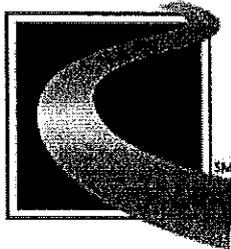


MARYLAND TRANSPORTATION AUTHORITY
Baltimore, Maryland
Invitation for Bids

FORT MCHENRY TUNNEL



**Maryland
Transportation
Authority**

CONTRACT NO. FT-928-000-006

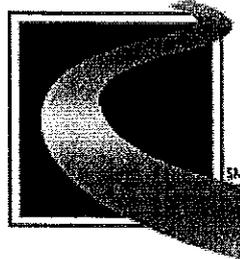
**I-95 FROM MORAVIA ROAD TO THE
FORT MCHENRY TUNNEL
PHASE 1 SOUTHBOUND**

BALTIMORE CITY

JANUARY, 2010

MARYLAND TRANSPORTATION AUTHORITY
Baltimore, Maryland
Invitation for Bids

FORT MCHENRY TUNNEL



**Maryland
Transportation
Authority**

CONTRACT NO. FT-928-000-006
I-95 FROM MORAVIA ROAD TO THE FORT McHENRY TUNNEL
PHASE 1 - SOUTHBOUND

BALTIMORE CITY

JANUARY 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 relative to Right-of-Way, Utilities, Design, and Construction Details will be conducted at 10:00am on February 11, 2010, in the Conference Room, 1st Floor of Francis Scott Key Bridge Administration Building at 303 Authority Drive in Dundalk, Maryland. While attendance at the Pre-Bid conference is not mandatory, this is the offeror's opportunity to raise questions and/or issues of concern regarding the project.



Maryland
Transportation
Authority

SPECIAL PROVISIONS

CONTRACT NO. FT-928-000-006

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IMPORTANT INFORMATION REGARDING MBE UTILIZATION AND BIDDING REQUIREMENTS

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

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

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

ATTACHMENT A

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

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

ATTACHMENT B Part 2

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

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

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

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

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

- If you are requesting a third tier relationship, you must state that request on the Attachment B form (Column 1). Please note: Third Tier MBE/DBE subcontracting will be approved by the Authority only when the Authority is satisfied that there is no way except by Third Tier contracting that an MBE/DBE goal can be achieved. Specifics as to why a Third Tier contracting agreement must be included
- Attachment B must be signed and dated.
- If you are the apparent low bidder, you will receive a letter from the Authority requesting your MBE Attachment C (Outreach Efforts Compliance Statement) and Attachment D (Subcontractor Project Participation Affidavit). You will have ten (10) working days to submit the attachments to the Authority. If you

requested a waiver at time of bid, all of the back up documentation that complies with COMAR 21.11.03.11, must be submitted within the ten working days with Attachments C & D.

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

Dual Certification Procurement Information

Effective on October 1, 2009, Minority Business Enterprise (MBE) firms may elect to be dually certified as woman-owned businesses and as members of an ethnic or racial category. For purposes of achieving any gender or ethnic/racial MBE participation subgoals in a particular contract, an MBE firm that has dual certification may participate in the contract either as a woman-owned business or as a business owned by a member of a racial or ethnic minority group, **but not both**.

WARNING – PLEASE READ:

- ◆ **A firm must be listed in the MDOT MBE/DBE Directory with the gender category in order to be used to meet the gender subgoal.**
- ◆ **A firm must be listed in the MDOT MBE/DBE Directory with an ethnic/racial category in order to be used to meet the ethnic/racial subgoal.**
- ◆ **A firm must be listed in the MDOT MBE/DBE Directory with both the gender and ethnic/racial categories in order for a contractor to have the option of selecting which of those categories it will use for the firm on a State contract.**
- ◆ **Contractors should designate whether the MBE firm will be used as a woman-owned business or as a business owned by a member of a racial/ethnic group before calculating the percentage of MBE participation goals and subgoals they intend to meet.**

Maryland's MBE/DBE Directory will reflect the dual certification status beginning October 1, 2009. You can access the MBE/DBE Directory at <http://mbe.mdot.state.md.us>. Firms with dual certification will now be listed as follows:

Example:

ABC Corporation, Inc.
123 Corporate Circle
Hanover, MD 21076
Female/African American
00-000

NOTICE TO BIDDERS

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

- When submitting your completed bid, do not separate the book. Submit the whole book including all addenda 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 Attachments, please see the insert named "Important Information regarding MBE Utilization and Bidding Requirements" located in the IFB.

- The Bid/Proposal Affidavit must be completely filled out and signed by all the parties as indicated.
- If Escrow is being offered in a contract, the contractor must indicate whether or not they wish to utilize an Escrow Account for Retained Funds on the provided form.
- A bid bond must accompany all bids of 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 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.

Notice to Bidders/Offerors

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 free registration provides a means for businesses to receive e-mail notification of upcoming contracting opportunities in their specified areas of interest and expertise.

For registration requirements, visit:
www.eMarylandMarketplace.com.



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.

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(l), State Finance and Procurement Article, Annotated Code of Maryland.
- (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.



CONTRACT PROVISIONS
APPRENTICESHIP TRAINING FUND

CONTRACT NO. FT 928-000-006

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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.

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.

- (a) A contractor or a subcontractor that makes contributions to the Fund shall do so in the amount of \$.25 per hour for each employee in each covered craft on the prevailing wage project on a monthly basis.



CONTRACT PROVISIONS
APPRENTICESHIP TRAINING FUND

CONTRACT NO. FT 928-000-006

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- (b) A contractor or a subcontractor that makes contributions to the Fund, who is performing work under a prevailing wage determination for a covered craft that includes a fringe benefit contribution that exceeds \$.25 cents, shall pay to the employee in wages the amount the fringe benefit contribution exceeds \$.25 cents.

Contributions to Approved Apprenticeship Programs. If a contractor or a subcontractor makes contributions to an approved apprenticeship program in an amount less than \$.25 per hour for each employee in each covered craft on the prevailing wage project, the contractor or subcontractor shall make payments to the Fund in the amount of the difference between \$.25 and its contribution on a monthly basis.

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.dlir.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.dlir.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.

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.dlir.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.
- (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.



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.

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

CONTRACT NO. FT 928-000-006
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>



OCCUPYING WETLANDS

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

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

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



CONTRACT PROVISIONS
HIGH VISIBILITY SAFETY APPAREL POLICY

CONTRACT NO. FT-928-000-006

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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.



CONTRACT PROVISIONS
HIGH VISIBILITY SAFETY APPAREL POLICY

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REFERENCES.

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

DEFINITIONS.

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



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SP 1-1 PROJECT DESCRIPTION

CONTRACT NO.: FT-928-000-006

TITLE: I-95 From Moravia Road to the Fort McHenry Tunnel Phase 1
- Southbound

FACILITY: Fort McHenry Tunnel

COUNTY: Baltimore City

ADVERTISED: January 26, 2010

PRE-BID MEETING: **10:00 AM on February 11, 2010** in the Conference Room at
the Maryland Transportation Authority, 303 Authority Drive,
1st Floor, Francis Scott Key Administration Building,
Baltimore, MD 21222

PROJECT CONTACT: Project Manager: Ms. Angelica Daniel at (410) 537-7828
Contract Administration: Ms. Maggie Johnson at (410) 537-7807

BIDS DUE: **12 Noon, March 11, 2010**, in the Bid Box on the 1st floor of
the Maryland Transportation Authority, Engineering Building,
300 Authority Drive, Baltimore, MD 21222

CLASSIFICATION: Class G (\$10,000,001 to \$15,000,000)

CONTRACT TIME: 555 Calendar Days

LIQUIDATED DAMAGES: \$1000.00 per calendar day

MINIMUM MBE GOALS: Overall 25%
Subgoal: Woman owned: 13%
Subgoal: African American owned: 6%

BID DOCUMENTS: \$50.00 Bid documents can be purchased between 7:30am and
3:30pm, Mondays, Wednesdays, Thursdays and Fridays and
between 10:00am and 4:00pm on Tuesdays at the Ticket
Office located at the Francis Scott Key Bridge, Maryland
Transportation Authority, Administration Building, 303
Authority Drive, Baltimore, MD 21222.



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This project, located in Baltimore City, reconfigures southbound I-95 from just north of Eastern Avenue to the I-95 Express Toll Lane Project, a distance of 1.3 miles. The project involves restriping southbound I-95 to provide one additional lane of traffic including reconstruction of at-grade shoulders; replacement of at-grade median concrete traffic barrier; and reconstruction of portions of existing bridge decks and concrete parapet.

It is anticipated that the portion of southbound I-95 directly adjacent to the northern limits of the project will be under construction by others in the same time period as this contract.

The work includes but is not limited to:

- Carbide grinding and resurfacing
- Full depth pavement reconstruction
- Concrete traffic barrier replacement
- Bridge deck demolition and construction
- Bridge parapet demolition and construction
- New storm drain and existing storm drain improvements
- New bridge scuppers
- New stormwater management facility
- Landscaping
- Signing and marking
- Lighting / electrical modifications*
- Pedestrian Ramp removal *

Demolition of pedestrian ramp and installation of conduit under roadway is subject to Baltimore City access. Contact Bill Pross, Utility/ROW-Permit Coordinator for more information; 410-537-7829 (see contract plans for details)

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, revisions thereof, or additions thereto, and the Special Provisions included in this Invitation for Bids.

SP 1-3 ORIGINAL FACILITY PLANS AND SITE VISITS

The original facility plans are on file at the Engineering 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 Ms. Angelica Daniel at (410) 537-7828. Parties interested in visiting the site should contact Mr. David Roehmer, Facility Administrator at (410) 537-1310.



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SP 1-4 PROMPT PAYMENT TO SUBCONTRACTORS

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

This contract requires the Contractor to make payment to all Subcontractors within ten (10) days of receiving payment from the Maryland Transportation Authority ("Authority").

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

If the Subcontractor does not receive payment within the required 10 days, the Subcontractor shall notify the Project Engineer in writing of the amount in dispute including the item numbers and payment quantity for each. The Project Engineer will then notify the Chief of Construction of the dispute. The Chief of Construction or his representative will verbally contact the prime Contractor within 48 hours to ascertain whether or not a performance dispute exists which necessitates non-payment to the Subcontractor. If a performance dispute exists, the prime Contractor must demonstrate that there is a valid basis to withhold payment from the Subcontractor. If the prime Contractor withholds payment from a Subcontractor, the prime Contractor shall provide to the Subcontractor written notice of the withholding of payment. The notice shall detail the reasons for withholding payment as well as the amount. A copy of the notice shall be provided to the Surety and the Authority. If no valid dispute exists, the prime Contractor will be directed to make immediate payment to the Subcontractor. The Subcontractor will be responsible for notifying the Chief of Construction if this payment is not made. Upon receipt of notification, the Chief of Construction will schedule a meeting with the Contractor and Subcontractor to verify and discuss the non-payment issue. This meeting will be held at the Authority's offices within 2 working days of the 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.



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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 for times permitted for lane closures and construction for I-95. Pile driving (and other activities which cause excessive noise) shall not be performed between the hours of 9:00 PM and 7:00 AM. Except for the above restriction, the Contractor will be allowed to work twenty-four (24) hours a day, seven (7) days a week.

SP 1-6 INSURANCE

TC-5.01 INSURANCE

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

1. The Contractor shall not commence work under this contract until he has obtained all of the minimum amounts of insurance required by these Special Provisions and the insurance has been approved by the Engineer. The Contractor shall furnish to the Maryland Transportation Authority ("Authority") duly executed certification of all required insurance on forms satisfactory to the Authority. The certificates of insurance shall state that it is in force and cannot be cancelled, release or non-renewed except upon thirty (30) days prior written notice, registered mail to the Authority. All Contractors' insurance policies, with the exception of the Worker's Compensation and Employer's Liability, shall be endorsed to provide as additional insureds the Maryland Transportation Authority and the State of Maryland.
2. The Contractor shall purchase and maintain such insurance as is specified herein which will provide the Authority, its members, employees and agents, as well as the Contractor from claims which may arise out of or as a result of the Contractor's operations under this contract, whether such operations be by the Contractor, by any subcontractor, by anyone directly or indirectly employed by any of them or by anyone whose acts any of them may be liable. This insurance



shall be maintained in full force until the Contract has been accepted by the Authority and final payment is made.

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

a) Worker's Compensation and Employer's Liability

The Contractor shall, at all times, maintain and keep in force such insurance as will protect him from claims under the Worker's Compensation Act of the State of Maryland and maintain and keep Employer's Liability Insurance at a limit of One Hundred Thousand Dollars (\$100,000.00). 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 (\$1,000,000.00) 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 (\$500,000.00) Combined Single Limit for bodily injury and property damage.

d) Additional Insurance

The Contractor shall also procure and keep in effect:

Excess liability (umbrella coverage) in excess of and applicable to the coverage in the Comprehensive General Public Liability and Property



Damage Insurance, "X, C, U" and Comprehensive Automobile Insurance in the amount of at least Two Million Dollars (\$2,000,000) for each occurrence.

4. Accident Notification - The Contractor shall send a written report to the Engineer and to the Maryland Transportation Authority within twenty-four (24) hours of any accident or other event arising in any manner from the performance of the Contract which results in or might result in personal injury or property damage.
5. Failure to comply with these Special Provisions may lead to termination for default or convenience.
6. There will be no special payment for the insurance as required by this contract and all costs incidental thereto shall be included in the Lump Sum for "Mobilization", (refer to Section 108), or if the Contract does not include such an item, the insurance costs are to be included in pay items for the Proposal.

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

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

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

The Contractor shall:

1. Identify specific work categories appropriate for subcontracting;
2. At least ten (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:



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

Third Tier Subcontracting:

Third Tier MBE/DBE Subcontracting will be approved by 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 prior to contract award and contain specifics as to why a Third Tier contracting agreement is being requested.

Waivers:

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



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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 Assessments and Taxation website at www.dat.state.md.us.

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

SP 1-10 CONTRACTOR'S EMPLOYEE IDENTIFICATION

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

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

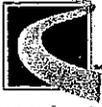
All Contractor's employees, including employees of subcontractors, on this project, present at the site, shall be in possession of a valid employee identification card provided by the Employer, which shall contain a photograph and identify the employee by name and job title. The employee must produce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

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

While working 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 Contractors' 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. Requests for hardhat and rearview mirror decals shall be made to the Construction Section before the beginning of construction and should include the number required of each type of decal.

All costs associated with identification cards will not be paid for separately and shall be incorporated under other items of payment in the Contract.

SP 1-12 METHOD OF PAYMENT (For repairs and replacements as a result of traffic accidents):



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The Contractor shall submit an itemized invoice to the Engineer, in triplicate, for the work. All invoices shall include the contract number, location of work performed, and a breakdown of all quantities used. All bills shall be sent, by the tenth day of each calendar month, for all work completed to:

Maryland Transportation Authority
Engineering Division
300 Authority Drive
Baltimore MD 21222
ATTN: Mr. Dave Ferrara

On the face of each invoice shall be affixed the Federal Tax Identification number or Social Security number assigned to the Contractor. Each monthly invoice shall be labeled as "Progress", and the final invoice shall be labeled as "Final".

Pursuant to Article 17-106, Certification of Payments, the following statement shall be placed on all Progress and Final payment invoices and signed by the Contractor. Failure to do so will result in non-payment.



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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 “Maryland
Transportation Authority”.

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



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



**GENERAL PROVISIONS
GP SECTION 2
BIDDING REQUIREMENTS AND CONDITIONS**

GP-2.06 PREPARATION OF THE BID

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

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

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

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

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

Sample forms shall be submitted to:

Ms. Linda McGill
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 have 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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**GENERAL PROVISIONS
GP SECTION 5
CONTROL OF WORK**

GP-5.12 FAILURE TO MAINTAIN ENTIRE PROJECT

Delete: Section GP-5.12 in its entirety

Insert: Revise the paragraph to read as follows:

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



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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 10 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:

Maryland Transportation Authority
Engineering Division
300 Authority Drive
Baltimore, Maryland 21222-2200

ATTN: Mr. James Wesselhoff, Highway Manager

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



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drawings shall conform to the following requirements, conditions, and procedure:

1. Substitution of equipment or materials other than those specified will be considered, providing, in the opinion of the Engineer, such equipment or material is equal to, or better than specified. The decision of the Engineer with respect to approval or disapproval of any material or equipment proposed to be substituted as an "or equal" is final. The Contractor shall have no claim of any sort by reason of such decision.
2. If the Contractor proposes to substitute materials or equipment as "or equal" to those specified, it shall be his responsibility to furnish, in addition to the information discussed above, a point by point comparison of the material or equipment specified under the Contract and that proposed to be substituted. The burden of responsibility in furnishing this information is with the Contractor.

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



**TERMS AND CONDITIONS
TC SECTION 4
CONTROL OF WORK**

TC-4.02 FAILURE TO ADEQUATELY MAINTAIN PROJECT.

16 **ADD:** To the existing paragraph.

Additionally, an appropriate deduction will be made from the Contractor's next progress estimate for each day or portion thereof that Maintenance of Traffic deficiencies exist, and will continue until the deficiencies are satisfactorily corrected and accepted by the Engineer. Any portion of a day will be assessed a full day deduction. The deduction will be equal to a prorata share of the lump sum price bid for Maintenance of Traffic or an amount prorated from the Engineer's estimate, whichever is more. The amount prorated will be the per diem amount established by using the working days (based upon calendar dates when required) divided into the total value of the bid item or the Engineer's estimate of that item, whichever is more.

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

The Contractor does not take action to correct the deficiencies and properly assume the responsibilities of maintaining the project (as determined by the Engineer) within four (4) hours of receiving a notice to comply with the required maintenance provisions.

The deduction will be equal to the daily prorated share of the lump sum price bid for Maintenance of Traffic or \$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.



**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/ Two Million Dollars (\$2,000,000.00) 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-7.06 FINAL ACCEPTANCE AND FINAL PAYMENT.

128 **DELETE:** (b) in its entirety.

INSERT: The following.

- (b) The Contractor shall then have a period of thirty (30) days, dating from the date upon which he received the aforementioned tabulation from the Administration, in which:
- (1) To decide whether or not he will accept final payment upon such a basis, and
 - (2) To notify the Administration, in writing, of his decision. The Contractor may request an additional period up to 30 days in which to notify the Administration of his decision. In the event the Contractor notifies the Administration that he protests final payment on such a basis, that notification shall outline the reasons for said protest.



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CATEGORY 100
PRELIMINARY

SECTION 100-01 — MAINTENANCE OF RAILROAD TRAFFIC

100-01.01 DESCRIPTION. This work shall consist of the maintenance of Railroad traffic in accordance with the requirements specified herein for work performed in or near Railroad property. For the purposes of these Special Provisions, National Railroad Passenger Corporation (Amtrak), CSX Transportation, Inc. (CSX), Norfolk Southern Corporation (NSC), and Canton Railroad will hereinafter be referred to as the "Railroad" unless individually specified.

100-01.02 MATERIALS. None.

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

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

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

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

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



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

NATIONAL RAILROAD PASSENGER CORPORATION (AMTRAK)

Mr. Mark Sawyer
Director of I&C Proposals
30th Street Station
3rd Floor Tower, Box 64
Philadelphia, PA 19104
Telephone: (215) 349-4971
sawyer@amtrak.com

CSX TRANSPORTATION, INC.

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

AECOM reviewers on behalf of CSX:

Mr. Jeff Konrad (primary); Jeffrey.Konrad@aecom.com
Mr. George Kevgas (secondary); george.kevgas@aecom.com
260 South Broad Street
Suite 1500
Philadelphia, PA 19102
Telephone: (215) 965-2220

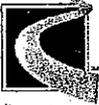
NORFOLK SOUTHERN CORPORATION

Mr. Scott Overbey
Bridges and Structures Department
1200 Peachtree Street, N.E., 7th Floor
Atlanta, GA 30309
scott.overbey@nscorp.com

AECOM reviewer on behalf of Norfolk Southern:

Mr. Jon Schmidt
260 S. Broad Street, Suite 1500
Philadelphia, PA 19102
Telephone: (215) 735-0832 x300
Jon.Schmidt@aecom.com

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



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

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

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

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

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

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

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

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

Any work performed by the Railroad at the Contractor's request, other than protective services and work specifically designated in these Special Provisions, shall be paid for by the Contractor immediately upon presentation of the bills by the Railroad. Final settlement by the Maryland Transportation Authority with the Contractor shall be contingent upon: (a) the Contractor showing proof that the Railroad's property has been cleared of all machinery, equipment, surplus materials, false work, rubbish, temporary buildings, and other property in a condition satisfactory



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to the Railroad; (b) the Contractor showing proof that no bills are owed by the Contractor to the Railroad in connection with the work performed on this project.

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

Approved minimum temporary construction clearances from Railroad tracks are as follows:
Amtrak – 15.00 ft. vertical from electrified wires and 15.00 ft. horizontal from outside track centerline; refer to attached Specifications Regarding Safety a Protection of Railroad Traffic and Property for additional clearance details;
CSX – 22.00 ft. vertical from top of rail and 18.00 ft. horizontal from outside track centerline;
NSC – 23.00 ft. vertical from top of rail and 13.00 ft. horizontal from outside track centerline;
Canton Railroad – 22.00 ft. vertical from top of rail and 18.00 ft. horizontal from outside track centerline.

Approval for clearances less than noted must be obtained by the Contractor through the Engineer from the Railroad and from the regulatory agency having jurisdiction over Railroad clearances in the State of Maryland before beginning any work involving such clearances.

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

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

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



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measures shall be performed by the Contractor at the Contractor's own expense in a manner satisfactory to the Railroad.

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

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

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

Should any damage occur to Railroad property as a result of the Contractor's operations, the Railroad may repair such damage and perform any work for protection of its property it may deem necessary and the actual cost for such work shall be borne by the Contractor.

The Contractor will not be permitted to use Railroad personnel for the Contractor's purposes when such personnel are required at the immediate site of project construction by the Railroad solely for the safe operations of the Railroad.

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

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

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

No work shall be performed until the Working Drawings are approved by the Engineer and the Railroad. Approval of the Working Drawings by the Engineer and the Railroad shall not relieve



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the Contractor's responsibility for errors in dimensions, elevations, or design calculations and for performance of the work in a safe manner without endangering the safety of the Railroad personnel, equipment, or the Contractor's workmen.

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

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

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

1. **Contractor's Public Liability and Property Damage Insurance:** Limits not less than \$3,000,000 per occurrence for Bodily Injury and \$3,000,000 per occurrence for Property Damage.
2. **Contractor's Protective Public Liability and Property Damage Insurance:** If any part of the work is to be performed by a Subcontractor, the prime Contractor shall carry in the Contractor's own behalf, insurance of same limits as set forth in Paragraph 1, above.
3. **Railroad Protective Public Liability and Property Damage Insurance:** This Policy shall name the respective "Railroad" as "The Insured" and shall be written on the form prescribed by the U.S. Department of Transportation, Federal Highway Administration, in the Federal Air Highway Program Manual, Volume 6, Chapter 6, Section 2, Subsection 2, Railroad-Highway Insurance Protection Required for Contractors.

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

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

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



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

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

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

An allowance of \$100,000.00 has been established for this item in the Schedule of Prices. This item, Maintenance of Railroad Traffic, will provide compensation to the Contractor for the costs of Railroad Insurance and Permits. The costs of the Contractor's time utilized to secure the Permits and Insurance will not be paid under this item, but costs thereof will be incidental to other items in the Contract. There is no guarantee that any or this entire item will be used during the term of the Contract.



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Amtrak
Engineering Construction
4th Floor - South Tower
30th Street Station (Mail Box 64)
Philadelphia, PA 19104

Temporary Permits to Enter Upon Amtrak Property (PTEs)

Requests for Temporary Permits to Enter Upon Amtrak Property (PTEs) must be submitted to Amtrak in writing and include the following information:

1. Name of company requesting the permit (include address and telephone number)
2. Who's attention the permit should be addressed to
3. Addressee's e-mail address
4. Exact location of work (including railroad milepost, if known)
5. Specific work activity being performed on railroad property (please provide dollar value of the contract if work being performed is other than surveys or bridge inspections)
6. Projected duration of work being performed on railroad property

Note: ***Temporary Permits for performing any environmental or geotechnical tests or studies (e.g., air, soil or water sampling) may be issued subsequent to completion of Amtrak's environmental review and approval process. Requests are reviewed on a case-by-case basis. Depending on the site specific circumstances, a separate Site Access Agreement that addresses environmental liability issues may be required prior to any Temporary Permit.***

All PTE Requests must be submitted to the Amtrak Engineering Construction Department by fax or mail as noted below:

- Faxed to (215) 349-3550
- Mailed to the following address:
Director I&C Projects
National Railroad Passenger Corporation
30th Street Station (Mail Box 64)
Philadelphia, PA 19104

Due to the heavy volume of requests for Temporary Permits to Enter Upon Amtrak Property, the processing time for initial Permit requests is approximately 30 days.

Rev. 5/23/07



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NATIONAL RAILROAD PASSENGER CORPORATION
TEMPORARY PERMIT TO ENTER UPON PROPERTY
C.E.-17 (REVISED 12/1/06)

Date:
File: E-47-
W.E.:

ATTN:

1. TEMPORARY PERMISSION. Temporary permission is hereby granted to _____ (hereinafter called "Permittee"), to enter property owned and/or controlled by the National Railroad Passenger Corporation (hereinafter called "Railroad"), for the purpose of _____ at _____, State of _____, under the terms and conditions set forth below.

- o In addition to the \$ _____ Temporary Permit preparation fee and the \$ _____ Railroad Protective Liability Insurance waiver fee, Permittee is required to pay in advance Amtrak's Force Account costs estimated at \$ _____ as detailed in the attached Force Account Estimate.

2. LOCATION AND ACCESS. (Give map reference, description or both)

(hereinafter called "Property").

3. INDEMNIFICATION. Permittee shall defend, indemnify and hold harmless Railroad, its officers, directors, employees, agents, servants, successors, assigns and subsidiaries, irrespective of their negligence or fault, from and against any and all losses and liabilities, penalties, fines, forfeitures, demands, claims, causes of action, suits, costs and expenses (including cost of defense and attorneys' fees), which any or all of them may hereafter incur, be responsible for, or pay as a result of injury, death, disease, or occupational disease to any person, and for damage (including environmental contamination and loss of use) to or loss of any property, including property of Railroad, arising out of or in any degree directly or indirectly caused by or resulting from activities of or work performed by Permittee, its officers, employees, agents, servants, contractors, subcontractors, or any other person acting for or by permission of Permittee. The foregoing obligation shall not be limited by the existence of any insurance policy or by any limitation on the amount or type of damages, compensation, or benefits payable by or for Permittee or any contractor or subcontractor, and shall survive the termination of this Temporary Permit for any reason. As used in this paragraph, the term "Railroad" also includes all commuter agencies and other railroads with rights to operate over Railroad property, and their respective officers, directors, employees, agents, servants, successors, assigns and subsidiaries.

4. CONSIDERATION FOR PREPARATION OF TEMPORARY PERMIT. Permittee will pay to Railroad the sum of Five Hundred Dollars (\$500.00) as compensation for the preparation of this Temporary Permit. This fee is to be delivered to Railroad at the address set forth in paragraph 17 hereof.

5. STARTING OF USE OF PROPERTY. Permittee shall notify Railroad's Deputy Chief Engineer-Construction, or his designee, at least ten (10) days in advance before entering upon, or starting any work on, the Property. No entry upon or use of the Property will be permitted until a fully executed copy of this Temporary Permit is returned to Railroad, and specific permission to enter upon the Property is received by Permittee from Railroad's Director Project Initiation & Development. (See paragraph 17 for contact information.)

6. RAILROAD OPERATIONS. All activities performed by or on behalf of Permittee shall be performed so as not to interfere with Railroad's operations or with any of Railroad's facilities. In no event



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shall personnel, equipment or material cross a track or tracks without special advance permission from Railroad's Deputy Chief Engineer-Construction or his designee. If, in the opinion of Railroad's Deputy Chief Engineer-Construction or his designee, conditions warrant at any time, Railroad will provide flag service and/or other protection at the sole cost and expense of Permittee, and Permittee agrees to pay to Railroad the full cost and expense therefor.

7. CLEARANCES. All equipment and material of Permittee shall be kept at all times not less than fifteen (15) feet from the centerline of the outside track, unless specifically otherwise authorized in writing by Railroad's Deputy Chief Engineer-Construction or his designee. Permittee shall conduct all operations so that no part of any equipment shall foul an operated track; transmission, communication or signal line; or any other structure or facility of Railroad.
8. RESTORATION OF PREMISES. Upon completion of its work, Permittee shall, at the option of Railroad, (a) leave the Property in a condition satisfactory to Railroad, or (b) restore the Property to its original condition. This may include, without limitation, the restoration of any fences removed or damaged by Permittee.
9. TERM OF TEMPORARY PERMIT. This Temporary Permit shall commence on the date Railroad receives a fully executed copy of this Temporary Permit pursuant to paragraph 17 hereof and shall extend until the end of the period Railroad determines is necessary for Permittee to accomplish the purpose set forth in paragraph 1 hereof; provided, however, Railroad reserves the right to revoke this Temporary Permit at any time, and in no event shall this Temporary Permit extend beyond _____, 200_. Under no circumstances shall this Temporary Permit be construed as granting to Permittee any right, title or interest of any kind in any property of Railroad.
10. PROTECTION. All work on, over, under, within or adjacent to the Property shall be performed in accordance with the document entitled "SPECIFICATIONS REGARDING SAFETY AND PROTECTION OF RAILROAD TRAFFIC AND PROPERTY," a copy of which is attached hereto as Attachment A and incorporated herein by reference.
11. INSURANCE. Before Permittee commences any work on, over, under, within or adjacent to the Property, Permittee and its contractors (unless Permittee opts to provide the required coverage for them), shall furnish to Railroad's Director Project Initiation & Development, evidence of the insurance coverages specified in the document entitled "INSURANCE REQUIREMENTS - NATIONAL RAILROAD PASSENGER CORPORATION," a copy of which is attached hereto as Attachment B and incorporated herein by reference.
12. SAFETY ORIENTATION CLASS. No person may enter within twenty-five (25) feet of the Property until he/she has attended Railroad's Safety Orientation Class, as noted in paragraph 12 of Attachment A.
13. COMPLIANCE BY CONTRACTORS. Permittee shall take all steps necessary to ensure that its contractors and subcontractors comply with the terms and conditions of this Temporary Permit.
14. SUPPORT SERVICES; COSTS; PAYMENTS. Railroad shall not be responsible for any costs incurred by Permittee in relation to any matter whatsoever. Permittee is required to reimburse Railroad for all costs incurred by Railroad in relation to this Temporary Permit. Without limiting the foregoing,
15. Permittee is required to reimburse Railroad for all costs incurred by Railroad in connection with the review of any plans, drawings or other submissions made by Permittee.



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Railroad's costs, expenses and labor charges will be billed to Permittee at Railroad's standard force account rates. Except as specified in paragraph 4 hereof, all payments due from Permittee to Railroad under this Temporary Permit shall be due and payable within thirty (30) days from the date of invoice. Permittee shall have no right to set off against any payment due under this Temporary Permit any sums which Permittee may believe are due to it from Railroad for any reason whatsoever. In the event that Permittee shall fail to pay, when due, any amount payable by it under this Temporary Permit, Permittee shall also pay to Railroad, together with such overdue payment, interest on the overdue amount at an annual rate of six (6) percentage points over and above the rate published from time to time by *The Wall Street Journal* as the prime commercial lending rate (or the highest rate allowed by law, if less than the foregoing), calculated from the date the payment was due until paid. All payments due from Permittee to Railroad hereunder shall be: (a) made by check drawn from currently available funds; (b) deemed made only upon receipt by Railroad of collected funds; (c) made payable to National Railroad Passenger Corporation; and (d) delivered to the National Railroad Passenger Corporation, 23615 Network Place – GROUP, Chicago, IL 60673-1236. (However, the permit fee referenced in paragraph 4 hereof and the Railroad Protective Liability premium referenced in Attachment B, if applicable, shall be delivered to Railroad at the address set forth in paragraph 17 hereof.) All payment obligations of Permittee under this Temporary Permit shall survive the termination or expiration of this Temporary Permit.

