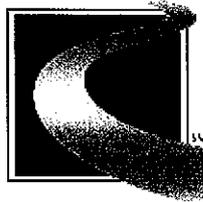


MARYLAND TRANSPORTATION AUTHORITY
Baltimore, Maryland

Invitation for Bids

Baltimore Harbor Tunnel Thruway



**Maryland
Transportation
Authority**

Contract No. HT-2028-000-002

**I-895 Pavement Rehabilitation from Toll Plaza to K-Truss
Bridge**

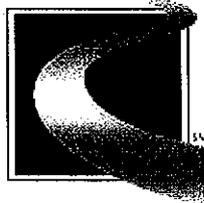
Baltimore City

January, 2009

MARYLAND TRANSPORTATION AUTHORITY
Baltimore, Maryland

Invitation for Bids

Baltimore Harbor Tunnel Thruway



Maryland
Transportation
Authority

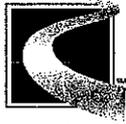
Contract No. HT-2028-000-002
I-895 Pavement Rehabilitation from Toll Plaza to K-Truss
Bridge

Baltimore City

January, 2009

NOTICE TO BIDDERS

A "Pre-Bidding Session" for the purpose of answering or obtaining answers to questions of parties interested in constructing the work relative to Right-of-Way, Utilities, Design, and Construction Details will be conducted at **1:30 pm** on **January 29th, 2009**, in the Conference Room, at the Maryland Transportation Authority, 300 Authority Drive, 2nd Floor, Baltimore, Maryland 21222. While attendance at the Pre-Bid conference is not mandatory, this is the offeror's opportunity to raise questions and/or issues of concern regarding the project.



Maryland
Transportation
Authority

SPECIAL PROVISIONS

CONTRACT NO. HT 2028-000-002

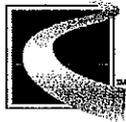
1 of 2

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.

11/20/08



Maryland
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Authority

SPECIAL PROVISIONS

CONTRACT NO. HT 2028-000-002

2 of 2

- 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.

11/20/08



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
-



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SPECIAL PROVISIONS

CONTRACT NO. HT 2028-000-002

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bid. Approvable means, the subcontractors are certified in the applicable NAICS Codes through MDOT and can perform the proposed services for the required participation goal. Contractors pending MBE certification at time of bid are **not** eligible for participation. If you submit a firm that is not certified to perform the proposed services and your contract falls short of the established MBE goal, your firm will be considered **non-responsive**. Prime Contractors are strongly encouraged to check the MDOT database at www.mbe.mdot.state.md.us to see if the subcontractor is certified to perform the services and to make sure the subcontractor has not graduated from the listed NAICS codes. If you have questions after checking the data base, you may contact the Authority MBE Office at 410-537-1048 for further assistance.

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

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

- If you are requesting a third tier relationship, you must state that request on the Attachment B form (Column 1). Please note: Third Tier MBE/DBE subcontracting will be approved by the Authority only when the Authority is satisfied that there is no way except by Third Tier contracting that an MBE/DBE goal can be achieved. Specifics as to why a Third Tier contracting agreement must be included.
- Attachment B must be signed and dated.
- If you are the apparent low bidder, you will receive a letter from the Authority requesting your MBE Attachment C (Outreach Efforts Compliance Statement) and Attachment D (Subcontractor Project Participation Affidavit). You will have ten (10) working days to submit the attachments to the Authority. If you requested a waiver at time of bid, all of the back up documentation that complies with COMAR 21.11.03.11, must be submitted within the ten working days with Attachments C & D.
- If the apparent low bidder fails to return the required documentation within the allotted ten (10) days, the Procurement Officer may determine that the apparent low bidder is not responsible and therefore not eligible for contract award.



Maryland
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Authority

CONTRACT PROVISIONS

CONTRACT NO. HT 2028-000-002

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Notice to Bidders/Offerors

eMaryland Marketplace

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

For registration requirements, visit:
www.eMarylandMarketplace.com



NOTICE TO ALL HOLDERS OF THIS CONTRACT DOCUMENT

**NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350
IMPLEMENTATION SCHEDULE FOR DEVICES USED IN THE MAINTENANCE OF
TRAFFIC**

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

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

Category 1 Devices

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

Category 2 Devices

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

Category 3 Devices

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

Category 4 Devices

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



CONTRACT PROVISIONS
(NCHRP) REPORT 350 IMPLEMENTATION SCHEDULE

CONTRACT NO. HT 2028-000-002

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 (TMA) (b) Temporary Barriers (1) Concrete Barrier (2) Traffic Barrier W Beam and Water Filled 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>



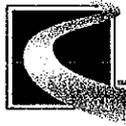
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CONTRACT PROVISIONS

CONTRACT NO. HT 2028-000-002

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**SP 1-1 PROJECT DESCRIPTION**

CONTRACT NO.: HT 2028-000-002

TITLE: I-895 Pavement Rehabilitation from Toll Plaza to K-Truss Bridge

FACILITY: Baltimore Harbor Tunnel Thruway

LOCATION: Baltimore City

ADVERTISED: **January 20, 2009**

PRE-BID MEETING: **1:30 p.m. on January 29, 2009** in the Conference Room at the Maryland Transportation Authority, 300 Authority Drive, 2nd Floor, Engineering Building, Baltimore, MD 21222

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

BIDS DUE: **12 Noon on February 20, 2009**, in the Bid Box on the 1st floor of the Maryland Transportation Authority, Engineering Building, 300 Authority Drive, Baltimore, MD 21222

CLASSIFICATION: Class D (\$1,000,001 - \$2,500,000)

CONTRACT TIME: 365 Calendar Days

LIQUIDATED DAMAGES: \$1,000 / Calendar Day

MINIMUM MBE GOALS: Overall 25%
Women owned businesses 6%
African-American owned businesses 11%

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 6:00pm on Tuesdays at the Ticket Office located at the Francis Scott Key Bridge, Maryland Transportation Authority, Administration Building, 303 Authority Drive, Baltimore, MD 21222.



This project is for the rehabilitation of Bridge BCY-082 and miscellaneous full depth and partial depth concrete paving repairs along I-895 south of the Harbor Tunnel Toll Plaza to the K Truss Bridge. Bridge BCY-082 carries Northbound and Southbound I-895 over a future railroad spur track adjacent to the Maryland Transportation Authority Maintenance Facility. The bridge is located east of Frankfurst Avenue.

The rehabilitation of Bridge BCY-082 is to include repairs to several portions of the structure. The anchor bolts at each abutment are to be removed and replaced and the bearings removed, cleaned and reset. The end 5' of all girders and all bearing assemblies are to be cleaned and painted. The existing concrete slope protection is to be removed and replaced with riprap. Repairs shall be made to the bridge piers and approach roadways. Numerous repairs to the concrete deck are required and the existing roadway joint compression seals are to be removed and replaced. The approach slabs are to be removed and replaced with Hot Mix Asphalt and repairs to a leaking storm drain pipe adjacent to the bridge are to be performed.

