epoxy begins to flow out of the port at the next highest elevation. The first port shall then be plugged and injection started at the second



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port until the adhesive flows from the next port. This sequence shall continue until the entire crack is repaired.

The injection procedure shall be monitored to assure the epoxy flow does not cease before the injection epoxy exudes from the adjacent port. If the epoxy flow stops before epoxy appears at the adjacent port, the feed line shall be moved to the adjacent port and the port just used shall be sealed.

During the course of all operations, extreme care shall be given to observe for breaking out of epoxy. When breaking out occurs, the injection shall stop and the line shall be moved to another crack. Injecting may be resumed in the original location after a minimum elapse of 24 hours.

A continuous injection operation shall be accomplished by replenishing the epoxy supply tanks in the mixing equipment before they are exhausted. Each epoxy component shall be thoroughly stirred before adding it to its respective storage tank in the mixing equipment. No discontinuity of epoxy flow through the feed lines of either component shall be allowed.

Any work stoppage permitting mixed epoxy to remain in the injection equipment more than 15 minutes shall require cleaning the mixing chamber and all equipment in contact with the mixed epoxy. Quantities of epoxy purged from the injection equipment shall not be included for payment.

After the injection process has been completed and the epoxy allowed to fully cure, the injection ports and surface seal shall be removed from all surfaces. Ports shall be cut or knocked off, while the surface seal and any spillage shall be ground off flush with the original surface.

Any damage to the concrete due to the Contractor's operations shall be repaired in a manner satisfactory to the Engineer at no additional cost to the Administration.

The cured injected epoxy shall have penetrated a minimum of 90 percent of the visible crack. Acceptance will be based upon drilling cores of the repaired concrete to determine the depth of penetration from representative locations selected by the Engineer. If the penetration is less than 90 percent of the visible crack along the sides of the core, the crack from which the core was taken will be deemed unsatisfactory and will not be included for payment. A minimum of three 4 in. diameter core samples for the full crack depth of the member or area being repaired shall be required for each 100 ft or fraction thereof per job site. The cored holes shall be filled with epoxy grout.

400-03.04 MEASUREMENT AND PAYMENT. The preparation of cracks, including chipping, cleaning, sealing, installation and removal of injection ports, testing of repairs, repairing of cored holes and for all material, labor, equipment, tools and incidentals necessary to complete the item including the services of the manufacturer's representative as directed by the Engineer will be measured and paid for at the Contract unit price per linear foot for the pertinent Pressure Injected Epoxy Crack Repairs item. The epoxy used shall be incidental to this item.



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**CATEGORY 400
STRUCTURES**

SECTION 400.10 – CONTINGENT MISCELLANEOUS REPAIRS AND MODIFICATIONS

400.10.01 DESCRIPTION. To provide for miscellaneous structural repairs and modifications as determined by the Engineer.

This item will only be used if necessary and will not be used without approval of the Engineer.

400.10.02 MATERIALS. Not applicable.

400.10.03 CONSTRUCTION. Not applicable.

400.10.04 MEASUREMENT AND PAYMENT. Payment for miscellaneous structural repairs and modifications as determined by the Engineer will be paid for under the Contingent Miscellaneous Repairs and Modifications item. There is no guarantee that any or all of this item will be used during the term of the Contract.



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**CATEGORY 400
STRUCTURES**

SECTION 421 – REINFORCING STEEL

338 ADD: the following:

421.04.05 Welded Wire Fabric will be measured and paid for at the Contract unit price per square foot based on the measured area of removal for concrete repairs.



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**CATEGORY 400
STRUCTURES**

SECTION 423 — PNEUMATICALLY APPLIED MORTAR

423.01 DESCRIPTION

DELETE AND INSERT THE FOLLOWING:

This work shall consist of furnishing all materials, equipment, labor, and incidentals necessary for pneumatically applying shotcrete mortar consisting of a prepackaged single component microsilica, enhanced Portland cement concrete with polypropylene fibers, applied by the wet process from a spray nozzle by means of compressed air, as specified in the Contract Documents and as directed by the Engineer. Elements of the structures to be repaired shall include the underside of the Ft. McHenry tunnel roadway slab and side walls of the supply air ducts. The existing surfaces shall be cleaned by hydro-demolition, and prepared to the extent that they are completely free of unsound concrete, or epoxy patches and other materials detrimental to achieving a suitable bond of a new material to the existing concrete. All work is to be performed in accordance with ACI 506.2-95, and the requirements herein. ACI Shotcrete Nozzleman Certification is required for this work.

423.02 MATERIALS

Refer to Subsection 423.02 of the Standard Specifications and the following:

- A. The shotcrete mortar shall be a microsilica enhanced polypropylene fiber reinforced shrinkage compensated, prepackaged material containing Portland Cement, conforming to Subsections 902.03 and 902.06 of the Specifications. The prepackaged shotcrete mortar shall be of recent manufacture and free of lumps or deleterious materials.
- B. Sand shall be clean, sharp and free of clay, loam and silts conforming to Section 901. Aggregate Gradation shall conform to ACI 506R, Gradation No. 1 with 100 percent passing 3/8-inch sieve.
- C. Water shall be potable fresh, clean and free from oil, salt, acids, alkali organic matter or other substances injurious to the finished product, conforming to Section 921.01. Chloride concentration shall not exceed 500 ppm.



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- D. Cement shall be Type II Portland cement, which shall be microsilica enhanced.
- E. Fibers shall be short strand polypropylene Synthetic Fiber: Polypropylene fibers engineered and designed for use in shotcrete, complying with ASTM C 1116, Type III, not less than 3/4 inch long.
- F. Silica Fume: ASTM C 1240, amorphous silica.
- G. Galvanized welded wire fabric shall be galvanized wire mesh, galvanized after welding and provided in flat sheets of sizes as shown on the drawings conforming to ASTM A 497, flat sheet. Rolled galvanized welded wire fabric will not be allowed.
- H. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, as recommended by the shotcrete mortar manufacturer.

423.02.01 Microsilica, Fiber Reinforced Shotcrete Mortar Mix Design

The microsilica, fiber reinforced prepackaged wet process shotcrete mortar shall have the following minimum physical properties:

Property	Conditions	Requirement
Coefficient of Thermal Expansion		6.0 X 10 ⁻⁶ deg. C max
Compressive Strength ASTM C-109	@ 1 day	3,000 psi min
-	@ 7 days	5,000 psi min
-	@ 28 days	7,500 psi min
Flexural Strength ASTM C-348	@ 28 days	1,500 psi min
Splitting Tensile Strength ASTM C-882	@ 28 days	650 psi min
Slant Shear Strength ASTM C-882	@ 28 days	2,250 psi min
Water Absorption ASTM C-140		1% absorb max
Freeze-Thaw Resistance MSMT-725, MDDOT	@ 28 days	-0.162% max
Working Time		45 minutes max
Initial Set	@ 75°F 50% RH	2 hours max
Final Set	@ 75°F 50% RH	4 hours max
Shrinkage ASTM C-157	@ 28 days	0.04% max max
Wet Density		135 lb/cf (min.)