15. ENVIRONMENTAL AND GEOTECHNICAL TESTS AND STUDIES. Permittee shall not perform any environmental or geotechnical tests or studies (e.g., air, soil or water sampling) unless specifically identified and authorized in paragraph 1 of this Temporary Permit. If any such tests or studies are performed, Permittee shall promptly furnish to Railroad, at no cost, a copy of the results including any reports or analyses obtained or compiled. Except as may be required by applicable law or as authorized by Railroad in writing, Permittee shall not disclose the results of any such tests or studies to anyone other than Railroad or Permittee's client. Failure to comply with the provisions of this clause shall result in immediate termination of this Temporary Permit and forfeiture of all compensation paid Railroad therefor.

16. SEVERABILITY. If any provision of this Temporary Permit is found to be unlawful, invalid or unenforceable, that provision shall be deemed deleted without prejudice to the lawfulness, validity and enforceability of the remainder of the Temporary Permit.

17. ACCEPTANCE. To confirm acceptance of this Temporary Permit, one fully executed copy must be returned to: Director Project Initiation & Development, National Railroad Passenger Corporation, 30th Street Station, Mail Box 64, Philadelphia, PA 19104 (215/349-1127). The second copy may be retained for your file.

NATIONAL RAILROAD PASSENGER CORPORATION

By: _____ Date: _____

DEPUTY CHIEF ENGINEER - CONSTRUCTION

AGREED TO AND ACCEPTED:

By: _____
(signature)

Title: _____ Date: _____
Must be an Owner/Partner or duly authorized representative



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ATTACHMENT A
Temporary Permit to Enter Upon Property
SPECIFICATIONS REGARDING SAFETY
AND PROTECTION OF RAILROAD TRAFFIC AND PROPERTY (Revised 2/3/06)

National Railroad Passenger Corporation (Railroad)

In the following Specifications, "Railroad" shall mean the National Railroad Passenger Corporation; "Chief Engineer" shall mean Railroad's Chief Engineer and/or his duly authorized representative; "Permittee" shall mean the party so identified in the Temporary Permit to Enter Upon Property; and "Contractor" shall mean the entity retained by the Permittee or the entity with whom Railroad has contracted in a Preliminary Engineering Agreement or Force Account Agreement, as applicable.

- (1) Pre-Entry Meeting: Before entry of Permittee and/or Contractors onto Railroad's property, a pre-entry meeting shall be held at which time Permittee and/or Contractors shall submit for written approval of the Chief Engineer, plans, computations and a detailed description of proposed methods for accomplishing the work, including methods for protecting Railroad's traffic. Any such written approval shall not relieve Permittee and/or Contractor of their complete responsibility for the adequacy and safety of their operations.
- (2) Rules, Regulations and Requirements: Railroad traffic shall be maintained at all times with safety and continuity, and Permittee and/or Contractors shall conduct their operations in compliance with all rules, regulations, and requirements of Railroad (including these Specifications) with respect to any work performed on, over, under, within or adjacent to Railroad's property. Permittee and/or Contractors shall be responsible for acquainting themselves with such rules, regulations and requirements. Any violation of Railroad's safety rules, regulations, or requirements shall be grounds for the immediate suspension of Permittee and/or Contractor work, and the re-training of all personnel, at Permittee's expense.
- (3) Maintenance of Safe Conditions: If tracks or other property of Railroad are endangered during the work, Permittee and/or Contractor shall immediately take such steps as may be directed by Railroad to restore safe conditions, and upon failure of Permittee and/or Contractor to immediately carry out such direction, Railroad may take whatever steps are reasonably necessary to restore safe conditions. All costs and expenses of restoring safe conditions, and of repairing any damage to Railroad's trains, tracks, right-of-way or other property caused by the operations of Permittee and/or Contractors, shall be paid by Permittee.
- (4) Protection in General: Permittee and/or Contractors shall consult with the Chief Engineer to determine the type and extent of protection required to ensure safety and continuity of railroad traffic. Any Inspectors, Track Foremen, Track Watchmen, Flagmen, Signalmen, Electric Traction Linemen, or other employees deemed necessary by Railroad, at its sole discretion, for protective services shall be obtained from Railroad by Permittee and/or Contractors. The cost of same shall be paid directly to Railroad by Permittee. The provision of such employees by Railroad, and any other precautionary measures taken by Railroad, shall not relieve Permittee and/or Contractors from their complete responsibility for the adequacy and safety of their operations.
- (5) Protection for Work Near Electrified Track or Wire: Whenever work is performed in the vicinity of electrified tracks and/or high voltage wires, particular care must be exercised, and Railroad's requirements regarding clearance to be maintained between equipment and tracks and/or energized wires, and otherwise regarding work in the vicinity of electrified tracks, must be strictly observed. No employees or equipment will be permitted to work near overhead wires, except when protected by a Class A employee of Railroad. Permittee and/or Contractors must supply an adequate length of grounding cable (4/0 copper with approved clamps) for each piece of equipment working near or adjacent to any overhead wire.



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(6) **Fouling of Track or Wire:** No work will be permitted within twenty-five (25) feet of the centerline of track or the energized wire or have potential of getting within twenty-five (25) feet of track wire without the approval of the Chief Engineer's representative. Permittee and/or Contractors shall conduct their work so that no part of any equipment or material shall foul an active track or overhead wire without the written permission of the Chief Engineer's representative. When Permittee and/or Contractors desire to foul an active track, they must provide the Chief Engineer's representative with their site-specific work plan a minimum of twenty-one (21) working days in advance, so that, if approved, arrangements may be made for proper protection of Railroad. Any equipment shall be considered to be fouling a track or overhead wire when located (a) within fifteen (15) feet from the centerline of the track or within fifteen (15) feet from the wire, or (b) in such a position that failure of same, with or without a load, would bring it within fifteen (15) feet from the centerline of the track or within fifteen (15) feet from the wire and requires the presence of the proper Railroad protection personnel.

If acceptable to the Chief Engineer's representative, a safety barrier (approved temporary fence or barricade) may be installed at fifteen (15) feet from centerline of track or overhead wire to afford the Permittee and/or Contractor with a work area that is not considered fouling. Nevertheless, protection personnel may be required at the discretion of the Chief Engineer's representative.

(7) **Track Outages:** Permittee and/or Contractors shall verify the time and schedule of track outages from Railroad before scheduling any of their work on, over, under, within, or adjacent to Railroad's right-of-way. Railroad does not guarantee the availability of any track outage at any particular time. Permittee and/or Contractors shall schedule all work to be performed in such a manner as not to interfere with Railroad operations. Permittee and/or Contractors shall use all necessary care and precaution to avoid accidents, delay or interference with Railroad's trains or other property.

(8) **Demolition:** During any demolition, Contractor must provide horizontal and vertical shields, designed by a Professional Engineer registered in the state in which the work takes place. These shields shall be designed in accordance with the Railroad's specifications and approved by the Railroad, so as to prevent any debris from falling onto the Railroad's right-of-way or other property. A grounded temporary vertical protective barrier must be provided if an existing vertical protective barrier is removed during demolition. In addition, if any openings are left in an existing bridge deck, a protective fence must be erected at both ends of the bridge to prohibit unauthorized persons from entering onto the bridge:

Ballasted track structure shall be kept free of all construction and demolition debris.

(9) **Equipment Condition:** All equipment to be used in the vicinity of operating tracks shall be in "certified" first-class condition so as to prevent failures that might cause delay to trains or damage to Railroad's property. No equipment shall be placed or put into operation near or adjacent to operating tracks without first obtaining permission from the Chief Engineer's representative. Under no circumstances shall any equipment or materials be placed or stored within twenty-five (25) feet from the centerline of an outside track, except as approved by the Site Specific Safety Work Plan. To ensure compliance with this requirement, Permittee and/or Contractors must establish a twenty-five (25) foot foul line prior to the start of work by either driving stakes, taping off or erecting a temporary fence, or providing an alternate method as approved by the Chief Engineer's representative. Permittee and/or Contractors will be issued warning stickers which must be placed in the operating cabs of all equipment as a constant reminder of the twenty-five (25) foot clearance envelope.

(10) **Storage of Materials and Equipment:** No material or equipment shall be stored on Railroad's property without first having obtained permission from the Chief Engineer. Any such storage will be on the condition that Railroad will not be liable for loss of or damage to such materials or equipment from any cause.



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If permission is granted for the storage of compressed gas cylinders on Railroad property, they shall be stored a minimum of 25 feet from the nearest track in an approved lockable enclosure. The enclosure shall be locked when the Permittee and/or Contractor is not on the project site.

(11) Condition of Railroad's Property: Permittee and/or Contractors shall keep Railroad's property clear of all refuse and debris from its operations. Upon completion of the work, Permittee and/or Contractors shall remove from Railroad's property all machinery, equipment, surplus materials, falsework, rubbish, temporary structures, and other property of Permittee and/or Contractors and shall leave Railroad's property in a condition satisfactory to the Chief Engineer.

(12) Safety Training: All individuals, including representatives and employees of Permittee and/or Contractors, before entering onto Railroad's property or coming within twenty-five (25) feet of the centerline of the track or energized wire shall first attend Railroad's Safety Orientation Class. The Safety Orientation Class will be provided by Railroad's Safety Representative at Permittee's expense. A photo I.D. will be issued and must be worn/displayed while on Railroad property. All costs of complying with Railroad's safety training shall be at the sole expense of Permittee. Permittee and/or Contractors shall appoint a qualified person as their Safety Representative. He/she shall continuously ensure that all individuals comply with Railroad's safety requirements. All safety training records shall be maintained with the site specific work plan.

(13) No Charges to Railroad: It is expressly understood that neither these Specifications, nor any document to which they are attached, include any work for which Railroad is to be billed by Permittee and/or Contractors, unless Railroad gives a written request that such work be performed at Railroad's expense.



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ATTACHMENT B
Temporary Permit to Enter Upon Property
INSURANCE REQUIREMENTS

NATIONAL RAILROAD PASSENGER CORPORATION (AMTRAK)
CHICAGO UNION STATION COMPANY (CUSCO)
WASHINGTON TERMINAL COMPANY (WTC)
Revised as of September 2008

DEFINITIONS

In these Insurance Requirements "Railroad" or "Amtrak" shall mean National Railroad Passenger Corporation and as appropriate, its subsidiaries Chicago Union Station Company ("CUSCO") and Washington Terminal Company ("WTC"). "Contractor" shall mean the party identified as "Permittee" in the Temporary Permit to Enter Upon Property Agreement or the party with whom Amtrak has contracted in the Preliminary Engineering Agreement or Force Account Agreement, as well as its officers, employees, agents, servants, contractors, subcontractors, or any other person acting for or by permission of Permittee or Contractor. "Operations" shall mean activities of or work performed by Contractor. "Agreement" shall mean the Temporary Permit to Enter Upon Property Agreement, Preliminary Engineering Agreement, or Force Account Agreement, as applicable.

INSURANCE

Contractor shall procure and maintain, at its sole cost and expense, the types of insurance specified below. Contractor shall evidence such coverage by submitting to Amtrak the original Railroad Protective Liability Policy and certificates of insurance evidencing the other required insurance, prior to commencement of Operations. All insurance shall be procured from insurers authorized to do business in the jurisdiction(s) where the Operations are to be performed. Contractor shall require all subcontractors to carry the insurance required herein, or Contractor may, at its option, provide the coverage for any or all subcontractors, provided the evidence of insurance submitted by Contractor to Amtrak so stipulates. The insurance shall provide for thirty (30) days prior written notice to Amtrak in the event coverage is substantially changed, canceled or non-renewed. All insurance shall remain in force until all Operations are satisfactorily completed (unless otherwise noted below), all Contractor personnel and equipment have been removed from Railroad property, and any work has been formally accepted. Contractor's failure to comply with the insurance requirements set forth herein shall constitute a violation of the Agreement.

Workers' Compensation Insurance complying with the requirements of the statutes of the jurisdiction(s) in which the Operations will be performed, covering all employees of Contractor. Employer's Liability coverage with limits of not less than \$1 million each accident or illness shall be included.

In the event the Operations are to be performed on or over navigable waterways, a Longshoremen and Harbor Workers' Compensation Act Endorsement and a Maritime Coverage Endorsement are to be added, including coverage for wages, transportation, maintenance and cure.

Commercial General Liability Insurance covering liability of Contractor with respect to all operations to be performed and all obligations assumed by Contractor under the terms of the Agreement. Products-completed operations, independent contractors and contractual liability coverages are to be included, with the contractual exclusion related to construction/demolition activity within fifty (50) feet of the railroad and any Explosion/Collapse/Underground (X-C-U) exclusions deleted. The policy shall name National Railroad Passenger Corporation, as appropriate CUSCO or WTC, and all commuter agencies and railroads that operate over the property or tracks at issue as additional insureds with respect to the operations to be performed. Coverage under this



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policy shall have limits of liability of not less than \$2 million each occurrence, combined single limit, for bodily injury (including disease or death), personal injury and property damage (including loss of use) liability.

Automobile Liability Insurance covering the liability of Contractor arising out of the use of any vehicles which bear, or are required to bear, license plates according to the laws of the jurisdiction in which they are to be operated, and which are not covered under Contractor's Commercial General Liability insurance. The policy shall name National Railroad Passenger Corporation, as appropriate CUSCO or WTC, and all commuter agencies and railroads that operate over the property or tracks at issue as additional insureds with respect to the operations to be performed. Coverage under this policy shall have limits of liability of not less than \$1 million each occurrence, combined single limit, for bodily injury and property damage (including loss of use) liability.

In the event Contractor or any subcontractor will be transporting and/or disposing of any hazardous material or waste off of the jobsite, a MCS-90 Endorsement is to be added to this policy and the limits of liability are to be increased to \$5 million each occurrence.

Railroad Protective Liability (RRP) Insurance covering the Operations performed by Contractor or any subcontractor within fifty (50) feet vertically or horizontally of railroad tracks. The current ISO Occurrence Form (claims-made forms are unacceptable) in the name of the National Railroad Passenger Corporation (and as appropriate CUSCO or WTC, and all commuter agencies and railroads that operate over the property or tracks at issue) shall have limits of liability of not less than \$2 million each occurrence, combined single limit, for Coverages A and B, for losses arising out of injury to or death of all persons, and for physical loss or damage to or destruction of property, including the loss of use thereof. A \$6 million annual aggregate shall apply. Additionally, Policy Endorsement CG 28 31 - Pollution Exclusion Amendment, is required to be endorsed onto the policy. Further, "Physical Damage to Property" as defined in the policy is to be deleted and replaced by the following endorsement:

"It is agreed that 'Physical Damage to Property' means direct and accidental loss of or damage to all property owned by any named insured and all property in any named insured's care, custody and control."

The original RRP Liability Insurance Policy must be submitted to Amtrak prior to commencement of Operations.

In the alternative, and upon Amtrak's approval, Contractor may elect to have Amtrak insure the Operations under its Blanket RRP Liability Insurance Program. The premium, which shall be determined by the rate schedule promulgated by the insurer in effect as of the effective date of the Agreement, shall be prepaid by Contractor. In the event Contractor and Amtrak agree to insure the Operations under Amtrak's RRP Program, Contractor shall include the RRP premium of \$ _____ in addition to the Permit Fee, and send its check made payable to National Railroad Passenger Corporation to the individual set forth below prior to commencement of Operations.

All Risk Property Insurance covering physical loss or damage to all property used in the performance of the Operations. The policy shall have limits of liability adequate to cover all property of Contractor (including personal property of others in Contractor's care, custody or control) and shall include a waiver of subrogation against Amtrak, as appropriate CUSCO or WTC, and all commuter agencies and railroads that operate over the property or tracks at issue.

Contractor's Pollution Liability Insurance covering the liability of Contractor arising out of any sudden and/or non-sudden pollution or impairment of the environment, including clean-up costs and defense, that arise from the Operations of Contractor with National Railroad Passenger Corporation, as appropriate CUSCO or WTC, and all commuter agencies and railroads that operate over the property or tracks at issue named as additional insureds. Coverage under this policy shall have limits of liability of not less than \$2 million each occurrence. The coverage shall be maintained during the term of the project, and for at least two (2) years following Amtrak acceptance of the completion of all Operations to be performed.



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Pollution Legal Liability Insurance is required if any hazardous material or waste is to be transported or disposed of off of the jobsite. Contractor, its subcontractor or transporter, as well as the disposal site operator, shall maintain this insurance. Contractor shall designate the disposal site, and must provide a certificate of insurance from the disposal facility to Amtrak. The policy shall name National Railroad Passenger Corporation, as appropriate CUSCO or WTC, and all commuter agencies and railroads that operate over the property or tracks at issue as additional insureds, with limits of liability of not less than \$2 million per claim.

Further, any additional insurance coverages, permits, licenses and other forms of documentation required by the United States Department of Transportation, the Environmental Protection Agency and/or related state and local laws, rules and regulations shall be obtained by Contractor.

Professional Liability Insurance covering the liability of Contractor for any and all errors or omissions committed by Contractor in the performance of the Operations, regardless of the type of damages. The coverage shall be maintained during the term of the Operations, and for at least three (3) years following completion thereof. The policy shall have limits of liability of not less than \$2 million per claim and in the annual aggregate. The policy may contain a deductible of a maximum of two hundred fifty thousand dollars (\$250,000), but in such case the deductible is the sole responsibility of Contractor, and no portion of such deductible is the responsibility of Amtrak.

Contractor may elect to satisfy this requirement through the addition of endorsement CG2279 "Incidental Professional Liability" to its CGL policy.

Claims-Made Insurance - If any liability insurance specified above shall be provided on a claims-made basis, then in addition to coverage requirements above, such policy shall provide that:

1. The retroactive date shall coincide with or precede Contractor's start of Operations (including subsequent policies purchased as renewals or replacements);
2. The policy shall allow for the reporting of circumstances or incidents that might give rise to future claims;
3. Contractor will use its best efforts to maintain similar insurance under the same terms and conditions that describe each type of policy listed above (e.g., Commercial General Liability, Professional Liability) for at least three (3) years following completion of the Operations; and
4. If insurance is terminated for any reason, Contractor will purchase an extended reporting provision of at least two (2) years to report claims arising from Operations.

Contractor shall furnish evidence of insurance as specified above at least fifteen (15) days prior to commencing Operations. THESE DOCUMENTS SHALL INCLUDE A DESCRIPTION OF THE PROJECT AND THE LOCATION ALONG THE RAILROAD RIGHT-OF-WAY (typically given by milepost designation) IN ORDER TO FACILITATE PROCESSING. The fifteen (15) day advance notice of coverage may be waived by Amtrak in situations where such waiver will benefit Amtrak, but under no circumstances will Contractor begin Operations without providing satisfactory evidence of insurance as approved by Amtrak. Such evidence of insurance coverage shall be sent to:

Director Project Initiation & Development
National Railroad Passenger Corporation
30th Street Station, Mail Box 64
Philadelphia, PA 19104-2817



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AMTRAK NORTHEAST CORRIDOR
Engineering Employee Development
30th & Market Streets - 3 North - Box 1
Philadelphia, PA 19104
Fax Number: 215-349-3731

Contractor Safety/Security Training Authorization
(Revised 10/12/07)

This is in response to your request on _____ to schedule Amtrak's Contractor/Lessee Safety Training for _____ Amtrak's Project Manager or Engineer assigned to your project will assist you with obtaining a temporary "Permit to Enter Upon Property." He or she will also verify the currency of your insurance documents. Once this process is complete, your training will be scheduled.

In addition, Amtrak requires you to formally accept the applicable training service fees. The costs are outlined on attachment 2.

The safety of Amtrak's passengers and all employees working on the property (Amtrak or Contractor) is our highest priority. For your protection, Amtrak requires your employees to comply with all safety regulations ("Specifications Regarding Safety and Protection of the Railroad Traffic and Property"). Safety violations will result in the immediate suspension of work within the railroad's property limits. Before resuming work, employees must attend a Safety Refresher course. Amtrak Employee Development arranges this service.

Please complete the Training Authorization (Attachment 1) and return it to the address or fax number on the form. If you have any questions with any aspect of the training services, contact Dawn Bey, Employee Development Specialist, at (215) 349-1553.

Respectfully,

Ed Murphy, Manager Employee Development

cc: D. Bey
Project File



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Attachment 1

TRAINING AUTHORIZATION FORM

TYPE OR PRINT ALL INFORMATION (EXCEPT APPROVAL SIGNATURE)
(Revised 10/12/07)

COMPANY INFORMATION

Company Name: _____

Billing Address: _____

City & State _____

Contact Person Name _____

Contact Person Phone _____

Amtrak Project Manager _____

Project Requiring This Training _____

Training Requirements

Estimated Number of Trainees: _____ (Attach list of potential trainee names)

Preferred Training Location: (Check one)	Washington, DC _____	Baltimore, MD _____	Philadelphia, PA _____
	Newark, NJ _____	New York, NY _____	Lancaster, PA _____
	New Haven, CT _____	Providence, RI _____	Boston, MA _____
	Wilmington, DE _____	Chicago, IL _____	Los Angeles _____
	New Orleans, LA _____		

Please advise if you have special concerns or considerations:

Acknowledgement

And Approval of _____ (Signature) _____ (Type or Print Name)

Training Costs _____

(See Attachment 1) _____ (Date) _____ (Phone#)

Return this authorization to:

Amtrak Engineering Employee Development
30th & Market Streets – 3 North – Box 1
Philadelphia, PA 19104 (Fax Number (215) 349-3731)



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Attachment 2
CONTRACTOR SAFETY/SECURITY TRAINING
(Revised 2/2/07)

AMTRAK Contractor Safety Enrollment Coordinators			
Location	Division or Territory Coordinator	Bell Telephone Number	Pager Telephone Number
New England Division	Midway M&W Base Groton, CT	(860) 446-3974 or (215) 349-1553	Answering Service checked daily If no answer contact (215) 349-1553
New York Division	New York, NY & Newark, NJ	Answering Service (973) 286-4003 or (215) 349-1553	If no answer contact (215) 349-1553
Mid-Atlantic Division	Philadelphia, PA	(215) 349-1553	(215) 349-3580
Mid-West Division	Chicago, IL	(312) 880-5399	If no answer contact (215) 349-1553
Western Division	Los Angeles, CA	(213) 891-3470	If no answer contact (215) 349-1553
AMTRAK Training Costs for Contractor Safety			
Minimum Class Cost (5 or less Participants) = \$540.00 Minimum Class Size – 6 Participants Maximum Class Size – 20 Participants			
Participant Class Size		Cost Per Person	
6 to 10		\$90.00	
11 to 15		\$80.00	
16 to 20		\$75.00	
Photo ID card is included in the above charges. Cost of Additional Photo ID is \$10.00 for each card			

Note: All Contractors are enrolled into our scheduled classes. Participant charges are based on total class size. To reduce Contractor costs, we strive to attain the minimum of 20 participants for each class.

AMTRAK – Training Locations For Northeast Corridor			
Mid – Atlantic Division		New York Division	New England Division
Philadelphia, PA		New York, NY	Groton, CT
Wilmington, DE	Baltimore, MD	Newark, NJ	Providence, RI
Lancaster, PA	Washington, DC		Boston, MA



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Attachment 3
NATIONAL RAILROAD PASSENGER CORPORATION
CONTRACTOR SAFETY TRAINING CSG - 106
PLEASE PRINT ALL INFORMATION
(Revised 2/2/07)

INSTRUCTOR: _____

EMP ID# _____

TRAINING LOCATION: _____

OF ATTENDEES: _____

WORK ORDER# _____

FUNCTION # _____

CLASS DATE: _____

RES/CEN# _____

P/O# _____

COST PER ATTENDEE: _____

CONTRACTOR INFORMATION

COMPANY CONTACT PERSON: _____

FAX#: _____

CONTACT PHONE # _____

COMPANY NAME: _____

COMPANY BILLING ADDRESS : _____

ZIP CODE: _____

ATTENDEE INFORMATION
PLEASE PRINT ALL INFORMATION

	PRINT NAME	SIGNATURE	DL STATE	DRIVERS LICENSE#	ID CARD #
1					
2					
3					
4					
5					
6					
7					



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	PRINT NAME	SIGNATURE	DL STATE	DRIVERS LICENSE#	ID CARD #
8					
9					
10					
11					
12					
13					
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CSXT SPECIAL PROVISIONS

I. AUTHORITY OF CSXT ENGINEER

The CSXT Representative shall have final authority in all matters affecting the safe maintenance of CSXT operations and CSXT property, and his or her approval shall be obtained by the Agency or its Contractor for methods of construction to avoid interference with CSXT operations and CSXT property and all other matters contemplated by the Agreement and these Special Provisions

II. INTERFERENCE WITH CSXT OPERATIONS

- A. Agency or its Contractor shall arrange and conduct its work so that there will be no interference with CSXT operations, including train, signal, telephone and telegraphic services, or damage to CSXT's property, or to poles, wires, and other facilities of tenants on CSXT's Property or right-of-way. Agency or its Contractor shall store materials so as to prevent trespassers from causing damage to trains, or CSXT Property. Whenever Work is likely to affect the operations or safety of trains, the method of doing such Work shall first be submitted to the CSXT Representative for approval, but such approval shall not relieve Agency or its Contractor from liability in connection with such Work.
- B. If conditions arising from or in connection with the Project require that immediate and unusual provisions be made to protect train operation or CSXT's property, Agency or its Contractor shall make such provision. If the CSXT Representative determines that such provision is insufficient, CSXT may, at the expense of Agency or its Contractor, require or provide such provision as may be deemed necessary, or cause the Work to cease immediately.

III. NOTICE OF STARTING WORK

Agency or its Contractor shall not commence any work on CSXT Property or rights-of-way until it has complied with the following conditions:

- A. Notify CSXT in writing of the date that it intends to commence Work on the Project. Such notice must be received by CSXT at least ten business days in advance of the date Agency or its Contractor proposes to begin Work on CSXT property. The notice must refer to this Agreement by date. If flagging service is required, such notice shall be submitted at least thirty (30) business days in advance of the date scheduled to commence the Work.
- B. Obtain authorization from the CSXT Representative to begin Work on CSXT property; such authorization to include an outline of specific conditions with which it must comply.
- C. Obtain from CSXT the names, addresses and telephone numbers of CSXT's personnel who must receive notice under provisions in the Agreement. Where more than one individual is designated, the area of responsibility of each shall be specified.

IV. WORK FOR THE BENEFIT OF THE CONTRACTOR

- A. No temporary or permanent changes to wire lines or other facilities (other than third party fiber optic cable transmission systems) on CSXT property that are considered necessary to the Work are anticipated or shown on the Plans. If any such changes are, or become, necessary in the opinion of CSXT or Agency, such changes will be covered by appropriate revisions to the Plans and by preparation of a force account estimate. Such force account estimate may be initiated by either CSXT or Agency, but must be approved by both CSXT and Agency. Agency or Contractor shall be responsible for arranging for the relocation of the third party fiber optic cable transmission systems, at no cost or expense to CSXT.
- B. Should Agency or Contractor desire any changes in addition to the above, then it shall make separate arrangements with CSXT for such changes to be accomplished at the Agency or Contractor's expense.

V. HAUL ACROSS RAILROAD

- A. If Agency or Contractor desires access across CSXT property or tracks at other than an existing and open public road crossing in or incident to construction of the Project, the Agency or Contractor must first obtain the permission of CSXT and shall execute a license agreement or right of entry satisfactory to CSXT, wherein Agency or Contractor agrees to bear all costs and liabilities related to such access.
- B. Agency and Contractor shall not cross CSXT's property and tracks with vehicles or equipment of any kind or character, except at such crossing or crossings as may be permitted pursuant to this section.



VI. COOPERATION AND DELAYS

- A. Agency or Contractor shall arrange a schedule with CSXT for accomplishing stage construction involving work by CSXT. In arranging its schedule, Agency or Contractor shall ascertain, from CSXT, the lead time required for assembling crews and materials and shall make due allowance therefore.
- B. Agency or Contractor may not charge any costs or submit any claims against CSXT for hindrance or delay caused by railroad traffic; work done by CSXT or other delay incident to or necessary for safe maintenance of railroad traffic; or for any delays due to compliance with these Special Provisions
- C. Agency and Contractor shall cooperate with others participating in the construction of the Project to the end that all work may be carried on to the best advantage.
- D. Agency and Contractor understand and agree that CSXT does not assume any responsibility for work performed by others in connection the Project. Agency and Contractor further understand and agree that they shall have no claim whatsoever against CSXT for any inconvenience, delay or additional cost incurred by Agency or Contractor on account of operations by others.

VII. STORAGE OF MATERIALS AND EQUIPMENT

Agency and Contractor shall not store their materials or equipment on CSXT's property or where they may potentially interfere with CSXT's operations, unless Agency or Contractor has received CSXT Representative's prior written permission. Agency and Contractor understand and agree that CSXT will not be liable for any damage to such materials and equipment from any cause and that CSXT may move, or require Agency or Contractor to move, such material and equipment at Agency's or Contractor's sole expense. To minimize the possibility of damage to the railroad tracks resulting from the unauthorized use of equipment, all grading or other construction equipment that is left parked near the tracks unattended by watchmen shall be immobilized to the extent feasible so that it cannot be moved by unauthorized persons.

VIII. CONSTRUCTION PROCEDURES

- A. General
 1. Construction work on CSXT property shall be subject to CSXT's inspection and approval.
 2. Construction work on CSXT property shall be in accord with CSXT's written outline of specific conditions and with these Special Provisions.
 3. Contractor shall observe the terms and rules of the CSXT Safe Way manual, which Agency and Contractor shall be required to obtain from CSXT, and in accord with any other instructions furnished by CSXT or CSXT's Representative.
- B. Blasting
 1. Agency or Contractor shall obtain CSXT Representative's and Agency Representative's prior written approval for use of explosives on or adjacent to CSXT property. If permission for use of explosives is granted, Agency or Contractor must comply with the following:
 - a. Blasting shall be done with high charges under the direct supervision of a responsible officer or employee of Agency or Contractor.
 - b. Electric detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way train radios.
 - c. No blasting shall be done without the presence of an authorized representative of CSXT. At least 10 days' advance notice to CSXT Representative is required to arrange for the presence of an authorized CSXT representative and any flagging that CSXT may require
 - d. Agency or Contractor must have at the Project site adequate equipment, labor and materials, and allow sufficient time, to (i) clean up (at Agency's expense) debris resulting from the blasting without any delay to trains; and (ii) correct (at Agency's expense) any track misalignment or other damage to CSXT's property resulting from the blasting, as directed by CSXT Representative, without delay to trains. If Agency's or Contractor's actions result in delay of any trains, including Amtrak passenger trains, Agency shall bear the entire cost thereof.
 - c. Agency and Contractor shall not store explosives on CSXT property.



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2. CSXT Representative will:

- a. Determine the approximate location of trains and advise Agency or Contractor of the approximate amount of time available for the blasting operation and clean-up.
- b. Have the authority to order discontinuance of blasting if, in his or her opinion, blasting is too hazardous or is not in accord with these Special Provisions.

IX. MAINTENANCE OF DITCHES ADJACENT TO CSXT TRACKS

Agency or Contractor shall maintain all ditches and drainage structures free of silt or other obstructions that may result from their operations. Agency or Contractor shall provide erosion control measures during construction and use methods that accord with applicable state standard specifications for road and bridge construction, including either (1) silt fence; (2) hay or straw barrier; (3) berm or temporary ditches; (4) sediment basin; (5) aggregate checks; and (6) channel lining. All such maintenance and repair of damages due to Agency's or Contractor's operations shall be performed at Agency's expense.

X. FLAGGING / INSPECTION SERVICE

- A. CSXT has sole authority to determine the need for flagging required to protect its operations and property. In general, flagging protection will be required whenever Agency or Contractor or their equipment are, or are likely to be, working within fifty (50) feet of live track or other track clearances specified by CSXT, or over tracks.
- B. Agency shall reimburse CSXT directly for all costs of flagging that is required on account of construction within CSXT property shown in the Plans, or that is covered by an approved plan revision, supplemental agreement or change order.
- C. Agency or Contractor shall give a minimum of 10 days' advance notice to CSXT Representative for anticipated need for flagging service. No work shall be undertaken until the flag person(s) is/are at the job site. If it is necessary for CSXT to advertise a flagging job for bid, it may take up to 90-days to obtain this service, and CSXT shall not be liable for the cost of delays attributable to obtaining such service.
- D. CSXT shall have the right to assign an individual to the site of the Project to perform inspection service whenever, in the opinion of CSXT Representative, such inspection may be necessary. Agency shall reimburse CSXT for the costs incurred by CSXT for such inspection service. Inspection service shall not relieve Agency or Contractor from liability for its Work.
- E. CSXT shall render invoices for, and Agency shall pay for, the actual pay rate of the flagpersons and inspectors used, plus standard additives, whether that amount is above or below the rate provided in the Estimate. If the rate of pay that is to be used for inspector or flagging service is changed before the work is started or during the progress of the work, whether by law or agreement between CSXT and its employees, or if the tax rates on labor are changed, bills will be rendered by CSXT and paid by Agency using the new rates. Agency and Contractor shall perform their operations that require flagging protection or inspection service in such a manner and sequence that the cost of such will be as economical as possible.