SP 1-2 SPECIFICATIONS

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

SP 1-3 ORIGINAL FACILITY PLANS AND SITE VISITS

The original facility plans are on file at the Engineering/Finance Building of the Francis Scott Key Bridge and will be made available for inspection to prospective bidders. Parties interested in viewing the plans should contact Mr. Abey Tamrat, Division of Engineering at (410) 537-7822. Parties interested in visiting the potential worksites should contact the following:

Facility	Administrator	Phone Number
Baltimore Harbor Tunnel	Mr. Don Smith	(410) 537-1285

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 Project Engineer will review the current pay items with the 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 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 Director of Construction of the dispute. The Director of Construction or his representative will verbally contact the 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 Contractor must demonstrate that there is a valid basis to withhold payment from the Subcontractor. If the Contractor withholds payment from a Subcontractor, the 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 Contractor will be directed to make immediate payment to the Subcontractor. The Subcontractor will be responsible for notifying the Director of Construction if this payment is not made. Upon receipt of notification, the Director 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 Contractor has withheld payment to the Subcontractor without cause, further progress payments to the Contractor will be withheld until the Subcontractor is paid. In addition, the Authority may order a suspension of work or other administrative actions as it sees fit.

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

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

SP 1-5 WORK HOURS

Refer to Section 104.01 of the Special Provisions.



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, released or non-renewed except upon thirty (30) days prior written notice by 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 Dollars (\$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 (\$2,000,000.00) for each occurrence.

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

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

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

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

The Contractor shall:



1. Identify specific work categories appropriate for subcontracting;
2. At least 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:
5. Upon acceptance of a bid, provide the Maryland Transportation Authority (Authority) with a list of Minority Businesses with whom the Contractor negotiated, including price quotes from Minority and Non-minority firms.

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

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

Criminal Fraud Provisions:

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



SP 1-8 PROGRESS SCHEDULE REQUIREMENTS

Refer to Section 109 of the Standard Specifications.

SP 1-9 CORPORATE REGISTRATION

A foreign corporation is any corporation not incorporated under the Laws of the State of Maryland. All foreign corporations, prior to performing any services for the Authority, must register with the Maryland State Department of Assessment and Taxation in compliance with Subtitle 2, Title 7, of the Corporations and Associations Article of the Annotated Code of Maryland. Compliance is required of the successful vendor as well as the proposed subcontractors.

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

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

SP 1-10 CONTRACTOR'S EMPLOYEE IDENTIFICATION

Contractor shall provide to the Authority, a list containing the following for Contractor and all subcontractors 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.



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SPECIAL PROVISIONS

Contract No. HT 2028-000-002

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

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



**GENERAL PROVISIONS
GP-SECTION 1
DEFINITIONS AND TERMS**

GP 1.03 – ORGANIZATIONAL DEFINITIONS

Revise the definitions of Administration to read as follows:

Administration – The word “Administration” shall mean “Maryland Transportation Authority”.

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



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

GP-2.06 PREPARATION OF THE BID

ADD: After paragraph (a), the following.

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

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

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

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

Sample forms shall be submitted to:

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



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

GP 2.23 - BID PROTESTS

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

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

All protests relating to this solicitation, the selection, and/or award must be filed in writing with the Authority's Procurement Officer; within the time limitations set forth in COMAR 21.10.07 and 21.10.02. Bid protests shall be filed not later than 7 days after the basis for protest is known, or should 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's immediately notifying the Contractor to comply with the required maintenance provisions. In the event that the Contractor fails to PROCEED WITH CORRECTIONS TO UNSATISFACTORY MAINTENANCE SO AS TO CONFORM TO THE PROVISIONS OF GP 5.11 within 4 hours of receipt of such notice, the procurement officer MAY NOTIFY THE CONTRACTOR TO SUSPEND ALL OTHER WORK ON THE CONTRACT UNTIL SUCH TIME AS THE UNSATISFACTORY MAINTENANCE IS CORRECTED. In the event that the Contractor fails to RESPOND TO unsatisfactory maintenance within 4 hours after receipt of such notice, the procurement officer will immediately proceed with adequate forces and equipment to maintain the project, and the entire cost of this maintenance will be deducted from monies due the Contractor ON THE NEXT MONTHLY ESTIMATE.



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**GENERAL PROVISIONS
GP SECTION 8
PROSECUTION AND PROGRESS**

GP 8.09 - LIQUIDATED DAMAGES

Delete: Section GP 8.09 in its entirety

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

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

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



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GP 9.05 LATE PAYMENTS

ADD the following:

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



TERMS AND CONDITIONS

**TC SECTION 2
BIDDING REQUIREMENTS AND CONDITIONS**

DELETE: TC-2.01 PROJECT CLASSIFICATION in its entirety.

INSERT: The following.

TC-2.01 PROJECT CLASSIFICATION

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

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

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



**TERMS AND CONDITIONS
TC SECTION 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:

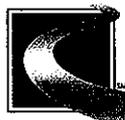
Maryland Transportation Authority
Engineering Division
300 Authority Drive
Baltimore, Maryland 21222-2200
ATTN: Mr. Abey Tamrat

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

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

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



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

ADD: To the existing paragraph.

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

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

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

The deduction will be equal to the daily prorated share of the lump sum price bid for Maintenance of Traffic or **\$ 500.00** per day, whichever is more for each day or portion thereof that the deficiencies exist, and will continue until the deficiencies and proper assumption of the required maintenance provisions are satisfactorily corrected and accepted by the Engineer. The amount of monies deducted will be a permanent deduction and are not recoverable. Upon satisfactory correction of the deficiencies, payment of the Maintenance of Traffic lump sum item will resume.



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**TERMS AND CONDITIONS
TC SECTION 5
LEGAL RELATIONS AND PROGRESS**

TC-5.01 INSURANCE.

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
304 Authority Drive
Baltimore, Maryland 21222



TERMS AND CONDITIONS
TC SECTION 7
PAYMENT

TC-7.03 FORCE ACCOUNT WORK.

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

INSERT: The following.

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

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

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

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

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

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

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



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bridge work shall be documented by the government agency with whom they had a contract and their performance shall be documented on Authority forms.

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



**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 or AMD processor.
- (2) Minimum microprocessor speed of 3.0 GHz.
- (3) Minimum hard drive storage of 80 GB (gigabyte).
- (4) Minimum of 1 GB RAM (Random Access Memory).
- (5) Enhanced 101 key keyboard with wrist rest.
- (6) Super Video Graphics Accelerator (SVGA).
- (7) Modem 56K BPS, ITU V.92 compliant – required for remote dial-in to the computer to provide MCMS system administration.
- (8) Mouse with mouse pad.
- (9) One CD-RW drive [re-writable CD-ROM].

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

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

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

(e) Software.

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



- (2) Symantec® pcAnywhere32 for Windows™ version 10.5 or later.
 - (3) Antivirus software shall be installed and configured to perform an automatic update when the microcomputer system connects to the internet. Antivirus software approved for SHA web email: *Norton, McAfee, Sophos, or ETrust. Norton Internet Security includes both Antivirus and a Personal Firewall).
- (f) Internet Access.** The microcomputer system shall be provided with unlimited Internet service approved by the Engineer. Where available internet high-speed service [DSL or cable] must be provided. With DSL or cable internet service an external Router device and firewall software are required to protect the computer from security intrusions. With DSL a Dual Outlet Modular Adapter [single-line RJ11] will be required to connect the DSL modem and the 56k dial-up modem to the same line.
- (g) Accessories.**
- (1) Uninterruptible power supply (UPS).
 - (2) Standard computer workstation with minimum desk space of 60 X 30 in. and a swivel type office chair, padded with arm rests.
 - (3) 8-1/2 X 11 in. xerographic paper to be supplied as needed.
 - (4) Toner or ink as needed for printer.
 - (5) Maintenance agreement to provide for possible down time.
 - (6) Physical security system to deter theft of computer components.
 - (7) Three 512MB USB Flash Drive storage devices.
 - (8) Blank recordable CD-R media for re-writable CD-ROM drive to be supplied as needed.
- (h) Notes.**
- (1) The microcomputer system shall be completely set up ready for use on or before the day the Engineers office is to be occupied.
 - (2) All software stated above shall be supplied on original disks with manuals and be retained in the construction field office for the duration of the Contract.
 - (3) If for any reason the system fails to operate, the system shall be replaced or repaired within 48 hours.