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423.02.02 Zinc Rich Coating

- A. The zinc rich coating shall provide protection to embedded reinforcing steel from corrosion. The zinc rich primer shall be a one component primer based on epoxy resins, containing zinc particles in suspension and shall contain the following physical properties:

Specific Gravity 1.9

Volume Solids 30%

Drying Time @ 70 degrees F. 45 min (touch dry)

4 hours (fully dry)

4 hours (recoatable)

423.02.03 Equipment

All equipment for the concrete preparation, mixing, placing and finishing of polymer shotcrete shall be approved by the Engineer prior to start of any work.

Surface preparation equipment shall be as follows:

- A. The demolition of the existing concrete shall be performed by using hydro-demolition equipment which has been calibrated to remove only unsound concrete with a compressive strength of less than 2500 psi. Water for the hydro-demolition shall be potable water. The water from the hydro-demolition shall be captured and recycled for reuse in the demolition process. Water and debris shall not be allowed to enter into the tunnel drains. The hydro-demolition equipment must be tested in an area of the site to verify the ability to remove only concrete with compressive strength of less than 2500 psi. The test section will be on site and determined by the Engineer. The test shall be part of the approval process of the demolition equipment and shall be at no cost to the Owner. Chipping hammers pavement breakers and robotic hoe ram demolition equipment will not be allowed.
- B. The use of Sandblasting equipment is not allowed.
- C. All steel surfaces to be painted with the zinc rich primer shall be cleaned of all rust and scale to a SSPC SP-2 or SP-3, hydro-demolition, hand or power tool cleaning, and must meet the manufacturers requirements for surface preparation for the zinc rich primer.



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- D. The type of equipment used to mix materials and apply shotcrete shall be as recommended by the manufacturer of the admixtures and approved by the Engineer. It shall be equipped with proper air control valves and gauges to allow necessary adjustments required for various hose lengths which carry the modified concrete materials.
- E. The minimum size of the air compressor shall be as recommended by the equipment manufacturer. The air from the compressor shall be free of any oils.

423.03 CONSTRUCTION

Refer to Subsection 423.03 of the Standard Specifications and the following:

A. General

1. Except as modified herein, mortar and reinforcing shall be installed in accordance with the applicable provisions of Subsection 423.03 of the Specifications and the Special Provision inserts.
2. The work to be performed shall consist of the installation of reinforcing, material, shotcrete mortar, and shall include all removal of unsound concrete, coating of the reinforcing steel, cleanup of overspray and rebound, and all other incidentals necessary to complete the proposed work. The specific locations of work will be determined by the Engineer and will be submitted to the Contractor prior to beginning work.
3. The electric lights attached to the bottom of the roadway slab shall be temporarily removed to facilitate the repair work. The lights, conduits and conductors shall be maintained in good working condition during the work and re-installed in the same location after completing the repairs. Temporary portable lighting will be required to perform the work in fresh air duct.
4. The job foreman shall be a working foreman and normally act as supervisor. A job superintendent shall, however, be required to visit the site at least once a week and at the request of the Authority.

B. Equipment

1. The batching facility for the repairs will be by the use of portable mixer. The portable mixer must be capable of continuously supplying



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shotcrete and have a minimum capacity of one (1) cubic yard. The mixer shall be capable of metering the prepackaged shotcrete and water to the manufacturer's recommendations to provide a suitable mix for overhead shotcrete applications. Mixing and charging the system shall be in accordance with the shotcrete manufacturer's recommendations. The batching facility and proportioning devices shall be capable of providing the exact required ingredients in proportions as approved by the Engineer. The mixer shall have the ability to mix the material to the proper moisture content without exceeding the manufacturer's recommended volume of water.

2. Do not use an air supply system that delivers air contaminated by oil, or that is incapable of maintaining constant pressure.
3. Use a rotary stator pump capable of introducing materials to the delivery hose at a uniform rate, with ejection from the nozzle at velocities that will afford adherence of material to the surface to be treated with a minimum rebound and maximum adherence and density. Swing tube shotcrete pumps or pot type pumps will not be allowed.
4. The air compressor shall be rated between 350 - 750 cubic feet per minute and capable of 100 - 125 psi pressure. Gunning is performed at 50 - 85 psi or as recommended by the product manufacturer.
5. The nozzle shall be a center feed nozzle, Thompson type or approved equal.
6. Hoses shall be made for wet-process shotcrete with pure gum rubber tube, good flexibility and high resistance to kinking. The contractor shall submit for approval by the Engineer a suitable method of ducting through the fresh air flues. Hose length is limited to a maximum of 100 feet from pump to nozzle and must be no larger than two (2) inches in diameter
7. Once the existing surface of the concrete substrate is properly cleaned and accepted by the Engineer, and the placement has started, the nozzleman must perform the work with recognized procedures for nozzle angle, material buildup, coverage of reinforcement, consideration of rebound and finished thickness and surface.

C. Testing & Quality Control

1. Qualification of Shotcreting Personnel



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The contractor shall have a minimum of three (3) years in the application of shotcrete for concrete resotoration. The contractor must have a minimum of three (3) years of tunnel rehabilitation work and be experienced in similar type of work for highway tunnels. The contractor must present a minimum of three (3) concrete restoration projects for verifacaiton of tunnel work experience.

Foremen, Nozzlemen, and Crewmen before employment on the work shall satisfy the Engineer that each has done satisfactory work in similar capacities elsewhere for a sufficient period of time to be fully qualified to properly perform the work in accordance with the requirements indicated. Foremen shall have had at least three years experience as nozzlemen, and at least two years experience on similar work. Nozzlemen shall be qualified workmen, having had at least three years experience in similar work.

Each shotcreting crew will be required to fabricate one acceptable test panel for each shooting position which the crew will encounter in the work, prior to application of shotcrete in the work, using the exact type of equipment intended to be used by the crew.

Should the results of control testing indicate that deficient shotcrete application is being produced by a crew, the crew may be required to be requalified for the shooting position in question.

The nozzle man must initially pre-qualify by shooting small (3 ft. x 3 ft.) reinforced three (3) test panels from which cores and cubes shall be extracted for compressive and visual examinations. The test panels will be shot to resemble actual field conditions. Two (2) panels will be shot over head and one (1) panel will be vertical. The test panels will have reinforcing steel and welded wire mesh to duplicate the actual field conditions. In order to demonstrate his capacity to consistently perform quality work, the Contractor may receive periodic requests from the Engineer to make test panels. These test panels shall be made and tested in accordance with the requirements of ACI 506.2-77 (Revised 1983). These test panels shall also serve to verify that the applied shotcrete mixture meets the specified requirements. Any failures in performance or mixture shall then be corrected prior to the execution of the remainder of the work.