XI. UTILITY FACILITIES ON CSXT PROPERTY

Agency shall arrange, upon approval from CSXT, to have any utility facilities on or over CSXT Property changed as may be necessary to provide clearances for the proposed trackage.

XII. CLEAN-UP

Agency or Contractor, upon completion of the Project, shall remove from CSXT's Property any temporary grade crossings, any temporary erosion control measures used to control drainage, all machinery, equipment, surplus materials, falsework, rubbish, or temporary buildings belonging to Agency or Contractor. Agency or Contractor, upon completion of the Project, shall leave CSXT Property in neat condition, satisfactory to CSXT Representative.

XIII. FAILURE TO COMPLY

If Agency or Contractor violate or fail to comply with any of the requirements of these Special Provisions, (a) CSXT may require Agency and/or Contractor to vacate CSXT Property; and (b) CSXT may withhold monies due Agency and/or Contractor; (c) CSXT may require Agency to withhold monies due Contractor; and (d) CSXT may cure such failure and the Agency shall reimburse CSXT for the cost of curing such failure.



CONSTRUCTION REQUIREMENTS

When performing work on, over or adjacent to CSX Transportation (CSXT) right-of-way or operations, the Contractor must abide by the current CSXT Special Provisions and the following additional requirements.

- 1 All construction related correspondence will be directed to AECOM, acting as the Construction Monitoring Representative (CMR) on behalf of CSXT, with the following contact and address:

Brian V. Harrison
Manager – Construction Services
AECOM
260 S. Broad Street, Suite 1500
Philadelphia, PA 19102
(215) 966-4846

Upon receipt of notification, the CMR will direct the Contractor to the local CSXT construction contact for the project.

2. The Contractor shall submit the following construction procedures and documents. The Contractor shall obtain written acceptance before proceeding with construction.
 - a. Means and Methods – The Contractor shall develop a detailed submission indicating the progression of work with specific times when tasks will be performed during the project. This submission will include a walkthrough at which time CSXT personnel will be present. Work will not be permitted to commence until the Contractor has provided CSXT with a satisfactory plan that the project will be undertaken without scheduling, performance or safety related issues. Provide a listing of the anticipated equipment to be used, the location of all equipment to be used and insure a contingency plan of action is in place should a primary piece of equipment malfunction. All work in the vicinity of CSXT property that has the potential of affecting CSXT train operations must be submitted and approved by CSXT prior to work being performed. This submission will also include a detailed narrative discussing the coordination of project safety issues between the sponsor, Contractor, CSXT and the CMR. The narrative shall address project level coordination and day to day, specific work operations including, but not limited to, crane and equipment operations, demolition plans and temporary works.
 - b. Demolition Shield – An overhead (deck level) demolition shield is required for the project. A track level shielding system will not be permitted. The demolition shield must maintain the existing vertical clearance over all tracks or a minimum of 23'-0" measured from top of high rail to the lowest point of structure in the clearance area which extends 6'-0" to both sides from centerline of track. Submittals must include a plan showing the details of the shield, a written installation and removal procedure and design calculations verifying the capacity of the shield. The shield should be a deck level shield designed for a minimum load of fifty (50) pounds per square foot plus the weight of the equipment, debris and any other load to be carried. A registered Professional Engineer in the State of Maryland must seal all demolition shield plans, calculations and procedures.
 - c. Demolition Plans – Submittals must include detailed plans and procedures for all demolition activities. The submission shall indicate the location and capacity of any proposed cranes, the estimated lifting loads and the connection devices (i.e. slings, shackles, etc.) All lifting equipment and connection devices shall have capacity for 150% of the actual lifting load. The factor of safety provided by the manufacturer in the lifting capacity charts shall not be considered in the 150% requirement. A registered Professional Engineer in the State of Maryland must seal all demolition plans, calculations and procedures.
 - d. Ballast Protection – The proposed ballast protection system shall use filter fabric and indicate the anchorage system. The ballast protection is to extend 25' beyond the proposed limit of work and be continuously maintained to prevent all contaminants from entering the ballast section of all tracks for the entire duration of the project.



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- e. Construction Schedule – Submit a detailed construction schedule for the duration of the project clearly indicating the time periods while working on and around CSXT right-of-way. As the work progresses, this schedule shall be updated and resubmitted as necessary to reflect changes in work sequence, duration and method, etc.
- f. Insurance – Submit all required insurance information in accordance with the current CSXT Insurance Standards for approval. The complete original policies should be submitted to:

Donna W. Melton
Manager – Insurance
CSX Transportation, Inc.
500 Water Street - C907
Jacksonville, FL 32202
Phone: 904-359-1247
Fax: 904-245-2833

with a copy to the CMR. The insurance policies will be required to be in place and approved prior to any work commencing on or that could potentially impact CSXT right-of-way.

- g. Emergency Action Plan – Submit an emergency action plan indicating the location of the site, contact numbers, access to the site, instructions for emergency response and location of the nearest hospitals. This plan should cover all items required in the event of an emergency at the site including fire suppression. Coordinate the Emergency Action Plan with the safety related discussion of the Means and Methods submission discussed above. The plan should also include a method to provide this information to each project worker for each day on site.
3. Up to thirty (30) days will be required to review all construction submissions. Up to an additional thirty (30) days will be required to review any subsequent submissions returned not approved.
 4. The Contractor must not use CSXT right-of-way for storage of materials or equipment during construction. The CSXT right-of-way must remain clear at all times.
 5. The Contractor will be required to abide by the provisions of the Agency/CSXT Construction Agreement. Periodically, throughout the project duration, the Contractor will be required to meet, discuss and, if necessary, take immediate action at the discretion of CSXT personnel and/or the CMR to comply with provisions of that agreement and these specifications.
 6. This project will require the use of CSXT Flagmen to protect train operations from project activity in the area of the tracks. While CSXT cannot guarantee the availability of flagmen at all requested times, every accommodation will be extended to the Contractor when forces are available. Flagging requests should be made to the CSXT Roadmaster, David Lackford at 302-994-8715 at least thirty (30) days in advance. Termination or cancellation of a flagman requires ten (10) days notice to avoid incurring costs.
 7. All crane and equipment operations that could potentially impact CSXT right-of-way must be coordinated with the CSXT Flagman.
 8. The Contractor shall execute Schedule I (Contractor's Acceptance) prior to starting work on, over, under or adjacent to CSXT right of way, which is part of the Construction Agreement to be executed between the Agency and CSXT.
 9. Contractor access will be limited to the immediate project area only. The CSXT right-of-way may not be used for contractor access to the project site and no temporary at-grade crossings will be allowed.



INSURANCE REQUIREMENTS

I. Insurance Policies:

Company and Contractor, if and to the extent that either is performing work on or about CSXT's property, shall procure and maintain the following insurance policies:

1. Commercial General Liability coverage at their sole cost and expense with limits of not less than \$5,000,000 in combined single limits for bodily injury and/or property damage per occurrence, and such policies shall name CSXT as an additional named insured.
2. Statutory Worker's Compensation and Employers Liability Insurance with limits of not less than \$1,000,000, which insurance must contain a waiver of subrogation against CSXT and its affiliates.
3. Commercial automobile liability insurance with limits of not less than \$500,000 combined single limit for bodily injury and/or property damage per occurrence, and such policies shall name CSXT as an additional named insured.
4. Railroad protective liability insurance with limits of not less than \$5,000,000 combined single limit for bodily injury and/or property damage per occurrence and an aggregate annual limit of \$10,000,000, which insurance shall satisfy the following additional requirements:
 - a. The insurer must be financially stable and rated B+ or better in Best's Insurance Reports.
 - b. The Railroad Protective Insurance Policy must be on the ISO/RIMA Form of Railroad Protective Insurance - Insurance Services Office (ISO) Form CG 00 35.
 - c. CSX Transportation must be named as the named insured on the Railroad Protective Insurance Policy.
 - d. Name and Address of Contractor and Company must be shown on the Declarations page.
 - e. Description of operations must appear on the Declarations page and must match the Project description, including project or contract identification numbers.
 - f. Authorized endorsements must include the Pollution Exclusion Amendment - CG 28 31, unless using form CG 00 35 version 96 and later.
 - g. Authorized endorsements may include:
 - (i) Broad Form Nuclear Exclusion - IL 00 21
 - (ii) 30-day Advance Notice of Non-renewal or cancellation
 - (iii) Required State Cancellation Endorsement
 - (iv) Quick Reference or Index - CL/II. 240



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h. Authorized endorsements may not include:

- (i) A Pollution Exclusion Endorsement except CG 28 31
- (ii) A Punitive or Exemplary Damages Exclusion
- (iii) A "Common Policy Conditions" Endorsement
- (iv) Any endorsement that is not named in Section 4 (f) or (g) above.
- (v) Policies that contain any type of deductible

5. Such additional or different insurance as CSXT may require.

II. Additional Terms

1. Contractor must submit its original insurance policies and two copies and all notices and correspondence regarding the insurance policies to:

Donna W. Melton
Manager – Insurance
CSX Transportation, Inc.
500 Water Street - C907
Jacksonville, FL 32202
Phone: 904-359-1247
Fax: 904-245-2833

2. Neither Company nor Contractor may begin work on the Project until it has received CSXT's written approval of the required insurance policies.



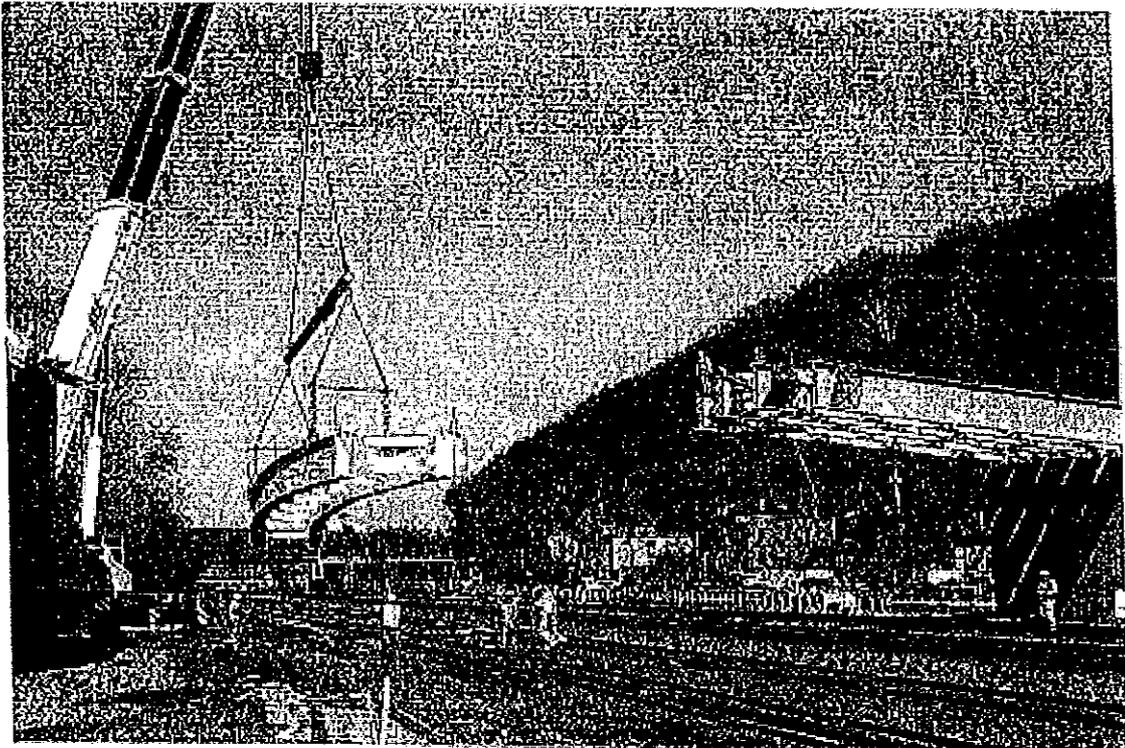
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SPECIAL PROVISIONS FOR PROTECTION OF RAILWAY INTERESTS



NORFOLK SOUTHERN RAILWAY COMPANY



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1. AUTHORITY OF RAILROAD ENGINEER AND DEPARTMENT ENGINEER:

The authorized representative of the Railroad Company, hereinafter referred to as Railroad Engineer, shall have final authority in all matters affecting the safe maintenance of Railroad traffic of his Company including the adequacy of the foundations and structures supporting the Railroad tracks.

The authorized representative of the Department, hereinafter referred to as the Department Engineer, shall have authority over all other matters as prescribed herein and in the Project Specifications.

2. NOTICE OF STARTING WORK:

A. The Department's Prime contractor shall not commence any work on railroad rights-of-way until he has complied with the following conditions:

1. Given the Railroad written notice, with copy to the Department Engineer who has been designated to be in charge of the work, at least ten days in advance of the date he proposes to begin work on Railroad rights-of-way.

Office of Chief Engineer
Bridges & Structures
Norfolk Southern Corporation
1200 Peachtree Street NE
Internal Box #142
Atlanta, Georgia 30309

2. Obtained written approval from the Railroad of Railroad Protective Liability Insurance coverage as required by paragraph 14 herein. It should be noted that Railroad Company does not accept notation of Railroad Protective Insurance on a certificate of liability insurance form or Binders as Railroad Company must have the full original countersigned policy. Further, please note that mere receipt of the policy is not the only issue but review for compliance. Due to the number of projects system-wide, it typically takes a minimum of 30-45 days for Railroad Company to review.
3. Obtained Railroad's Flugging Services as required by paragraph 7 herein.
4. Obtained written authorization from the Railroad to begin work on Railroad rights-of-way, such authorization to include an outline of specific conditions with which he must comply.



5. Furnished a schedule for all work within the Railroad rights-of-way as required by paragraph 7,B,1.

B. The Railroad's written authorization to proceed with the work shall include the names, addresses, and telephone numbers of the Railroad's representatives who are to be notified as hereinafter required. Where more than one representative is designated, the area of responsibility of each representative shall be specified.

3. INTERFERENCE WITH RAILROAD OPERATIONS:

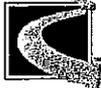
A. The Contractor shall so arrange and conduct his work that there will be no interference with Railroad operations, including train, signal, telephone and telegraphic services, or damage to the property of the Railroad Company or to poles, wires, and other facilities of tenants on the rights-of-way of the Railroad Company. Whenever work is liable to affect the operations or safety of trains, the method of doing such work shall first be submitted to the Railroad Engineer for approval, but such approval shall not relieve the Contractor from liability. Any work to be performed by the Contractor which requires flagging service or inspection service shall be deferred by the Contractor until the flagging service or inspection service required by the Railroad is available at the job site.

B. Whenever work within Railroad rights-of-way is of such a nature that impediment to Railroad operations such as use of runaround tracks or necessity for reduced speed is unavoidable, the Contractor shall schedule and conduct his operations so that such impediment is reduced to the absolute minimum.

C. Should conditions arising from, or in connection with the work, require that immediate and unusual provisions be made to protect operations and property of the Railroad, the Contractor shall make such provisions. If in the judgment of the Railroad Engineer, or in his absence, the Railroad's Division Engineer, such provisions is insufficient, either may require or provide such provisions as he deems necessary. In any event, such unusual provisions shall be at the Contractor's expense and without cost to the Railroad or the Department.

4. TRACK CLEARANCES:

A. The minimum track clearances to be maintained by the Contractor during construction are shown on the Project Plans. However, before undertaking any work within Railroad right-of-way, or before placing any obstruction over any track, the Contractor shall:



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1. Notify the Railroad's representative at least 72 hours in advance of the work.
2. Receive assurance from the Railroad's representative that arrangements have been made for flagging service as may be necessary.
3. Receive permission from the Railroad's representative to proceed with the work.
4. Ascertain that the Department Engineer has received copies of notice to the Railroad and of the Railroad's response thereto.

5. **CONSTRUCTION PROCEDURES:**

A. **General:**

Construction work and operations by the Contractor on Railroad property shall be:

1. Subject to the inspection and approval of the Railroad.
2. In accord with the Railroad's written outline of specific conditions.
3. In accord with the Railroad's general rules, regulations and requirements including those relating to safety, fall protection and personal protective equipment.
4. In accord with these Special Provisions.

B. **Excavation:**

The subgrade of an operated track shall be maintained with edge of berm at least 10'-0" from centerline of track and not more than 24- inches below top of rail. Contractor will not be required to make existing section meet this specification if substandard, in which case existing section will be maintained.

Additionally, the Railroad Engineer may require installation of orange construction safety fencing for protection of the work area.



C. Excavation for Structures:

The Contractor will be required to take special precaution and care in connection with excavating and shoring pits, and in driving piles or sheeting for footings adjacent to tracks to provide adequate lateral support for the tracks and the loads which they carry, without disturbance of track alignment and surface, and to avoid obstructing track clearances with working equipment, tools or other material. All plans and calculations for shoring shall be prepared and signed by a Registered Professional Engineer. The Registered Professional Engineer will be responsible for the accuracy for all controlling dimensions as well as the selection of soil design values which will accurately reflect the actual field conditions. The procedure for doing such work, including need of and plans and calculations for shoring, shall first be approved by the Department Engineer and the Railroad Engineer, but such approval shall not relieve the Contractor from liability.

Additionally, walkway with handrail protection may be required as noted in paragraph 11 herein.

D. Demolition, Erection, Hoisting

1. Railroad tracks and other railroad property must be protected from damage during the procedure.
2. The Contractor is required to submit a plan showing the location of cranes, horizontally and vertically, operating radii, with delivery or disposal locations shown. The location of all tracks and other railroad facilities as well as all obstructions such as wire lines, poles, adjacent structures, etc. must also be shown.
3. Crane rating sheets showing cranes to be adequate for 150% of the actual weight of the pick. A complete set of crane charts, including crane, counterweight, and boom nomenclature is to be submitted.
4. Plans and computations showing the weight of the pick must be submitted. Calculations shall be made from plans of the existing and/or proposed structure showing complete and sufficient details with supporting data for the demolition or erection of the structure. If plans do not exist, lifting weights must be calculated from field measurements. The field measurements are to be made under the supervision of the Registered Professional Engineer submitting the procedure and calculations.
5. A data sheet must be submitted listing the types, size, and arrangements of all rigging and connection equipment.



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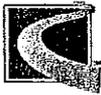
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6. A complete procedure is to be submitted, including the order of lifts, time required for each lift, and any repositioning or re-hitching of the crane or cranes.
7. All erection or demolition plans, procedures, data sheets, etc. submitted must be prepared, signed and sealed by a Registered Professional Engineer.
8. The Railroad Engineer or his designated representative must be present at the site during the entire demolition and erection procedure period.
9. All procedures, plans and calculations shall first be approved by the Department Engineer and the Railroad Engineer, but such approval does not relieve the Contractor from liability.

E. Blasting:

1. The Contractor shall obtain advance approval of the Railroad Engineer and the Department Engineer for use of explosives on or adjacent to Railroad property. The request for permission to use explosives shall include a detailed blasting plan. If permission for use of explosives is granted, the Contractor will be required to comply with the following:
 - (a) Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of the Contractor and a licensed blaster.
 - (b) Electric detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way radios.
 - (c) No blasting shall be done without the presence of the Railroad Engineer or his authorized representative. At least 72 hours advance notice to the person designated in the Railroad's notice of authorization to proceed (see paragraph 2B) will be required to arrange for the presence of an authorized Railroad representative and such flagging as the Railroad may require.
 - (d) Have at the job site adequate equipment, labor and materials and allow sufficient time to clean up debris resulting from the blasting without delay to trains, as well as correcting at his expense any track misalignment or other damage to Railroad



property resulting from the blasting as directed by the Railway's authorized representative. If his actions result in delay of trains, the Contractor shall bear the entire cost thereof.

2. The Railroad representative will:
 - (a) Determine approximate location of trains and advise the Contractor the appropriate amount of time available for the blasting operation and clean up.
 - (b) Have the authority to order discontinuance of blasting if, in his opinion, blasting is too hazardous or is not in accord with these special provisions.

F. Maintenance of Railroad Facilities:

1. The Contractor will be required to maintain all ditches and drainage structures free of silt or other obstructions which may result from his operations and provide and maintain any erosion control measures as required. The Contractor will promptly repair eroded areas within Railroad rights-of-way and repair any other damage to the property of the Railroad or its tenants.
2. All such maintenance and repair of damages due to the Contractor's operations shall be done at the Contractor's expense.

G. Storage of Materials and Equipment:

Materials and equipment shall not be stored where they will interfere with Railroad operations, nor on the rights-of-way of the Railroad Company without first having obtained permission from the Railroad Engineer, and such permission will be with the understanding that the Railroad Company will not be liable for damage to such material and equipment from any cause and that the Railroad Engineer may move or require the Contractor to move, at the Contractor's expense, such material and equipment.

All grading or construction machinery that is left parked near the track unattended by a watchman shall be effectively immobilized so that it cannot be moved by unauthorized persons. The Contractor shall protect, defend, indemnify and save Railroad, and any associated, controlled or affiliated corporation, harmless from and against all losses, costs, expenses, claim or liability for loss or damage to property or the loss of life or personal injury, arising out of or incident to the Contractor's failure to immobilize grading or construction machinery.



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H. Cleanup:

Upon completion of the work, the Contractor shall remove from within the limits of the Railroad rights-of-way, all machinery, equipment, surplus materials, falsework, rubbish or temporary buildings of the Contractor, and leave said rights-of-way in a neat condition satisfactory to the Chief Engineer of the Railroad or his authorized representative.

6. DAMAGES:

- A. The Contractor shall assume all liability for any and all damages to his work, employees, servants, equipment and materials caused by Railroad traffic.
- B. Any cost incurred by the Railroad for repairing damages to its property or to property of its tenants, caused by or resulting from the operations of the Contractor, shall be paid directly to the Railroad by the Contractor.

7. FLAGGING SERVICES:

A. Requirements:

Flagging services will not be provided until the contractor's insurance has been reviewed & approved by the Railroad.

Under the terms of the agreement between the Department and the Railroad, the Railroad has sole authority to determine the need for flagging required to protect its operations. In general, the requirements of such services will be whenever the Contractor's personnel or equipment are or are likely to be, working on the Railroad's right-of-way, or across, over, adjacent to, or under a track, or when such work has disturbed or is likely to disturb a railroad structure or the railroad roadbed or surface and alignment of any track to such extent that the movement of trains must be controlled by flagging.

Normally, the Railroad will assign one flagman to a project; but in some cases, more than one may be necessary, such as yard limits where three (3) flagmen may be required. However, if the Contractor works within distances that violate instructions given by the Railroad's authorized representative or performs work that has not been scheduled with the Railroad's authorized representative, a flagman or flagmen may be required full time until the project has been completed.



B. Scheduling and Notification:

1. The Contractor's work requiring railroad flagging should be scheduled to limit the presence of a flagman at the site to a maximum of 50 hours per week. The Contractor shall receive Railroad approval of work schedules requiring a flagman's presence in excess of 40 hours per week.
2. Not later than the time that approval is initially requested to begin work on Railroad right-of-way, Contractor shall furnish to the Railroad and the Department a schedule for all work required to complete the portion of the project within Railroad right-of-way and arrange for a job site meeting between the Contractor, the Department, and the Railroad's authorized representative. Flagman or Flagmen may not be provided until the job site meeting has been conducted and the Contractor's work scheduled.
3. The Contractor will be required to give the Railroad representative at least 10 working days of advance written notice of intent to begin work within Railroad right-of-way in accordance with this special provision. Once begun, when such work is then suspended at any time, or for any reason, the Contractor will be required to give the Railroad representative at least 3 working days of advance notice before resuming work on Railroad right-of-way. Such notices shall include sufficient details of the proposed work to enable the Railroad representative to determine if flagging will be required. If such notice is in writing, the Contractor shall furnish the Engineer a copy; if notice is given verbally, it shall be confirmed in writing with copy to the Engineer. If flagging is required, no work shall be undertaken until the flagman, or flagmen are present at the job site. It may take up to 30 days to obtain flagging initially from the Railroad. When flagging begins, the flagman is usually assigned by the Railroad to work at the project site on a continual basis until no longer needed and cannot be called for on a spot basis. If flagging becomes unnecessary and is suspended, it may take up to 30 days to again obtain from the Railroad. Due to Railroad labor agreements, it is necessary to give 5 working days notice before flagging service may be discontinued and responsibility for payment stopped.
4. If, after the flagman is assigned to the project site, an emergency arises that requires the flagman's presence elsewhere, then the Contractor shall delay work on Railroad right-of-way until such time as the flagman is again available. Any additional costs resulting from such delay shall be borne by the Contractor and not the Department or Railroad.



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C. Payment:

1. The Department will be responsible for paying the Railroad directly for any and all costs of flagging which may be required to accomplish the construction.
2. The estimated cost of flagging is current rate per day based on a 10-hour work day. This cost includes the base pay for the flagman, overhead, and includes a per diem charge for travel expenses, meals and lodging. The charge to the Department by the Railroad will be the actual cost based on the rate of pay for the Railroad's employees who are available for flagging service at the time the service is required.
3. Work by a flagman in excess of 8 hours per day or 40 hours per week, but not more than 12 hours a day will result in overtime pay at 1 and 1/2 times the appropriate rate. Work by a flagman in excess of 12 hours per day will result in overtime at 2 times the appropriate rate. If work is performed on a holiday, the flagging rate is 2 and 1/2 times the normal rate.
4. Railroad work involved in preparing and handling bills will also be charged to the Department. Charges to the Department by the Railroad shall be in accordance with applicable provisions of Subchapter B, Part 140, Subpart I and Subchapter G, Part 646, Subpart B of the Federal-Aid Policy Guide issued by the Federal Highway Administration on December 9, 1991, including all current amendments. Flagging costs are subject to change. *The above estimates of flagging costs are provided for information only and are not binding in any way.*

D. Verification:

1. Railroad's flagman will electronically enter flagging time via Railroad's electronic billing system. Any complaints concerning flagging must be resolved in a timely manner. If need for flagging is questioned, please contact Railroad's System Engineer Public Improvements (404) 529-1641. All verbal complaints will be confirmed in writing by the Contractor within 5 working days with a copy to the Highway Engineer. Address all written correspondence to:



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Office of Chief Engineer
Bridges & Structures
Norfolk Southern Corporation
1200 Peachtree Street NE,
Internal Box 142
Atlanta, Georgia 30309

Attn:
System Engineer
Public Improvements

2. The Railroad flagman assigned to the project will be responsible for notifying the Department Engineer upon arrival at the job site on the first day (or as soon thereafter as possible) that flagging services begin and on the last day that he performs such services for each separate period that services are provided. The Department Engineer will document such notification in the project records. When requested, the Department Engineer will also sign the flagman's diary showing daily time spent and activity at the project site.

8. **HAUL ACROSS RAILROAD:**

- A. Where the plans show or imply that materials of any nature must be hauled across a Railroad, unless the plans clearly show that the Department has included arrangements for such haul in its agreement with the Railroad, the Contractor will be required to make all necessary arrangements with the Railroad regarding means of transporting such materials across the Railroad. The Contractor will be required to bear all costs incidental to such crossings whether services are performed by his own forces or by Railroad personnel.
- B. No crossing may be established for use of the Contractor for transporting materials or equipment across the tracks of the Railroad Company unless specific authority for its installation, maintenance, necessary watching and flagging thereof and removal, until a temporary private crossing agreement has been executed between the Contractor and Railroad. The approval process for an agreement normally takes 90-days.



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9. WORK FOR THE BENEFIT OF THE CONTRACTOR:

- A. All temporary or permanent changes in wire lines or other facilities which are considered necessary to the project are shown on the plans; included in the force account agreement between the Department and the Railroad or will be covered by appropriate revisions to same which will be initiated and approved by the Department and/or the Railroad.
- B. Should the Contractor desire any changes in addition to the above, then he shall make separate arrangements with the Railroad for same to be accomplished at the Contractor's expense.

10. COOPERATION AND DELAYS:

- A. It shall be the Contractor's responsibility to arrange a schedule with the Railroad for accomplishing stage construction involving work by the Railroad or tenants of the Railroad. In arranging his schedule he shall ascertain, from the Railroad, the lead time required for assembling crews and materials and shall make due allowance therefore.
- B. No charge or claim of the Contractor against either the Department or the Railroad Company will be allowed for hindrance or delay on account of railway traffic; any work done by the Railway Company or other delay incident to or necessary for safe maintenance of railway traffic or for any delays due to compliance with these special provisions.

11. TRAINMAN'S WALKWAYS:

Along the outer side of each exterior track of multiple operated track, and on each side of single operated track, an unobstructed continuous space suitable for trainman's use in walking along trains, extending to a line not less than 10 feet from centerline of track, shall be maintained. Any temporary impediments to walkways and track drainage encroachments or obstructions allowed during work hours while Railway's protective service is provided shall be removed before the close of each work day. If there is any excavation near the walkway, a handrail, with 10'-0" minimum clearance from centerline of track, shall be placed and must conform to AREMA and/or FRA standards.

12. GUIDELINES FOR PERSONNEL ON RAILROAD RIGHT-OF-WAY:

- A. All persons shall wear hard hats. Appropriate eye and hearing protection must be used. Working in shorts is prohibited. Shirts must cover shoulders, back and abdomen. Working in tennis or jogging shoes, sandals, boots with high heels, cowboy and other slip-on type boots is prohibited. Hard-sole, lace-up footwear, zippered boots or boots cinched up with straps which fit



snugly about the ankle are adequate. Wearing of safety boots is strongly recommended. In the vicinity of at-grade crossings, it is strongly recommended that reflective vests be worn.

- B. No one is allowed within 25' of the centerline of track without specific authorization from the flagman.
- C. All persons working near track while train is passing are to lookout for dragging bands, chains and protruding or shifted cargo.
- D. No one is allowed to cross tracks without specific authorization from the flagman.
- E. All welders and cutting torches working within 25' of track must stop when train is passing.
- F. No steel tape or chain will be allowed to cross or touch rails without permission.

13. GUIDELINES EQUIPMENT ON RAILROAD RIGHT-OF-WAY:

- A. No crane or boom equipment will be allowed to set up to work or park within boom distance plus 15' of centerline of track without specific permission from railroad official and flagman.
- B. No crane or boom equipment will be allowed to foul track or lift a load over the track without flag protection and track time.
- C. All employees will stay with their machines when crane or boom equipment is pointed toward track.
- D. All cranes and boom equipment under load will stop work while train is passing (including pile driving).
- E. Swinging loads must be secured to prevent movement while train is passing.
- F. No loads will be suspended above a moving train.
- G. No equipment will be allowed within 25' of centerline of track without specific authorization of the flagman.
- H. Trucks, tractors or any equipment will not touch ballast line without specific permission from railroad official and flagman.



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- I. No equipment or load movement within 25' or above a standing train or railroad equipment without specific authorization of the flagman.
- J. All operating equipment within 25' of track must halt operations when a train is passing. All other operating equipment may be halted by the flagman if the flagman views the operation to be dangerous to the passing train.
- K. All equipment, loads and cables are prohibited from touching rails.
- L. While clearing and grubbing, no vegetation will be removed from railroad embankment with heavy equipment without specific permission from the Railroad Engineer and flagman.
- M. No equipment or materials will be parked or stored on Railroad's property unless specific authorization is granted from the Railroad Engineer.
- N. All unattended equipment that is left parked on Railroad property shall be effectively immobilized so that it cannot be moved by unauthorized persons.
- O. All cranes and boom equipment will be turned away from track after each work day or whenever unattended by an operator.