When the microcomputer system is no longer required, the Construction Management software system including original user/operator guide manuals, program disks, and all data



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



SECTION 104 – MAINTENANCE OF TRAFFIC

104.00 GENERAL

INSERT: The following:

This project affects I-895 and the Toll Plaza, between the roadway just south of the tunnel and past the K-Truss bridge on the south side.

It also affects local Baltimore City roads in the vicinity.

AGENCY CONTACTS

Pre-Construction / Existing Contract Coordination:

Facility/Purpose	Contact	Phone Number
Baltimore Harbor Tunnel	Mr. Don Smith	(410) 537-1285
Baltimore City	Mr. Frank Murphy	(410) 984-2153
Engineering Division – Structures	Abey Tamrat	(410) 537-7822
Engineering Division – Traffic	Roxane Y. Mukai	(410) 537-7848

104.01 TRAFFIC CONTROL PLAN (TCP).

104.01.01 DESCRIPTION.

DELETE: The fourth paragraph “The Contractor shall make...equipment, and debris.” in its entirety.

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 fourteen calendar days or ten working days notification, whichever is greater. The Project Engineer shall then notify the affected facilities, the Traffic Manager and other appropriate offices.



The Traffic Control Plan (TCP) for this work consists of the Maryland Standards for Highway and Incidental Structures, "Temporary Traffic Control Typical Applications" and the TCP plans included in the contract documents. The Project 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 Project 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.

The Contractor will not be permitted to use any portions of the existing roadway or impede the free flow of traffic in any manner during the prohibited hours.

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
- Good Friday
- Easter Weekend
- Memorial Day, the last Monday in May
- Independence Day, July 4
- Labor Day, the first Monday in September
- Thanksgiving Day, the fourth Thursday in November
- Christmas Day, December 25

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

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

The Contractor is required to work with the Project Engineer to coordinate work schedules with other on-going maintenance or contractor activities in the work area.

When a temporary lane or shoulder closure is in effect, work shall begin within one hour after the lane or shoulder 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 Authority. The Contractor's Certified Traffic Manager shall attend Pre-Construction Meetings and shall discuss traffic control and the Traffic Control Plan including procedures to be implemented for lane and shoulder closures.



TEMPORARY LANE OR SHOULDER CLOSURE SCHEDULE			
ROADWAY	# LANE(S) / SHOULDER CAN BE CLOSED	DAY OF THE WEEK	CLOSURE PERIOD (TIME OF DAY)
I-895 Northbound	1 lane can be closed	Monday through Thursday	9:00 am through 2:30 pm
	1 lane can be closed	Monday through Thursday	8:00 pm through 5:00 am
	1 lane can be closed	Friday	9:00 am through 12:00 pm (noon)
	Refer to the Traffic Control Plans	Friday through Monday	10:00 pm Friday through 5:00 am Monday (continuous)
I-895 Southbound	1 lane can be closed	Monday through Thursday	9:00 am through 3:00 pm
	1 lane can be closed	Monday through Thursday	8:00 pm through 5:00 am
	1 lane can be closed	Friday	9:00 am through 12:00 pm (noon)
	Refer to the Traffic Control Plans	Friday through Monday	10:00 pm Friday through 5:00 am Monday (continuous)

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

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



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ELAPSED TIME, MINUTES	DEDUCTION
1 – 5	\$ 75.00
Over 5	\$ 75.00 per Minute (In addition to the Original 5 minutes)

When closing or opening a lane on freeways, expressways and roadways with posted speeds \geq 50 mph, a work vehicle shall be closely followed by a protection vehicle (PV) during installation and removal of temporary traffic control devices. The PV shall consist of a work vehicle with approved flashing lights, approved truck-mounted attenuator (TMA) with support structure designed for attaching the system to the work vehicle, and approved arrow panel (arrow mode for multilane roadways and caution mode on two-lane, two-way roadways.) The work vehicle size and method of attachment shall be as specified in the TMA manufacturer's specifications as tested under NCHRP 350 Test Level 3.

104.01.02 MATERIALS. Not applicable.

104.01.03 CONSTRUCTION. Not applicable.

104.01.04 MEASUREMENT AND PAYMENT.

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 any incidentals necessary to complete the work.

The cost shall include all required equipment and set ups shown on the maintenance of traffic standards and contract documents, as well as removal of all traffic control set ups.



**CATEGORY 100
PRELIMINARY**

SECTION 104 – MAINTENANCE OF TRAFFIC

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

104.04.03 CONSTRUCTION.

ADD: The following after the last paragraph.

Temporary Concrete Traffic Barriers. On all Contracts, the Precast 32 Inch F Shape Temporary Concrete Traffic Barrier will be the Concrete Traffic Barrier for Maintenance of Traffic.

Connections. The TCB joint connections shall be the pin and loop connection as specified in the Standards. The channel splice, vertical I beam, and lapped joint connections specified in the AASHTO Roadside Design Guide, the proprietary T-Lok and J-J Hook Systems will be allowed provided only one type of joint connection is used for the length of the barrier.



**CATEGORY 100
PRELIMINARY**

SECTION 104 — MAINTENANCE OF TRAFFIC

104.08 TEMPORARY TRAFFIC SIGNS (TTS)

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

INSERT: The following.

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

104.08.03 CONSTRUCTION.

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

INSERT: The following.

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

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

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



TTS for this project shall be fabricated with fluorescent orange high performance wide angle retro-reflective sheeting as specified in Sections 950.03.02. Fabricated wood signs shall not be used. Sheet aluminum signs shall not be used on portable sign supports.

All TTS backing material used on this project shall be on the Maryland State Highway Administration, Office of Traffic and Safety's approved products list for temporary traffic control devices and miscellaneous items

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

164 **DELETE:** 104.08.04 **MEASUREMENT AND PAYMENT** in its entirety.

INSERT: **The following**

104.08.04 MEASUREMENT AND PAYMENT: Temporary traffic signs will not be measured and paid for but shall be incidental to the Contract Lump Price bid for Maintenance of Traffic. The payment will be full compensation for furnishing the signs and supports, wood posts, erection, relocation, maintenance, cleaning, replacement due to nontraffic damage or normal wear, removal, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

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

Temporary traffic signs and all associated hardware, fittings, posts, brackets, and incidentals shall be removed from the project site when no longer needed and become the property of the Contractor.



**CATEGORY 100
PRELIMINARY**

SECTION 104 – MAINTENANCE OF TRAFFIC

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

INSERT: The following.

104.11 TEMPORARY PAVEMENT MARKINGS.

104.11.01 DESCRIPTION. This work shall consist of furnishing, installing, and removal of temporary pavement markings as specified in the Contract Documents or as directed by the Engineer. These markings include lines (striping), legends (letters and numbers) and symbols. The requirement of Section 549 applies to this specification.

104.11.02 MATERIALS.

Pavement Marking Paint	951.01
Removable Pavement Marking Tape	951.04
Black Out Tape	QPL

Material shall be selected from the Qualified Products List (QPL). Refer to the Administration’s website.