2. Control testing

Control testing will be performed for each 50 cubic yards of each shotcrete, or



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fraction thereof, applied in the work by each crew in each shooting position, fabricate four unreinforced test panels, each one foot square and three inches thick. Fabricate the test panels in accordance with the accepted procedures. Cure the test panels in accordance with ASTM C31.

The Engineer may require, at no additional expense to the Authority, adjustments to the procedures, requalification of the shotcreting crew, or additional curing of the shotcrete if either:

- a. The average seven day strength of any two specimens for the shotcrete mix is less than 70 percent of specified strength, (three days for High-Early Strength Design); or
 - b. The average 28-day strength of any two specimens for the shotcrete is less than 100 percent of the specified strength.
3. Test Cores
- a. The Engineer may take test cores from the areas represented by the test panels, to determine compliance of the in-place shotcrete with the specified requirements.

D. Surface Preparation

1. The Engineer or his authorized representative will inspect and test designated concrete surfaces by means of a geologist's hammer to determine the areas that have deteriorated and which require repairs. The Contractor shall not begin any repairs until directed to do so by the Engineer.
2. All loose, deteriorated, damaged, fouled and porous material shall be removed to clean, solid concrete and to such a depth that the thickness of the repairs will be at least two (2") inches; except at the perimeter of the area. The perimeter of all prepared repair areas shall be perpendicular to the surface with a one-quarter inch (1/4" \pm) depth. No feathering at the edges will be permitted. Where the existing reinforcing is encountered, the bar's entire circumference shall be exposed by means of hydro-demolition unless other means are approved by the Engineer.
3. The structural integrity of the roadway slab, and other members shall be maintained at all times. If more than 20% of the reinforcing of any location, or other member is exposed at any cross-section, the Engineer shall be



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consulted to determine if the strength of any member is in jeopardy. If so, the contractor shall take such measures or sequence of repairs to maintain the integrity of the structure.

4. All steel surfaces to be painted with the zinc rich primer shall be cleaned of all rust and scale to a SSPC SP-2 or SP-3, hydro-demolition, hand or power tool cleaning, and must meet the manufacturer's requirements for surface preparation the zinc rich primer. The zinc rich primer shall be placed on the exposed steel in accordance with the manufacturer's recommendations. The recommended mill thickness for application is 5 1/2 mills, wet and a dry thickness of 1 1/2 mill.
5. After exposing the reinforcing of any member in accordance with Paragraph 3 above, the exposed areas shall be shotcreted within one week after exposure. Prior to shotcreting, the reinforcing steel and concrete shall be inspected for corrosion or contamination. Additional cleaning of surfaces may be required. After approval of the reinforcing steel the reinforcing steel shall be coated with a s zinc rich coating.
6. After all deteriorated concrete has been removed, the reinforcing steel coated with the zinc rich coating, the concrete surface shall be thoroughly cleaned prior to placing shotcrete. The entire surface shall be rinsed by flushing or scouring with water and compressed air to assure removal of all loose particles. The air pressure at the nozzle shall not be less than 50 psi and the water pressure shall be 20 psi greater unless otherwise directed by the Engineer.

E. Cleaning and Replacing Existing Reinforcing Steel

1. Existing reinforcing steel which has been exposed and is to be incorporated into the new work shall be thoroughly cleaned of all loose rust, concrete and other foreign materials. It is anticipated that most of this deleterious material will be removed by the hydro-demolition and surface cleaning of the concrete. However, any remaining rust, concrete and foreign material shall be removed by hydro-cleaning or a method approved by the Engineer.

Reinforcement shall be used when voids are equal to or greater than 2 square feet in area and shall be well secured to insure no displacement from impact of the shotcrete during application. Reinforcement shall be anchored by means of 1/4 inch diameter expansion J hook bolts spaced a maximum of 18 inches in each direction. The full area of mesh shall be held firmly in position



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by means of 16 gauge wire ties. The reinforcement shall not be less than $\frac{1}{2}$ inch from the surface on which the shotcrete is to be placed, and there shall be not less than $\frac{3}{4}$ inch between the reinforcement and the final surface of the shotcrete.

3. At locations where there is a 30 % loss of section of the reinforcing bars it will be necessary to replace reinforcing steel, bars of equivalent cross sectional areas shall be lapped in accordance to ACI 343R. Mechanical splices may used if approved by the Engineer. The mechanical splices must be capable of develop the full strength of the reinforcing bar. Existing reinforcing steel shall not be cut to install the splices. Splice must be capable of splicing to new reinforcing steel to existing without cutting the existing bars.
4. In large voided areas the shotcrete shall be applied in layers no thicker than 4 inches.
5. Where more than one-half ($\frac{1}{2}$) the diameter of the steel is exposed, the concrete adjacent to the bar shall be removed to a depth of one (1) inch below the bar which will permit modified shotcrete to bond to the entire periphery of the bar so exposed.

F. Placing Micro Silica, Fiber Reinforced Shotcrete Mortar

1. Before any mortar is placed, the surface of the concrete and reinforcing shall be inspected for soundness and cleanliness by the Engineer. All unnecessary wires, chairs, etc. shall be removed. The Contractor shall notify the Engineer 24 hours in advance of performing any shotcreting operations so that visits to the site may be properly scheduled.
2. Before shotcreting begins and within twenty-four (24) hours, the entire concrete surface and rebars shall be hydroblasted to white metal. The surfaces of previously placed shotcrete layers shall be sandblasted to remove the plastic film and air dried surface to promote bond. If the surface contains grease, oil, dirt or other foreign matter, sandblasting, detergent cleaning, water blasting and/or air blasting or any combination thereof shall be required to insure bond. The prepared surface shall finally be washed with clean, fresh water and kept moist prior to the application of the shotcrete. Immediately following this wetting period, the shotcrete shall be applied. Twenty four (24) hours of good curing shall have elapsed prior to chipping



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on adjacent concrete within twenty five (25) feet of shotcrete previously placed.

3. Shotcrete shall be applied in layers so that no sagging or separating of the material will occur. The nozzle shall be held generally from three (3) to four (4) feet from the surface being covered and held such that the material strikes at as near perpendicular as possible without excessive impact. The water content shall be maintained at a practicable minimum so that the mix will properly adhere. The water content shall not be high enough to cause the mix to sag or fall from the surface being shotcreted nor to separate in horizontal layers. The shotcrete shall be built up to the original surface.
4. Sequence of application on vertical surfaces shall be from bottom to top with approximately a 45-degree slope, and that rebound be kept out of the work.
5. Surfaces not to receive shotcrete shall be protected from mortar spray and rebound. Adjacent surfaces which are coated or damaged shall be restored to their original condition by the Contractor.
6. Shotcreting shall be suspended when:
 - a. Micro Silica, Fiber Reinforced Shotcrete mortar cannot be placed at temperatures lower than forty-five degrees F. It may be placed at forty-five (45) degrees F. and rising. Temperatures below fifty-five (55) degrees F. will require a longer cure period.