14. INSURANCE:

- A. In addition to any other forms of insurance or bonds required under the terms of the contract and specifications, the Prime Contractor will be required to carry insurance of the following kinds and amounts:
 - 1. Commercial General Liability Insurance having a combined single limit of not less than \$2,000,000 per occurrence for all loss, damage, cost and expense, including attorneys' fees, arising out of bodily injury liability and property damage liability during the policy period. Said policy shall include explosion, collapse, and underground hazard (XCU) coverage, shall be endorsed to name Railroad specified in Item A.2.c. below both as the certificate holder and as an additional insured, and shall include a severability of interests provision.
 - 2. Railroad Protective Liability Insurance having a combined single limit of not less than \$2,000,000 each occurrence and \$6,000,000 in the aggregate applying separately to each annual period. If the project involves track over which passenger trains operate, the insurance limits required are not less than a combined single limit of \$5,000,000 each occurrence and \$10,000,000 in the aggregate applying separately to each annual period. Said policy shall provide coverage for all loss,



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damage or expense arising from bodily injury and property damage liability, and physical damage to property attributed to acts or omissions at the job site.

The standards for the Railroad Protective Liability Insurance are as follows:

- a. The insurer must be rated A- or better by A.M. Best Company, Inc.
- b. The policy must be written using one of the following combinations of Insurance Services Office ("ISO") Railroad Protective Liability Insurance Form Numbers:
 - (1) CG 00 35 01 96 and CG 28 31 10 93; or
 - (2) CG 00 35 07 98 and CG 28 31 07 98; or
 - (3) CG 00 35 10 01; or
 - (4) CG 00 35 12 04.
- c. The named insured shall read:

Norfolk Southern Railway Company
Three Commercial Place
Norfolk, Virginia 23510-2191
Attn: Risk Management
- e. The description of operations must appear on the Declarations, must match the project description in this agreement, and must include the appropriate Department project and contract identification numbers.
- f. The job location must appear on the Declarations and must include the city, state, and appropriate highway name/number. NOTE: Do not include any references to milepost on the insurance policy.
- g. The name and address of the prime contractor must appear on the Declarations.
- h. The name and address of the Department must be identified on the Declarations as the "Involved Governmental Authority or Other Contracting Party."



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i. Other endorsements/forms that will be accepted are:

- (1) Broad Form Nuclear Exclusion – Form IL 00 21
- (2) 30-day Advance Notice of Non-renewal or cancellation
- (3) Required State Cancellation Endorsement
- (4) Quick Reference or Index Form CL/IL 240

j. Endorsements/forms that are NOT acceptable are:

- (1) Any Pollution Exclusion Endorsement except CG 28 31
- (2) Any Punitive or Exemplary Damages Exclusion
- (3) Known Injury or Damage Exclusion form CG 00 59
- (4) Any Common Policy Conditions form
- (5) Any other endorsement/form not specifically authorized in item no. 2.h above.

B. If any part of the work is sublet, similar insurance, and evidence thereof as specified in A.1 above, shall be provided by or on behalf of the subcontractor to cover its operations on Railroad's right of way.

C. Prior to entry on Railroad right-of-way, the original Railroad Protective Liability Insurance Policy shall be submitted by the Prime Contractor to the Department at the address below for its review and transmittal to the Railroad. In addition, certificates of insurance evidencing the Prime Contractor's and any subcontractors' Commercial General Liability Insurance shall be issued to the Railroad and the Department at the addresses below, and forwarded to the Department for its review and transmittal to the Railroad. The certificates of insurance shall state that the insurance coverage will not be suspended, voided, canceled, or reduced in coverage or limits without (30) days advance written notice to Railroad and the Department. No work will be permitted by Railroad on its right-of-way until it has reviewed and approved the evidence of insurance required herein.

DEPARTMENT:

RAILROAD:

Risk Management
Norfolk Southern Railway Company
Three Commercial Place
Norfolk, Virginia 23510-2191

D. The insurance required herein shall in no way serve to limit the liability of Department or its Contractors under the terms of this agreement.



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15. FAILURE TO COMPLY:

In the event the Contractor violates or fails to comply with any of the requirements of these Special Provisions:

- A. The Railroad Engineer may require that the Contractor vacate Railroad property.
- B. The Engineer may withhold all monies due the Contractor on monthly statements.

Any such orders shall remain in effect until the Contractor has remedied the situation to the satisfaction of the Railroad Engineer and the Engineer.

16. PAYMENT FOR COST OF COMPLIANCE:

No separate payment will be made for any extra cost incurred on account of compliance with these special provisions. All such costs shall be included in prices bid for other items of the work as specified in the payment items.

Office of Chief Engineer
Bridges & Structures
Norfolk Southern Corporation
1200 Peachtree Street, N. E.
Internal Box 142
Atlanta, GA 30309

Date:
File:
Milepost:



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**CATEGORY 100
PRELIMINARY**

SECTION 103 — ENGINEERS OFFICE

103.03 CONSTRUCTION.

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

INSERT: The following.

103.03.06 Microcomputer System for all Offices.

(a) Desktop Unit.

- (1) IBM compatible with an Intel Pentium 4 or AMD processor.
- (2) Minimum microprocessor speed of 3.4 GHz.
- (3) Minimum hard drive storage of 80 GB (gigabyte).
- (4) Minimum of 2.0 GB RAM (Random Access Memory).
- (5) Enhanced 101 key keyboard with wrist rest.
- (6) Super Video Graphics Accelerator (“SVGA”) with 16MB memory.
- (7) Modem 56K BPS, ITU V.92 compliant – required for remote dial-in to the computer to provide MCMS system administration.
- (8) Full Duplex Sound Card (Sound Blaster Pro & Windows Compatible).
- (9) Audio Speakers.
- (10) Mouse with mouse pad.
- (11) One CDRW/DVDRW combo drive. Min Speed = 48X.
- (12) One Parallel Port, One Serial Port, Two USB Ports.

(b) Operating System. Minimum Microsoft® Windows XP.

(c) Video Monitor. Color Super VGA monitor conforming to Energy Star requirements with a minimum screen size of 17-inch flat panel.

(d) Printer/Scanner. HP (Hewlett-Packard) Photosmart C6180 All-in-One Inkjet Printer, 32 PPM, 4800x1200 DP, Color, 64MB, PC/Mac. Office jets and Bubble jets will not be accepted.



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(e) Software.

- (1) Microsoft® Office 2000/XP Professional for Windows™ or later.
- (2) Antivirus software shall be installed and configured to perform an automatic update when the microcomputer system connects to the Internet.

(f) Internet Access. The microcomputer system shall be provided with unlimited DSL/Broadband or better Internet access approved by the Engineer.

(g) Accessories.

- (1) Uninterruptible power supply (“UPS”).
- (2) Standard computer workstation with minimum desk space of 60 X 30 in. and a swivel type office chair, padded with arm rests.
- (3) 8-1/2 X 11 in. xerographic paper to be supplied as needed.
- (4) Toner or ink as needed for printer.
- (5) Maintenance agreement to provide for possible down time.
- (6) Physical security system to deter theft of computer components.
- (7) Blank recordable CD-R media for re-writable CD-ROM drive to be supplied as needed.
- (8) One – USB 2.0 Flash Drive (1GB of Memory).

(h) Notes.

- (1) The microcomputer system shall be completely set up ready for use on or before the day the Engineer’s Office is to be occupied.
- (2) All software stated above shall be supplied on original disks with manuals and be retained in the construction field office for the duration of the Contract.
- (3) If for any reason the system fails to operate, the system shall be replaced or repaired within 48 hours.
- (4) When the microcomputer system is no longer required, the Construction Management software system including original user/operator guide manuals, program disks, and all data files will be removed by the Engineer and delivered to the Area Engineer and become the property of the Authority. The remaining microcomputer system shall remain the property of the Contractor.

Type ‘C’ and Type ‘D’ Engineer’s Office shall have two (2) complete microcomputer systems.



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**CATEGORY 100
PRELIMINARY**

SECTION 104 — MAINTENANCE OF TRAFFIC

104.00 GENERAL.

148 **INSERT:** The following:

This project affects I-95 in Baltimore City adjacent to on-going construction for the I-95 Express Toll Lanes Project and will require coordination with the Maryland Transportation Authority (Authority), Baltimore City, and the I-95 Express Toll Lanes Project General Engineering Consultant (I-95 GEC).

AGENCY CONTACTS

Pre-Construction/Existing Contract Coordination

Maryland Transportation Authority

CONTACT	TITLE	PHONE NUMBER
Dave Roehmer	Facility Administrator, Fort McHenry Tunnel	(410) 537-1310
Angelica Daniel	Authority Project Manager	(410) 537-7828
Roxane Mukai	Authority Traffic Manager	(410) 537-7848

I-95 Express Toll Lanes – Construction

CONTACT	TITLE	PHONE NUMBER
Gradon Tobery	Construction Project Manager	(410) 931-0808
Neil Leary	I-95 ETL Traffic Manager	(410) 241-3415

Baltimore City Department of Transportation – Traffic Division

CONTACT	TITLE	PHONE NUMBER
Randall Scott	Chief of Traffic	(443) 984-2150

The Contractor shall coordinate with Ms. Roxane Mukai and Mr. Neil Leary for information on construction and other activities related to the FT 710-000-002R contract.



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**CATEGORY 100
PRELIMINARY**

SECTION 104 — MAINTENANCE OF TRAFFIC

104.01 TRAFFIC CONTROL PLAN (TCP)

104.01.01 DESCRIPTION:

149 **DELETE:** The fourth paragraph “Refer to the Contract Documents for Work Restrictions.”

149 **INSERT:** The following:

Work Restrictions. On Monday of each week, the Contractor shall provide the Engineer with a complete list of anticipated lane closures for the following two weeks, allowing the Authority a minimum of ten working days notification. The Engineer shall then notify the affected facilities, the Engineering Division’s Traffic Section and other appropriate offices.

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

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

- New Year’s Day (January 1)
- Martin Luther King, Jr. Day (third Monday in January)
- President’s Day (third Monday in February)
- Good Friday
- Easter Saturday and Sunday
- Memorial Day (last Monday in May)
- Independence Day (July 4)
- Labor Day (first Monday in September)
- Columbus Day (second Monday in October)
- Veteran’s Day (November 11)



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Work is not permitted on the holidays, or two work days preceding and following holidays indicated below with an “X”:

- Thanksgiving Day (fourth Thursday in November)
- Christmas Day (December 25)

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

ALLOWABLE LANE CLOSURE SCHEDULES ON I-95

Time of Day	Days of the Week	Allowed Closures
9:00 AM – 2:30 PM	Monday - Thursday	Southbound, South of I-395 Single Lane Closure
9:30 AM – 2:30 PM	Monday - Thursday	Southbound, North of I-395 Single Lane Closure
9:30 AM – 2:30 PM	Monday - Thursday	Northbound, South of I-395 Single Lane Closure
7:00 AM – 2:30 PM	Monday - Thursday	Northbound, North of I-395 Single Lane Closure
9:00 AM – 1:00 PM	Friday	Southbound, South of I-395 Single Lane Closure
9:30 AM – 1:00 PM	Friday	Southbound, North of I-395 Single Lane Closure
9:30 AM – 1:00 PM	Friday	Northbound, South of I-395 Single Lane Closure
7:00 AM – 1:00 PM	Friday	Northbound, North of I-395 Single Lane Closure
7:30 PM – 5:00 AM	Monday - Thursday	Southbound, South of I-395 Single Lane Closure
7:00 PM – 5:00 AM	Monday - Thursday	Southbound, North of I-395 Single Lane Closure
7:30 PM – 5:00 AM	Monday - Thursday	Northbound, South of I-395 Single Lane Closure
7:30 PM – 7:00 AM	Monday - Thursday	Northbound, North of I-395 Single Lane Closure
9:00 PM – 9:00 AM	Friday & Saturday	NB & SB Single Lane Closure
9:00 PM – 5:00 AM	Sunday	Northbound, South of I-395 & SB Single Lane Closure
9:00 PM – 7:00 AM	Sunday	Northbound, North of I-395 Single Lane Closure
9:30 PM – 5:00 AM	Sunday - Thursday	NB & SB Double Lane Closure – 4 Lane Section
10:30 PM – 5:00 AM	Sunday - Thursday	NB & SB Double Lane Closure – 3 Lane Section
10:00 PM – 9:00 AM	Friday - Saturday	NB & SB Double Lane Closure – 4 Lane Section
10:30 PM – 8:00 AM	Friday - Saturday	NB & SB Double Lane Closure – 3 Lane Section
11:00 PM – 5:00 AM	Monday - Thursday	Triple Lane Closure – 4 lane Section

No lane/shoulder closures are permitted 2 hours before, during or 2 hours after a stadium event.



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ALLOWABLE SCHEDULES FOR DETOUR ROUTE

During Stage 3 construction, the closure of the westbound US 40 to southbound I-95 interchange ramp and resulting implementation of the detour route along Moravia Park Drive and Moravia Road shall be restricted to the following periods.

TIME OF DAY	DAYS OF THE WEEK	ALLOWED CLOSURES
10:00 PM – 5:00 AM	Sunday – Thursday	WB US 40 to SB I-95 Ramp
10:00 PM – 9:00 AM	Friday – Saturday	WB US 40 to SB I-95 Ramp

Lane closures will not be permitted during periods of falling precipitation, heavy fog or otherwise poor visibility, or in the event of emergencies such as serious traffic accidents

or unusually severe traffic congestion, as directed by the Engineer. No lane closures are permitted two hours before, during, and after any major traffic generating event in Baltimore City. 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 (30) minutes.

Full roadway closures on I-95 shall be permitted for only the sole purpose of removing existing and erecting new structural steel that spans the roadway. All closures shall be implemented in accordance with MD STD 104.06-08, except that the maximum duration of each closure shall be 15 minutes. The highway must be opened to traffic after each closure and queued traffic cleared through the work area prior to implementation of the next closure period.

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 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 5 minutes prior to actual time lane/shoulder closure or restriction is permitted. Temporary traffic signs may be displayed 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.



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All temporary lane and shoulder closures shall be restored at the end of the closure period and no travel lane shall be reduced to less than 11.5 feet. Prior to opening the closed lane or shoulder, the Contractor shall clear the lane or shoulder of all material, equipment, and debris.

Failure to restore traffic capacity within the time specified will result in 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	\$150.00
Over 5	\$150.00 per minute (in addition to the original 5 minutes)

When closing or opening a lane on I-95, 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). The work vehicle size and method of attachment shall be as specified in the TMA manufacturer's specification as tested under NCHRP Test Level 3.

104.01.04 MEASUREMENT AND PAYMENT:

150 **ADD:** The following:

Maintenance of Traffic will not be measured but will be paid for at the Contract lump sum price. The payment will be full compensation for all labor (including Traffic Manager), material and equipment for which a bid item has not been established, and an incidentals necessary to complete the work.

The cost shall include all required equipment and setups shown on the typical traffic control applications and TCP, as well as removal of all traffic control setups.



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**CATEGORY 100
PRELIMINARY**

SECTION 104 — MAINTENANCE OF TRAFFIC

104.02 MAINTENANCE OF TRAFFIC (MOT)

104.02.03 CONSTRUCTION

155 **ADD:** The following:

(h) Response to Emergency within Project Limits. The Contractor shall respond within two hours to an emergency within the project limits. The Contractor shall provide and setup traffic control, including channelization devices, signs and PVMS, arrow panels, and other equipment to direct traffic within the project limits as directed by the Engineer.

An Emergency includes a traffic incident or other occurrence that requires police, fire, and/or medical response or any other unexpected event as determined by the Administration. The Contractor shall notify the Engineer of any and all emergencies within the project limits.



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**CATEGORY 100
PRELIMINARY**

SECTION 104 — MAINTENANCE OF TRAFFIC

**104.04 TEMPORARY CONCRETE TRAFFIC BARRIER (TCB) FOR
MAINTENANCE OF TRAFFIC**

104.04.03 CONSTRUCTION

157 **ADD:** The following:

Anchorage. Anchorage to bridge decks will be in accordance to bridge standards as stated on the individual structural plans. When barriers are no longer needed the anchor hole shall be repaired in accordance to the Contract Documents.



**CATEGORY 100
PRELIMINARY**

SECTION 104 — MAINTENANCE OF TRAFFIC

104.11 TEMPORARY PAVEMENT MARKINGS

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

INSERT: The following.

104.11 TEMPORARY PAVEMENT MARKINGS

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

104.11.02 MATERIALS

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

104.11.03 CONSTRUCTION

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

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

Bi-Weekly Marking Inspection. The Contractor shall perform bi-weekly inspection of all removable pavement marking tape and black line mask tape. The Contractor shall remove and replace any pavement marking tape or black line mask tape if it is damaged, peeling, or has become detached from the pavement surface. The Contractor may be required to remove and replace pavement marking tape or black line mask tape at the discretion of the Engineer at no additional cost to the Administration.

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



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

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

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

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

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

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

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

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



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

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



**CATEGORY 100
PRELIMINARY**

SECTION 104 — MAINTENANCE OF TRAFFIC

104.14 CONES FOR MAINTENANCE OF TRAFFIC.

104.14.02 MATERIALS.

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

INSERT: The following.

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

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

104.14.03 CONSTRUCTION.

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

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



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200 – REMOVAL OF EXISTING CONCRETE BARRIER

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**CATEGORY 200
GRADING**

SECTION 200 – REMOVAL OF EXISTING CONCRETE BARRIER (ANY TYPE)

200.01.01 DESCRIPTION. This work shall consist of the complete removal and disposal of existing concrete traffic barrier as specified in the Contract Documents or as directed by the Engineer.

200.01.02 MATERIALS. Not applicable.

200.01.03 CONSTRUCTION.

A. Removal.

Removal shall include all portions of the existing concrete barrier and barrier foundation.

B. Full Depth Saw Cut.

The Contractor shall full depth saw cut the existing concrete traffic barrier at the limits of barrier removal shown in the Contract Documents or as directed by the Engineer.

C. Use of Removed Concrete Barrier.

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

D. Protection of Retained Pavement.

The Contractor shall not damage existing pavement sections or concrete traffic barrier that are not to be removed. Damage done by the Contractor to those areas to remain in place shall be repaired or replaced at no additional cost to the Authority.

200.01.04 MEASUREMENT AND PAYMENT. The payment will be full compensation at the Contract unit price per linear foot for all excavation, backfill, disposal of unsuitable material, sawcut, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

The removal of existing concrete barrier will be measured and paid for at the Contract unit price per linear foot.



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300 – STORMWATER MANAGEMENT AS BUILT CERTIFICATION

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**CATEGORY 300
DRAINAGE**

**SECTION 300.01 — STORMWATER MANAGEMENT
AS-BUILT CERTIFICATION**

300.01.01 DESCRIPTION. An as-built certification by a Professional Engineer or Professional Land Surveyor licensed in the State of Maryland shall be submitted by the Contractor to the Administration to certify that constructed stormwater management facilities comply with the Contract Documents as required by the Storm Water Management Guidelines for State and Federal Guidelines.

300.01.02 MATERIALS. Not applicable.

300.01.03 CONSTRUCTION. Upon completion of the stormwater management facilities as specified in the Contract Documents, the Contractor shall submit to the Administration a signed as-built certification and as-built plan certifying compliance with the Contract Documents for the completed stormwater management facilities. The submission of the as-built plan shall include a completed As-built Check List, a copy of the grading plans, along with any and all sheets associated with the stormwater management facilities (i.e. details, profiles, landscaping, structure, etc). The As-built Certification shall be signed by a registered Professional Engineer or Professional Land Surveyor with experience in designing stormwater management facilities. The Professional Engineer or Professional Land Surveyor shall be an agent of the Contractor and shall make regular inspections and prepare documentation at specified stages of construction as listed in as-built construction check list provided on the plans. The as-built plan shall include all information necessary to compare the actual constructed stormwater management facilities to the Contract Documents. With a copy sent to the Engineer, the as-built certification including the aforementioned attachments shall be sent to:

Mr. Doug Novocin
Maryland Transportation Authority
300 Authority Drive
Baltimore, Md. 21222

300.01.04 MEASUREMENT AND PAYMENT. Stormwater management as-Built Certification shall be paid for at the Contract Lump Sum bid price for “Stormwater Management As-Built Certification – Bioretention Facility”. Payment will be full compensation for all labor, inspections, plan reviews and documentation which may include pictures, suggestions, final signed plans with as-built corrections marked as required to satisfactorily complete the work.



**CATEGORY 300
DRAINAGE**

SECTION 300.02 — PIPE LINING

300.02.01 DESCRIPTION. This work shall consist of installing a pipe liner within the existing 24 inch C.M.P. as specified in the Contract Documents or as directed by the Engineer.

300.02.02 MATERIALS.

Portland Cement Type I or Type II	902.02 and 902.03
Fine Aggregate, Natural Sand	901
Water	921.01
Fly Ash, Class F	902.06.04(a)
Grout	902.11

The pipe liner shall be made of high density polyethylene resins in accordance with the requirements of ASTM D-3350-02 or later. The Cell Classification shall be 345464C and have the Plastic Pipe Institute (PPI) designation of PE 3408. The pipe liner shall comply with the requirements of ASTM F-714 for dimensions and have a minimum DR value of 32.5. The pipe liner shall have a smooth non-corrugated interior surface.

The pipe liner shall be capable of being joined into a continuous length by an approved jointing method. The joints shall not result in an increase of the outside diameter of the pipe. The joints must be water-tight that are capable of handling pressures in excess of 25 feet of head per ASTM D3212.

300.02.03 CONSTRUCTION. The pipe liner shall be installed in accordance with the manufacturer's recommended procedures.

Construction Measures. The existing pipe shall be cleaned of all debris, scaling, and any sharp edges that might damage the liner removed. Care should be taken when installing the liner with extruding bolts or hardware so as not to score or damage the liner.

Grouting. After the liner is in place, the annular space between the existing C.M.P. and the new pipe liner shall be completely filled with grout in such a manner as to obtain a substantially uniform space between the line and original pipe; on the top, sides and bottom. The grout shall be foamed with a density of not more than 50 lbs. per cubic foot. The grout shall have a strength of 300 psi. Care shall be taken to ensure that any unbalanced grouting pressures do not exceed the safe allowable limits specified by the manufacturer.

CERTIFICATION. A manufacturer's certification shall accompany each shipment of pipe stating the material in the pipe meets the requirements of ASTM D-3350-02 with a Cell



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300 – PIPE LINING

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Classification of PE 345464C. The supplier shall certify the dimensions meet the requirements of ASTM F-714. A copy of the certification shall be delivered to the Engineer and the Contractor for each shipment. One copy shall remain at the plant for a minimum of three years and be made available to the Administration upon request. The certification shall include the following:

- (a) Plant name, address, and location.
- (b) Lot or production identification.
- (c) Date of manufacture and shipment.
- (d) Number of units of each size pipe or total linear feet of each size pipe.
- (e) Administration Contract number.
- (f) Statement of Specification compliance.
- (g) Signature of the quality control manager, or authorized representative (name shall be designated in the Quality Control Plan).

300.02.04 MEASUREMENT AND PAYMENT. The pipe liner will be measured and paid for at the Contract unit price per linear feet and include full compensation for cleaning and all necessary preparatory work performed on the existing pipe, installation, grouting, repair and/or replacement of any damages that occur to the site during this work, proper clean-up and disposal of all waste materials, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.



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300 – BIORETENTION FACILITIES

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**CATEGORY 300
DRAINAGE**

SECTION 300.03 – BIORETENTION FACILITIES

300.03.01 DESCRIPTION. This work shall consist of installing bioretention facilities, small landscaped basins that provide water quality management by filtering stormwater runoff before it is released into stormdrain systems and waterways, as specified in the Contract Documents or as directed by the Engineer.

300.03.02 MATERIALS.

No. 57 Stone	MD. SHA 901.01
Geotextile Fabric	MDE 2000 SWM Design Manual, Appendix B.3.B, Table B-3.2
Planting soil	MDE 2000 SWM Design Manual, Appendix B.3.B, Table B-3.2
Mulch	MDE 2000 SWM Design Manual, Appendix B.3.B, Table B-3.2
Plant Materials	MDE 2000 SWM Design Manual, Appendix A

Pipe, Polyvinyl Chloride (PVC) and Fittings. The material shall have a diameter of 6 in. and includes perforated and non-perforated pipe. Pipe materials and fittings shall conform to M-304. Perforations shall be slotted. Perforated PVC used for observation wells shall include an appropriate geotextile sock as recommended and supplied by the manufacturer.

300.03.03 CONSTRUCTION. Bioretention facilities shall not be constructed until all contributing drainage areas are stabilized as shown on the Contract Plans and to the satisfaction of the Engineer. Bioretention facilities shall not be used as sediment control facilities nor shall they be constructed in areas previously used for erosion and sediment control.

Excavation. Bioretention facilities shall be excavated to the dimensions, side slopes, and elevations as specified in the Contract Documents or as directed by the Engineer. The method of excavation shall minimize the compaction of the bottom of the bioretention facilities. Excavators and backhoes, operating on the ground adjacent to the bioretention facilities, shall be used for excavation whenever possible. Otherwise, excavators, backhoes and other equipment shall be wide-track or marsh-track for use within the bioretention facilities. The use of light equipment with turf tires operating within the facility is also acceptable. The use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high-pressure tires is prohibited within the perimeter of bioretention facilities.

After the excavation is complete and prior to placing aggregate and pipe, the bottom of the excavation shall be roto-tilled to a minimum depth of 6 in. to alleviate compaction from excavation activities. Any substitute method for roto-tilling must be approved by the Engineer prior to use. Any standing water shall be removed from the bottom of the excavation and the soil shall be friable before roto-tilling. The excavation bottom shall not be roto-tilled while in a muddy or frozen condition.



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Geotextile. After roto-tilling the excavation bottom, geotextile shall be placed on all sides of bioretention facilities, including the excavated bottom, as specified in the Contract Documents. Geotextile shall be placed tightly against the excavation walls to eliminate voids beneath the geotextile. Wrinkles and folds in the geotextile shall be avoided. A minimum 6 in. overlap at the geotextile joint ends or breaks shall be maintained. Geotextile joints and overlaps shall be pinned to securely hold the geotextile in place until placement of the aggregate, pipe, and Planting soil.

Damaged geotextile shall be replaced or repaired as directed by the Engineer at no additional cost to the Administration.

Perforated Pipe System and Aggregate. The perforated pipe system using PVC shall be placed on the geotextile fabric that completely covers the bottom of bioretention facilities. The fabric and perforated pipe system shall be covered with 8 in. of No. 57 aggregate and further topped a 2nd layer of geotextile fabric followed by the planting soil. All aggregate shall be placed according to the dimensions as specified in the Contract Documents.

All aggregate shall be clean and free of all soil and fines. Care shall be taken to prevent soil, fines, and other debris from intermixing with the aggregate. All contaminated aggregate shall be removed and replaced with uncontaminated aggregate at no additional cost to the Administration.

The ends of pipes not terminating in a cleanout, vent, or drainage structure shall be capped unless otherwise specified in the Contract Documents.

Cleanouts. Cleanouts using non-perforated PVC shall be placed vertically in bioretention facilities as specified in the Contract Documents. The cleanouts shall be connected to the perforated pipe system with the appropriate manufactured connections as specified in the Contract Documents. The cleanouts shall extend 6 in. above the top elevation of the mulch layer and shall be capped with a screw cap.

Observation Wells. Observation wells using perforated and non-perforated PVC shall be placed vertically in bioretention facilities as specified in the Contract Documents. The wells shall terminate at the mulch layer top elevation and shall be capped with a screw cap. The perforated PVC portion of the well shall be wrapped with an appropriate geotextile sock as recommended and supplied by the manufacturer.

Vents. Inverted J-vents using non-perforated PVC shall be placed in bioretention facilities as specified in the Contract Documents. The vents shall be connected to the perforated pipe system with the appropriate manufactured connections as specified in the Contract Documents. The inverted J-vents shall extend above the water surface elevation of bioretention facilities.



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Placement and Compaction of the Planting soil. The planting soil shall be placed and graded by using excavation hoes operating on the ground adjacent to bioretention facilities or, if the configuration of the bioretention facilities is exceedingly large, wide-track or marsh-track equipment, or light equipment with turf type tires operating within the perimeter of bioretention facilities may be used to place and grade the planting soil. The use of equipment with narrow tracks or narrow tires, rubber tires with large lugs or high-pressure tires is prohibited within the perimeter of bioretention facilities.

The planting soil shall be placed in horizontal layers not to exceed 12 in.. After each lift of planting soil is placed, it shall be compacted by saturating with water until water flows from the perforated pipe system. Water for saturation shall be applied by spraying or sprinkling. Saturation of each lift shall be performed in the presence and to the satisfaction of the Engineer. An appropriate sediment control device shall be used to treat any sediment-laden water discharged from the perforated pipe system. If the planting soil becomes contaminated during the construction of bioretention facilities, the contaminated material shall be removed and replaced with uncontaminated material at no additional cost to the Administration. Final grading of the planting soil shall be performed after a 24-hour settling period. Final elevations shall be within 2 in. of elevations specified in the Contract Documents.

Plant Installation. Plant material shall be installed immediately after final grading of bioretention facilities as specified in the Contract Documents.

Mulching. Bioretention facilities shall be mulched in accordance with the following, as appropriate:

Typical. Immediately following plant installation, occurring immediately after final grading, bioretention facilities shall be mulched to a uniform thickness of 3 in., and the mulch shall be raked to an even surface.

Temporary. For plant installation that will commence within 30 calendar days of final grading, bioretention facilities shall be mulched to a minimum thickness of 1 in. immediately following final grading. The mulch shall be raked to an even surface. During plant installation, care shall be taken to prevent contamination of the mulch and planting soil. Immediately after plant installation, bioretention facilities shall be mulched to a total uniform thickness of 3 in. and raked to an even surface.

Extended Temporary. For plant installation that will commence beyond 30 calendar days of final grading, bioretention facilities shall be mulched to a uniform thickness of 3 in., and the mulch shall be raked to an even surface. Prior to plant installation, the extended temporary mulching layer shall be removed in its entirety from bioretention facilities and disposed of as excess or unsuitable material. Care shall be taken to prevent the removal of planting soil



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during the mulch removal. Immediately after plant installation, bioretention facilities shall be mulched to a uniform thickness of 3 in. and raked to an even surface.

300.03.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for all applicable excavation, sheeting, shoring, dewatering, hauling, storing, re-handling of material, removal and disposal of excess and unsuitable material, roto-tilling, grading and slope adjustments, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

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

Aggregate. Aggregate will be measured and paid for at the Contract unit price for one or more of the items listed below:

(a) No. 57 Stone for Sediment Control per cubic yard.

PVC. PVC and fittings will be measured and paid for at the Contract unit price per linear foot for 6 Inch Solid Polyvinyl Chloride Pipe (PVC) or 6 Inch Perforated Polyvinyl Chloride Pipe (PVC). Galvanized hardware cloth cover for perforated PVC will not be measured but the cost will be incidental to the Contract price.

Geotextile. Geotextile, Class PE, Type III will not be measured but the cost will be incidental to the Contract unit price for Bioretention Soil Mixture (PLANTING SOIL).

PLANTING SOIL. PLANTING SOIL will be measured and paid for at the Contract unit price per cubic yard for Bioretention Soil Mixture. Water necessary for compaction by sprinkling or spraying will not be measured but the cost will be incidental to the Contract price.

Mulch. Mulch will be measured and paid for at the Contract unit price per square yard for Shredded Hardwood Bark Mulching, 3 Inch Depth.

Discharge from Perforated Pipe System. Any sediment-laden water discharged from the perforated pipe system during compaction of the PLANTING SOIL by saturation shall be filtered or removed from the outlet structure and is incidental to complete the work.

Plant Materials. Plant Materials will be measured and paid for at the Contract unit price per each for the pertinent plant species, type, and size.



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**300 – STORMWATER MANAGEMENT ACCESS ROAD WITH
CELLULAR CONFINEMENT LOAD SUPPORT SYSTEM**

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**CATEGORY 300
DRAINAGE**

**SECTION 300.04 – ACCESS ROAD WITH CELLULAR CONFINEMENT LOAD
SUPPORT SYSTEM**

300.04.01 DESCRIPTION. Construct an access road with a cellular confinement load support system as specified in the Contract Documents or as directed by the Engineer.