104.11.03 CONSTRUCTION.

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

Retroreflectance. The initial retroreflectance readings for temporary pavement markings shall be a minimum of 250 and 150 millicandelas/lux/square meter for white and yellow, respectively. The Engineer will monitor the pavement markings in conformance with MSMT 729 during the service life of the material.

104.11.03.02 Service Life. The Contractor shall maintain and be responsible for any defects in the pavement markings for the service life of the materials. The service life shall be 60 days for paint and 180 days for other materials. Retroreflectance shall not be allowed to fall below 150 and 100 millicandelas/lux/square meter for white and yellow, respectively.

The Contractor shall replace the pavement markings as necessary within the periods specified above and as directed by the Engineer at no additional cost to the Administration. Refer to GP-5.11.

The Contractor shall remove and replace the tape at the end of the service life.

104.11.03.03 Application. 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 and shall be placed before traffic is allowed on the pavement. The markings shall be located as specified in the Contract Documents or as directed by the Engineer.



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.

104.11.03.04 Pavement Marking Removal. All removable 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 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.

Refer to the Contract Documents for the removal of existing permanent paving markings.

All nonapplicable pavement markings within the travel way or adjacent to the travel way shall be completely removed or obscured with removable pavement marking tape, as specified in 104.11.02.

104.11.04 MEASUREMENT AND PAYMENT. Pavement Marking Paint and Removable Pavement Marking Tape 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, installing, and removal of lines, letters, numbers, arrows, symbols, and the removal of all residue. In addition, payment will cover maintenance and replacement during the service life, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

- (a) Replacement of Pavement Markings required beyond the service life per linear foot for the specified pavement marking item.
- (b) Replacement of Removable Markings during the service life as a result of plowing (as determined by the Engineer) per linear foot for the specified removable marking item.
- (c) Pavement Marking Paint Lines - in width specified - per linear foot.
- (d) Pavement Marking Paint Legends (letters and numbers) and Symbols per square foot. The square foot quantity for Legends (letters and numbers) and Symbols will be as specified in the Administrations Standard Details.
- (e) Removal of Removable Pavement Marking Tape Lines - in width specified - per linear foot.
- (f) Removal of Removable Pavement Marking Tape Legends (letters and numbers) and Symbols per square foot. The square foot quantity for Legends (letters and numbers) and Symbols will be as specified in the Administrations Standard Details.
- (g) Placement of Removable Pavement Marking Tape Lines – any type, any width – per linear foot.
- (h) Placement of Removable Pavement Marking Tape Legends (letters and numbers) and Symbols per square foot. The square foot quantity for Legends (letters and numbers) and Symbols will be as specified in the Administrations Standard Details.
- (i) Black Out Tape Lines – any type, any width – per linear foot.



**CATEGORY 100
PRELIMINARY**

SECTION 104 – MAINTENANCE OF TRAFFIC

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

INSERT: The following.

104.12 DRUMS FOR MAINTENANCE OF TRAFFIC.

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

104.12.02 MATERIALS.

Reflectorization	950.03
Plastic Drums	As approved by the Office of Traffic and Safety

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

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

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

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

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

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



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104.12.04 MEASUREMENT AND PAYMENT. Drums for Maintenance of Traffic will not be measured and paid for but shall be incidental to the Contract Lump Price bid for Maintenance of Traffic. The payment will include reflectorization, setting, resetting, removing, sandbags, maintenance, cleaning of drums to like new condition, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

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



**CATEGORY 100
PRELIMINARY**

SECTION 104 — MAINTENANCE OF TRAFFIC

104.23 PROTECTION VEHICLE (PV).

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

The PV shall consist of a work vehicle with approved flashing lights (per Standards MD 104.01-18 and 104.01-21), a truck-mounted attenuator (TMA) with support structure designed for attaching the system to the work vehicle or a trailer truck-mounted attenuator (TTMA) designed for attaching the system to the work vehicle by a pintle hook. The size of the work vehicle and the method of attachment shall be as specified in the TMA/TTMA manufacturer's specifications, as tested under NCHRP Report 350 at Test Level 3.

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

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

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

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

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

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

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



Dimensions.

- (a) Road clearance for the TMA/TTMA shall be 12 ± 1 in. or as specified by the manufacturer.
- (b) Total weight of the TMA, exclusive of the work vehicle, shall not exceed 2100 lb unless it is trailer-mounted.

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

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

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

104.23.02 MATERIAL. Not applicable.

104.23.03 CONSTRUCTION. Not applicable.

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



**CATEGORY 100
PRELIMINARY**

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

INSERT: The following.

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

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

106.02 MATERIALS.

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

106.03 CONSTRUCTION. Refer to the applicable portions of 504.03.

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

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

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



**CATEGORY 100
PRELIMINARY**

SECTION 107 — CONSTRUCTION STAKEOUT

107.03 CONSTRUCTION.

107.03.04 Control Stakes.

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

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

107.03.08 Subgrade, Subbase and Base Controls.

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

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

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

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



- (3) The Contractor shall provide control points and conventional grade stakes at critical points such as, but not limited to, all PC's, PT's and super elevation points begin full super, half-level plane inclined, etc., along with other critical points required for the construction of structures and utility relocation or coordination. The Engineer will determine whether additional control points and stakeout are necessary.
- (4) The Contractor shall provide adequate control points, stationing and stakes for coordination activities involving environmental agencies, utility companies and Contractors on adjacent projects at no additional cost to the Administration.
- (b) **Real-Time Kinematic (RTK) GPS.** RTK GPS may be utilized to control equipment and shall be within tolerances of ± 0.1 ft.
- (c) **RTS Positioning.** RTS positioning shall be utilized where grade tolerances are less than ± 0.1 ft. The index error of the vertical circle of the RTS shall be checked and adjusted as necessary prior to each day's operations. Each work session shall begin and end by checking between adjacent control points.
- (d) **Grade Busts.** Grade busts and all associated quantity adjustments or errors resulting from the Contractor's activities shall be corrected by the Contractor to the satisfaction of the Engineer at no additional cost to the Administration.
- (e) **Utilizing Automated Controlled Equipment.** When the Contractor chooses to utilize automated controlled equipment, the Contractor shall furnish a GPS Rover instrument for Administration use during the project, along with 8 hours of formal training on GPS/RTS and the Contractor's systems. The Contractor shall provide a surveyor to perform verification when discrepancies arise.
- (f) **Test Sections.** The Contractor shall perform test sections with both GPS and RTS systems to demonstrate they have the capability, knowledge, equipment, and experience to properly operate the systems and achieve acceptable tolerances. If the Contractor fails to demonstrate this ability, the Contractor shall conform to the requirements for the conventional takeout.



**CATEGORY 100
PRELIMINARY
SECTION 111 – DIGITAL CAMERA**

111.01 DESCRIPTION. This work shall consist of furnishing a new or like new digital camera with a Color Inkjet Printer for use by Administration personnel. The digital camera and printer shall be delivered to the Engineer at the time of the Notice to Proceed. They shall remain operational and not be returned to the Contractor until final acceptance of the entire project, in conformance with GP-5.13.

111.02 MATERIALS.

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

- (1) Windows 2000, ME, XP compatible operating system
- (2) Photo Suite, Photo Deluxe, Picture Works, Photo Shop, or similar Photo Managing Software
- (3) 4.0 megapixel image resolution (minimum)
- (4) 3X optical zoom (minimum)
- (5) Two (2) sets of rechargeable batteries
- (6) SmartMedia Card or memory stick (512 MB minimum)
- (7) Pop-up or built-in flash modes
- (8) All items required for quick downloading
- (9) Auto-quick focus
- (10) Lens Cover, Shoulder Strap, and Carrying Case
- (11) AC adapter and Battery Charger

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

- (1) Resolution of 2400 x 1200 DPI (dots per inch).
- (2) Print speed of 17 PPM (pages per minute) for black and white and 13 PPM for color.
- (3) Memory 8 MB.
- (4) Duty cycle of 5,000 pages/month.