G. Finishing

After the surface has taken its initial set, excess material shall be removed with a wood float or screed to produce a uniform surface as directed by the Engineer. All surfaces shall meet the existing surfaces in a smooth transition. The surface shall then be given a thin flash coat of shotcrete mortar, which shall bring the surface to within 1/8" of the finished surface. The finish coat shall be applied to the fresh shotcrete mortar surface as soon as possible after the screeding. Surfaces exposed to view shall be given either a brushed finish or a steel trowel finish, whichever matches the existing adjacent surfaces. All finishing shall be done while the mortar is still plastic. Any over spray of shotcrete shall be cleaned by the Contractor at the direction of the Engineer.



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H. Curing

Cure the final shotcrete layer with a film coating acrylic latex as recommended and manufactured by the product shotcrete manufacturer. Maintain air in contact with shotcrete surfaces at temperatures above 40 degrees F for a minimum of seven days.

If wet cure is employed, it shall be kept wet for the first 7 days and maintain temperature of 40 degrees F.

I. Sounding

The Engineer shall sound all completed and cured repairs with a hammer to check for loose repair material and delaminations. Any areas that sound hollow when struck with a hammer shall be removed. The areas removed shall be repaired using the procedures described in this section.

J. Safety

All scaffolding, ladders, belts, harnesses, lifelines and other safety equipment used to reduce hazards to the workers shall be in compliance with regulations set forth in the Occupational Safety and Health Act (OSHA) and provisions of the American National Standard Institute (ANSI).

K. Certificates of Compliance

Prior to the delivery of material, the Contractor shall submit a certificate stating that the materials to be used meet the requirements of these specifications. Supporting test reports, physical properties, shall be submitted with the certificate showing actual values.

L. Shotcrete Restrictions

All shotcrete application operations shall end and all shotcrete repairs shall have curing compound applied a minimum of 30 minutes prior to opening the bore to traffic.

423.04 MEASUREMENT AND PAYMENT

The removal of concrete as required for the mortar shotcrete repair areas shall be incidental to the contract unit prices bid for the pertinent Pneumatically Applied Mortar Repairs items.



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Measurement and payment for the micro silica, fiber reinforced shotcrete mortar repairs shall be made at the contract unit price bid per cubic foot of mortar in place.

The unit price bid shall include all materials, labor, tools, equipment and all incidentals necessary to complete this item of work including hauling, preparation of surfaces, sand, reinforcement, epoxy coating, anchor bolts, finishing, curing and cold weather protection as required by these Special Provisions and/or as directed by the Engineer.

All equipment, materials and labor including contingencies, operating costs, scaffolding, temporary portable lighting, removing and reinstalling existing electric lights and staging to access the repair areas and test panels, etc, will be considered incidental to the above pay items.



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CATEGORY 400
STRUCTURES

SECTION 436 — CLEANING AND PAINTING EXISTING STRUCTURAL STEEL

382 **ADD:** to paragraph 436.01.01

(f) **Steel Surfaces at the Immersed Tube Joints.** All exposed steel surfaces at the joints between the immersed tube sections.

Paint system G as specified in Section 912.05 shall be used for this Contract.

390 **REPLACE:** paragraph 436.03.10 with the following:

A. The following paragraphs shall serve to define water-blasting demolition methods which may be used in cleaning of existing steel framing for painting.

B. Materials: All water used in the hydro-demolition equipment shall be potable.

C. Equipment: Surface preparation shall be as follow:

1. Hydro-demolition Equipment: An approved water jet equipment utilizing high pressure water stream for removal of the existing concrete slab portions. Equipment shall be capable of removing all rust and scale on the steel surfaces at the immersed tube joints to an SSPC 2 white metal condition by the use of hydro-demolition with a minimum pressure of 10,000 psi .

2. Sandblasting Equipment: Sandblasting equipment is not allowed for the preparation of steel surfaces at the immersed tube joints for preparation for painting.

3. Power-Drive Hand Tools: Power-driven hand tools may be used only when approved by the Engineer for preparation of steel surfaces at the immersed tube joints for painting.

4. All water and debris from the hydro-demolition for the preparation of steel surfaces to be painted shall be contained and not allowed to enter the tunnel drain systems.



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CATEGORY 400
STRUCTURES

SECTION 499 — WORKING DRAWINGS

499.03 CONSTRUCTION.

499.03.02 Consultant Engineering Firm.

438 **ADD**: The following after the first paragraph, “When the Contract...to that firm.”

Working drawings for this Contract shall be submitted electronically as outlined in TC-4.01 Shop Plans and Working Drawings.

438 **DELETE**: The last paragraph on the page, “to expedite.....time extension.” in its entirety.

439 **DELETE**: The first paragraph on this page, “The Contractor, fabricator...for primary review.” in its entirety.

INSERT: The following.

The Contractor, fabricator, or supplier shall submit all working drawings, etc. for approval in accordance with, and as outlined in TC-4.01.

439 In the 2nd and 3rd complete paragraphs

REPLACE: “Administration’s Office of Bridge Development.”

WITH: “GEC Partners.”

439 **DELETE**: 499.03.03 Office of Bridge Development. In its entirety.

499.03.04 Revisions and Substitutions.

439 **REPLACE**: “Director-Office of Bridge Development.”

WITH: “Director-Maryland Transportation Authority.”



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**CATEGORY 900
MATERIALS**

- 665 **DELETE:** SECTION 902 — PORTLAND CEMENT CONCRETE AND RELATED PRODUCTS in its entirety.
INSERT: The following.

SECTION 902 – PORTLAND CEMENT CONCRETE AND RELATED PRODUCTS

902.01 STORAGE. Storage of materials shall conform to the Contract Documents and as directed by the Engineer.

902.02 CERTIFICATION OF PORTLAND CEMENT AND BLENDED HYDRAULIC CEMENT. The manufacturer shall furnish certification as specified in TC-1.02. The certification shall also include:

- (a) The mill shall report its quality control procedures, and submit a new report whenever there is a procedural change.
- (b) The mill's control laboratory shall be inspected by the Cement and Concrete Reference Laboratory of the National Institute of Standards and Technology on their regularly scheduled visits. The Engineer shall be provided with copies of the reports of these inspections along with an account of the action taken to correct cited deficiencies.
- (c) Records of data accumulated by the quality control procedures shall be produced upon request.
- (d) A certified document shall accompany each shipment stating that the contents conform to all applicable requirements. Additionally, the document shall show the producer's name, mill location, carrier number, date loaded, weight contained in carrier, silo number, consignee, destination, Contract number, and type of cement. The signature and title of the signer shall be shown on the document.
- (e) The mill shall, upon request, supply certified chemical and physical test values that can be associated with any sample representing cement drawn from a particular silo on a given date.
- (f) Acceptance of cement by certification will be terminated if test results differ from mill results by more than the precision limits given in the test method. The acceptance procedure will then revert to storage testing and approval prior to shipment.