300.04.02 MATERIALS.

No. 7 Stone Aggregate	901.01
Topsoil	920.01
Seed	920.06
Mulch	920.04.01 and 920.04.02
Water, Pesticides, and Adjuvants	920.09
Geotextile, Class SE (nonwoven)	921.09

Cellular Structure. Fabricate using sheet strips of perforated, textured, high-density polyethylene (HDPE) conforming to the following:

PROPERTY	METHOD	REQUIREMENT
Density, lb/ft ³	D 1505	58.4 - 60.2
Environmental Stress Crack Resistance, hr min	D 1693	3000
Carbon Black, % by weight	—	1.5 - 2
Thickness before Texturing, mil	D 5199	50 (+5, -10 %)
Thickness after Texturing, mil	D 5199	60 (±10 %)

Each strip shall have a length of 12 ft and a width of 6 in. The surface texturing shall be diamond shape indentations at the rate of 140 to 200 indentations/in. The perforations shall consist of horizontal rows of 0.4 in. diameter holes on 0.75 in. centers. Horizontal rows of perforations shall be staggered and separated by 0.5 in relative to the hole centers. The dimension from the edge of the strip to the nearest edge of perforation shall be 0.3 in.

Connect the HDPE strips in series to form a honeycomb like cellular structure, using full depth ultrasonic spot welded seams, aligned perpendicular to the longitudinal axis of the strips. Weld spacing shall be 14 in. The ultrasonic weld melt pool width shall not exceed 1 in.



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**300 – STORMWATER MANAGEMENT ACCESS ROAD WITH
CELLULAR CONFINEMENT LOAD SUPPORT SYSTEM**

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When expanded, the interconnected strips shall form the walls of a flexible, three-dimensional cellular confinement structure into which aggregate can be placed. HDPE cell dimensions shall have an expanded length ranging from 8.02 to 9.65 in. and an expanded width ranging from 9.20 to 11.07 in. The number of cells in a manufactured section may vary according to site conditions. Each expanded section shall have a minimum width of 9.2 ft and minimum length of 12 ft.

HDPE cell seam strength shall be uniform over the full depth of the cell. Short-term seam strength shall be tested in conformance with the U.S. Army Corps of Engineers Technical Report GL 86 19, Appendix A. Minimum short-term seam peel strength shall be 480 lb. A long-term seam peel strength test shall be performed for a period of 7 days minimum in a temperature controlled environment that undergoes change on a one hour cycle from room temperature to 130 F. Room temperature shall be as defined in E 41. Test samples shall be made by welding four HDPE strips together to produce a two cell structure. Individual welds shall be tested by cutting them from the two cell structure so that 4 in. of material exist on each side of the weld. Samples shall be cut to a 4 in. width and tested by securing one end to a stationary upper clamp and attaching a weight to the free lower end. The test sample shall support a 160 lb load for the test period.

The cellular confinement load support system shall include stake anchors in the form of steel J pin stakes fabricated as specified in the Contract Documents and 1/2 in. staples. Steel for J pin stakes shall conform to 909.02.

300.04.03 CONSTRUCTION.

Subgrade Preparation. Subgrade soils shall be cleared and grubbed of all trees, brush, debris, and root matter and in conformance with 211.03.02.

Geotextile Placement. Place according to 211.03.03.

Cellular Structure Placement. Place HDPE cells within three working days of geotextile placement. Expand sections into position and anchor with steel J pins prior to placing the No. 7 stone aggregate. Install the minimum number and layout of the J pins as specified with additional pins as needed to hold the shape and specified dimensions of the expanded cell sections. Ensure J pin diameter and length are suitable to hold the expanded cell sections in tension for the subgrade conditions at the site.

At manholes or other obstructions, stretch the cell section into position and cut out around the perimeter of the obstruction to allow the cell section to fit around the obstruction and be anchored flat on the prepared surface.



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Ensure the upper surfaces of adjoining cell sections are flush at the joint. Interleaf sides and abut the ends of adjoining cell sections. Staple adjoining sections staple to each other. Align welded edge seams when stapling sides of adjoining sections. Align abutting sections at longitudinal center lines and staple at the cell wall contact point.

Placement of Infill. Place No. 7 stone aggregate into the expanded HDPE cells to a level at least 2 in. above the top of the cell walls. Limit the drop height of infill to 3 ft. using equipment operating adjacent to the cell sections. Equipment operating on the cell sections is only allowed on cell sections that have been filled and covered with the minimum 2 in. of additional material. Compact infill material to a minimum density of 95 percent of the standard proctor dry density. Grade compacted aggregate surface to a level $1 \pm 1/2$ in. above top of the cell walls.

Placement of Topsoil, Seed, and Mulch. Place topsoil on the aggregate infill material to a minimum depth of 4 in. according to 701.03. Apply according to 705.03.

300.04.04 MEASUREMENT AND PAYMENT. Stormwater Management Access Road with Cellular Confinement Load Support System will be measured and paid for at the Contract unit price per square yard. Payment will be full compensation for all excavation, geotextile, cellular structure, J pins, staples, fasteners, aggregate, subgrade preparation, hauling, removal and disposal of unsuitable material, anchoring, grading, compacting, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Topsoil will be measured and paid for as specified in Section 701.

Seed and mulch will be measured and paid for as specified in Section 705.



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305 – MISCELLANEOUS STRUCTURES

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**CATEGORY 300
DRAINAGE**

SECTION 305 – MISCELLANEOUS STRUCTURES

305.04 MEASUREMENT AND PAYMENT.

248 **ADD:**

305.04.08 Type S-1 Inlet, Double Grate Tandem – Minimum Depth and Modified Type S-Combination Inlet, Double Grate Tandem will be measured and paid for at the contract unit price per each, regardless of the depth of the inlet.



**CATEGORY 300
DRAINAGE**

SECTION 308 — EROSION AND SEDIMENT CONTROL

DELETE: 308.01.03 Quality Assurance Ratings in its entirety.

INSERT: The following.

308.01.03 Quality Assurance Ratings. A Quality Assurance Inspector will inspect each project every 2 weeks to ensure compliance with the approved Erosion and Sediment Control Plan. The MdTA Office of Engineering and Construction Erosion and Sediment Control (ESC) Quality Assurance Inspector is Mr. Timothy Plume @ 443-790-8975 and Tplume@mdta.state.md.us The scores will be reported on Form No. ESC1, Erosion and Sediment Control Field Investigation Report. The Quality Assurance Inspector will use the scores to determine the following ratings:

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

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

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

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

Rating D. The project is in non-compliance. The Administration will shut down all earthwork operations. All work efforts shall focus on correcting erosion and sediment control deficiencies. The project will be re-inspected within 72 hours. All required corrective actions shall be completed within the 72 hour period for the project to be upgraded to a 'B' rating. Failure to upgrade the project from a 'D' to a 'B' or better rating will result in the project being rated an 'F'.



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Noncompliance penalty will be imposed for each day the project has a 'D' rating. Refer to Shutdown elsewhere in this Specification for additional requirements.

Rating F. The project is in non-compliance. An 'F' rating indicates a score less than 60 or the appropriate permits and approvals have not been obtained; or that the limit of disturbance has been exceeded, or that wetlands, wetland buffers, Waters of the United States (WUS), floodplains, and tree preservation areas as specified in Section 107 have been encroached upon; or that work is not proceeding according to the approved Erosion and Sediment Control Plan and schedules. The Administration will shut down the entire project until the project receives a 'B' or better rating. All work efforts shall focus on correcting erosion and sediment control deficiencies. Noncompliance penalties will be imposed for each day the project has an 'F' rating.

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

If consecutive 'C' ratings are received, the Contractor will be alerted that their overall effort is marginal and a shut down of all earthwork operations is imminent if erosion and sediment control efforts do not substantially improve within the next 72 hours. The project will be re-inspected at the end of this period. If the deficiencies are not satisfactorily corrected or other deficiencies are identified that result in a score of less than 80 and not below 60 on Form No. ESC1, a 'D' rating will be given and all earthwork operations will be shut down.

If disregard for correcting these deficiencies is evident, an 'F' rating will be given and the entire project will be shut down until the project receives a 'B' or better rating. When degradation to a resource could occur, or if the Contractor is unresponsive, the Administration may elect to have these corrective actions performed by another contractor or by Administration maintenance staff. All costs associated with this work will be billed to the original Contractor in addition to noncompliance penalties.

Noncompliance Penalty. Whenever a project is rated 'D' or 'F', the Administration will assess Noncompliance Penalties. Noncompliance Penalties shall be paid within 30 days from the date of notification to the Contractor. Payments will not be allowed to accrue for consideration at final project closeout.

The second time that a project is rated 'F', the Erosion and Sediment Control Training Certificate issued by the State Highway Administration will be immediately revoked from the project superintendent and the Erosion and Sediment Control Manager for at least a six month period and until successful completion of the State Highway Administration's Erosion and Sediment Control Certification Program. Neither the project superintendent nor the Erosion and Sediment Control Manager will be allowed to oversee the installation and



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308 – EROSION AND SEDIMENT CONTROL

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maintenance of erosion and sediment controls during the period the certification is revoked on any project of the Authority. Replace the project superintendent and the Erosion and Sediment Control Manager with certified personnel. Work may not commence until the certified personnel are in place.

DELETE: 308.01.04 Incentive Payments and Liquidated Damages in its entirety.

INSERT: The following.

308.01.04 Noncompliance Penalty Payments. For each day that the project has a 'D' rating, the Contractor and/or his surety shall be liable for noncompliance penalties in the amount of \$ 1,000.00 per day. Failure to upgrade the project to a minimum of a 'B' rating within 72 hours will result in the project being rated 'F'.

For each day that the project has an 'F' rating, the Contractor and/or his surety shall be liable for noncompliance penalties in the amount of \$ 2,000.00 per day.



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SPECIAL PROVISIONS
400 – REPAIRING STRUCTURAL CONCRETE

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CATEGORY 400
STRUCTURES

SECTION 400.01 – REPAIRING STRUCTURAL CONCRETE

400.01.01 DESCRIPTION: This work shall include locating and performing structural concrete repairs throughout the existing bridge substructure, including epoxy crack injection and concrete spall and delamination repairs. The materials and methods specified below apply to the particular types of structural repairs as shown on the Plans and specified herein. Due to the time interval between the field survey and notice to proceed, further deterioration may have occurred which would not be reflected in the quantities for the particular bid item; the Engineer will be the sole judge of the extent and total quantity of repairs that are to be made.

400.01.02 MATERIALS

Concrete	Mix No. 6 Concrete (4,500 p.s.i.) as per 902.10 except as follows: High early strength with 3/8" maximum aggregate size
Non-shrink Grout	A proprietary formulation conforming to 902.11 (c) except that the minimum compressive strength shall be 5,000 p.s.i. within 24 hours.
Polymer Modified Mortar	Polymer modified cementitious repair mortar for use on horizontal, vertical and overhead applications with minimum compressive strength of 3,000 p.s.i. within 24 hours and minimum bond strength of 2,000 p.s.i.
Epoxy Bonding Agent	921.04
Epoxy Grout	902.11(d)
Surface Sealant	Epoxy resin used to seal cracks and ports before injection. ASTM C881, Type III, Grade 3, Class B and C.
Low Viscosity Epoxy for Pressure Injection Grouting	Epoxy resin used for repair of cracks through pressure injection. ASTM C881, Type IV, Grade 1, Class B and C.
Trowel Grade Mortar	Rapid hardening trowelable mortar for use in horizontal, vertical and overhead applications with minimum compressive strength of 3,000 p.s.i. within 24 hours and minimum bond strength of 2,500 p.s.i.
Welded Wire Fabric	908.05



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Anchor Bolts

Self-anchoring bolts shall be carbon steel, sleeve type mechanical anchors. All bolts and associated hardware shall be galvanized as per A 153.

The epoxy injection 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 the epoxy resin 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 if the material.

400.01.03 CONSTRUCTION:

400.03.03.01 REPAIR TYPE 1, CRACK REPAIR

The work covered by this item includes surface repair of concrete cracks by pressure injection of epoxy as shown on the contract documents. The method of application shall be approved by the Engineer prior to beginning work.

The Contractor shall ensure that the epoxy manufacturer's technical representative will be present for the duration of the injection process, and shall submit details of the proposed method of repairs and the injection procedure for the Engineer's approval.

- A. Equipment: 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.

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 non-chlorinated solvent.

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

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.



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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.

- B. Locations: Prior to the beginning of work, the Engineer will mark the exact crack locations to receive epoxy injection.
- C. Damage: Extreme caution shall be taken when selecting a pressure necessary to complete crack repair so as not to damage the structure by causing additional cracking. If additional damage occurs as a result of the Contractor's operations, repairs shall be made at the Contractor's expense to the satisfaction of the Authority.
- D. Surface Preparation:
 - 1. Cleaning – Concrete surfaces shall be clean and sound. Clean all cracks of loose matter such as dirt, laitance, oil, grease, salt or any other contaminants by abrasive blasting.
 - 2. Surface Seal – Apply surface seal material to the crack prior to installing entry ports. Surface seal shall be applied on the face of the crack to prevent the epoxy from leaking out, and shall completely bridge the crack when applied. Allow surface seal to set before beginning injection procedure.
 - 3. Entry Ports - Install entry ports in the surface seal at 6 to 12 inches apart along the full length of the crack. Ports shall be 3/4" diameter and 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.
- E. 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 epoxy until it has cured, the Contractor shall remove the surface seal and place a new surface seal at no additional cost to the Authority.

Before injecting any epoxy, the automatic mixing and metering pump shall be activated and approximately 1 pint 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.



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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.

Inject low viscosity epoxy adhesive at the lowest port. Continue injection until epoxy begins to flow out of the port at the next higher level. Plug the first port and start injection at the second port. Repeat until all of the ports are filled. Allow epoxy to cure as per the manufacturer's specifications.

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.

- F. Finish: After the epoxy injection is complete, all entry ports shall be removed and all excess surface seal and epoxy shall be removed flush with adjacent concrete surfaces.
- G. Testing:
1. First Test – After the completion of the first crack repair, the Engineer shall designate a random location within the finished crack repair to be cored. Extreme care shall be taken in the selection of the core locations to avoid primary reinforcing steel. The core shall be 1 inch in diameter, and shall extend to the depth of crack being investigated. This core will be examined by the Engineer to verify the full sealing of the crack. If the crack is not sealed to the satisfaction of the Engineer, the procedure used for crack injection will be modified.
 2. Additional Tests – The Engineer shall designate one location for every 100 linear feet of crack repair and no less than one additional random location where the cracks have been epoxy injected for the Contractor to core. These cores will be examined by the Engineer to verify full sealing of the cracks.
 3. Acceptance – The cured injected epoxy shall have penetrated a minimum of 90 percent of the visible crack. Test cores will be evaluated to ensure that the epoxy has penetrated a minimum of 90 percent of the crack depth along the sides of the core. If the injected epoxy does not satisfy these requirements, the crack from



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which the core was taken will be deemed unsatisfactory and will not be included for payment.

4. Core Holes – The core holes shall be filled with an epoxy grout and finished to the satisfaction of the Engineer.

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 Authority.

400.03.03.02 REPAIR TYPE 2, CONCRETE PATCH AND REPAIR TYPE 3, CONCRETE REPAIR

The work covered by this item includes surface repair of concrete spalls and delamination using non-shrink grout, trowel grade mortar or cast-in-place concrete, as shown on the Contract Documents. The method of repair shall be approved by the Engineer prior to beginning work.

- A. Limits of Deterioration: The extent for removal of deficient concrete shall be as indicated by sounding with a hand held steel hammer. A hollow sound indicates deficiency. All sounding shall be performed in the presence of the Engineer.
- B. Concrete Removal: The limits of the repair areas previously designated shall be saw cut along neat lines to a depth of at least 1 inch so as to obtain a rectangular area. The saw cut lines shall encompass the area of deterioration. Special care shall be taken to protect any parts of the structure that are not specifically to be removed. Pneumatic hammers may be used to remove unsound concrete. The maximum pneumatic hammer used shall be 30 lb. All devices proposed for concrete removal shall be approved by the Engineer.
- C. Depth of Concrete Removal: Concrete shall be removed in the previously designated areas to depth at which sound concrete is found. The depth at which sound concrete is found will determine the type of repair to be utilized as follows:
 1. Depth 2 ½ Inches or Less – Repair Type 2, Concrete Patch
 2. Depth Greater Than 2 ½ Inches – Repair Type 3, Concrete Repair

After concrete removal to a depth of 2 ½ inches has taken place, the Engineer shall have the option to remove additional concrete depth and designate which repair type will be used. Payment shall be made under the repair type designated.

- D. Existing Reinforcing Steel: Extreme care shall be taken when removing concrete so as not to damage the existing reinforcing steel. If the reinforcing steel is damaged or deemed unsuitable by the Engineer as a result of the Contractor's operations, it shall be replaced by dowel bars that are the same diameter as the damaged reinforcing steel. The minimum size of a replacement dowel shall be a #5 bar. The replacement dowel bars and all required labor shall be provided at the Contractor's expense in accordance with Section 421.03.07 of the Specifications.



- E. Under Cut: The perimeter of the repair area shall be under cut or bevel cut to key in the proposed repair.
- F. Surface Preparation: The repair areas shall be structurally sound and free from all dust, dirt, grease, paint and other foreign material. Exposed reinforcing steel shall be abrasive blast cleaned to near-white metal. The concrete surfaces that are to be repaired shall then be blown clean with oil-free and clean air.

REPAIR TYPE 2 - CONCRETE PATCH

- A. Forms: Set forms maintaining all chamfers and flush with adjacent concrete surface. Provide adequate ports in forms for applying the bonding agent and placing repair concrete. The forms shall be removable. Provide a minimum of 1 inch cover by bending existing reinforcement back behind finished surface, if required.
- B. Bonding Agent: An epoxy resin adhesive shall be applied to the prepared surface. Adhesive shall be applied when the ambient air temperature is in excess of 60°F unless otherwise recommended by the manufacturer. The adhesive shall be in a tacky condition immediately prior to placing repair material.
- C. Repair: The material used to effect this repair type shall conform to either of the following:
 - 1. Trowel Grade Mortar – Finish and cure in accordance with the manufacturer's specifications and Section 420.03 of the Specifications.
 - 2. Polymer Modified Mortar- Finish and cure in accordance with the manufacturer's specifications and Section 420.03 of the Specifications.
 - 3. Non-Shrink Grout – Finish and cure in accordance with the manufacturer's specifications and Section 420.03 of the Specifications.

REPAIR TYPE 3, CONCRETE REPAIR.

- A. Welded Wire Fabric with Anchors: Place 3/8 inch diameter concrete anchors at a maximum spacing of 12 inch on centers in each direction and attach welded wire fabric to anchors. A minimum of one anchor is required per repair area. The welded wire fabric shall be of an appropriate size to fill the repair area.
- B. Forms: Set forms maintaining all chamfers and flush with adjacent concrete surface. Provide adequate ports in forms for applying the bonding agent and placing repair concrete. The forms shall be removable. Provide a minimum of 1 inch cover by bending existing reinforcement back behind finished surface if required.



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C. Bonding Agent: An epoxy resin adhesive shall be applied to the prepared surface. Adhesive shall be applied when the ambient air temperature is in excess of 60°F unless otherwise recommended by the manufacturer. The adhesive shall be in tacky condition immediately prior to placing repair concrete.

D. Repair – Fill cavity with repair concrete, finish and cure concrete in accordance with Section 420.03 of the Specifications.

400.01.04 MEASUREMENT AND PAYMENT:

400.01.04.01 Repair Type 1 – Crack Repair will be measured and paid for per linear foot of crack that is repaired and identified in the field. The payment will include furnishing all materials, labor, preparation of cracks, including injected epoxy, chipping, sealing, installation and removal of injection ports, testing of repairs, repairing of cored holes and for all tools, and equipment to accomplish the work specified and shown. Cost shall exclude the cost for the injected epoxy.

400.01.04.02 Repair Type 2 – Concrete Patch will be measured and paid for per cubic foot of repair in-place and as measured in the field. The payment will include furnishing all materials, labor, tools and equipment to accomplish the work specified and shown.

400.01.04.03 Repair Type 3 – Concrete Repair will be measured and paid for per cubic foot of repair in-place and as measured in the field. The payment will include furnishing all materials, labor, tools and equipment to accomplish the work specified and shown.

400.01.04.04 Repair Bar for Substructure to replace existing reinforcing as outlined in 421.03.07 will be measured and paid for per linear foot of reinforcing steel in-place. Payment shall include all labor, tools, connections, materials and equipment to accomplish the work specified.



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**CATEGORY 400
STRUCTURES**

**SECTION 400.02 – REMOVAL OF EXISTING SIGN
STRUCTURE SUPPORT BRACKETS**

400.02.01 DESCRIPTION. This work shall consist of the removal and proper disposal of existing steel sign structure support brackets to the limits as shown on the Plans, in accordance with the requirements of these Special Provisions and as may be directed by the Engineer. This work shall also consist of providing safe access and inspecting the existing girders for weld and base metal cracks at intermediate transverse connection plate locations adjacent to the existing bracket to be removed.

400.02.02 MATERIALS.

High Strength Bolts, Nuts and Washers

A325 Type 3

400.02.03 CONSTRUCTION. Before removal operations commence, the Contractor shall prepare and submit to the Engineer for review and approval a complete list of all equipment to be utilized in the removal of each steel sign structure support bracket including the proposed method of removal as an official shop drawing submittal. Materials obtained from the removal operations shall become the property of the Contractor and shall be removed off site.

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

Following the removal of each steel sign structure support bracket, the Contractor, in the presence of the Engineer, shall perform a hands-on inspection of the portions of the existing structure to remain, focusing on welded connections and those areas adjacent locally to the remaining connection plates. The Contractor shall provide safe access to the areas via bucket truck, snoopers, scaffolding, etc. All inspection observations will be documented by the Engineer. If any defects (cracking, section loss, etc.) are observed, the Engineer will provide subsequent direction on any necessary repairs.



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High strength bolts placed in open bolt holes remaining after the removal of the steel sign structure support bracket shall be installed in conformance with 430.03.17.

A plasma cutter or approved equal shall be used to cut the structural steel of the existing sign structure support bracket as shown on the Plans. The finished edge resulting from cutting the structural steel shall be relatively smooth and free of sharp, jagged edges.

The Contractor is hereby notified that portions of this work may be located adjacent to or over active railroad tracks. The Contractor shall coordinate with the appropriate railroad to ensure that all requirements are met when working adjacent to or over any track. Any temporary scaffolding or demolition shields required for this work shall be prepared as a working drawing and submitted to the appropriate railroad for review in accordance with the structural plans and Special Provisions included elsewhere herein.

400.02.04 MEASUREMENT AND PAYMENT. The Removal of Existing Sign Structure Support Brackets will be measured and paid for at the Contract unit price per each for the pertinent Removal of Existing Sign Structure Support Bracket item specified in the Contract. The payment will be full compensation for preparing, submitting and revising shop drawings, removing and disposing the specified existing steel sign structure support brackets to the Plan limits shown, furnishing and installing high strength bolts, cutting the existing structural steel as shown on the Plans, coordinating with the railroad(s) and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

The removal and disposal of existing overhead sign structures will be paid for under the Remove Existing Overhead Sign Structure and Signs and Supports items as specified in the Contract.

Furnishing and operating the access equipment necessary to perform the inspection of existing portions of steel members to remain will be incidental to the pertinent Removal of Existing Sign Structure Support Brackets item.

Any delays to the Contractor's operations caused by coordination efforts with the railroad(s) will not be cause for a delay claim to the Authority.

An allowance of Twenty Thousand Dollars (\$20,000.00) has been established under the Miscellaneous Structural Repairs item. This item, Miscellaneous Structural Repairs, will provide compensation to the Contractor for the cost of performing repairs to defects observed in the existing structure identified by the hands-on inspection. This item will include materials, labor and equipment necessary to perform the specified repairs, non-destructive testing on the repair area, follow-up hands-on inspection, access to perform the repairs and non-destructive testing, and follow-up repairs, testing, hands-on inspection, and access that may be required. Prior to the



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commencement of any repair work, the Contractor shall submit the price to perform the repairs specified by the Engineer to the Authority for review. There is no guarantee that this item will be used during the term of the Contract.



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**CATEGORY 400
STRUCTURES**

SECTION 400.03 – NEW SIGN STRUCTURE SUPPORTS

400.03.01 DESCRIPTION. This work shall consist of the construction of new sign structure supports on existing bridges as detailed on the Plans and in accordance with the requirements of these Special Provisions and as may be directed by the Engineer. This work may also include the installation of new chain link fencing and swing gates, scuppers and associated downspout piping and barrier delineators.

400.03.02 MATERIALS.

Concrete – Mix No. 6	902.10.03 – Table 902 A
Microsilica	902.10.03 – Table 902 B, Option 3
Reinforcement	908.01
Steel Shear Studs	909.05
Fusion Bonded Epoxy	917.02
Prefomed Fabric Pads	910.02.03
Steel Plates	A709 Grade 36, Galvanized
Resilient Laminated Fabric Pads and Washers	MIL-C-882E
Prefomed Fabric Bearing Pad	910.02.03
Anchor Bolts (sign structures)	F1554, Grade 55, S1, Galvanized
Anchor Bolt Nuts and Washers	909.08
Anchor Studs or Bolts (fencing)	A 276, Type 430 or 304
Epoxy Grout (fencing)	902.11 (d)
Curing Materials	902.07
Form Release Compound	902.08
Steel Shear Stud Developers	909.05
Conduits	921.07.01 ANSI C80.1 and 921.07.02 UL 651
Drains	905, 921.11, A 74, A 888, A 53 Grade B, A 234
Epoxy Bonding Compound	921.04
Steel Forms (to remain in place)	909.11
Water	921.01
Admixtures	420.02.01
Grout	902.11 (c)
Production Plants	915
Barrier Delineators	As approved by the Office of Traffic and Safety



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

All accessories shall meet the requirements as specified under 420.02.02.

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

Junction boxes shall be fabricated from Type 304 stainless steel and be watertight. All hardware for the junction boxes shall be Type 304 stainless steel. All hardware attaching the cover to the junction box shall be countersunk so that they are flush with the cover.

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

420.03.03 Anchor Bolt Placement

DELETE: The subsection in its entirety.

INSERT: The following.

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

420.03.04 Concreting.

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

INSERT: The following.

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



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from ACI 308, Standard Practice for Curing Concrete. If the theoretical rate of evaporation is above 0.10 pounds per square foot per hour, the Contractor shall take all necessary precautions to reduce the probability of plastic shrinkage cracking, such as:

- (a) Misting the surface of the concrete immediately behind the finishing machine with an approved fogger. If misting is used, it shall be applied continuously up until the placement of the wetted burlap covers.
- (b) Covering the surface with polyethylene sheeting between the finishing and texturing operations.
- (c) Reducing the temperature of the concrete mix.

420.03.07 Finishing Concrete Surfaces.

DELETE: First paragraph under Subparagraph (d)(1) in its entirety.

INSERT: The following.

- (1) **Slab Grooving.** The new portion of deck slab shall be mechanically grooved to match the original deck slab surface if so grooved. The grooving operation shall start after the bridge deck slab has been cured in conformance with 420.03.10, and attained a minimum compressive strength specified in 420.03.15. The bridge deck shall be grooved in an orientation to match the existing grooves.

420.03.15 Loads on Concrete Structures.

DELETE: The subsection in its entirety.

INSERT: The following.

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

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



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

ADD: The following.

420.03.19 Steel Shear Stud Developers.

Steel shear stud developers shall be installed in conformance with 431.03 where indicated on the Plans.

420.03.20 Junction Boxes.

Junction boxes shall be fabricated in conformance with dimensions shown on existing plans.

400.03.04 MEASUREMENT AND PAYMENT. New Sign Structure Supports will be measured and paid for at the contract unit price per each for the New Sign Support Brackets for OH-52 item specified in the Contract. The payment will be full compensation for all concrete, forms and form removal, curing and misting, steel reinforcement bars, welded splices or approved mechanical splices for steel reinforcement bars, steel shear studs, anchor rods or bolts, steel clamp plates, steel leveling plates, resilient laminated fabric pads and washers, preformed fabric pads, conduits, junction boxes, covers and associated hardware, floodlighting, installation of new chain link fencing and swing gates, and for all material, labor, equipment, tools, and incidentals necessary to complete the work as specified herein and on the Plans.

The installation of parapet control joints and drains for conduits and junction boxes, mechanical grooving (if necessary) and placement of epoxy bonding compound will be incidental to the New Sign Support Brackets for OH-52 item specified in the Contract.

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

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

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



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BRIDGE MOUNTED SIGN SUPPORTS**

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**CATEGORY 400
STRUCTURES**

SECTION 400.04 – BRIDGE MOUNTED SIGN SUPPORTS

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

400.04.02 MATERIALS.

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

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

400.04.03 CONSTRUCTION. The construction of Bridge Mounted Sign Supports shall be in accordance with the requirements of 430.03 of the Standard Specifications and these Special Provisions.

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



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

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



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**CATEGORY 400
STRUCTURES**

SECTION 400.05 – PROTECTION OF EXISTING STRUCTURES

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

400.05.02 MATERIALS. None.

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

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



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PROTECTION OF EXISTING STRUCTURES**

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

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

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

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

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

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

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

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

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



**CATEGORY 400
STRUCTURES**

SECTION 405 – REMOVAL OF EXISTING STRUCTURES

405.03 CONSTRUCTION

286 **ADD: 405.03.04 Deck Surface Removal.** The existing deck shall be removed with a combination of mechanical grinding and high pressure water blasting (hydro-demolition). Power operated mechanical type and high pressure water jet type equipment shall be capable of uniformly removing the specified minimum depth from the existing concrete surface.

(1) **Mechanical Type.** This removal shall consist of grinding/milling the existing surface to a depth of 1 inch above the top of the top mat of reinforcing steel.

(2) **Hydro-demolition.** A high pressure water jet shall be used to remove the existing deck surface from 1 inch above the top mat of reinforcing steel (bottom of mechanical grinding) to 1 inch below the bottom of the top mat of reinforcing steel.

The contractor shall control the runoff water to keep it from reaching any traveled roadway, railroad, waterway, any location under I-95 structures, or any other designated areas.

405.04 MEASUREMENT AND PAYMENT

286 **DELETE:** First paragraph in its entirety.

INSERT: The following.

The removal of existing bridge and structures or portion thereof will be measured and paid for as specified. The payment will be full compensation for all excavation, mechanical grinding, hydro-demolition, backfill, saw cuts, professional engineer services, removal of existing shields and debris, temporary protective shields, temporary sheeting and shoring, hauling, disposal, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. On deck replacement projects, payment also includes obtaining all deck elevations specified to determine rebound, computations necessary to place new deck at required elevation, and submitting all data for review.

286 **ADD:**

405.04.04 Mechanical grinding/milling and hydro-demolition of bridge decks will not be measured but will be paid for at the Contract lump sum price for Removal of Portions of Existing Concrete Bridge Deck.



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SPECIAL PROVISIONS
REMOVAL OF EXISTING STRUCTURES

CONTRACT NO. FT-928-000-006

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286 **ADD:**

405.04.05 Removal and resetting of existing fences on structure will be measured and paid for at the Contract unit price per linear foot for the pertinent items specified.



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SPECIAL PROVISIONS
420 – PORTLAND CEMENT CONCRETE STRUCTURES

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CATEGORY 400
STRUCTURES

SECTION 420 – PORTLAND CEMENT CONCRETE STRUCTURES

420.02 MATERIALS.

306 **DELETE:**

Concrete Mixes 902.10 and 420.02.04

306 **INSERT:** The following:

Concrete Mixes Modified Mix No. 6 Concrete (4,500 psi) as specified in 902.10 except that the aggregate used shall have 3/4" maximum aggregate size using coarse aggregate no. 7 as specified in Section 901 of the Standard Specifications.

Welded Wire Fabric 908.05

307 **INSERT:** The following:

420.02.05 Field Control. Field control will be compressive strength, slump, and air entrainment. If the field results fall below the specified value, Contractor shall prepare a new mix design as directed.



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SPECIAL PROVISIONS

CONTRACT NO. FT-928-000-006

PREFORMED PATTERNED REFLECTIVE CONTRAST MARKINGS

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**CATEGORY 500
PAVING**

**PERMANENT PREFORMED PATTERNED REFLECTIVE
CONTRAST PAVEMENT MARKINGS**

DESCRIPTION. This work shall consist of furnishing and applying permanent preformed patterned reflective contrast pavement (PPPRCP) markings as specified in the Contract Documents or as directed by the Engineer.

MATERIALS.

Permanent Preformed Patterned Reflective Pavement Marking Materials	951.07
--	--------

CONSTRUCTION.

General. PPPRCP markings shall be applied in conformance with the manufacturer's recommendations or as directed by the Engineer.

When the Contract Documents specifies the use of PPPRCP markings on concrete pavements or existing asphalt pavements, the Contractor shall use heat, solvent, or other type of adhesive primer in conformance with the manufacturer's recommendations.