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



111.03 CONSTRUCTION. Not applicable.

111.04 MEASUREMENT AND PAYMENT. The Digital Camera will not be measured but the cost will be incidental to the Contract price for Maintenance of Traffic unless otherwise specified in the Contract Documents. If the digital camera or printer becomes defective, is stolen, or for any other reason does not function as intended, it shall be replaced with an approved camera or printer at no additional cost to the Administration. A nonfunctioning or stolen camera or printer shall be replaced within eight hours after the Engineer notifies the Contractor.

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

LIST OF APPROVED DIGITAL CAMERAS

Approved Cameras	Approx. Cost
Kodak EasyShare Z730	\$375.00
Kodak EasyShare Z760	\$300.00
Kodak EasyShare DX7630	\$300.00
Canon PowerShot A700	\$325.00
Canon PowerShot SD500	\$450.00
Canon PowerShot S60	\$400.00
HP Photosmart R727	\$300.00
Olympus Camedia C-7000 Zoom	\$525.00
Olympus Camedia C-770 Ultra Zoom	\$350.00
Olympus Stylus 800	\$450.00
Nikon Coolpix S6	\$400.00
Nikon Coolpix P3	\$450.00
Fujifilm FinePix E550	\$350.00
Fujifilm FinePix F810	\$475.00
Panasonic Lumix DMC-TZ1	\$300.00
Samsung Digimax V700	\$375.00
Sony Cyber-Shot DSC-H5	\$500.00
Sony Cyber-Shot DSC-T30	\$500.00
Casio EXILIM Pro EX-P700	\$475.00
Casio EXILIM Pro EX-P505	\$475.00
Pentax Optio A10	\$350.00

NOTE: Contractors may submit cameras not appearing on list for approval to the Office of Construction as indicated in the contract documents.



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Requirements

- Windows 2000, ME, XP compatible (Compatible with operating system on project)
- Photo managing software compatible with operating system selected for each project.
(Photo Suite, Photo Deluxe, Picture Works, Photo Shop)
- 4.0 megapixel image resolution (minimum)
- 3x optical zoom (minimum)
- Two (2) sets of rechargeable batteries
- SmartMedia card or memory stick (512 MB Minimum)
SmartMedia / memory stick not required if CD or CDRW or other recording media is used
- Pop-up or built-in Flash modes
- All items required for quick downloading.
- Auto – quick focus
- Lens cover or cap
- Shoulder strap
- AC Adapter
- Battery Charger
- Carrying case



**CATEGORY 100
PRELIMINARY**

DELETE: SECTION 111 THRU 119 — RESERVED

INSERT: SECTION 111 AND 112 — RESERVED

ADD: The following.

**SECTION 113 — SAMPLING DEVICES
AND TESTING EQUIPMENT**

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

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

113.03 CONSTRUCTION.

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

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

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



113.03.01 Sampling Devices and Testing Equipment with Accessories. The following is a general list for sampling devices and testing equipment to be furnished by the Contractor for the specified testing. The Contractor may contact OMT Materials Management Division at 410-321-4100 for any questions concerning the requirements for Sampling Devices, Testing Equipment and Accessories. The devices, testing equipment and accessories will be randomly inspected during Independent Assurance Audits.

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

- (1) Soil bags (ability to hold min. of 35 lb).
- (2) Screw top cans - 1 qt.
- (3) Friction top cans - 1 qt and 1 gal.
- (4) Plastic jar - 1 gal.
- (5) Flow panels for joint sealer.

(b) Testing Equipment and Accessories from the Administration's Materials Manual - Determination of Moisture Content of Aggregates (MSMT 251).

- (1) Electric hot plate or a gas burner.
- (2) Scale or balance conforming to M 231, Class G2.
- (3) Metal container, such as large frying pan or equivalent.
- (4) Pointing trowel or large spoon.

(c) Field Determination of the Amount of Stabilization Agent in Bases and Subbases (MSMT 254).

- (1) Scale or balancing conforming to M 231, Class G 100 having a minimum capacity of 100 lb/sample containers.
- (2) Bench brush.
- (3) Large spoon or scoop.
- (4) Sampling mat consisting of a sheet of plywood or canvas with a minimum surface of 1 yd².
- (5) Tape measure.

(d) Field Determination of Moisture Density Relations of Soils (MSMT 351). Refer to MSMT 350

(e) Hot Applied Joint Materials Sealer and Crack Filler (MSMT 404). Flow panels (brass panel may be used in lieu of a tin panel).



(f) In-Place Density of Embankment, Subbase, Base, Surface and Shoulder Material (T 99, T 180, T 191, and MSMT 350).

- (1) Cylindrical compaction molds, 1/30 and 1/13.33 ft³.
- (2) Compaction rammers, 5.5 and 10 lb.
- (3) 12 in. straightedge.
- (4) Scale or balance conforming to M 231, Class G 100, having 100 lb minimum capacity.
- (5) Two 10 in. pie pans.
- (6) 12 in. frying pan.
- (7) 12 in. rocker set complete with pan.
- (8) One each of the following sieves conforming to M 92:

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

* For density sand.

- (9) Field density plate with recess to accommodate sand cone apparatus.
- (10) Steel pan, 12 x 30 in.
- (11) Electric plate or gas burner.
- (12) Soil density pick.
- (13) Precalibrated sand cone density apparatus.
- (14) Spatula, 3 in.
- (15) Two water pails.
- (16) Bag of density sand.
- (17) Stencil brush, bench brush, sprinkling can, large spoon, and sample shovel.



(g) Sampling Hot Mix Asphalt prior to Compaction (MSMT 457) - Performed by the paving contractor).

- (1) Measuring tape, 25 ft minimum.
- (2) Random selection cards numbered from 0 to width of the paving lane in 1 ft increments.
- (3) Sample boxes.
- (4) Spatula.
- (5) Spray paint or other suitable marking material.
- (6) GPS equipment.
- (7) Masonry nails or equivalent.
- (8) Thermometers (50 to 550°F).
- (9) Square end shovel or fire shovel or grain shovel.
- (10) Scoop.
- (11) 24 ft of 18 gauge mechanical wire or equivalent to tie through each hole of the plate template.

(h) Concrete Tests.

TEST	METHOD
Slump	T 119
Air Content - Pressure Method	T 152,
Air Content - Volumetric Method	T 196
Sampling	T 141
Temperature	T 309

- (1) Air meter, pressure type for conventional concrete and Roll-a-Meter for lightweight Concrete.
- (2) Air Bulb.
- (3) Air pump.
- (4) Rubber mallet.
- (5) Slump cone with rod.
- (6) Steel straight edge.



- (7) Large scoop.
- (8) Trowel.
- (9) 3/8 in. rod for latex cylinder.
- (10) Unit weight bucket for light weight concrete.
- (11) Sprinkle can or bucket for water.
- (12) Postal scale (only for lightweight concrete).
- (13) Thermometer (0 to 220° F).
- (14) 6 x 12 in. cylinder molds.
- (15) 3 x 6 in. cylinder molds for latex concrete.