902.03 HYDRAULIC CEMENT.

902.03.01 Portland Cement. M 85, with the fineness and the time of setting determined using T 153 and T 131, respectively.



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902.03.02 Ground Iron Blast Furnace Slag. M 302, Grade 100 or 120. The Contractor may request to substitute a maximum of 50 percent of the weight of cement with ground iron blast furnace slag. When ground iron blast furnace slag is used, the minimum cement factor and water/cement ratio will be determined on the basis of the combined weight of the portland cement and ground iron blast furnace slag. When ground iron blast furnace slag is used to control alkali silica reactivity, see Table 902 B for percentage.

902.04 BLENDED HYDRAULIC CEMENT. M 240, Type I (PM) or a Type IP containing 15 to 25 percent pozzolan by weight of cement. Maximum loss on ignition is 3.0 percent. Do not use ground iron blast furnace slag for blending. The requirement for a manufacturer's written statement of the chemical composition is waived.

902.05 MASONRY CEMENT. C 91, except the water retention and staining tests are waived.

902.06 CONCRETE ADMIXTURES. Do not use concrete admixtures that contribute more than 200 ppm of chlorides based on the cement content when tested per MSMT 610. Use only prequalified admixtures.

Do not use pozzolan and Type I (PM) or Type IP cement in the same mix. Since the strength gains are delayed with these materials, a longer period of time may be required for curing and form removal.

902.06.01 Air Entraining Admixtures. M 154.

902.06.02 Chemical Admixtures. M 194, Type A, D, or nonchloride C.

902.06.03 High Range Water Reducing Admixtures. M 194, except that it shall be a liquid, the water content shall be a maximum of 85 percent of that of the control, and the durability factor shall be a minimum of 90. Use Type F for early strength, which shall produce a minimum compressive strength in 12 hours of 180 percent of that of the control. Use Type G when early strength is not specified. The manufacturer shall furnish certification as specified in TC-1.02. The certification shall include curves indicating the fluid ounces of admixture per 100 lb of cement as related to water reduction and strength gain for 12 hours when used with a minimum cement factor of 700 lb.

902.06.04 Pozzolans. The use of pozzolans may be requested to control alkali silica reactivity or for other reasons. When a pozzolan is used, determine the minimum cement factor and water/cement ratio on the basis of the combined weight cement and pozzolan. See Table 902 B for percentage of fly ash, and microsilica.

(a) **Fly Ash.** M 295, pozzolan Class C or F, except that the maximum permissible moisture content shall be 1.0 percent, and when used in concrete Mix Nos. 3 and 6 the maximum loss on ignition 3.0 percent.

(b) **Microsilica.** C 1240, except that the oversize requirement is waived.



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902.06.05 Corrosion Inhibitors. Corrosion inhibitors shall be calcium nitrite based and contain a minimum of 30 percent active ingredients by mass. The gallonage of corrosion inhibitor used in the concrete mixture shall be included as water when determining the water/cementitious materials ratio.

902.07 PORTLAND CEMENT CONCRETE CURING MATERIALS. Use burlap cloth, sheet materials, liquid membrane forming compounds, or cotton mats.

902.07.01 Burlap. M 182, Class 1, 2, or 3.

902.07.02 Sheet Materials. M 171 with the following exceptions:

- (a) **White Opaque Burlap Polyethylene Sheeting.** Tensile strength and elongation requirements are waived. Use sheeting having a finished product weight of not less than 10 oz/yd².
- (b) **White Opaque Polyethylene Backed Nonwoven Fabric.** 902.07.02(a), with the thickness requirement waived. Use material having a finished product weight of not less than 5 oz/yd².
- (c) **White Opaque Polyethylene Film.** Tensile strength and elongation requirements are waived.

902.07.03 Liquid Membrane. M 148. Field control testing of the white pigmented curing compounds is on the basis of weight per gallon. The samples shall not deviate more than ± 0.3 lb/gal from the original source sample.

902.07.04 Cotton Mats. Cotton mats consist of a filling material of cotton bats or bats covered with unsized cloth and tufted or stitched to maintain the shape and stability of the unit under job conditions of handling.

Use coverings of either cotton cloth, burlap or jute having the following properties:

- (a) Cotton cloth covering shall weigh not less than 6.0 oz/yd² and have an average of not less than 32 threads/in. of warp and not less than 28 threads/in. of filling. Use raw cotton, cotton comber waste, cotton card strip waste, or combinations thereof as the raw material used in the manufacture of the cotton cloth.
- (b) Burlap or jute covering for cotton mats shall weigh not less than 6.4 oz/yd² and shall have not less than 8 threads/in. of warp and not less than 8 threads/in. of filling. Use the grade known commercially as "firsts" and they shall be free from avoidable imperfections in manufacture and from defects or blemishes affecting the serviceability.

Use a cotton bat, or bats made of raw cotton, cotton waste, cotton linters, or combinations thereof, as the filling material for the mats. Mats shall weigh not less than 12 oz/yd².



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902.08 FORM RELEASE COMPOUNDS. Use form release compounds that effectively prevent the bond of the concrete to the forms. Form release compounds shall not cause discoloration of the concrete or adversely affect the quality or rate of hardening at the interface of the forms.

The flash point of the form release compound shall not be less than 100 F when tested per T 73.

902.09 PARAFFIN WAX. Use clear paraffin wax for use as a bond breaker for concrete. The flash point shall not be less than 380 F when tested under D 92.

902.10 PORTLAND CEMENT CONCRETE. Section 915 and as specified herein.

902.10.01 Proportioning. Prior to the start of construction, submit to the AME the source and proportions of materials to be used for each concrete mix. The mixture shall meet 902.10.03.

The concrete, with the exception of water and chemical admixtures, shall be proportioned by weight. Water and chemical admixtures may be proportioned by volume or weight. The mix shall be uniform and workable.

902.10.02 Materials.

Coarse Aggregate	901.01
Fine Aggregate	901.01
Cement	902.03 and 902.04
Concrete Admixtures	902.06
Synthetic Fibers	902.15
Water	921.01

902.10.03 Portland Cement Concrete Mixtures.



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The concrete mixes shall conform to the following:

TABLE 902 A

PORTLAND CEMENT CONCRETE MIXTURES									
MIX NO.	28 DAY SPECIFIED COMPRESSIVE STRENGTH	STANDARD DEVIATION	CRITICAL VALUE	MIN CEMENT FACTOR	COARSE AGGREGATE SIZE	MAX WATER/ CEMENT RATIO	SLUMP RANGE	TOTAL AIR CONTENT	CONCRETE TEMPERATURE
	psi	psi	psi	lb/yt ³	M 43 / M 195	by wt	in.	%	F
1	2500	375	2430	455	57, 67	0.55	2 – 5	5 – 8	70 ± 20
2	3000	450	3010	530	57, 67	0.50	2 – 5	5 – 8	70 ± 20
3	3500	525	3600	580	57, 67	0.50	2 – 5	5 – 8	70 ± 20
4	3500	525	3600	615	57, 67	0.55	4 – 8	N/A	70 ± 20
5	3500	525	3600	580	7	0.50	2 – 5	5 – 8	70 ± 20
6	4500	675	4770	615	57, 67	0.45	2 – 5	5 – 8	65 ± 15
7	4200	630	4420	580	57	0.50	1½ – 3	5 – 8	70 ± 20
8	4000	600	4180	750	7	0.42	2 – 5	5 – 8	65 ± 15
9	3000 (a)	N/A	N/A	800	57, 67	0.45	4 – 8	5 – 8	70 ± 20
10	4500	675	4770	700	¾" – No. 4	0.45	2 – 5	6 – 9	65 ± 15
11	4200	630	4420	—	57, 67	0.45	2 – 5	5 – 8	65 ± 15
12	4200	630	4420	—	¾" – No. 4	0.45	2 – 5	6 – 9	65 ± 15

Note 1: When concrete is exposed to water exceeding 15,000 ppm sodium chloride content, Type II cement shall be used. In lieu of Type II cement, a Type I cement may be used in combined form with an amount of up to 50 percent replacement with ground iron blast furnace slag, or an amount of up to 25 percent replacement with Class F fly ash. The Contractor shall submit to the Engineer the proposed mix proportions and satisfactory test results per C 1012 showing a sulfate resistance expansion not exceeding 0.10 percent at 180 days

Note 2: The temperature of Mix No. 6 when used for other than superstructure work as defined in TC-1.02 shall be 70 ± 20 F.

Note 3: Type A or D admixture shall be added to bridge, box culvert, and retaining wall concrete.

Note 4: Nonchloride Type C admixtures may be used when approved by the Engineer.

Note 5: Other Slump Requirements:

When a high range water reducing admixture Type F or Type G is specified, the slump shall be 4 to 8 in.

When synthetic fibers are specified, the slump shall be 5 in. maximum.

When concrete is to be placed by the slip form method, the slump shall be 2-1/2 in. maximum.

When the absorption of the coarse aggregate is greater than 10 percent, the slump shall be 3 in. maximum.

Note 6: Mix 9 shall contain a Type F high range water reducing admixture.

Note 7: Mix 10 and 12 shall be proportioned as specified in 211.2 of the ACI's Recommended Practices for Selection Proportions for Structural Lightweight Concrete. The maximum average Density of Cured Concrete shall be 118 lb/ft³. Control testing for Density of Cured Concrete shall be two companion cylinders for each 100 yd³, or fraction thereof, as specified in M 195.

Note 8: Mix 11 and 12 shall also conform to all requirements as specified in Table 902 C.

(a) Acceptance will be based on a minimum compressive strength of 3000 psi in 24 hours. Design approval will be given based on trial batch obtaining a minimum compressive strength of 2500 psi in 12 hours. Testing shall conform to 902.10.08 except that cylinders shall remain in the molds until tests are conducted.

Coarse and fine aggregate having an expansion up to 0.10 percent when tested for alkali silica reactivity (ASR) MSMT 212 may be used without restriction. Aggregates having an expansion greater than 0.10 but less than 0.35 percent are considered reactive and may only be used when one of the options in table 902 B are employed. Those having an expansion of 0.35 percent and greater are prohibited.



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TABLE 902 B

OPTION	ALKALI CONTENT OF CEMENT % max	REPLACE CEMENT WITH		SPECIFICATION
		MATERIAL	% BY WEIGHT	
1	1.50	Class F Fly Ash	15 – 25	M 295
2	1.50	Ground Iron Blast Furnace Slag	25 – 50	M 302 Grade 100 or 120
3	1.50	Microsilica	5 – 7	C 1240
4	—	Blended Cement (a)	100	M 240
5	0.60 (b)	Low Alkali Cement	100	M 85

(a) Pozzolan content of 15 – 25 percent by weight of cement

(b) For mix 9 used for Portland cement concrete pavement repairs; the maximum allowable percentage of alkalis in Portland cement shall be 0.70.

When reactive aggregate is used, designate which option will be used to control the formation of the ASR gel. If an option other than option 5 in Table 902 B above is chosen, conduct tests per MSMT 212 using the reactive aggregate and the proposed cementitious material. The expansion test results shall not be greater than 0.10 percent. When more than one reactive aggregate is used in a concrete mix, each shall be tested individually and the maximum amount of pozzolan required to reduce the expansion of all the aggregates to 0.10 percent or less shall be used. Submit the aggregate source, test results, and the percent and type of replacement cement to the Engineer. The Engineer may withhold source approval pending verification testing.



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TABLE 902 C

MIX PHYSICAL PROPERTIES		
TEST PROPERTY	TEST METHOD	SPECIFICATION LIMITS
Minimum Cementitious Materials Factor, lb/yd ³	—	580
Maximum Content of Portland Cement, lb/yd ³	—	550
Water/Cementitious Materials Ratio by Wt.	—	0.45
Corrosion Inhibitor, gal/yd ³	902.06.05	2.0
Synthetic Fibers, lb/yd ³	902.15	1.5
Permeability of Field Concrete, moving average of three tests, coulombs max	T 277 Modified	2500
Permeability of Field Concrete, individual test, coulombs max	T 277 Modified	3000
Shrinkage at 28 days, microstrains	C 157	400

Note 1: Only Type I or II Portland cement shall be used.

Note 2: Mixes shall contain ground iron blast furnace slag, fly ash or microsilica.

Note 3: The water to cement ratio shall be based upon the total water to cementitious materials ratio. The gallonage of the corrosion inhibitor shall be included in the water/cementitious materials ratio.

Note 4: The permeability test value of field concrete shall be the average of two test specimens representing production concrete. Test specimens shall be molded on the project site in 4 x 8 in. molds conforming to M 205. Test specimens shall be handled under same conditions as compressive strength test specimens in conformance with C 31 for the first seven days. When seven days old, they shall be cured in a 100 F water bath for the remainder of the 28 day curing. The 28 day rapid chloride permeability of the specimens will be determined in conformance with T 277. Test for the geometry of test specimens will be waived.

Note 5: Shrinkage tests will be performed on trial mixes only.

Note 6: High range water reducing admixture may be used except the water reducing requirements will be waived.

Note 7: A sealer conforming to 902.12 shall be used on the finished surface.

902.10.04 Trial Batch. A trial batch shall be prepared to certify that each mix meets 902.10.05 and 902.10.06. Approval will be given when the test results meets the minimum required average strength.

Make arrangements with the AME at least two weeks in advance, to have an authorized representative present during the batching and testing. Each trial batch shall consist of at least 3 yd³ of concrete. Supply all equipment, and labor required to produce the trial batches and conduct the required tests at no additional cost to the Administration.

The AME may waive the requirement for a trial batch when past performance records show that the required average strength requirement has been met.



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902.10.05 Design Required Average Strength.