PPPRCP markings shall conform to pavement contours and be resistant to deformation by traffic and damage from snow removal equipment. Surface preparation, use of solvents and primers and equipment used in the application of PPPRCP markings shall conform with the manufacturer's recommendations and be approved by the Engineer. After PPPRCP markings are applied, they shall be immediately ready for traffic.

The PPPRCP markings shall consist of durable retroreflective white or yellow pliant polymer markings with durable matte black non-reflective polymer borders. The total width of the PPPRCP markings shall be an additional three inches wider than the nominal width specified. This additional three in. shall be a black non reflective film with one and one half in. on both sides of the white or yellow film.

Quality Assurance/Quality Control. Refer to 549.03.01.

Cleaning Pavement Surfaces. Refer to 549.03.02.

Application. Refer to 549.03.03 and the following:

- (a) **Manufacturer's Recommendations.** The Contractor shall provide a copy of the manufacturer's recommendations to the Engineer, and shall follow them for the installation of the line markings.



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PREFORMED PATTERNED REFLECTIVE CONTRAST MARKINGS**

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- (b) **Adherence.** Adherence of PPPRCP markings shall be randomly checked by using a paint scraper or another approved tool, which shall be held nearly parallel with the highway surface, so there is no dislodging of the tape.
- (c) **Thickness.** The finished thickness of the PPPRCP markings shall have a minimum caliper of 0.060 in. at the thickest portion of the patterned cross section, and a minimum caliper of 0.020 in. at the thinnest portion of the cross section. Measurements shall be made from the top of finished pavement surface.
- (d) **Color.** The color of the markings shall match Federal Standard 595 (33538 - yellow, 37886 - white, or 37038 - black). The Contractor shall supply the specified color chips for the Engineer's use to visually determine that the PPPRCP markings match the specified color.
- (e) **Retroreflectance.** Refer to 549.03.03(h) and the following:

MINIMUM RETROREFLECTANCE

COLOR	RETROREFLECTIVITY	CORRECTIVE ACTION
White	350 or higher	None
Yellow	250 or higher	
White	less than 350	Necessary corrective actions, removal, replacement
Yellow	less than 250	

- (f) **Width.** Refer to 549.03.03(e).
- (g) **Alignment.** Refer to 549.03.03(f).
- (h) **Layout Markings.** Refer to 549.03.03(i).

Quality Control Test Strip. Refer to 549.03.04.

Protection During Application. Refer to Section 549.03.05.

Observation Period. The Contractor shall be responsible for any defects in materials and workmanship of the PPPRCP markings for a period of 180 days from the date the markings are applied and under traffic.

The Engineer will not assess time charges during the observation period provided all other work on the Contract is complete. At the end of the observation period, the Engineer will inspect the pavement marking for durability, color, reflectivity, and inform the Contractor of all pavement



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SPECIAL PROVISIONS

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PREFORMED PATTERNED REFLECTIVE CONTRAST MARKINGS

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markings that have failed and require replacement. The pavement marking will be considered failed for any of the following conditions:

- (a) More than five percent of the substrate is exposed in any 2000 ft section of longitudinal pavement marking line.
- (b) Retroreflectance values have dropped below 300 mcd/L/m² for white or 220 mcd/L/m² for yellow.
- (c) Marking is discolored on a visual comparison with the color chips.

The Contractor shall remove and replace all failed PPPRCP markings within 30 days of receiving written notification from the Engineer at no additional cost to the Administration. Work shall be in conformance with the manufacturer's recommendation and as approved by the Engineer before the project is accepted. The replacement markings shall conform to the same requirements as the original markings. If the work is not completed in this period, the Engineer will resume time charges until this work is completed.

At the end of the observation period, the Engineer will accept the work and terminate the Contractor's responsibilities upon satisfactory inspection of the PPPRCP markings.

MEASUREMENT AND PAYMENT. Measurement and payment for Permanent Preformed Patterned Reflective Contrast Pavement Markings will be measured and paid for at the Contract unit price per linear foot for the color and width specified. The payment will be full compensation for all pavement preparation, furnishing and placing of markings, testing, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Removal, Replacement, or Corrective Actions. Any additional cost (including Maintenance of Traffic) for the removal of markings that are incorrectly or inaccurately installed or failed the observation period, shall be at no additional cost to the Administration. In addition, the current road users fee will be applied when traffic disruption occurs during corrective actions.



**CATEGORY 500
PAVING**

SECTION 504 — HOT MIX ASPHALT PAVEMENT

504.04 MEASUREMENT AND PAYMENT.

478 **DELETE:** 504.04.01 Price Adjustment for Asphalt Binder in its entirety.

INSERT: The following.

504.04.01 Price Adjustment for Asphalt Binder. A Price Adjustment (PA) will be made to provide additional compensation to the Contractor or a credit to the Administration for the fluctuation in the cost of asphalt binder.

For adjustment purposes, the prevailing base index price will be the price specified for PG 64-22 Asphalt Binder currently posted at www.marylandroads.com (Business with SHA/Contracts, Bid, and Proposals) prior to bid opening. Cost differentials between PG 64-22 and a binder specified shall be included in the price bid per ton for Hot Mix Asphalt. A historical database will be maintained by the Administration

The PA will be made when the index price for the month of placement increases or decreases more than 5 percent of the prevailing base index price. Computations will be as follows:

$$\text{Percent Change} = ((P_p - P_b) / P_b) \times 100$$

$$PA = T \times Q \times ((P_p - (D \times P_b))$$

Where:

- PA = Price Adjustment for the current month
- T = Design target asphalt content expressed as a decimal
- Q = Quantity of Hot Mix Asphalt placed for the current month
- P_p = Index price for PG 64-22 Asphalt Binder per ton for the month of placement
- D = 1.05 for increases over 5 percent; 0.95 for decreases over 5 percent
- P_b = Prevailing base index price for PG 64-22 Asphalt Binder per ton

PA resulting in increased payment to the contractor will be paid under the item Price Adjustment for Asphalt Binder. The item amount will be established by the Administration and shall not be revised by the Contractor. PA resulting in a decreased payment will be deducted from monies owed the Contractor.



**CATEGORY 500
PAVING**

SECTION 504 — HOT MIX ASPHALT PAVEMENT

504.04 MEASUREMENT AND PAYMENT.

479 **DELETE:** 504.04.02 Price Adjustments for Hot Mix Asphalt Mixture and Pavement Density in its entirety.

INSERT: The following.

504.04.02 Payment Adjustments for Pavement Density and Hot Mix Asphalt Mixture. Payment adjustments for pavement density will be based on individual subplot core test data for a given lot and the lot average density as specified in this section and Table 504A. Payment reductions for density and for mixture will be made by adjusting the payment for Hot Mix Asphalt. Incentive payments will be made using the Contract items for Pavement Density and Hot Mix Asphalt Mixture. The item amounts established by the Administration shall not be revised. Payment reductions for density will be waived for portions of the pavement where a poor foundation is determined as the cause for inadequate density.



SPECIAL PROVISIONS INSERT
504 — HOT MIX ASPHALT PAVEMENT
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CONTRACT NO. FT-928-000-006

TABLE 504A		
Dense Graded HMA Mixes – Percent of Maximum Density		
Lot Average % Minimum	No Individual Sublot Below %*	Pay Factor (DF)
94.0	94.0	1.050
93.8	93.7	1.045
93.6	93.4	1.040
93.4	93.1	1.035
93.2	92.8	1.030
93.0	92.5	1.025
92.8	92.2	1.020
92.6	91.9	1.015
92.4	91.6	1.010
92.2	91.3	1.005
92.0	91.0	1.000
91.8	90.8	0.990
91.6	90.6	0.980
91.4	90.4	0.970
91.2	90.2	0.960
91.0	90.0	0.950
90.8	89.8	0.940
90.6	89.6	0.930
90.4	89.4	0.920
90.2	89.2	0.910
90.0	89.0	0.900
89.8	88.8	0.890
89.6	88.6	0.880
89.4	88.4	0.870
89.2	88.2	0.860
89.0	88.0	0.850
88.8	87.8	0.840
88.6	87.6	0.830
88.4	87.4	0.820
88.2	87.2	0.810
88.0	87.0	0.800
Less than 88.0	87.0	0.750 or rejected by Engineer

Note 1: When any test data is above 97.0, the Engineer may reject the lot. When not rejected, the lot will receive a pay adjustment in accordance with the following:

- (a) When the density lot average is above 97.5, the pay factor = 0.750.
- (b) When 3 sublot densities are above 97.0, the pay factor = 0.950.
- (c) When 4 or more sublot densities are above 97.5, the pay factor = 0.750.

Note 2: Pay incentive or pay disincentive will not be paid for placements identified as wedge/level courses or thin lift courses.

*Note 3: When the Contractor's core specific gravity data does not compare with the Administration's core specific gravity data, only the Administration's single sublot values and lot average value will be used in acceptance decision.

*Note 4: The average sublot values and the lot average will be used in acceptance decision.



Acceptance of a mixture lot will be in conformance with Sections 904, 915, and MSMT 735. A composite pay factor (CPF) for asphalt content and gradation will be based on the total estimated percent of the lot that is within Specification limits as computed using the quality level analysis in conformance with MSMT 735.

Payment adjustments will be computed as follows:

$$\text{Density Lot Payment Adjustment} = (\text{DF} - 1) \times (\text{AP}) \times (\text{TL})$$

$$\text{Mix Design Lot Payment Adjustment} = (\text{MF} - 1) \times (\text{AP}) \times (\text{TL})$$

where:

MF = Mixture pay factor $[0.55 + (0.5 \times \text{CMPWSL})]$

Refer to MSMT 735 for CMPWSL.

DF = Density pay factor from Table 504A.

AP = Adjusted/applicable unit price per 504.04.01.

TL = Applicable tonnage per lot.

An in-place density lot containing material with a pay factor of less than 1.000 may be accepted at the reduced pay factor provided the pay factor for density is at least 0.800, and there are no isolated defects.

A mixture lot containing material with a pay factor of less than 1.000 may be accepted at the reduced pay factor provided the composite pay factor for asphalt content and grading is at least 0.750, and there are no isolated defects.

An in-place density lot containing nonconforming material that fails to obtain at least a 0.800 pay factor and a mixture lot containing nonconforming material that fails to obtain at least a 0.750 pay factor for asphalt content and gradation will be evaluated to determine acceptance. Lots that are rejected shall be replaced.

Lots with less than five Quality Control or Quality Assurance samples per in-place density lot will not be evaluated for incentive payment.

When less than three mix samples have been obtained at the time of the acceptance sampling or at the time a lot is terminated, the Engineer will determine if the material in a shortened lot will be considered a part of the previous lot or whether it will be accepted based on the individual test data.



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CONTRACT NO. FT-928-000-006

557 — SNOWPLOWABLE RAISED PAVEMENT MARKERS

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**CATEGORY 500
PAVING**

SECTION 557 – SNOWPLOWABLE RAISED PAVEMENT MARKERS

557.01 DESCRIPTION. Furnish and install new Snowplowable Raised Pavement Markers (SRPM) and replacement components as specified in the Contract Documents or as directed by the Engineer.

557.02 MATERIALS.

Castings	Qualified Products List / 951.05
Pavement Marker Reflector Lenses	Qualified Products List / 951.05
Epoxy	951.05

Snowplowable Raised Pavement Markers are durable materials.

557.03 CONSTRUCTION.

Casting. Recycled iron castings are prohibited.

Placement. Snowplowable Raised Pavement Markers shall be installed and located as specified in the Contract Documents and in conformance with the Maryland Manual of Uniform Traffic Control Devices (Md MUTCD).

General Installation Requirements.

- (a) The Contractor shall install the SRPM no later than two weeks after the completion of the final surface or as directed by the Engineer.
- (b) At the time of installation, the road surface and ambient temperature shall be as specified in the manufacturers' recommendations. Installing markers on wet pavement surfaces as determined in MSMT 729 is prohibited.
- (c) At the time of installation, the Contractor shall have on the jobsite all the materials necessary to complete the installation.
- (d) The quality control test strip containing a minimum of 10 groove cuts spaced as specified in the Contract Document shall be constructed to verify the accuracy and ability of the equipment and personnel. The contractor shall replace at no additional cost to the Administration any incorrect groove cuts and any incorrect casting placements within the test strip.
- (e) At the time of installation, SRPM castings delivered with Pavement Marker Reflector Lens affixed should be free of dirt, dust, oil, grease, rust, moisture, or any foreign matter that will impair adhesion to the pavement. Any residual material that inhibits retroreflectivity of



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557 — SNOWPLOWABLE RAISED PAVEMENT MARKERS

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- (f) the reflector lens shall be removed without damage to the lens surface. It shall be the contractor's responsibility to clean each contaminated casting by sand blasting, wire brushing or other procedure approved by the Engineer to remove all foreign matter prior to installation. The use of chemicals to remove rust from the castings is prohibited.
- (g) The contractor shall replace at no additional cost to the Administration any incorrect groove cut and any incorrect casting placement. An additional test strip may be required by the Engineer in the event of incorrect installations. Incorrect installations, as determined by the Engineer, shall be corrected and repaired by the contractor at no additional cost to the Administration.

Pavement Marker Reflector Lens. Reflector lenses for pavement markers shall be the same color as the adjacent pavement marking except the back side shall be as follows;

- (a) One-Way Applications: The backside for One-Way Markers shall be red or blank as specified in the Contract Documents or as directed by the Engineer.
- (b) Two-Way Applications: The backside for Two-Way Markers shall be the same color as the adjacent pavement marking.

The pavement marker reflector lens shall be imprinted with the model/batch number and the manufacturers' name.

Castings. The casting shall be imprinted with the model number and the manufacturer's name.

New Installation.

- (a) The SRPM shall be installed in accordance with manufacturer's recommendations and D 4383. The installed height shall not exceed 0.25 in. above the road surface. The surface of the keel and web shall be free of scale, dirt, oil, grease or any other contaminant which may reduce its bond to the epoxy adhesive. All requirements of the manufacturer's installation instructions shall be met.
- (b) The groove cut for the casting shall be the appropriate dimensions to allow 0.125 in. movement side to side of the casting. All leveling lugs on the casting must contact the pavement. The leading and trailing edges of the casting must lie below the pavement surface and the casting properly seated. All other requirements of the manufacturer's installation instructions shall be met.
- (c) Lenses used shall be of a type specifically manufactured and approved for use as SRPM reflector lenses. Lenses that are manufactured exclusively for recessed pavement markers are not permitted as substitutes for SRPM reflector lenses.

Replacement.



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557 — SNOWPLOWABLE RAISED PAVEMENT MARKERS

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- (a) Casting Replacement. The re-use of damaged or removed castings is prohibited.
- (b) Pavement Marker Reflector Lens Replacement. The Contractor shall remove and dispose of any damaged reflector lens and replace with a new lens. Previously installed undamaged castings which are missing a reflector lens shall have a new reflector lens installed. The replacement lenses shall be installed per manufacturer's written instructions.
- (c) Casting Groove Cut Replacement and Accuracy. The re-use of existing groove cuts is prohibited; castings shall only be installed in new groove cuts. Previously used groove cuts shall be permanently patched in accordance with applicable sections of 504, 505 and 522 or as directed by the Engineer. The location of the replacement groove cut shall be within 10 percent longitudinally in front (with the direction of traffic) and no lateral deviation exceeding 1½ in.

Removal of Resetting of Pavement Marker Reflector Lenses.

- (a) The contractor shall remove the reflector lenses of all pavement markers that are within the limits of temporary traffic control but outside the limits of pavement marker replacement as specified in the Contract Documents.
- (b) The removed reflector lenses shall be reset within the pavement markers concurrent with the installation of new pavement markers included in the Contract Documents.
- (c) The contractor shall replace at no additional cost to the Administration, and reflector lenses damaged during removal or resetting.

Casting Adhesive. The epoxy adhesive used to fasten the castings to the pavement surface shall conform to D 4383-05 Table X1.1.

Reflector Lens Adhesive in Casting. The adhesive used to fasten the reflector lens to the casting shall meet the manufacturers' recommendations.

Quality Assurance/Quality Control. Refer to Section 549.

Observation Period. The Contractor shall replace at no additional cost to the Administration, any SRPM or Pavement Marker Reflector Lenses found to be damaged, non-retroreflective or missing due to improper installation or manufacturing defects within 180 days after opening to traffic.

557.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for all pavement preparation, furnishing and placement of SRPM's, testing, removal, groove cutting, repair and all materials, labor, equipment, tools and all incidentals necessary to complete the work.



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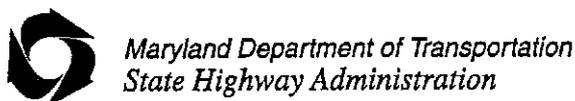
SPECIAL PROVISIONS

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557 — SNOWPLOWABLE RAISED PAVEMENT MARKERS

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- (a) Snowplowable Raised Pavement Markers will be paid for at the Contract unit price per each. Furnishing and installing SRPM includes the casting, reflector, adhesive and grooving.
- (b) Removal of existing Castings, excluding any incorrect installation by the Contractor, and repair of Groove Cuts will be paid for at the Contract unit price per each.
- (c) Replacement of Pavement Marker Reflector Lenses will be paid for at the Contract unit price per each.
- (d) Removal and resetting of reflector lenses for all pavement markers to remain will not be measured but will be incidental to the cost of Maintenance of Traffic.



CATEGORY 500
PAVING

**SECTION 559 — PERMANENT PREFORMED PATTERNED
REFLECTIVE PAVEMENT MARKINGS**

559.01 DESCRIPTION. This work shall consist of furnishing and applying permanent preformed patterned reflective pavement (PPPRP) markings as specified in the Contract Documents or as directed by the Engineer.

559.02 MATERIALS.

Permanent Preformed Patterned Reflective Pavement Marking Materials	951.07
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559.03 CONSTRUCTION.

559.03.01 General. PPPRP markings shall be applied in conformance with the manufacturer's recommendations or as directed by the Engineer.

On new hot mix asphalt projects, the PPPRP markings shall be inlaid into the hot surface of the top course of pavement. No top course paving shall be permitted unless the stripping crew and marking materials are at the project site.

When the Contract Documents specifies the use of PPPRP markings on concrete pavements or existing asphalt pavements, the Contractor shall use heat, solvent, or other type of adhesive primer in conformance with the manufacturer's recommendations.

Preformed legends and symbols shall conform to the applicable shape and sizes as specified in the MUTCD, and Contract Documents.

PPPRP markings shall conform to pavement contours and be resistant to deformation by traffic and damage from snow removal equipment. Surface preparation, use of solvents and primers and equipment used in the application of PPPRP markings shall conform with the manufacturer's recommendations and be approved by the Engineer. After PPPRP markings are applied, they shall be immediately ready for traffic.

559.03.02 Quality Assurance/Quality Control. Refer to 549.03.01.

559.03.03 Cleaning Pavement Surfaces. Refer to 549.03.02.

559.03.04 Application. Refer to 549.03.03 and the following:

- (a) **Manufacturer's Recommendations.** The Contractor shall provide a copy of the manufacturer's recommendations to the Engineer, and shall follow them for the installation of the line markings.



- (b) **Adherence.** Adherence of PPPRP markings shall be randomly checked by using a paint scraper or another approved tool, which shall be held nearly parallel with the highway surface, so there is no dislodging of the tape.
- (c) **Thickness.** The finished thickness of the PPPRP markings shall have a minimum caliper of 0.060 in. at the thickest portion of the patterned cross section, and a minimum caliper of 0.020 in. at the thinnest portion of the cross section. Measurements shall be made from the top of finished pavement surface.
- (d) **Color.** The color of the markings shall match Federal Standard 595 (33538 - yellow, 37886 - white, or 37038 - black). The Contractor shall supply the specified color chips for the Engineer's use to visually determine that the PPPRP markings match the specified color.
- (e) **Retroreflectance.** Refer to 549.03.03(h) and the following:

MINIMUM RETROREFLECTANCE

COLOR	RETROREFLECTIVITY	CORRECTIVE ACTION
White	350 or higher	None
Yellow	250 or higher	
White	less than 350	Necessary corrective actions, removal, replacement
Yellow	less than 250	

- (f) **Width.** Refer to 549.03.03(e).
- (g) **Alignment.** Refer to 549.03.03(f).
- (h) **Layout Markings.** Refer to 549.03.03(i).

559.03.05 Quality Control Test Strip. Refer to 549.03.04.

559.03.06 Responsibility. Refer to Section 549.

559.03.07 Observation Period. The Contractor shall be responsible for any defects in materials and workmanship of the PPPRP markings for a period of 180 days from the date the markings are applied and under traffic.

The Engineer will not assess time charges during the observation period provided all other work on the Contract is complete. At the end of the observation period, the Engineer will inspect



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559 — PREFORMED PATTERNED REFLECTIVE MARKINGS

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the pavement marking for durability, color, reflectivity, and inform the Contractor of all pavement markings that have failed and require replacement. The pavement marking will be considered failed for any of the following conditions:

- (a) More than five percent of the substrate is exposed in any 2000 ft section of longitudinal pavement marking line.
- (b) Retroreflectance values have dropped below 300 mcd/L/m² for white or 220 mcd/L/m² for yellow.
- (c) Marking is discolored on a visual comparison with the color chips.

The Contractor shall remove and replace all failed PPPRP markings within 30 days of receiving written notification from the Engineer at no additional cost to the Administration. Work shall be in conformance with the manufacturer's recommendation and as approved by the Engineer before the project is accepted. The replacement markings shall conform to the same requirements as the original markings. If the work is not completed in this period, the Engineer will resume time charges until this work is completed.

At the end of the observation period, the Engineer will accept the work and terminate the Contractor's responsibilities upon satisfactory inspection of the PPPRP markings.

559.04 MEASUREMENT AND PAYMENT. Measurement and payment for the pertinent Permanent Preformed Patterned Reflective Pavement Marking items will be as specified in 549.04. The reflectometer will become the property of the Contractor at the completion of the project.



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565 – REMOVAL OF EXISTING PAVEMENT MARKINGS

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CATEGORY 500 PAVING

SECTION 565 — REMOVAL OF EXISTING PAVEMENT MARKINGS

565.01 DESCRIPTION. Remove existing pavement markings (lines, letters, numbers, arrows, and symbols) during temporary or permanent traffic shifts, and repairing any roadway areas damaged during the removal process. This Specification does not apply to raised or recessed pavement markers. Temporary blackout tape shall be applied when existing pavement markings will require salvaging for reuse after completion of temporary traffic shifts necessary to perform work specified in the Contract Documents. Refer to 104.11.02.

565.02 MATERIALS. Not applicable.

565.03 CONSTRUCTION. The Contractor shall layout and apply all new pavement markings (temporary or permanent) as specified in Section 549 before any removal of existing pavement markings begin.

565.03.01 Quality Control/Quality Assurance. At least two weeks prior to the start of pavement markings removal, the Contractor shall submit a Quality Control Plan (QCP) to the Engineer for review. The QCP shall contain (as a minimum) the following information:

- (a) How the Contractor proposes to perform the work while ensuring conformance with the Specifications.
- (b) Proposed method of removal based on road conditions, type and number of equipment to be used, manpower expectations, and time frame to complete the work based on maintenance of traffic (MOT) restrictions.
- (c) Location and quantity of markings to be removed.
- (d) Protective shielding plan and containment system, particularly in the case of markings that may contain toxic materials.

The QCP shall also detail when, how, and what corrective actions will be taken for unsatisfactory construction practices and deviations from the Contract Documents. Any deviation from the QCP shall be cause for immediate suspension of work. Operations shall not resume without the Engineer's approval.

565.03.02 Quality Control Test Strip. Prior to the beginning of work, the Contractor shall demonstrate the removal method to the Engineer for approval. A minimum of 100 ft of existing pavement markings shall be removed as a test strip at a location determined by the Engineer. If



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565 – REMOVAL OF EXISTING PAVEMENT MARKINGS

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the method does not work or shows signs of damaging the road surface, then another method shall be tried. Additional control strips will be required. The preferred method is that which least damages the roadway and completely removes the markings.

565.03.03 Methods of Removal. The following removal methods are based on the pavement condition and type of marking material:

- (a) **Manual.** A scraper or putty knife shall be used to lift tape from the pavement surface. Open flame for tape removal is prohibited.
- (b) **High Pressure Water Blasting.** A high pressure water blast shall be used to break the bond between the marking material and the pavement surface. The water blast may contain fine grit.
- (c) **Alternate Methods.** Abrasive blasting or grinding methods shall be submitted for approval to the Office of Materials Technology prior to use. *Grinding shall not be performed on concrete surfaces.*

565.03.04 Cleaning Pavement Surfaces. Immediately behind the removal operation, a vacuum equipped street sweeper capable of removing all loose material shall be used to remove all dust and debris generated by the removal process prior to returning the area to traffic. The Contractor shall prevent debris from draining into inlets and waterways, and all debris shall be collected and disposed of on an approved spoil area or landfill.

565.03.05 Alignment. Removal shall be performed in a straight and uniform manner, and shall follow the longitudinal alignment of the markings with a lateral deviation of no more than 1 in. in any 10 ft section. Affected area shall not exceed 1/2 in. on either side of the existing marking. The depth shall be uniform throughout, 1/8 in. or less, with no gouge areas in the pavement surface. If a second pass is necessary to completely remove the markings, the edges of the groove shall be feathered to a width of 1.25 in. on each side for every additional 1/8 in. of depth.

565.03.06 Corrective Action. Any pavement surface damaged beyond the requirements specified herein by the Contractor's operations shall be repaired or repaved as determined by the Engineer at no additional cost to the Administration.

565.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for the removal of the markings, pavement clean up, test strips, protective shielding, containment, disposal of marking material and pavement debris, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.



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Removal of the existing pavement markings will be measured and paid for at the Contract unit price for one or more of the following items:

- (a) Removal of Existing Pavement Marking Lines per linear foot, any width.
- (b) Removal of Existing Pavement Marking Letters, Symbols, Arrows, and Numbers per square foot.



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REMOVAL OF EXISTING FENCE**

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**CATEGORY 600
SHOULDERS**

SECTION 600 – REMOVAL OF EXISTING FENCE

600.01.01 DESCRIPTION. This work shall consist of the complete removal and disposal of existing chain link fence as specified in the Contract Documents or as directed by the Engineer.

600.01.02 MATERIALS. Not applicable.

600.01.03 CONSTRUCTION. Construction shall consist of removal and disposal of all portions of the existing chain link fence and terminal posts. The Contractor shall backfill the terminal post holes with material as specified in Section 916.

600.01.04 MEASUREMENT AND PAYMENT. The payment will be full compensation at the Contract unit price per linear foot for removal of fence, backfill for post holes, disposal of fence components, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.



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604 – CONCRETE TRAFFIC BARRIERS

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**CATEGORY 600
SHOULDERS**

SECTION 604 — CONCRETE TRAFFIC BARRIERS

604.04 MEASUREMENT AND PAYMENT.

530 **INSERT:** The following.

604.04.04 Concrete Traffic Barrier Transition will be measured and paid for at the Contract unit price per linear foot. Measurement will be along the centerline of the top of the barrier.



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800.01 – CATALOG CUTS AND WORKING DRAWINGS

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**CATEGORY 800
TRAFFIC**

SECTION 800.01 - CATALOG CUTS AND WORKING DRAWINGS

800.01.01 DESCRIPTION. This work shall consist of the Contractor preparing and transmitting submittals to demonstrate the performance of the work will be in accordance with the Contract Documents. Submittal schedules, catalog cuts, shop drawings, installation methods, manufacturer's certifications, photometric data and working drawings shall be furnished on all Contractor furnished items for highway signing, sign lighting, highway lighting and traffic signals. Stakeouts of the sign locations shall be submitted for all sign structure locations as specified in the Contract Documents

800.01.02 MATERIALS. Not Applicable.

800.01.03 CONSTRUCTION.

Submittal Requirements. Submittals shall be scheduled and coordinated with the Contractor's construction schedule. A complete submittal schedule and list of required submittals shall be submitted with the first submittal, but no later than three days after the pre-construction conference. The schedule for submission of submittals shall be arranged so that related equipment items are submitted concurrently.

The Engineer may require changes to the submittal schedule to permit concurrent review of related equipment. Shop drawings for closely related items such as a sign and its support structures shall be submitted together.

Submittal Documents. Contractor's drawings shall be neat in appearance, legible and explicit to enable proper review to ensure Contract compliance. They shall be complete and detailed to show fabrication, assembly and installation details, wiring and control diagrams, catalog data, pamphlets, descriptive literature, and performance and test data. They shall be accompanied by calculations or other sufficient information to provide a comprehensive description of the structure, machine or system provided and its intended manner of use. If the Contractor's drawings deviate from the Contract Documents, the Contractor shall so advise the Engineer in writing with the submittal and state the reason therefore.

No portion of the work requiring a Contractor's drawing shall be started nor shall any materials be fabricated, delivered to the site, or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-site



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800.01 – CATALOG CUTS AND WORKING DRAWINGS

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construction accomplished which does not conform to approved Contractor's drawings shall be at the Contractor's risk. The Administration will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.

Shop drawings shall show types, sizes, accessories, layouts including plans, elevations and sectional views, component, assembly and installation details, and all other information required to illustrate how applicable portions of the Contract requirements will be fabricated and installed.

In case of fixed mechanical and electrical equipment, layout drawings drawn to scale, shall be submitted to show required clearances for operation, maintenance and replacement of parts. Manufacturer's certified performance curves, catalog cuts, pamphlets, descriptive literature, installation and application recommendations, shall be provided and indicate conformance to the Contract Documents. Certifications shall be originals. Certification shall also be sent to the Maryland Department of Transportation (SHA) Office of Materials and Technology ("OMT") as required in the Contract Documents.

Manufacturer's catalog, product and equipment data shall be certified and shall include materials type, performance characteristics, voltage, phase, capacity, and similar data along with wiring diagrams when applicable. Indicate catalog, model and serial numbers representing specified equipment. Provide complete component information to verify all specified required items. Installation recommendations and instructions shall provide written Manufacturer's detail step by step preparation and installation of the materials, and products including recommended tolerances and space for maintenance and operation.

Catalog cuts for sign luminaires shall have photometric data attached for each sign to be illuminated. Photometric printouts shall include the sign number, the illumination on a one foot square grid covering the entire sign face, the average illumination, the maximum to minimum uniformity ratio, and a working drawing for the sign face attached.

Catalog cuts for roadway luminaires shall have photometric data attached as specified in the Contract Documents.

The Contractor shall submit working drawings as required for changes, substitutions, contractor design items, and Contractor designed methods of construction. Requirements for working drawings will be listed in appropriate Specification Sections and in Special Provisions. Drawings shall be accompanied by calculations or other information to completely explain the structure, machine or system described and its intended use.



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800.01 – CATALOG CUTS AND WORKING DRAWINGS

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Review and approval of such drawings by the Engineer shall not relieve the Contractor from his responsibility with regard to the fulfillment of the terms of the Contract.

Working drawings and calculations as submitted shall be sealed, dated and signed by a Professional Engineer registered in the State of Maryland.

The review and approval of Contractor's drawings by the Administration shall not relieve the Contractor from his responsibility with regard to the fulfillment of the terms of the Contract. The

Contractor shall be responsible for the verification and accuracy of all dimensions and insuring that all Contractor furnished items are compatible, and conform to all design and performance criteria.

All risks of error and omission are assumed by the Contractor and the Engineer will have no responsibility therefore.

Submittal Process. Each Contractor's drawing submitted by the Contractor shall have affixed to it the following Certification Statement, signed by the Contractor:

"By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and pertinent data and I have checked and coordinated each item with other applicable approved drawings and Contract requirements."

With the first submittal, submit a Contractor's submittal schedule, listing by Specification Section number, all submittals required and approximate date submittal will be forwarded.

Each submittal having catalog descriptions, shop drawings, working drawings, photometric data, manufacturer's certifications, method of construction and manufacturer's installation recommendations shall be submitted for approval:

Each submittal shall have a transmittal page that indicates the Contractor's and Subcontractor's address and phone numbers. Submittals containing multiple items need the identification only on the exterior of each package. For original submittals, and each subsequent resubmittal that may be required, 9 copies will be submitted. A separate copy shall be forwarded to the Engineer.



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800.01 - CATALOG CUTS AND WORKING DRAWINGS

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All submittals for approval shall have the following identification data, as applicable, contained thereon or permanently adhered thereto.