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

SECTION 114 THRU 119 — RESERVED



**CATEGORY 300
DRAINAGE**

SECTION 308 – EROSION AND SEDIMENT CONTROL

308.01 DESCRIPTION.

ADD: The following after the third paragraph.

General Notes.

- (a) **MDE Notification.** If an Erosion and Sediment Control Permit is issued for this project, the Contractor or the Administration shall notify MDE in writing or by telephone (410) 537-3510 at the following points:
- (1) Pre-construction meeting.
 - (2) Erosion and sediment control meeting (minimum 7 working days prior to commencing earth disturbing activities).
 - (3) Following installation of initial sediment control measures.
 - (4) During installation of major sediment control basins/traps.
 - (5) Prior to removal or modification of any sediment control structures.
 - (6) Prior to removal of all sediment control devices.
 - (7) Prior to final acceptance by the Administration.
- (b) **Ingress/Egress Controls.** The Contractor shall protect all points of construction ingress and egress to prevent the deposition of materials on public roads. All materials deposited on public roads shall be mechanically removed immediately. The flushing of road surfaces is prohibited.
- Typically, all ingress and egress points shall be controlled through the use of a stabilized construction entrance conforming to 308.03.30.
- (c) **Inspection.** The Contractor shall inspect daily and maintain continuously in an effective operating condition all erosion and sediment control measures.
- (d) **Shutdowns and/or Penalties.** Total compliance with the approved erosion and sediment control plan is expected at all times. In cases where the Contractor is found to be in noncompliance the Administration may take steps to impose selected or total shutdowns and impose per day penalties for noncompliance.

The District Engineer may impose a total or partial shutdown if the project may adversely impact the waters of the State.



- (e) **Record Keeping.** The project's approval letter, approved erosion and sediment control plans, approved change requests, daily log books and test reports shall be available at the site for inspection by duly authorized officials of MDE.
- (f) **Erosion and Sediment Control Excavation.** Silt removed from control devices shall be placed in an approved waste site either on or off the project. Material stored on site may be reused once it is dried and if it conforms to the Administration's requirements for embankment or any unspecified need.
- (g) **Off-Site Utility Work.** Sediment control for utility construction in areas outside of designed controls shall follow these additional best management practices:
 - (1) Call "Miss Utility" at 1-800-257-7777 48 hours prior to the start of work.
 - (2) Excavated material shall be placed on the high side of the trench.
 - (3) Trenches for utility installations shall be backfilled, compacted and stabilized at the end of each working day. When this is not possible, the area shall conform to (4).
 - (4) Temporary silt fences shall be placed immediately downstream of any disturbed area intended to remain disturbed for more than one day.
- (h) **Sensitive Areas.** No construction activities shall be undertaken within specified sensitive areas of the project without prior notification of the Engineer. All work in these areas shall be monitored by a responsible party designated by the Contractor to assure that reasonable care is taken in or adjacent to these areas. Areas considered sensitive are defined as: floodplains, wetlands (tidal, nontidal and associated buffers) critical areas, forested areas, archeological sites, historic sites, parkland, and open water.
- (i) **Standard Stabilization Note.** Following initial soil disturbance or redisturbance, permanent or temporary stabilization shall be completed within seven (7) calendar days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes greater than 3 horizontal to 1 vertical (3:1); and fourteen days (14) as to all other disturbed or graded areas on the project site.
- (j) **Site Information (Not for Bidding Purposes).**

(1) Total area of site	N/A acres
(2) Area disturbed	N/A acres
(3) Area to be roofed or paved	N/A acres
(4) Total cut	N/A cubic yards
(5) Total fill	N/A cubic yards
(6) Off-site waste/borrow area location (if known)	N/A



(k) Incremental Stabilization. Refer to the current Maryland Standards and Specifications for Soil Erosion and Sediment Control for the incremental stabilization of cuts and fills.

(l) Disturbed Areas. Excavated trench material for any storm drain pipe and underdrain pipe installation shall be placed on the high side of the trench. Trenches for any storm drain pipe and underdrain pipe installations shall be backfilled, compacted, and stabilized at the end of each working day.

All other disturbed areas shall also be stabilized at the end of the working day. Any areas that cannot be stabilized at the end of the work day are to have silt fence placed downgrade of them such that all runoff from the disturbed area will be filtered.

(m) Additional Controls. The MDE Inspector or the Administration's Engineer may require additional controls. In that event, the Contractor shall inspect daily and maintain continuously in an effective operating condition all erosion and sediment control measures until they are removed with prior permission from MDE and the Administration. Prior to the removal of sediment control measures, the Contractor shall have established permanent stabilization for all contributory disturbed areas.

Any areas disturbed by the removal of sediment control measures shall be immediately stabilized.

(n) Notice of Enforcement. Sediment and erosion control regulations shall be strictly enforced during construction.

DELETE: 308.01.01 Standards and Specifications in its entirety.

INSERT: The following.

308.01.01 Standards and Specifications. The plans are designed and shall be constructed in accordance with the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control, the 2000 Maryland Stormwater Design Manual, Volumes I and II and the Maryland Department of the Environment Erosion and Sediment Control and Stormwater Management regulations and all revisions thereof, and as specified in the Contract Documents. The Contractor shall keep a copy of the latest MDE Standards and Specifications for Soil Erosion and Sediment Control on the site at all times.

308.01.02 Quality Assurance Ratings.

Noncompliance Penalty.

244 **ADD:** The following at the end of the fourth paragraph.

The daily penalty to be assessed when a rating of 'D' is given will be \$ \$1000.00.



**CATEGORY 400
STRUCTURES**

400-01 CRACK REPAIRS

400-01.01 DESCRIPTION. This work shall consist of concrete crack repair to the top of Pier Caps 3 and 4 at Bridge BCY-082.

400-01.02 MATERIALS. Use a two component, 100% solids, moisture tolerant, low viscosity, high-strength, structural epoxy adhesive.

Properties listed are at 73 degrees Fahrenheit, 50 percent humidity, and 14 days:

Compressive Strength	ASTM D695, 10,000 psi
Tensile Strength	ASTM D638, 7,900 psi
Shear Strength	ASTM D732, 4,300 psi
Bond Strength	ASTM C882, 2,200 psi (14 day moist cure)
Bond Strength	ASTM C882, 3,000 psi (2 day dry cure)

400-01.03 CONSTRUCTION.

Contractor shall submit the Product Data Sheets, Product Certificates and Material Test Reports. The Product Data sheets will include material descriptions, chemical composition, physical properties, test data, and mixing and application instructions. The Product Certificates are to certify that the products furnished comply with requirements and are recommended by manufacturer for uses indicated. The Material Test Reports are from a qualified testing agency indicating and interpreting test results for compliance of all materials with requirements indicated.

Quality Assurance. The Contractor shall submit proof of the following:

1. Concrete Repair Product Manufacturer Qualifications: The manufacturer of the specified product shall have been in existence, for a minimum of 10 years, a program of training, certifying, and technically supporting a nationally organized Approved Contractor Program with annual re-certification of its participants.
2. Contractor Qualifications: Contractor shall have at least five years of experience in concrete repair services. The Contractor shall also be an Approved Contractor of the manufacturer of the specified product, who has completed a program of instruction in the use of the specified



material, and shall provide a notarized certification from the manufacturer attesting to their Approved Contractor status.

3. **Manufacturer's Representative Services:** The Contractor shall arrange for, and provide, the services of the product manufacturer's technical representative to be on-site for the first day and subsequent days as required.