Specified compressive strength, f_c' , psi	Required average compressive strength, f_{cr}' , psi
$f_c' \leq 5000$	Use the larger value computed from Eq. (A-1) and (A-2) $f_{cr}' = f_c' + 1.34s$ (A-1) $f_{cr}' = f_c' + 2.33s - 500$ (A-2)
Over 5000	Use the larger value computed from Eq. (A-1) and (A-3) $f_{cr}' = f_c' + 1.34s$ (A-1) $f_{cr}' = 0.90 f_c' + 2.33s$ (A-3)

where:

- f_c' = the 28 day specified compressive strength.
- s = the standard deviation as specified in 902.10.06.

A test is defined as the average strength of two companion cylinders.

902.10.06 Standard Deviation.

- (a) When past performance records are available, a standard deviation will be established from documented performance records of the producer consisting of a minimum of 15 consecutive 28 day compressive strength tests obtained within the last 12 months.

The standard deviation will be established as the product of the calculated standard deviation and multiplier.

NUMBER OF TESTS	MULTIPLIER FOR STANDARD DEVIATION
15	1.16
20	1.08
25	1.03
30 or more	1.00

Interpolate for intermediate number of tests.



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(b) When past performance records are not available, the required average strength shall meet to the following:

Specified compressive strength, f_c' , psi	Required average compressive strength, f_{cr}' , psi
$f_c' < 3000$	$f_{cr}' = f_c' + 1000$
$3000 \leq f_c' \leq 5000$	$f_{cr}' = f_c' + 1200$
$f_c' > 5000$	$f_{cr}' = 1.10 f_c' + 700$

902.10.07 Standard of Control. The average of all sets of three consecutive strength tests shall equal or exceed the critical value as specified in 902.10.03 which shall be computed using the following formula:

$$\text{Critical Value} = f_c' + (1.14 \times S) - 500$$

Failure to conform to this criteria shall be cause for immediate investigation and remedial action up to and including suspension of production. A design standard deviation equal to 15 percent of the specified strength shall be used for calculation until a minimum of 15 test results are obtained.

The actual average strength and standard deviation shall be computed upon the availability of 28 day strength data comprising a minimum of 15 tests. Should this determination indicate an excessive margin of safety, the concrete mix may be modified to produce lower average strength as approved by the Engineer. If these calculations indicate a coefficient of variation greater than 15, the quality of the concrete and testing will be evaluated.



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902.10.08 Testing. Sampling per T 141. Testing as follows:

TEST	METHOD	MINIMUM TEST FREQUENCY	RESPONSABILITY
Temperature (e)	T 309	1 per 50 yd ³ (or fraction thereof)	Project Engineer
Slump (a)(e)	T 119	1 per 50 yd ³ (or fraction thereof)	Project Engineer
Air Content (a)(e)	T 152 T 196	1 per 50 yd ³ (or fraction thereof)	Project Engineer
Compression (b)(c)(d)	T 23	1 per 50 yd ³ (or fraction thereof)	Project Engineer
Compression (b)(c)(d) Mix No. 7 Only	T 23	3 per Day	Project Engineer

- (a) A second test will be made when the first slump or air content test fails. Acceptance or rejection will be based on the results of the second test.
- (b) Compressive strength tests are defined as the average of two companion cylinders.
- (c) The Contractor shall be responsible for the making of all early break cylinders and furnishing the molds, stripping, curing/delivery of all cylinders, including 28 day cylinders, to the testing laboratory.
- (d) The Project Engineer will be responsible for making, numbering and signing the 28 day cylinders.
- (e) When constructing plain and reinforced concrete pavements, the testing frequency for slump, air content, and temperature shall be 1 per 100 yd³ or fraction thereof.

902.10.09 Acceptance. Concrete will be acceptable if both of the following requirements are met:

- (a) The average of all sets of three consecutive strength tests equal or exceed the specified design strength.
- (b) No individual strength test (average of two companion cylinders) falls below the specified design strength by more than 500 psi.

902.10.10 Price Adjustment. A price adjustment will be based on the Contract unit price per cubic yard of concrete. If the unit is a lump sum item, the price per cubic yard for the concrete will be determined by dividing the cubic yards into the Contract lump sum price.

- (a) **Test Results More Than 500 psi Below the Specified Design Strength.** Failing strength tests will be considered individually with a price adjustment being applied on the percentage basis as shown below.

(Price per yd³) X (quantity of yd³ represented by the failing concrete strength) X (percent of failure).

Example:

$$\$400.00 \text{ per yd}^3 \times 50 \text{ yd}^3 \times [1 - (3600 / 4500 \text{ psi})] = \$4,000.00$$



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No payment will be allowed when the test results fall below 50 percent of the specified design strength for structural concrete or 40 percent for incidental concrete.

The Engineer will determine when the strength of the concrete represented by the failing tests is sufficient to remain in place or whether it must be removed and replaced with Specification concrete.

- (a) **Test Results 500 psi or Less than the Specified Design Strength.** Strength failures 500 psi or less than the specified design strength will be averaged with the next two consecutive tests. If those two tests include a failure greater than 500 psi, those tests will be evaluated as in 902.10.10(a) and replaced with the next consecutive test. If the resulting average falls below the specified design strength, a price adjustment will be applied as specified in the table below. Any failure will only be included in one grouping.

STRENGTH BELOW THE SPECIFIED (avg of 3 tests) DESIGN LEVEL, psi	ADJUSTMENT FACTOR
MIX NO. 1 THRU MIX NO. 7	
1 – 100	0.005
101 – 200	0.01
201 – 300	0.02
301 – 400	0.04
401 – 500	0.08

Adjustment price equals (price per yd³) X (quantity of yd³ represented by the failing cylinders) X (the adjustment factor).

Example:

$$\$400.00 \text{ per yd}^3 \times 50 \text{ yd}^3 \times 0.01 = \$200.00$$

902.11 MORTAR FOR GROUT. Mortar used for grouting anchor bolts, pipe, handrail posts, and miscellaneous items shall be composed in accordance with one of the following:

- (a) One part Portland cement or blended hydraulic cement and one part mortar sand by dry loose volume.
- (b) Prepared bag mixes consisting of Portland cement or blended hydraulic cement and mortar sand. The prepared mixes shall produce a mortar meeting the strength requirements specified in the Contract Documents.
- (c) Use nonshrink grout when specified. The grout shall have a minimum compressive strength of 5000 psi in seven days when tested as specified per T 106, except that the cube molds shall remain intact with a top firmly attached throughout the curing period. The nonshrink grout shall have a minimum expansion of 0.0 percent after seven days when tested as specified per T 160.



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- (d) Epoxy grout shall consist of sand and epoxy mixed by volume in per the manufacturer's recommendations. The grout shall be capable of developing a minimum compressive strength of 6500 psi in 72 hours when tested per MSMT 501. Sand for epoxy grout as specified in 901.01.
- (e) An epoxy or polyester anchoring system may be used when approved by the Engineer in accordance with the manufacturer's recommendations. Strength values shall be as specified in the Contract Documents.