- (a) Drawing title, drawing number, revision number, and date of drawing and revision.
- (b) Applicable Contract Drawing Numbers and Specification Section and Paragraph Numbers.

The first page of every catalog description, working drawing and material certification shall be stamped in red with the following. All pertinent Contract Document information shall be filled in the spaces provided.

MARYLAND TRANSPORTATION AUTHORITY	
SUBMITTAL PACKAGE # _____ DATED _____	
CONTRACT # _____ LOCATION _____	
PROJECT DESCRIPTION _____	
ITEM # _____ THIS ITEM CONTAINS _____ PAGES	
ITEM DESCRIPTION _____	
<input type="checkbox"/> ACCEPTED	
<input type="checkbox"/> ACCEPTED AS NOTED	
<input type="checkbox"/> REJECTED - REVISE & RESUBMIT	
REVIEWERS NAME _____	DATE _____

The Contractor shall indicate the submittal package by sequential numbering and date of submittal. Catalog, product data or brochure submittals containing various products, sizes and materials shall be underscored or highlighted to indicate the salient features required to meet the specifications. Likewise, items not applicable to the Contract shall be marked "not applicable" or crossed out.



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800.01 – CATALOG CUTS AND WORKING DRAWINGS

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If one or more of the items in a submittal are not approved, resubmittal of only the unapproved items is required, highlighted to show the particular item being resubmitted. Resubmittals shall bear original submittal number and be lettered sequentially.

Three copies of all Contractor's drawings will be returned to the Contractor.

Each submittal shall be in accordance with the Contractor's submission schedule. Allow thirty days for checking and appropriate action by the Engineer.

Contractor's submittals will be returned, marked with one of the following classifications:

ACCEPTED: no corrections, no marks **ACCEPTED AS NOTED:** a few minor corrections. Item shall be installed in accordance with the corrected drawings.

REJECTED - REVISE & RESUBMIT: requires corrections or is otherwise not in accordance with the Contract Documents. No items shall be fabricated. Correct and resubmit drawings as per original submission. Allow thirty days for checking and appropriate action by the Engineer.

800.01.04 MEASUREMENT AND PAYMENT. Catalog cuts, manufacturer's certifications, photometric data and working drawings will not be measured but the cost will be incidental to the pertinent items specified in the Contract Documents.



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800.02 – SIGN INSTALLATION DATE STICKERS

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**CATEGORY 800
TRAFFIC**

SECTION 800.02 – SIGN INSTALLATION DATE STICKERS

800.02.01 DESCRIPTION. This work shall consist of furnishing and installing a sign installation date sticker to identify the date of installation for every proposed sign.

800.01.02 MATERIALS. The sign installation date sticker shall be a self-adhesive label which displays the year and month (see example below), and would allow the sign installer to hole-punch the month, to indicate date of installation. The sign installation date sticker shall be provided by the sign sheeting manufacturer. The sticker shall be a minimum size of 2” wide by 1” high, and shall not exceed 8” wide by 4” high.

800.02.03 CONSTRUCTION. The sign installation date sticker shall be installed, on the date of installation on the lower reverse corner of the sign, closest to traffic. The sign installation date sticker shall be directly applied to the aluminum sign as per the manufacturer’s specifications. The contractor shall prepare the surface as required by the manufacturer’s specifications.

800.02.04 MEASUREMENT AND PAYMENT. Sign Installation Date Sticker will not be measured but the cost will be incidental to the appropriate furnish and install sheet aluminum and extruded aluminum signs items in the contract. The payment will be full compensation for all materials, labor, equipment, tools and incidentals necessary to complete the work.

1	2	3	4	5	6
05					
7	8	9	10	11	12

Note: Numbers shown for display purposes only.



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800.03 – SIGN STRUCTURE IDENTIFICATION NUMBER LABEL

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**CATEGORY 800
TRAFFIC**

**SECTION 800.03 – SIGN STRUCTURE IDENTIFICATION
NUMBER LABEL**

800.03.01 DESCRIPTION. This work shall consist of furnishing and installing a Sign Structure Identification Number Label on all Authority owned sign structures (overhead and cantilever) within the limits of the project. The contractor shall contact the Authority's Bridge Engineer to coordinate identification numbers for each sign structure that are owned and maintained by the Maryland Transportation Authority as detailed on the plans. Sign structures not owned and maintained by the Maryland Transportation Authority, as detailed on the plans, will not require labels.

800.03.02 MATERIALS. Sign Structure Identification Number Labels shall be fabricated of the same sheeting material for other signs in the contract as specified on Drawing No. SN-1. Reflective Sheeting per 950.03.

800.03.03 CONSTRUCTION. The Sign Structure Identification Number Label shall be installed perpendicular to traffic, at 7'-0" from top of roadway to bottom of Identification Number. The sheeting only shall be directly applied to the sign structure as per the manufacturer's specifications. The contractor shall prepare the surface as required by the manufacturer's specifications.

800.03.04 MEASUREMENT AND PAYMENT. Sign Structure Identification Number Labels will not be measured but the cost will be incidental to the appropriate furnish and install sign structure items in the contract. For existing sign structures, the costs will be incidental to other pertinent items in the contract. The payment will be full compensation for all materials, labor, equipment, tools and incidentals necessary to complete the work.



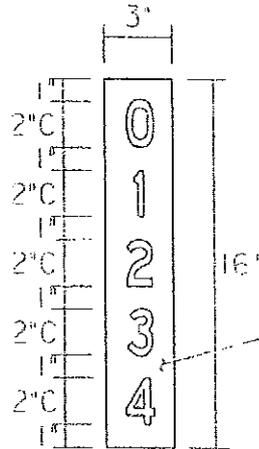
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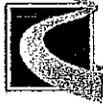
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800.03 – SIGN STRUCTURE IDENTIFICATION NUMBER LABEL

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Note: Numbers shown for
display purposes only.



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SPECIAL PROVISIONS
800.04 – PORTABLE GENERATOR

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**CATEGORY 800
TRAFFIC**

SECTION 800.04 – PORTABLE GENERATOR

800.04.01 DESCRIPTION. This work shall consist of furnishing and utilizing a portable generator to power facilities that cannot be re-energized to cabinet circuits prior to night time hours.

800.04.02 MATERIALS.

The contractor shall furnish a generator that meets the following minimum requirements as specified below:

Generator shall furnish adequate AC power to operate all required lighting equipment

Minimum wattage at full capacity shall be 12,000 watts

277V/480V three phase

Minimum of 18 amps @ 480V

Gasoline or Diesel engine powered

5 gallon fuel tank

All wiring shall be waterproof and installed according to local, State, NEC, NESC, Federal and OSHA requirements.

All power sources shall be equipped with a Ground-Fault Circuit Interrupter.

800.04.03 CONSTRUCTION. When the contractor determines that a portable generator will need to be used overnight to power lighting facilities the contractor shall locate the generator behind an approved traffic barrier to ensure a conflict between the generator and vehicular traffic will not exist.

The contractor is required to monitor the operation of the generator during nighttime operation.



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800.04 – PORTABLE GENERATOR

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800.04.04 MEASUREMENT AND PAYMENT. Portable Generators will be measured and paid for at the Contract unit price per Each generator supplied of type required. The payment will be full compensation for all materials, labor, equipment, tools and incidentals necessary to complete the work which includes, but is not limited to, portable generator, gasoline or diesel fuel, transportation, monitoring, testing, connection to lighting components, storage, disconnection and maintenance.



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SPECIAL PROVISIONS
800.05 – TEMPORARY ELECTRICAL LIGHTING SYSTEM

CONTRACT NO. FT-928-000-006

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CATEGORY 800
TRAFFIC

SECTION 800.05 – TEMPORARY ELECTRICAL LIGHTING SYSTEM

800.06.01 DESCRIPTION. This work shall consist of furnishing and installing a temporary electrical system that will provide electrical power to existing lighting structures, existing overhead sign structure lighting and proposed overhead sign structure lighting during installation of the permanent electrical lighting system. The work will consist of installing temporary conduit, cables, splices, etc.

800.05.02 MATERIALS.

Electrical Conduit and Fittings	805
Ground Rods	804
Ground Wire	804
Electrical Cable, Wire and Connectors	810
General Electrical Work and Testing	820
Electrical Hand Holes, Manholes, Pull and Junction Boxes	811

Splice Kits for splicing of underground direct buried or electrical duct cable. Kits shall consist of a mechanical single conductor connector with four lugs (two for each end of cable), arranged in-line. The kit shall also consist of two heat shrink sleeves. The first sleeve shall be slightly smaller than the outer sleeve. An adhesive shall be applied to the inner portion of the heat shrink sleeves. Kits and components shall be UL Listed for direct burial.

Girder clamps for clamping conduit to bridge girders. Clamps shall be Bridgeport conduit beam clamps, spaced at 5 foot intervals. Vibration pads shall be installed at each conduit clamp location in accordance with section 910.02.03 of the standard specifications.

800.05.03 CONSTRUCTION.

To maintain power to the lighting structure within the project limit the contractor shall furnish and install splice kits at light structure and sign structure locations to allow continuation of circuits during switchover of the lighting and sign structure to the ultimate lighting system. The contractor should refer to the details shown in the contract documents for schematic details of the splicing at existing lighting structures as well as the location where the detail should be used.



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800.05 – TEMPORARY ELECTRICAL LIGHTING SYSTEM

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For lighting structures and sign structures fed from existing concrete traffic barrier wall on existing bridge structure viaduct, the contractor shall furnish and install a temporary conduit system to be installed on the existing bridge girders as shown in the details provided in the contract documents. The temporary conduit system shall have electrical cable furnished and installed. Prior to demolition of the existing concrete barrier wall containing lighting circuits, the temporary electrical system shall be operational.

No luminaire shall be without power during night time hours without written permission from the engineer. A portable generator shall be used to power facilities that cannot be re-energized to cabinet circuits prior to night time hours.

The contractor is responsible for providing temporary electrical connectors for existing luminaires. High mast pole detail A and B shown in the electrical plans of the contract documents describe means by which the temporary electrical connections will be made. For temporary electrical circuits run on the bridge girders, the contractor shall match the number of conductors and conductor size used in the existing electrical system run in the existing concrete barrier wall.

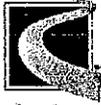
The temporary electrical lighting system installed on bridge girders shall tie into the existing in-ground electrical duct system prior to running along the bridge. This connection shall be made by intercepting the existing duct cable with a manhole/handhole. Payment for this interception shall be included in the lump sum "Temporary Electrical Lighting System" item.

All temporary lighting system work shall be in compliance with all NEC, SHA and MdTA electrical and lighting requirements.

Temporary electrical lighting system components install on bridge girders shall be properly ground as specified in the National Electric Code (NEC).

The contractor shall remove the temporary electrical lighting system installed on the bridge girders when the permanent lighting system is installed and functional.

800.05.04 MEASUREMENT AND PAYMENT. Temporary Electrical Lighting System will be paid at a Lump Sum contract price. The payment shall include full compensation for all conduits, fittings, cables, manholes, hand holes, connector kits, cable connection, removal of temporary electrical lighting system, excavation, splice kits, ground rods, ground wire, testing, condulets, interception of existing electrical facilities, bridge girder clamps, vibration pads, labor, equipment, tools and incidentals necessary to complete the work.



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800.05 – TEMPORARY ELECTRICAL LIGHTING SYSTEM

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Permanent electrical system items shall be paid for as specified in pertinent sections.
The Portable Generator shall be paid for as specified in Section 800.05.



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800.06 - SQUARE PERFORATED TUBULAR STEEL POSTS

Page 1 of 2

**CATEGORY 800
TRAFFIC**

SECTION 800.06 - SQUARE PERFORATED TUBULAR STEEL POSTS

800.06.01 DESCRIPTION. Furnish and install Square Perforated Tubular Steel Posts and Square Perforated Tubular Steel Anchor Bases for mounting traffic signs as specified in the contract documents, or as directed by the Engineer.

800.06.02 MATERIALS.

Steel Posts	A570 Grade 50
Galvanizing	A653 Designation G-90
Spray Galvanizing Compound	A780

Square Tubular Steel Posts and Square Tubular Steel Anchor bases must be formed from 12 gauge steel. All sides of the tubes shall have 7/16 in. die punched circular holes or perforated knock-outs, at one in. centers along their entire length.

The Tubular Steel Posts shall be two in. square tubes 12 ft long.

Square Tubular Steel Anchor Bases shall be comprised of two telescoping tubes. The first shall be 2 1/4 in. square, three ft long, formed from 12 gauge steel and shall snugly fit over the sign post. The second section shall be a 2 1/2 in. square, 18 in. long, formed from 12 gauge steel, and shall snugly fit over the 2 1/4 in. section.

800.06.03 CONSTRUCTION. The Square Tubular Steel Anchor Base assembly shall be constructed by placing the 18 in. base section over the 3 ft base section so that they are flush at the top and the holes are aligned. The entire unit shall be driven into the ground so that one or two rows of holes in the Square Perforated Tubular Steel Base are exposed. The base shall be driven so that it remains plumb and to provide the final sign assembly with the correct orientation.

Finished length of the Tubular Steel Posts shall be determined by adding the total height of the signs to 8 Ft, 2 in. The sign post shall be cut to the correct length, and cold spray galvanizing shall be applied to the cut end. The signs shall be bolted to the top of the post, using tamper

proof bolts or drive rivets. The Square Tubular Steel Posts shall be lowered 8 in. into the base, and the post secured to the base using two corner bolts designed for this purpose.



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800.06 - SQUARE PERFORATED TUBULAR STEEL POSTS

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800.06.04 MEASUREMENT AND PAYMENT. Square Tubular Steel Posts will be measured and paid for at the contract unit price per each. The payment will be full compensation for the sign post, corner bolts, and painting as required, and for all materials, labor, equipment, tools, and incidentals necessary to complete the work.

Square Tubular Steel Anchor bases will be measured and paid for at the contract unit price per each. The payment will be full compensation for both tubes comprising the base section, all excavation, and for all materials, labor, equipment, tools, and incidentals necessary to complete the work.



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SPECIAL PROVISIONS
803 – OVERHEAD SIGN STRUCTURES

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**CATEGORY 800
TRAFFIC**

SECTION 803 — OVERHEAD SIGN STRUCTURES

803.03 CONSTRUCTION.

Add the following;

At least 48 hours after the sign structure is completely constructed/installed, including all the signs per contract requirements, the Contractor shall return to the structure and retighten all the anchor bolts and nuts per the specifications. All costs related to this shall be part of the pertinent sign structure bid item.



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SPECIAL PROVISIONS
805 – ELECTRICAL CONDUITS AND FITTINGS

CONTRACT NO. FT-928-000-006

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CATEGORY 800
TRAFFIC

SECTION 805 - ELECTRICAL CONDUITS AND FITTINGS

805.03 CONSTRUCTION

ADD: The following after paragraph 805.03.10:

805.03.11 Guardrail. Where guardrail is to be placed, reset, removed, or otherwise worked in any manner that tends to disturb the earth, place conduits and wiring only after such work is complete so as to avoid damage to the electrical work.

805.03.12 Buried Conduit. Fiber optic conduits shall have a Minimum cover of 24" and a maximum cover of 48 inches in all trenches. Fiber optic conduits shall be placed so that a distance of two (2) inches or more exists between the outside of the conduit and virgin undisturbed earth.

805.03.13 Pull Cord. Pull cord shall be placed in all conduit runs for future use.

805.03.14 Cable Tray. A conduit run in between a cable tray shall end between 3 and 6 inches from the cable tray. Ends of conduit shall have compression fittings and grommets.

805.03.15 Conduit Type. All outdoor conduits underground, except as stated elsewhere in the contract, shall be PVC schedule 80. All outdoor conduits above ground or exposed conduits shall be galvanized steel. All indoor conduits shall be EMT with compression connectors and couplers. At the transition between below ground and above ground conduit runs, the elbow and all conduit within 24" below grade to grade level shall be galvanized rigid steel.

805.03.16 Bend Radius. All conduits shall have a bend radius greater than the manufacturers recommended minimum bend radius of the cables inside the conduit.

805.03.17 Conduit Ends. The Contractor shall seal all conduit ends with an approved compression fitting.

805.03.18 Conduit Support. Conduits shall be supported within 2 feet of the beginning, and on each side, of a 90 degree bend or offset. Each support shall be applied to the straight section of conduit and shall be firm fixed support.



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805 – ELECTRICAL CONDUITS AND FITTINGS

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805.04 MEASUREMENT AND PAYMENT

ADD: The following after paragraph 805.04.04:

805.04.05 Electrical conduits and fittings installed in trench shall be paid for per linear foot per conduit complete and in place. The costs of the trenching and backfill shall not be included.



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809 – TRENCHING AND BACKFILL

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**CATEGORY 800
TRAFFIC**

SECTION 809 – TRENCHING AND BACKFILL

809.03 CONSTRUCTION

ADD: the following paragraphs before the “Cable Treatment” paragraph:

"Miss Utility". Where trenching and backfilling for the placement of conduits, splice boxes, handholes and handboxes is required, the contractor must contact "Miss Utility". "Miss Utility" shall be notified 48 hours in advance of any work under the contract and test pit all marked locations for exact position of cables, conduits, and other underground utilities.

Depth. Unless otherwise specified on the contract drawings, trenches shall be excavated to a depth such that all conduits, wires, and duct cable in trench is at a finished elevation at least 24" below the final grade. Where trenches are placed on slopes, cover shall be measured from the outside jacket of the duct cable or conduit to the nearest top of grade. This measurement will generally be perpendicular to the slope of the grade.

Where proper trench depth cannot be obtained, and improper depth presents a hazard to the cables, or conduit, the Engineer may direct that lengths of 4" galvanized rigid steel conduit be installed as a sleeve. The sleeve length shall be in intervals of 10'. The contractor must bend conduit to conform to the line and grade of the trench. Additionally, the Engineer may require concrete cover in shallow trench, on slopes, or where other conditions indicate the need.

Width. Unless otherwise specified on the contract drawings, trenches shall be excavated to a width such that all conduits, wires, and duct cables in the trench are placed with at least 3" of backfilled material between the outside edge of the conduits, wires, and duct cables and undisturbed earth.

Stake Out. Stake out trenches prior to trenching and review the exact placement with the Engineer. Generally, keep trenches at least 3' behind guardrail and curb, and out of drainage ditches, gutters, culverts etc.. Run trenches in as straight a line as possible and parallel to the nearest roadway.



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Guardrail. Where guardrail is to be placed, reset, removed, or otherwise worked in any manner, that tends to disturb the earth, place conduits and wiring only after such work is complete so as to avoid damage to the electrical work by the guardrail work.

Curb and Gutter. Where curb or gutter work is to be done in close proximity to electrical work, perform the work in the order and fashion necessary to minimize the risk of damaging either of the two types of works.

Unsuitable Materials in Trench. Remove any objects or projections into a trench, which may damage the wire or cable duct. These may include rocks, debris, glass, old cables, concrete, etc.. Alternatively, provide a galvanized rigid steel sleeve with grommets where projections into the trench cannot be removed.

809.04 MEASUREMENT AND PAYMENT

INSERT: The following after paragraph beginning with “Trenching and backfilling will not...”

The contractor’s quality assurance and quality control responsibilities shall be incidental to the pertinent pay items. Construction stake out and coordinations shall be incidental to the pertinent pay items. Testing as specified in the Special Provisions and Specifications shall be incidental to the pertinent pay items.



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810 – ELECTRICAL, CABLE, WIRE AND CONNECTORS

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**CATEGORY 800
TRAFFIC**

SECTION 810 – ELECTRICAL, CABLE, WIRE AND CONNECTORS

810.01 DESCRIPTION

DELETE: The following text from the paragraph: “loop detector wires and leads” and “micro-loop probe sets.”

810.02 MATERIALS

DELETE: “Micro-Loop Probe” and “Sealer for Loop Detector.”

810.03 CONSTRUCTION

INSERT: The following just prior to paragraph 810.03.01

All wire intended for systems of 60VAC to 600VAC shall be color-coded and #12AWG minimum. Wire size #10 AWG and smaller shall have permanently colored insulation. Wire size #8 AWG and larger may have permanently colored insulation or have colored tape applied in all hand boxes, pull boxes, junction boxes, light standards, and signs. The colored tape shall measure at least 6 inches along the length of the wire and shall wrap completely around the wire. The colored tape shall be applied to clean dry wires. Wire colors shall be as indicated in the following table:

Voltage	Phase A	Phase B	Phase C	Neutral	Ground
60 to 240	Black	Red	Blue	White	Green
277 to 600	Yellow	Brown	Orange	Gray	Green

DELETE: Paragraphs 810.03.06 and 810.03.09 in their entirety.



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820 – GENERAL ELECTRICAL WORK AND TESTING

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**CATEGORY 800
TRAFFIC**

SECTION 820 – GENERAL ELECTRICAL WORK AND TESTING

See Section 820 of the SHA's *Standard Specifications for Construction and Materials* in conjunction with the changes shown in this Section.

820.01 DESCRIPTION

ADD: The following.

- (a) This work includes contacting, coordinating and cooperating with BG&E (or other local utility company) for the changes and additions to the electrical service.
- (b) The Plans show only diagrammatic locations of cables, conduits, and other underground utilities. They are approximate and do not show every detail. The Contractor shall provide working drawings, shop drawings, and catalog cuts, etc., which show final details of the installation.

802.01.01 Codes, Standards, Inspection, and Documentation

- (a) All work shall be performed in accordance with the codes and standards listed below. In addition, materials and construction methods shall meet the minimum requirements and recommendations of the listed codes, standards, and organizations. Unless otherwise stated, the latest edition, revision, or supplement, as of the date of advertisement, of the specified codes shall be used.
 - ANSI - American National Standards Institute
 - ASTM - American Society for Testing and Materials
 - IEEE - Institute of Electrical and Electronic Engineers
 - NEC - National Electrical Code (NFPA70)
 - NECA - National Electrical Contractors Association (NECA 1-2006)
 - NEMA - National Electrical Manufacturers Association
 - NESC - National Electrical Safety Code
 - NFPA - National Fire Protection Association



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820 – GENERAL ELECTRICAL WORK AND TESTING

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- UL - Underwriters' Laboratories
 - TIA - Telecommunications Industry Association
- (b) All materials supplied by the contractor shall be new and UL listed, where such listing is possible. Submit catalog cuts for all materials in accordance with Shop Plans & Working Drawings in SPECIAL PROVISIONS (TC4.01).
- (c) The MDTA Chief Electrical Inspector or his appointed representative will inspect the entire installation. The Contractor shall contact the Electrical Inspector at least 48 hours before needed inspections. All trenches shall be inspected before backfilling. All equipment, conduits, etc. shall be inspected at rough in and prior to concealment. All work shall be inspected prior to power-up. Contact the Chief Electrical Inspector, Douglas Evans, at 410-977-2687 or devans3@mdta.state.md.us to arrange necessary inspections.
- (d) All rough-in work shall be documented via a digital camera prior to concealment. Camera shall be color, minimum of 5 mega pixels, and images shall be clear and readable to the naked eye. All color photos shall be time stamped with the date of the picture. Filename or other label shall identify project number and general location of the picture. All pictures shall be submitted on a CD or DVD at the conclusion of the project, however, electronic copies shall be made available at any time by request to the project engineer, inspector, and/or electrical inspector.
- (e) Special attention is directed to the fact that the Standard Specifications For Construction and Materials dated July 2008 and published by the Maryland Department of Transportation, State Highway Administration, also governs this work, and is referenced frequently herein as the "Specifications."
- (f) All work shall be performed in accordance with NECA 1-2006 (Standard for Good Workmanship in Electrical Construction) or latest revision.
- (g) Unless clearly specified otherwise, all voltages indicated are AC (alternating current), shall be at 60 Hz, and stated as RMS values.

820.01.02 Quality Assurance and Quality Control

The contractor shall inspect all materials furnished or installed under this contract and shall bring any damage, failure, or other problem to the attention of the project inspector prior to incorporation into the work. The contractor shall provide his own quality assurance and quality control for the work performed in the contract. The inspectors



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operating on behalf of the state are not a replacement for contractor's management and the contractor's own quality assurance and quality control.

Prior to final inspections/punch list development the contractor shall conduct his own inspections. The use of inspection checklists and quality control documents is required as evidence that inspections have been completed.

820.03 CONSTRUCTION

820.03.01 GENERAL

ADD: The following.

For the purpose of this specification, "direct supervision" shall mean that the qualified Master Electrician shall be at the job site at all times electrical work is performed. The Master Electrician shall be the single point of contact for inspection and quality control issues related to electrical work and shall be able to effectively manage the electrical work force.

The contractor must provide qualified labor to perform installation. Where licenses or certifications are available or required by local jurisdictions, state jurisdictions, or federal jurisdictions for certain skilled trades, such as electrical, mechanical, plumbing, welding, etc. The skilled trade workers shall have current versions of the appropriate license or certification prior to working the associated specialty and shall provide copies to the Project Engineer or Inspectors upon request.

Installation, splicing, terminating, and testing of fiber optic cable shall be performed by a trained and qualified fiber optic cable technician. Copies of certifications and experience shall be submitted to the Engineer prior to starting work.

ADD: The following just prior to paragraph 820.04.

820.03.04 Testing Fiber Optic Cables

Circuit tests shall be performed to verify that each fiber is connected to the proper circuit, and that it is continuous with no breaks, or damaged sections, in the fiber. All strands shall meet current EIA/TIA-568 specifications. Dark fibers and excessive attenuation due to breaks, bends, bad splices, defective connectors and bad installation practices shall not be accepted and shall be corrected. For fiber optic testing standards, see EIA-455-171 (FOTP-171), EIA 526-14.



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- (a) All cables shall have ST connectors installed prior to testing. All testing, for purposes of acceptance of the system, shall be conducted on fully installed and assembled fiber optic cables.
- (b) Upon completion of testing, replace or repair any failed cable(s) with a new fiber or cable, and test the new cable to demonstrate acceptability.
- (c) Insertion loss testing shall be performed.
- (d) These tests shall be measured in dB.
- (e) These tests shall use 850 nm and 1300 nm light sources for multimode fiber and 1300 and 1550 nm for single mode fiber.
- (f) Test shall be documented for all wavelengths as noted above.
- (g) Test results shall be documented on paper and stored on a computer diskette and shall be turned over to the electrical inspector after testing is complete. Attachment 820-A to this Section shows a sample fiber optic test report.
- (h) An optical time domain reflectometer (OTDR) approved by the Engineer shall be used to conduct testing. The OTDR shall be calibrated to sheath (jacket) length, not optical length, by adjusting the unit's index of refraction. Properly trained technicians shall conduct tests.
- (i) All OTDR traces shall maximize both the vertical and horizontal scales to the greatest extent possible and still fit the entire trace on the screen.
- (j) A cable segment shall be deemed a failure if the total loss exceeds the calculated loss for that length of cable as indicated in Attachment 820-A. A cable segment shall fail in any individual splice loss is greater than 0.3dB, or if any mated connector pair loss is greater than 1.0dB, or if there is any point loss (over less than 1' of cable) or more that 1.0dB.
- (k) After the circuit test, a functional test shall be performed. This test shall consist of allowing the system to operate as normal for 30 consecutive days. Any failures shall be repaired by the Contractor at his own expense, and the test restarted.



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820.03.05 All switches and breakers shall be operational and the operation of the devices they control verified. That is, the Contractor shall test switches and breakers in the presence of the MDTA electrical inspector to prove and assure that the device (or devices) specified is (are) controlled and no other device (or devices) is (are) controlled. All panel schedules shall be accurate and reflect the final installation.

820.03.06 All GFI protected outlets shall be tested with a suitable tester in the presence of the MDTA electrical inspector. The tester shall be a device that plugs into the outlet and indicates proper wiring of the outlet. A switch on the tester shall be utilized to introduce a ground fault that must trip the GFI device.

820.03.07 All Uninterruptible Power Supplies shall be tested by removal of power sources. Verify proper transfer to battery and backup time consistent with the manufacturers load vs time data for the particular model of UPS. Restore normal power and verify that batteries are charged and normal operation commences.

820.03.08 All PVC conduit fittings, except threaded fittings, shall be schedule 80 and glued and water tight. All GRSC fittings shall be tight fit.

820.03.09 All photo electric controls shall be tested by applying a temporary shade to simulate photometric changes intended to activate the controls. Such testing shall be performed by the contractor in the presence of the MDTA electrical inspector.

820.03.10 All three phase panels, loads, motors, generators, UPS's, and ATS's shall be checked for proper phase rotation and consistent phase termination between termination points. Ie: Phase A is the same Phase at all Phase A termination points and the phase rotation is the same at all points. Such testing shall be performed by the contractor and witnessed by the electrical inspector.

820.03.11 Flexible metal conduit (Greenfield) and liquid tight flexible metal conduit (seal tight), and liquid tight flexible non-metallic conduit may be used as follows. Flexible fabric innerduct and innerduct used for low-voltage and fiber optic systems is not covered by this requirement.

- (a) Lengths not exceeding 3' shall be used to connect transformers over 5KVA and motors.
- (b) Lengths not exceeding 6' may be used for the final connection of light fixtures used in ceilings.



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- (c) Lengths not exceeding 6” may be used for the final connection devices that may be subject to minor vibration or minor movement perhaps from temperature expansion and contraction.
- (d) Other lengths as clearly specified on the plans or as approved by the Engineer.

820.03.12 Conduit/Cable labeling. Interior cable and raceways shall be permanently labeled at a minimum of every 50 feet, **every 25 feet when view is obstructed, and within 5’ of any wall or floor/ceiling penetration** at all junction boxes, terminations, **and within 12” of electrical panel**. Label color shall be Safety Orange with Black Letters and shall follow ANSI (ASME) A13.1 for location and size.

820.03.13 Unless specifically shown otherwise on the plans, wiring derived from different system voltages shall be installed in separate conduits. Wiring of different voltages derived from the same system (i.e. Control wiring) may be permitted to be installed in the same conduit or junction box provided that all requirements of the NEC are maintained.

820.03.14 No wiring other than the primary voltage indicated shall be installed in electrical panels and Safety/Disconnect Switches. Exception may be granted for wiring that terminates on a devices within the panelboard or safety/disconnect switch that is integral to the operation of that device. Enclosures for switches or overcurrent devices shall not be used as junction boxes, auxiliary gutters, or raceways for conductors feeding through or tapping off to other switches or overcurrent devices.

820.03.15 Branch Circuits: Any circuits supplying more than 50% non-linear loads shall have a dedicated neutral conductor.

820.03.16 Conduit or tubing 1” and larger shall be provided with a suitable insulating bushing.

820.03.17 Panel Board Labeling. All circuits installed or modified by the contractor in any way shall be properly labeled in the associated panel board panel schedule. This work shall include verifying that the existing load on the affected circuit(s) is also correctly identified. The label shall identify the type of load(s) served (e.g.: receptacles, lighting, appliances, motors, pumps, etc..) and the location (e.g.: room 103, sump pit#1, etc...). Where changes are minor (e.g.: two circuits or less being changed), the existing panel schedule may be modified as approved by the Electrical Inspector. Larger changes shall require a new panel schedule typed, neat in appearance. The new schedule may copy the identifying labels of the old schedule provided that the contractor has not made



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any changes to those circuits. To clarify, replacing a panel board, moving circuits within a panel board, or similar changes shall be considered modifying the circuit and shall require testing to verify the connections of all such circuits and coordinating the panel schedule with the existing conditions.

820.03.18 Fire Stopping. All penetrations into fire walls or core holes between floors and wall must be properly fire-stopped in accordance with NEC requirements for fire stopping. Penetrations into the surface of any firewall or presumed firewall should be only slightly larger than the conduit, cable or cables that will need to pass through it. This will make fire stopping easier and allow the wall to maintain a better overall structural integrity.

820.03.19 Construction Stakeout and Coordination

- (a) The Contractor shall coordinate this work with the work of other trades to avoid conflicts. Electrical cables and equipment damaged by the execution of work of other trades shall be completely removed and replaced with new.
- (b) The Contractor shall keep an up-to-date set of as-built red lined drawings on the job site. Submit as-built drawings upon completion of the work. The Contractor shall note the exact location of trenches at 100-foot intervals on the as-built drawings by station, and offset from the roadway. The Contractor shall show only the work that is part of the final project on as-built drawings.

820.03.20 Boxes and Cabinets. Unless specified otherwise, junction boxes, pull boxes, disconnect switches, cabinets, and other boxes installed outdoors and above ground shall be NEMA4X rated; except cabinets and boxes requiring ventilation which shall be NEMA3X rated.