Delivery, Storage, and Handling. Materials shall be delivered to the project site in the manufacturer's original and unopened containers, labeled with type and name of products and manufacturers. The Contractor shall comply with manufacturers written instructions for minimum and maximum temperature requirements and other conditions for storage.

Mixing of Products. The Contractor shall mix the products in clean containers according to manufacturer's written instructions. Do not add water, thinners, or additives unless recommended by manufacturer. When practical, use manufacturer's premeasured packages to ensure that materials are mixed in proper proportions. When premeasured packages are not used, measure ingredients using graduated measuring containers; do not estimate quantities or use shovel or trowel as a unit of measure. Do not mix more materials than can be used within recommended open time. The Contractor shall discard materials that have begun to set.

Concrete Crack Repair. Prior to commencing repair work, the Contractor shall clean the surface around the repair area of all loose matter, dirt, broken or loose concrete, and stains using high pressure water or other approved means. Clean all cracks using vacuum or compressed air. Compressors must employ in-line traps or filters to prevent water or oil from contaminating cracks. Repairs shall include all secondary cracks less than or equal to 9 inches in length.

The location of cracks to be repaired runs along the top of the pier caps, between the bearings. Installation of crack repair material shall be in accordance with the manufacturer's written recommendations. Remove all debris, tools, equipment, etc. from the site and restore the site to a condition that is acceptable to the Engineer.

400-01.04 MEASUREMENT AND PAYMENT. Concrete Crack Repairs at Pier Caps 3 and 4 will be measured and paid for at the Contract unit price per linear foot. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

The length of the secondary cracks repaired shall not measure, nor paid for at the Contract unit price. Secondary cracks shall be considered incidental to the item.

**CATEGORY 400
STRUCTURES****400-02 BEARING REPAIRS**

400-02.01 DESCRIPTION. This work shall consist of repairs to existing abutment bearings on Bridge BCY-082. Repairs to be made include: jacking of the existing stringers, replacement of existing anchor bolts, and resetting of the bearings.

400-02.02 MATERIALS.

Curing Materials	902.07
Form Release Compound	902.08
Concrete Mixes	902.10 (Mix No 3)
Grout	902.11
Reinforcement	908.01
Structural Steel	909.01
Steel for Miscellaneous Use	909.02
Welding Materials	909.03
High Strength Bolts, Nuts and Washers	909.07
Anchor Bolts	909.08
Coating Systems for Structural Steel	912
Production Plants	915
Water	921.01

400-02.03 CONSTRUCTION

Installation of the Jacking System. The existing bearing elevations shall be determined prior to installation of the jacking beams. The Contractor shall install the jacking beams and jack stands according to the Contract Documents. The steel for the jacking beams and jack stands do not need to be new steel, but shall have only minimum scaling and surface rust. All jack beams shall be primed and painted as they are to remain in place.

Raising of the Bridge. The Contractor shall raise only one end of the bridge at a time. Each jack shall have a safe capacity of 50 tons. All jacks shall be manifold together to allow for the lifting of the entire end of the bridge at one time. The bridge shall only be raised 3/8" maximum prior to being shimmed. The shims are to hold the bearings at the original elevation plus 1/16" maximum, minus 0".



Bearing Repairs. The Contractor shall saw cut around the exposed perimeter of the existing bearing pedestals. The bearing plates shall be removed from the beam by air arcing the welds. The concrete pedestals shall be removed with the use of a jack hammer (30 lb. max) exposing the anchor bolts. The bearing assemblies shall be removed carefully; blast cleaned to remove all rust, primed, secured together and labeled so that it can be re-installed at the same location, and stored until bearing are to be reinstalled. The underside of the beam where the bearing was located shall be cleaned and primed.

The existing concrete shall be removed as required so that the new anchor bolts can be installed with a minimum 12 in embedment. Any reinforcing steel that was damaged during removal operations shall be repaired or replaced prior to installing the bearings.

The existing bearings with two new anchor bolts each shall be reinstalled on the beam by use of fillet welds.

The area under the bearing shall be filled with non-shrink non-metallic grout. The grout shall be mixed in accordance with the written recommendations from the manufacturer. The use of filler aggregate in the grout is allowed up to the maximum recommended by the manufacturer.

400-02.04 MEASUREMENT AND PAYMENT

Concrete Pedestal Replacement will not be measured but will be paid for at the Contract lump sum price. The payment will be full compensation for all material, labor, equipment, tools, and incidentals, including access, necessary to complete the work.

Bearing Reset will be measured and paid for at the Contract unit price per bearing assembly. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Jack Existing Stringers will be measured and paid for at the Contract unit price per beam. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Anchor Bolt Replacement will be measured and paid for at the Contract unit price per anchor bolt. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

**SECTION 436 — CLEANING AND PAINTING
EXISTING STRUCTURAL STEEL**

436.01 DESCRIPTION. This work shall consist of cleaning and painting existing structural steel in the field, and repairing existing coatings damaged during repairs or by the Contractor's operations. The work to be performed shall be as specified in the Contract Documents, these Specifications, and as directed by the Engineer.

The scope includes cleaning and painting bearings and beam ends including all structural steel for a distance of 5.0 ft from the ends of the stringers at the abutments, and 5.0 ft in each direction from the center line of the piers for a total distance of 10.0 ft.

436.01.01 Definitions of Areas to be Cleaned and Painted. The following definitions are used to designate the specific areas to be cleaned and painted:

- (a) **All Steel Surfaces.** All steel surfaces consists of steel superstructure elements including but not limited to steel beams, girders, rockers, bearing assemblies, trusses, floor beams, stringers, joists, purlins, cross-bracings, lateral-bracings, diaphragms, sway-bracings, scupper downspouts, and support brackets for utilities, light poles and sidewalks. All steel surfaces does not include substructure elements, bridge railings, sign structures, utilities or light poles.
- (b) **Outside Facing Surfaces of Beams.** The outside facing surfaces of beams are those surfaces that face away from the structure on exterior/fascia beams in all spans. These surfaces include the underside of the top flange and the web facing away from the structure, the top of the bottom flange, the outside edge of the bottom flange, the underside of the bottom flange, the inside edge of the bottom flange, and a portion of the top of the bottom flange on the inside facing surface. The transition between the existing and new coating on the top of the bottom flange shall occur approximately half way between the edge of the flange and the fillet. A sharp well-defined transition between the new and existing coating will not be required, but the existing coating shall be feathered. All attached bearing assemblies are included in the cleaning and painting.
- (c) **Inside Facing Surfaces of Beams.** The inside facing surfaces of beams are those surfaces that face toward the longitudinal roadway joint on beams adjacent to the longitudinal joint. These surfaces include the underside of the top flange and the web facing toward the longitudinal joint, the top of the bottom flange, the inside edge of the bottom flange, the underside of the bottom flange, the outside edge of the bottom flange, and a portion of the top of the bottom flange on the outside facing surface. The transition between the existing and new coating on the top of the bottom flange shall occur approximately half way between the edge of the flange and the fillet. A sharp well-defined transition between the new and existing coating will not be required, but the existing coating shall be feathered. All attached bearing assemblies are included in the cleaning and painting.



(d) Bearings and Beam Ends. Bearings and beam ends shall include all structural steel and bearing assemblies for the specified distance from the ends of the beams at the abutments, and the specified distance in each direction from the center line of the piers for a total of twice the specified distance at the piers.

(e) Roadway Joints. Refer to Section 460. Roadway joints shall include all roadway joint steel on the outside, top and inside surfaces of the parapets and from the parapet to the first pavement marking. High efficiency particulate air (HEPA) filter vacuum shrouded power tools may be used in lieu of containment in areas of paint containing toxic metals.