902.12 LINSEED OIL. Shall consist of a 50-50 mixture (by volume) of boiled linseed oil meeting Federal Specification TT-L-190 and kerosene per D 3699.

902.13 LATEX MODIFIED CONCRETE. Portland cement concrete containing prequalified Laboratory approved styrene butadiene latex emulsion is defined as Latex Modified Concrete (LMC).

Latex emulsion shall have a minimum of 90 percent of the nonvolatiles as styrene butadiene polymers. The latex emulsion as specified in Table 902.13 A. The material shall be stored in suitable containers and be protected from freezing and exposure to temperatures in excess of 85 F.

LMC shall be proportioned using volumetric mixing and designed as follows:

LATEX MODIFIED CONCRETE	
MATERIAL	SPECIFICATION LIMITS
Portland Cement, CWT/yd ³ , min	6.6
Latex Emulsion/Cement Ratio	0.31 – 0.34
Water/Cement Ratio, max	0.22
Entrained Air, %	6.0 ± 3
Slump, in.	5 ± 1

The physical properties of LMC shall conform to Table 902.13 B. The Contractor shall furnish the necessary 3 X 6 in. molds per M 205 to be used for the fabrication of compressive strength cylinders.

Control and Acceptance Sampling.

- (a) Submit a two qt minimum sample, of the styrene butadiene latex emulsion to the AME daily for each lot of material used in a day's production.
- (b) A batch for LMC is defined as the capacity of the equipment being used on the project. Slump and air samples will be taken and tested before the placement of a batch is permitted. The slump shall be measured four to five minutes after discharge from the mixer. The test material shall be deposited off the deck and not be disturbed during this



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waiting period. One additional sample for slump and air will be taken randomly during the placement of each batch. For seven day compressive strength, two tests each per batch are required. A test is defined as consisting of two companion cylinders. The samples for these tests will be taken at random while the placement is in progress.

TABLE 902.13 A

REQUIREMENTS FOR CHEMICAL PROPERTIES OF LATEX EMULSION MATERIALS				
<u>PROPERTY</u>	<u>SPECIFICATIONS</u>		<u>QUALITY ASSURANCE TESTS</u>	
	<u>LIMITS</u>	<u>TOLERANCE</u>	<u>PREQUALIFICATION TESTS</u>	<u>CONTROL AND ACCEPTANCE</u>
Color	White	—	X	X
pH	9.0 – 11.0	—	X	X
Weight, lb/gal	8.40 – 8.47	—	X	X
Solids Content, %	46 – 53	—	X	X
*Butadiene Content, % of polymer	30 – 40	—	—	—
Viscosity @ 10 rpm-cps	Match Original	± 20	X	X
*Surface Tension, dynes/cm max	50	—	—	—
*Mean Particle Size, polymer – Å	1400 – 2500	—	—	—
Coagulum, % max	0.10	—	X	X
*Freeze-Thaw Stability, coagulum, % max	0.10	—	X	X
Infrared Spectra of Latex Film	Match Original	—	X	X
Infrared of Alcohol, Soluble Portion of Latex	Match Original	—	X	X
Shelf Life, min	1 yr	—	X	—

Note 1: Quality assurance tests shall be conducted as specified in MSMT 612 except those denoted by an * shall be conducted as specified in FHWA RD – 78-35.

Note 2: The original or prequalification sample shall be accompanied by the producer's certification on all of the tests and properties noted above and as specified in TC-1.02. The certification shall contain actual test values of the product and the infrared spectrograph.

Note 3: A separate certification is required for each lot of material. The certification shall note the date of manufacture, lot size, and whether or not the material is identical to the formulation of the original sample.



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TABLE 902.13 B

LATEX MODIFIED CONCRETE PHYSICAL PROPERTIES			
TEST PROPERTY	TEST VALUES	QUALITY ASSURANCE TESTS	
		PREQUALIFIED TESTS	CONTROL AND ACCEPTANCE
7 Day Compressive Strength, psi min	3000	X	X
28 Day Compressive Strength, psi min	3500	X	—
42 Day Compressive Strength, psi min	3500	X	—
7 Day Flexural Strength, psi min	550	X	—
28 Day Flexural Strength, psi min	650	X	—
42 Day Shear Bond Strength, psi min	2000	X	—
Durability Factor, 300 cycles, % min	85	X	—
Chloride Permeability, Ppm max	510	X	—
Scaling Resistance, 50 cycles, max	3	X	—

Note 1: Quality assurance tests shall be conducted as specified in MSMT 721.

Note 2: Seven Day Compressive Strength Test will be used for Control & Acceptance of the material. The minimum specified design strength is 3000 psi at seven days. The mix design approval and acceptance will be based on a coefficient of variation of 10 percent with a probability of 1 in 10 tests falling below the specified strength. Only test values 80% or greater than the specified strength will be accepted

902.14 RAPID HARDENING CEMENTITIOUS MATERIALS FOR CONCRETE PAVEMENT REPAIRS. Materials shall be a dry, packaged cementitious mortar having less than 5 percent by weight of aggregate retained on the 3/8 in. sieve and meet the following requirements:

Classification.

Class I — For use at ambient temperatures below 50 F.

Class II — For use at ambient temperatures of 50 to 90 F.

Class III — For use at ambient temperatures above 90 F.

Chemical Requirements. C 928 except that no organic compounds such as epoxy resins or polyesters as the principal binder.



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Physical Requirements. Meet the following when tested per MSMT 725:

A. COMPRESSIVE STRENGTH, psi min				
CLASSIFICATION	< 2 hr	2-6 hr	6 hr	28 days
Type I — Slow	—	—	2000	4500
Type II — Rapid	—	2000	—	4500
Type III — Very Rapid	2500	—	—	4500

TEST RESULTS	
TEST PROPERTY	LIMITS
Bond Strength, 7 days, psi min	2000
Length Change, increase after 28 days in water, based on length at 3 hr, % max	+ 0.15
Length Change, decrease after 28 days, % max	- 0.15
Freeze Thaw, loss after 25 cycles in 10% CaCl ₂ solution, % max	8
Initial Setting Time, minutes min	10

Marking. All packages delivered to the project shall be marked with the following information:

- (a) Date material was packaged.
- (b) Approximate setting time.
- (c) Recommended dosage of water or liquid component.
- (d) Mixing instructions.
- (e) Class or temperature range.

Certification. The manufacturer shall furnish certification as specified in TC-1.02 showing the actual test results for each class and type of material submitted to the Laboratory.

902.15 SYNTHETIC FIBERS. When synthetic fibers are specified in the Contract Documents, the fibers shall be 1/2 to 1-1/2 in. long and conform to C 1116, Type III. The manufacturer shall furnish certification as specified in TC-1.02. The quantity of fibers used and their point of introduction into the mix shall conform to the fiber manufacturer's recommendations.