820.03.21 Rodent stopping. All conduits that connect to exterior mounted cabinets shall be stuffed with copper mesh at the cabinet end point to deter rodent egress through the conduit. The copper mesh shall be installed after all wires and cables have been installed. The mesh shall be removable and the mesh and installation and removal technique shall not damage wires or cables.

820.03.22 Conduit Fill. All conduit, new or existing, shall not exceed conduit fill requirements as specified in ANSI/NECA/BICSI-568-2006. Discrepancies shall be brought to the attention of the engineer prior to incorporation into the work.



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**ATTACHMENT 820-A
SAMPLE FIBER OPTIC CABLE TEST REPORT**

(To be filled out after installation is complete)

Job Name:	Fiber Cable:
Job ID:	
Location (A):	Location (B):

ANSI/EIA/TIA 568A: Cable Loss Factor (CLF); 1km=3280.83 feet

3.75 db/km (0.00114 db/ft) @ 850 nm for 62.5/125 μm MM

0.50 db/km (0.00045 db/ft) @ 1300 nm for 62.5/125 μm MM

0.50 db/km (0.00015 db/ft) @ 1310 nm and 1550 nm for OSP SM

1.0 db/km (0.00030 db/ft) @ 1310 nm and 1550 nm for ISP SM

0.5 Connector Loss (CL) = 0.75 db per pair of connectors

Splice Loss (SL) = 0.3 db each

To calculate **ACCEPTABLE LOSS (db)**: Multiply cable length x (CLF) + (CL) + (SL) = DB margin: _____

Cable Length	Strand No	A to B	B to A	Fiber ID
Feet	1			Blue
850 NM MM	2			Orange
dB	3			Green
	4			Brown
	5			Slate
	6			White
	7			Red
	8			Black
	9			Yellow
	10			Violet
	11			Rose
	12			Aqua



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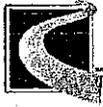
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Cable Length	Strand No.	A to B	B to A	Fiber ID
Feet	1			Blue
1300 NM MM	2			Orange
dB	3			Green
	4			Brown
	5			Slate
	6			White
	7			Red
	8			Black
	9			Yellow
	10			Violet
	11			Rose
	12			Aqua

Cable Length	Strand No.	A to B	B to A	Fiber ID
Feet	1			Blue
1550 NM MM	2			Orange
dB	3			Green
	4			Brown
	5			Slate
	6			White
	7			Red
	8			Black
	9			Yellow
	10			Violet
	11			Rose
	12			Aqua

Technician: _____ Date: _____



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831 – MISS UTILITY

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CATEGORY 800
UTILITIES

SECTION 831 – MISS UTILITY

831.01 DESCRIPTION.

This work shall consist of contacting Miss Utility as required by Law and providing evidence of Miss Utility Marking of the construction area.

This work shall include written notification to the Maryland Transportation Authority at least seventy-two (72) hours in advance of excavation for each site.

831.03 CONSTRUCTION.

The Contractor shall contact Miss Utility and assure that all construction areas are marked where excavation or other work affecting or possibly affecting underground utilities will take place. The Contractor shall maintain the markings. The Contractor shall pay any Miss Utility fees. The Contractor shall submit copies of Miss Utility tickets to the Engineer as evidence of this work.

The Contractor shall provide a written notification of intent to excavate or disturb the earth in an area to the Maryland Transportation Authority at least seventy-two (72) hours in advance of such activity. The Maryland Transportation Authority is not a subscriber to utility marking services. This notification shall permit the Authority to mark any Authority owned utilities within the excavation or disturbance area. The written notification shall be provided to the Authority's Project Manager and a copy provided to the Administrator and Utility Manager as indicated below:

Name	Phone	Fax
Dave Roehmer, Administrator	410-537-1310	410-537-1304
Jeff Robson, Utility Manager	410-537-1274	410-537-1304

The Contractor shall maintain markings of utilities until excavation and disturbance work is complete. Existing marked utilities shall not be damaged or disturbed without permission of the owner of the utility.

831.04 MEASUREMENT AND PAYMENT.

This work will not be measured or paid separately, but shall be considered incidental to other work on the project.



**CATEGORY 900
MATERIALS**

SECTION 901 — AGGREGATES

664 **DELETE:** 901.05 STONE FOR GABIONS in its entirety.

INSERT: The following.

901.05 STONE FOR GABIONS. Meet the quality requirements specified in 901.03 except the loss by sodium sulfate shall not be greater than 12 percent:

<i>DEPTH OF BASKET in.</i>	<i>SIZE OF INDIVIDUAL PIECES * in.</i>
6	3 - 6
9	4 - 7
12	4 - 7
18	4 - 7
36	4 - 12

*Size of pieces will be determined visually.



**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.

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.

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 of 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.

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. The concrete mixes shall conform to the following:

TABLE 902 A

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

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

Note 2: The temperature of Mix No. 6 when used for other than superstructure work as defined in TC-1.02 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.



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.



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.



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.



(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.



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

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

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

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

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

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

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

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

Example:

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



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.

- (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:

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

TABLE 902.13 A

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

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

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

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	—
Sealing 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.

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

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

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

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

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

Certification. The manufacturer shall furnish certification as specified in TC-1.02 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.



**CATEGORY 900
MATERIALS**

SECTION 908 — REINFORCEMENT STEEL

703 **DELETE:** 908.07 thru .10 in their entireties.

INSERT: The following.

908.07 FABRICATED STEEL BAR MATS. Steel shall meet A 184.

908.08 WIRE FABRIC FOR PNEUMATICALLY APPLIED MORTAR AND CONCRETE ENCASEMENT. Fabric shall meet A 185 and be galvanized as specified in 906.01.01. Fabricate from size W1.4 wire on 3 in. centers in each direction or from W0.9 wire on 2 in. centers in each direction.

908.09 COLD DRAWN STEEL WIRE. Concrete reinforcement shall meet M 32.

908.10 TIE DEVICES FOR CONCRETE PAVEMENT. Tie device sizes shall be as specified and produce a frictional force of at least 160 lb/ft per foot of spacing when tested per MSMT 512.

908.11 STEEL STRAND. M 203, Grade 270, Low Relaxation Strand.



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**CATEGORY 900
MATERIALS**

SECTION 950 - TRAFFIC MATERIALS

950.03 REFLECTORIZATION OF SIGNS AND CHANNELIZING DEVICES.

DELETE: 950.03 Type IX Retroreflective Sheeting in its entirety.

INSERT: The following.

950.03 Permanent Signs Retroreflective Sheeting. Retroreflective sheeting for permanent signs shall conform to ASTM D4956-05, except as modified as below:

MINIMUM REFLECTIVE INTENSITY VALUES FOR RETROREFLECTIVE SHEETING Minimum Coefficient of Retroreflection (R_A) $cd/(lx \cdot m^2)$ Per ASTM E-810 (Average of 0 and 90 degree orientation)									
Observation Angle°	Entrance Angle°	White	Yellow	Fluor. Yellow	Fluor. Yellow-Green	Red	Green	Blue	Fluor. Orange
0.2	-4	570	425	340	455	114	57	26	170
0.2	30	215	160	130	170	43	21	10	64
0.5	-4	400	300	240	320	80	40	18	120
0.5	30	150	112	90	120	30	15	6.8	45
1	-4	120	90	72	96	24	12	5.4	36
1	30	45	34	27	36	9	4.5	2	14

INSERT:

950.03.07 Permanent traffic Signs (PTS) Unless otherwise specified in the Contract Documents, retroreflective sheeting for permanent signs shall conform to 950.03.03.



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**CATEGORY 900
MATERIALS
SECTION 950 - TRAFFIC MATERIALS**

950.12 LUMINAIRES AND LAMPS

950.12.01 Luminaire Construction

DELETE: subsection C and replace with:

(c) Sign lighting luminaires shall utilize Inductively Coupled Electrodeless Lighting Systems (ICELS). Each ICELS shall consist of a heavy gauge A383 aluminum die cast luminaire housing with 5/32" thick microprismatic tempered glass lens. All fasteners shall be stainless steel. The luminaire shall be complete with sheet aluminum reflector made from 95% reflective aluminum. The completed luminaire shall be U.L. and wet location listed. The luminaire shall be compliant with vibration testing in accordance with ANSI C136.21 – 2001 American National Standard for Roadway Lighting Equipment – Luminaire Vibration. The lamp and ballast shall be securely mounted within the luminaire. The completed luminaire housing shall be IP66 rated. The luminaire shall be rated to start and operate between -40°F to +131°F when operated at 277V. The lamp and ballast shall be rated for a 100,000-hour life and lumen output shall be at least 70% of initial output at 60,000 hours. Lamp system CRI shall be 75 or greater. Ballast shall be universal type suitable for operation with any standard voltage from 120VAC through to 277VAC, 60Hz. The lamp system shall be an instant on/instant re-strike system. The system wattage (lamp and ballast) shall be rated 150Watts with maximum system draw of 156W @ 277V and 161W @ 120V. The lamp and ballast shall be furnished with a 6-year manufacturer warranty that shall replace failed lamps and ballasts with parts-only replacement lamps or ballasts upon failure.

ADD: to table in section 950.12.02

TYPE	WATTS	INITIAL LUMENS	RATED LIFE (10 hr/start)	PERCENT INITIAL LUMENS
ICELS	150	11,000	60,000	≥0.70 @ 60,000hrs ≥0.63 @ 100,000hrs



**CATEGORY 900
MATERIALS**

SECTION 951 — PAVEMENT MARKING MATERIALS

951.01 NONTOXIC LEAD FREE WATERBORNE PAVEMENT MARKINGS

All nontoxic lead free waterborne pavement marking materials shall be ready-mixed, pigmented binder, emulsified in water, and capable of anchoring reflective beads that are applied separately.

The pavement marking material shall not contain any hazardous material listed in the Environmental Protection Agency Code of Federal Regulations (CFR) 40, Section 261.24, Table 1.

951.01.01 Waterborne Physical Requirements. The nontoxic lead free waterborne pavement marking material shall conform to the manufacturer's formulations as initially approved for use by the Administration and shall be controlled from batch to batch. All paint shall be evaluated in conformance to the requirements listed below.

Production batch samples will be subject to random tests, such as but not limited to, X-ray spectroscopy, infrared spectroscopy, ultraviolet spectral analysis, and atomic absorption spectroscopy.

The combined total of lead, cadmium, mercury, and hexavalent chromium shall not exceed 100 ppm, when tested by X-ray fluorescence spectroscopy, or other method capable of detection at this level.

For each production batch, the Contractor shall provide the Administration with the manufacturer's certified analysis conforming to TC-1.02 of the Standard Specifications.

- (a) **Viscosity.** The viscosity shall be 85 ± 10 KU when tested in conformance with D 562.
- (b) **Pigment For Yellow Pavement Marking Material.** The colorants used to attain the color of the yellow product shall be one or more of the following, along with titanium dioxide: Pigment Yellow 65, Pigment Yellow 75, and opaque Pigment Yellow 74.
- (c) **Color and Appearance.** Color and appearance shall be evaluated using the following: CIE 1976 L*a*b*, illuminant D 65, and standard observer angle 1931 CIE 2 degrees. The geometry shall be 45/0 or 0/45, or d/8, excluding specular gloss. Measurements shall be taken from samples applied to an opacity chart, e.g., Leneta Form 2A, at a wet film thickness of 15 mils \pm 1 mil. The applied sample shall have been allowed to dry for at least 12 hours before measurements are taken. The evaluation shall be as follows:



- (1) **Production:** The color of the dry paint film of the production sample shall match the $L^*a^*b^*$ values provided, under the specified conditions. For white material the values are: $L^* = 94.80$, $a^* = -2.35$, $b^* = 3.20$. For yellow material the values are: $L^* = 80.70$, $a^* = 19.40$, $b^* = 88.65$. The colors shall match when compared instrumentally.
- (2) **Control.** The maximum permissible variation from the specified $L^*a^*b^*$ values shall be $2.0 \Delta E_{cmc}$. The measurements shall be taken from a sample applied over the black portion of an opacity chart.

The Administration will approve or disapprove any batch based on a laboratory visual evaluation for blemishes and irregularities in the test specimen (i.e. cracks, flaking, surface depressions, pooling, etc.) that would interfere with the measurement of color and appearance on the opacity chart. The Administration will make the final decision.

- (3) **Reflectance.** The reflectance, without beads, and using CIE XYZ Y_{xy} , shall be a minimum Y of 80 percent for white production batches; and a minimum of 50 percent for yellow production batches with a maximum of 60 percent. The measurement shall be taken from a sample applied over the black portion of an opacity chart.
- (4) **Color Difference over Black and White.** For any production batch the measured color difference between readings taken over the black portion of the opacity chart from those taken over the white portion shall be a maximum value of $1.0 \Delta E_{cmc}$ for white products and $1.3 \Delta E_{cmc}$ for yellow products.
- (5) **Yellowness Index.** The yellowness index of the white material, when determined according to E 313, Using Equation 1 and the coefficients for CIE D 65 illumination, 1931 from Table 1 in that standard, shall not exceed 8.0.
- (d) **Flexibility.** The pigmented binder shall not display cracking or flaking when subjected to the flexibility test of Federal Test Method TT-P 1952D, with the exception that the panels shall be 35 to 31 gauge (0.0078 to 0.0112 in.) tin plate approximately 3 x 6 in. The tin plates shall be lightly buffed with steel wool and thoroughly cleaned with solvent and dried before being used for the test.
- (e) **Weight per Gallon.** The weight per gallon for a production batch, when determined according to D 1475, shall be within ± 0.3 lb/gal of the value obtained by The National Transportation Product Evaluation Program (NTPEP), and reported on a NTPEP deck designated "north". When the Administration waives the NTPEP requirements, another target value will be stipulated.

951.01.03 Glass Bead Physical Requirements. Each lot of glass beads shall be sampled in conformance with the Administration's Frequency Guide and shall be



submitted to the Administration’s Office of Materials and Technology for testing and approval prior to use.

Glass beads shall be colorless, clean, transparent, and free of milkiness and excessive air bubbles.

Reflective glass beads shall conform to M 247, except that the gradation shall conform to the following:

PERCENT PASSING			
SIEVE SIZE	Standard Beads	Large Beads	Maryland Blend
12 (1.70 mm)	—	100	100
14 (1.40 mm)	—	95 – 100	98 – 100
16 (1.18 mm)	—	80 – 95	88 – 97
18 (1.00 mm)	—	10 – 40	48 – 70
20 (0.85 mm)	100	0 – 5	28 – 50
30 (0.60 mm)	75 – 95	—	—
50 (0.30 mm)	15 – 35	—	5 – 25
80 (0.18 mm)	—	—	0 – 5
100 (0.15 mm)	0 – 5	—	—

Moisture resistance and flotation test are not required.

- (a) **Refractive Index.** The refractive index shall be 1.50 minimum, when tested in conformance with MSMT 211.
- (b) **Roundness.** Glass beads shall be smooth, spherical in shape, free of sharp angular scars, scratches, or pits, and shall contain a minimum of 60 percent silica. Beads shall have a minimum average roundness of 75 percent when tested in conformance with D 1155.

951.01.04 Qualification. Pavement marking material manufacturers desiring to have their material formulations approved under this Special Provision shall have their formulations evaluated on a NTPEP North Test Deck unless waived by the Administration. Only NTPEP evaluated formulations will be considered candidates for selection, unless the requirement is waived.

951.01.05 Field testing. Materials conforming to this specification shall be field evaluated for performance on a NTPEP North Test Deck. Materials performing satisfactorily throughout the test period will be placed on the Administration’s Qualified



Products List. All marking materials supplied under the Contract Documents shall be identical in composition to the materials submitted for initial NTPEP testing. The Office of Materials and Technology will determine conformity with these requirements.

951.01.06 Material Acceptance. Only Administration approved and stamped materials conforming to these Specifications shall be used.

Prior to the shipment of any pavement marking material batch, the manufacturer shall provide access for the Administration's representative to collect samples of the material from each production batch. The samples shall be sent to the Administration laboratory for QA testing. Each sample shall be accompanied by a certified analysis conforming to TC 1.02, showing compliance with the physical and chemical requirements of this Specification, and a statement certifying that any marking material supplied under the Contract Documents is identical in composition to the material submitted for initial NTPEP testing. The Administration will determine conformity with these requirements. Administration authorization shall be required before a batch or a portion of a batch is shipped.

Paints shall be compatible with cleaning solvents used in equipment cleaning.

Nontoxic waterborne pavement markings shall not skin, curdle, settle or be unusable or difficult to apply within 12 months of the date of manufacture. The supplier, at the Administration's request, shall replace containers of marking material exhibiting an unacceptable level of settling, skinning, or curdling, as determined by the Administration. Marking material from a production batch shall not be used beyond 12 months after the date of manufacture.

951.01.07 Certification. The manufacturer shall explicitly certify in writing that any marking material supplied under the Contract Documents conforms to the formulation identified by the same product code or name placed on the NTPEP test deck from which it was approved. The same code or name as used in the published report from that test deck must identify the product. Failure to certify will be considered grounds for product batch rejection.

The manufacturer shall, in accordance with TC-1.02, explicitly certify, in writing, of any paint batch supplied under the Contract Documents that it complies with all applicable specifications. Failure to so certify will be considered grounds for product batch rejection. Certification for yellow nontoxic lead free waterborne pavement markings shall include, for the purpose of showing compliance with this specification, the name or the type of colorant used to achieve the yellow color. The Administration will keep the paint composition and chemical analysis information confidential.

The Certification shall also, contain the following:

- (a) Manufacturer's name.
- (b) Place (address) of manufacture.



- (c) Color of material.
- (d) Date of manufacture (month-day-year).
- (e) Lot or batch identification.
- (f) Size of lot/batch.
- (g) The recommended paint temperature at the spray gun.
- (h) Material Safety Data Sheets for all materials submitted for testing and application.

The Contractor shall furnish a copy of this certification to the Administration's representative before applying the paint batch it represents.

951.01.08 Production Facility.

- (a) The producer shall have a facility, presently in operation, capable of producing the traffic paint in the quantity and quality required by the Administration. This facility will be subject to the Administration's approval.
- (b) The producer shall have a laboratory, subject to the Administration's approval, that is capable of performing the required tests.



**CATEGORY 900
MATERIALS**

SECTION 951 — PAVEMENT MARKING MATERIALS

951.04 REMOVABLE PAVEMENT MARKING TAPE. Removable pavement marking tape shall remain in place on the pavement surface without being displaced by traffic, or affected by weather conditions. The material shall be capable of being removed without the use of heat, solvents, grinding, or sand blasting and shall not leave an objectionable residue.

The material shall be of good appearance and free from cracks. Edges shall be true, straight and unbroken. Line marking material shall be in rolls having no more than three splices per 150 ft of length. All marking materials shall be packaged in conformance with accepted commercial standards and shall have a minimum shelf life of one year.

Performance Requirements. When applied in conformance with the manufacturer's recommendations, the material shall provide a neat, durable marking that will not flow or distort due to temperature if the pavement surface or underlying markings remain stable. The material shall be weather resistant and, through normal traffic wear, shall show no lifting or shrinkage that will significantly impair the intended usage of the tape throughout its useful life, and shall show no significant tearing while in place, or other signs of poor adhesion. The material shall be capable of easy removal without tearing into small pieces.

951.04.01 White and Yellow. Removable preformed pavement marking materials shall conform to the requirements of the MdMUTCD and the following:

- (a) **Composition.** The marking material shall consist of a mixture of polymeric materials, pigment, and glass beads distributed uniformly throughout the surface.
- (b) **Color.** The color of the marking materials shall match Federal Test Standard No. 595 for the following color numbers:
 - White - 37925
 - Yellow - 38907
- (c) **Glass Beads.** Glass beads shall conform to the General Requirements of M 247 and have a minimum refractive index of 1.90 when tested as specified in MSMT 211.
- (d) **Frictional Resistance.** The British Pendulum Number shall be a minimum of 50 when tested as specified in E 303.
- (e) **Certification.** Samples submitted to the Office of Materials Technology (OMT) for testing shall be accompanied by the manufacturer's certified analysis in conformance with TC-1.02.



Any material supplied for a Contract shall be identical in composition to the material originally submitted for testing. Conformity will be determined by OMT.

- (f) **Field Testing.** Line marking materials conforming to the Contract Documents will be field tested by The National Transportation Product Evaluation Program (NTPEP) and over 180 day period as specified in MSMT 723 for conformance with the following:
- (1) Ease of Application - satisfactory.
 - (2) Removability - a minimum rating of 2.
 - (3) Residue Remaining at Time of Removal (day and night) - minimum rating of 2.
 - (4) Durability, Appearance, and Night Visibility - minimum weighted rating of 4.
 - (5) Loss or Movement - minimum rating of 2.

Upon satisfactory completion of the field testing, the marking materials will be placed on OMT's Qualified Products List. The material shall conform to all criteria for a minimum period of 120 days to be considered satisfactory.

951.04.02 Black. Removable preformed pavement marking materials shall conform to the requirements of the Md MUTCD and the following:

- (a) **Composition.** The non-reflective blackout tape shall not contain metallic foil and shall consist of a mixture of high quality polymeric materials, pigments, and inorganic fillers distributed throughout its cross-sectional area, with a matte black non-reflective surface. The film shall be pre-coated with a pressure sensitive adhesive. A nonmetallic medium shall be incorporated to facilitate removal.

For patterned materials, a minimum of 20 percent of the total surface area shall be raised and coated with nonskid particles. The channels between the raised areas shall be substantially free of particles.

- (b) **Color.** The color of the blackout material shall match Federal Test Standard No. 595 for the following color numbers:

Black - 37038 (or as approved by the Engineer)

- (c) **Frictional Resistance.** The British Pendulum Number shall be a minimum of 50 when tested as specified in E 303.
- (d) **Certification.** Samples submitted to OMT for testing shall be accompanied by the manufacturer's certified analysis in conformance with TC-1.02.

Any material supplied for a Contract shall be identical in composition to the material originally submitted for testing. Conformity will be determined by OMT.



- (e) **Field Testing.** Line marking materials conforming to the Contract Documents will be field tested by The National Transportation Product Evaluation Program (NTPEP) and over a 180 day period as specified in MSMT 723 for conformance with the following:
- (1) Ease of Application - satisfactory.
 - (2) Removability - a minimum rating of 2. The manufacturer shall show that the blackout tape can be manually removed after its intended use, intact or in large pieces, at temperatures above 40 F without the use of heat, solvents, grinding, or sand or water blasting. The blackout tape shall remove cleanly from existing markings that are adequately adhered to the pavement surface.
 - (3) Residue Remaining at Time of Removal (day and night) - minimum rating of 2.
 - (4) Durability, Adhesion, Appearance, and Night Visibility - minimum weighted rating of 4. The manufacturer shall demonstrate that the properly applied blackout tape adheres to the roadway and existing stable roadway markings under climatic and traffic conditions normally encountered in the construction work zone.
 - (5) Loss or Movement - minimum rating of 2.

Upon satisfactory completion of the field testing, the marking materials will be placed on OMT's Qualified Products List. The material shall conform to all criteria for a minimum period of 180 days to be considered satisfactory.

951.04.03 Packaging. Preformed pavement markings shipping package shall conform to the manufacturer's shipping requirements to prevent damage during delivery and unloading of all shipments. The shipping package shall be marked with the following information placed on each container:

- (a) Description of item.
- (b) Date of manufacture.
- (c) Successful Bidder's Name.
- (d) Purchase Order Number.
- (e) Lot Number.
- (f) Color.
- (g) Installation instructions.



SPECIAL PROVISIONS

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**951.05 — SNOWPLOWABLE RAISED PAVEMENT MARKERS and
RECESSED PAVEMENT MARKERS**

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**CATEGORY 900
MATERIALS**

SECTION 951 — PAVEMENT MARKING MATERIALS

**951.05 SNOWPLOWABLE RAISED PAVEMENT MARKERS (SPRPM) AND
RECESSED PAVEMENT MARKERS (RPM).**

Pavement Marker Reflector Lenses. Pavement marker reflector lenses shall conform to the requirements of D 4383 and shall be comprised of materials with adequate chemical, water and UV resistance for the intended use. The reflector lens shall contain one or two prismatic reflective faces to reflect incident light from opposite directions. The reflector lens shall be in the shape of a shallow frustum of a pyramid. The bottom of the reflector lens shall be equipped with an elastomeric pad to permit its attachment to the surface of the casting using the manufacturer's recommended adhesive. The lens faces shall provide extremely hard and durable abrasion resistant surfaces.

Pavement marker reflector lenses shall be 4.00 x 2.00 x 0.46 in. The slope of the reflecting surface shall be 30 degrees and the area of each reflecting surface shall be 1.7in.². The outer surface of the shell shall be smooth except in identification areas.

The pavement marker reflector lens shall be imprinted with the model number and the manufacturer's name.

SPRPM Casting. Both ends of the casting shall be shaped to deflect a snow plow blade. The bottom of the casting shall incorporate two parallel keels and an arcuately shaped web designed to fit into a grooved surface. Casting dimensions shall be a minimum of 9.25 x 5.86 x 1.69 in. and shall not exceed 10.5 x 7.25 x 1.69 in. The installed height shall not exceed 0.25 in. above the road surface.

The casting shall be nodular iron conforming to A 536, Grade 80-55-06, hardened to 51 to 55 Rc. The surface of the keel and web shall be free of scale, dirt, oil, grease or any other contaminant, which may reduce its bond to the epoxy adhesive.

The casting shall be imprinted with the model number and the manufacturer's name.

Recessed Pavement Marker Adhesive. The adhesive used to fasten the pavement marker lens to the pavement surface shall conform to D 4383-05 Table X1.4.2.3 M 237 Type II. Rapid Set Type adhesives shall not be used.

Casting Adhesive. The epoxy adhesive used to fasten the castings to the pavement surface shall conform to D 4383-05 Table X1.1.

Reflector Lens Adhesive in Casting. The adhesive used to fasten the reflector lens to the casting shall conform to the manufacturers' recommendations.



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951.05 — SNOWPLOWABLE RAISED PAVEMENT MARKERS and
RECESSED PAVEMENT MARKERS

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951.05.01 Field Testing. Materials conforming to SPRPM Specification shall be field evaluated at the National Transportation Product Evaluation Program (NTPEP) Northeast test deck for performance. Materials conforming to recessed pavement marker specification shall be field evaluated at any (NTPEP) test deck for performance. Materials performing satisfactorily throughout the test period will be placed on the Administrations Prequalified Materials List. All marking materials supplied during the Contract shall be identical in composition to the materials submitted for initial testing. Random sampling will be performed on projects sites. Conformity with these requirements will be determined by the Office of Materials Technology (OMT).

951.05.02 Facility Sampling. Random testing of samples will be performed by the Administration as Quality Assurance and certification verification. Materials will be periodically sampled at the manufacturer's facility by the Administration. Each sample shall be accompanied by a certification showing compliance with the physical requirements of this Specification. Materials supplied during the Contract shall be identical in composition to the materials submitted for initial testing. Conformity with these requirements will be determined by OMT.

Sources supplying materials shall be submitted by the Contractor to the Engineer for approval in conformance with the Contract Documents.

The material manufacturer shall reimburse the Administration for the cost of sampling and shipment of the samples when sampled by the Administration.

Material Shipment. The components shall be shipped in containers sealed by the manufacturer. The label on each container shall include the following information:

- (a) Manufacturer's Name.
- (b) Place of Manufacture.
- (c) Color of Material and Component Type.
- (d) Date of Manufacture (month-year).
- (e) Batch and Lot Identification Number.
- (f) Size/quantity of lot represented.

951.05.03 Certification. The Contractor shall furnish notarized certification as specified in TC-1.02.



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**951.05 — SNOWPLOWABLE RAISED PAVEMENT MARKERS and
RECESSED PAVEMENT MARKERS**

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The manufacturer shall certify that any SPRPM materials supplied during the Contract conforms to the identical composition of the samples submitted for evaluation on the NTPEP Northeast Test Deck, and identify the SPRPM materials by referring to the code used on the deck. PRPM materials which fail to conform will be rejected.

The manufacturer shall certify that any recessed pavement marker materials supplied during the Contract conforms to the identical composition of the samples submitted for evaluation on any NTPEP Test Deck, and identify the recessed pavement marker materials by referring to the code used on the deck. Recessed pavement marker materials which fail to conform will be rejected.

The manufacturer shall also provide the following:

- (a) Material Safety Data Sheets for all materials submitted for testing and use.
- (b) A facility, in operation, capable of producing the materials in the quantity and quality required by the Administration.
- (c) A laboratory capable of performing the required tests. This laboratory will be subject to the Administration's approval.



**CATEGORY 900
MATERIALS**

SECTION 951 — PAVEMENT MARKING MATERIALS

951.07 PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT (PPRP) MARKING MATERIAL. The material shall be capable of adhering to hot mix asphalt and portland cement concrete surfaces, and to any existing pavement markings in accordance with manufacturer's recommendations by a pre-coated pressure sensitive adhesive. A primer shall be used to precondition the surface if recommended by the manufacturer. The markings shall be capable of being inlaid in new hot mix asphalt surfaces during the paving operation.

The material shall be highly durable and retroreflective and shall be fabricated of a polymeric material designed for longitudinal and legend/symbol markings subjected to high traffic volumes and severe wear conditions, such as shear action from crossover or encroachment on typical longitudinal configurations, and where high levels of reflectivity are required to ensure the safety of the motoring public.

The material shall be of good appearance and free from cracks. Edges shall be true, straight and unbroken. Line marking material shall be in rolls having no more than three splices per 150 ft of length. All marking materials shall be packaged in conformance with accepted commercial standards and shall have a minimum shelf life of one year.

The material shall remain in place on the pavement surface without being displaced by traffic, and shall not be affected by weather conditions.

951.07.01 Permanent Preformed Patterned Reflective Pavement Marking Material Components.

Composition. The material shall consist of a mixture of polymeric materials, pigments and reflective spheres distributed throughout the base cross-sectional area and reflective spheres bonded to the topcoat surface to provide immediate and continuing retroreflection.

Restrictions. The combined total of lead, cadmium, mercury and hexavalent chromium shall not exceed 100 ppm. Diarylides based pigments and non-leachable lead pigmentation are not acceptable. The presence of these compounds shall be tested for compliance to the specification by X-ray diffraction, ICP, or another comparable method, capable of this level of detection.

951.07.02 Permanent Preformed Patterned Reflective Pavement Marking Material Physical Requirements.

- (a) **Reflectance.** The manufacturer shall certify that the white and yellow materials shall have the minimum initial retroreflectance values of 350 mcd/L/m² for white and 250 mcd/L/m² for yellow markings in any 528 ft section. Reflectance shall be measured using a reflectometer with CEN 30-meter geometry (88.76 degree entrance angle and 1.05 degree observation angle).



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- (b) **Color.** The color of preformed markings shall essentially match the 37886, 33538 or 37038 color chips for white, yellow or black respectively as shown in Federal Standard 595A.
- (c) **Frictional Resistance.** The surface of the retroreflective pliant polymer shall provide a minimum initial average skid resistance value of 45 BPN when tested according to ASTM E 303.

951.07.03 Field Testing. Materials conforming to this specification shall be field evaluated at the National Transportation Product Evaluation Program (NTPEP) Northeast test deck for performance. Materials performing satisfactorily throughout the test period will be placed on the Administration's Prequalified Materials List. All marking materials supplied during the Contract shall be identical in composition to the materials submitted for initial testing. Conformity with these requirements will be determined by the Office of Materials and Technology.

951.07.04 Prequalification. Samples shall be taken by Administration for testing. The manufacturer shall submit any data from AASHTO NTPEP Northeast Test Deck which support material performance. Materials conforming to this Specification will be placed on the Administration's Prequalified List of Patterned Tapes.

951.07.05 Certification. The Contractor shall furnish notarized certification as specified in TC-1.02. The manufacturer shall certify that any reflective thermoplastic materials supplied during the Contract conforms to the identical formulation as the samples submitted for evaluation on the NTPEP Northeast test deck, and identify the formulas by referring to the code used on the deck. Reflective thermoplastic materials which fail to conform will be rejected.

The manufacturer shall also provide the following:

- (a) Material Safety Data Sheets for all materials submitted for testing and use.
- (b) A facility, presently in operation, capable of producing the reflective thermoplastic materials in the quantity and quality required by the Administration.
- (c) A laboratory subject to the Administration's approval which is capable of performing the required tests.