The paint system, finish coat color, and areas to be cleaned and painted for each bridge shall be as specified in the Cleaning and Painting Table included in the Contract Documents.

436.01.02 General. The work shall conform to SSPC Standards and the manufacturer's recommendations unless otherwise approved by the Engineer.

Any structural defects including cracks, missing bolts or rivets, deterioration, etc., detected during cleaning and painting shall be brought to the attention of the Engineer.

The Contractor shall protect utility pipes, conductors, light fixtures, and conduits from these operations; they shall not be cleaned and painted unless specified in the Contract Documents.

The Contractor shall perform Quality Control (QC) inspections to ensure that each phase of the work complies with Specification requirements.

All maintenance of traffic required for corrective action shall be at no additional cost to the Administration. When a railroad is included in the project, all railroad fees shall be as specified in the Contract Documents, except that any additional impact on the railroad and associated fees due to corrective actions or additional inspections shall be at no additional cost to the Administration.

The Contractor shall conform to the requirements of OSHA, including exposure to lead, arsenic, cadmium, etc., comply with 29 CFR 1926 construction standards; and the applicable Federal and State laws, including COMAR 26.16.01.

Existing paint systems or abrasives used for blast cleaning may include toxic metals such as lead, arsenic, cadmium, chromium, etc., and shall be considered hazardous waste when removed unless tests conducted as specified in the Toxicity Characteristic Leaching Procedure (TCLP), EPA Method 1311 prove otherwise.

Prior to bidding, the Contractor shall be familiar with the current environmental regulations and safety procedures. In conformance with the EPA's RCRA regulation, the Administration will be considered the "Waste Generator" of the paint wastes generated by the work. The Contractor is considered the "Hazardous Waste Generator" of all other waste associated with the



painting process/work and includes waste produced such as petroleum waste, solvent related waste, unapplied waste paints, used rags, used protective clothing and other personal protective clothing (PPE) determined to be waste.

The Contractor shall obtain his own EPA Hazardous Waste Generator ID Number, and dispose of his waste under manifest as required by RCRA (40 CFR 260 thru 265, and 271).

The Contractor shall be responsible for preventing waste from entering into the environment by containing, collecting, storing, testing and disposing of all waste in conformance with Federal, State and local regulations.

436.01.03 Minimum Contracting Requirements for Field Painting. The Contractor/subcontractor removing or applying paint shall be certified as specified in (a) below. When the paint being removed contains toxic metals, the Contractor/subcontractor removing the paint shall be certified as specified in (b) below. All certificates shall be effective prior to Award of Contract and shall remain in effect for the duration of the Contract. Refer to 436.03.01.

(a) **SSPC-QP1.** Standard Procedure for Evaluating Qualifications of Painting Contractors: Field Application to Complex Structures.

(b) **SSPC-QP2, Category A.** Standard Procedure for Evaluating Qualifications of Painting Contractors to Remove Hazardous Paint.

436.02 MATERIALS.

Paint Systems	436.02.01 and 912.05 Paint System C
Abrasives	436.02.02

436.02.01 Paint Systems. All coats within the paint systems specified herein shall be from the same manufacturer. When more than one paint system is used on a bridge, all overlapping paint systems shall be from the same manufacturer. The color of the touch up finish coat on existing steel shall match the existing finish coat.

436.02.02 Abrasives. Abrasive media used in blast cleaning operations shall result in blasted surfaces having a surface profile height of 1.5 to 4.0 mils as determined by a spring micrometer with surface profile replica tape. The Contractor shall provide material safety data sheets MSDS for the abrasives used and a letter from the abrasive supplier indicating that the expendable abrasives conform to SSPC-AB 1, and the recyclable abrasives conform to SSPC-AB 3. The cleanliness of recycled abrasives shall be verified in conformance with SSPC-AB 2.

436.03 CONSTRUCTION. The definition of the word "Bridge" as defined in TC-1.02 shall not apply to this Specification. Any references to "Bridges" in this Specification shall mean any structures carrying traffic over water, roadway, railway, etc., regardless of its length.



436.03.01 Submittals. The Contractor shall submit the following drawings, plans, and information for accomplishing the work to the Engineer for approval. Except for (e) below, six copies on company letterhead shall be submitted to the Office of Bridge Development, Bridge Inspection and Remedial Engineering Division. Work is prohibited until the submittals are approved by the Administration.

- (a) **SSPC-QP Certification.** A copy of the SSPC-QP1 or QP2, Category A certificate is required. Refer to 436.01.03.
- (b) **Personnel Qualifications.** Provide applicable personnel qualifications to the Project Engineer prior to using the personnel on site. Refer to 436.03.02.
- (c) **Quality Control (QC) Plan.** A written QC program is required. Refer to 436.03.03.
- (d) **Paint Manufacturer Certifications and Letters.** The following information shall be submitted in conformance with 900.01 and 912.01:
 - (1) When detergents or additives are proposed to be incorporated into the water used for washing, the Contractor shall provide MSDS and a letter from the coating manufacturer that approves the use of the detergents with their coating.
 - (2) The manufacturer shall provide a letter that approves any proposed solvents for use in solvent cleaning prior to painting or between coats. MSDS for the solvents shall be provided.
 - (3) The paint manufacturer's application and thinning instructions, MSDS and product data sheets shall be provided.
 - (4) When caulking is used, a letter from the coating manufacturer shall be provided identifying the recommended caulking material, the application sequence for integrating the caulking into the coating system between Coats II and III, and the minimum cure time prior to paint application.
- (e) **Containment Plans.** Written Containment Plans are required. Refer to 436.03.28. Submittal shall conform to Section 499.
- (f) **Worker Protection Compliance Program.** A written Worker Protection Program is required when paint containing toxic metals is being disturbed. Refer to 436.03.31.
- (g) **Environmental Protection Plan of Action.** A written Environmental Protection Plan of Action is required. Refer to 436.03.33.



- (h) Waste Handling Program.** Waste Handling Program is required for the handling of all hazardous waste regardless of the presence of toxic metals. Waste Handling Program shall also include disposal of unused paint and solvent. Refer to 436.03.36. A written program will not be required for the handling of nonhazardous waste.

Work is prohibited until the Contractor receives written approval of the submittals from the Administration. The Contractor shall not construe Administration approval of the submittals or safety to imply approval of any particular method or sequence for conducting the work, or for addressing health and safety concerns. Approval of the proposed plans does not relieve the Contractor from the responsibility to conduct the work in conformance with Federal, State, or local regulations, this Specification, or to adequately protect the health and safety of all workers involved in the project, and any members of the public who may be affected by the project. The Contractor shall remain responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

436.03.02 Personnel Qualifications and Responsibilities. The Contractor shall provide documentation that all applicable project personnel conform to the training and accreditation requirements of COMAR 26.16.01. The documentation shall be submitted to the Project Engineer and approved prior to utilizing the personnel at the work site.

- (a) QC Inspectors.** A QC inspector shall be on site full time during cleaning and painting operations. The Contractor shall provide documentation that personnel performing quality control related functions are experienced and qualified to perform the work, and have completed the training specified for SSPC-QP1, and when paint containing toxic metals is being disturbed, SSPC-QP2.
- (b) Competent Person.** A competent person as specified in SSPC-QP2 shall be on site full time when paint containing toxic metals is being disturbed. The competent person shall perform all quality control related functions involving the oversight of worker and environmental protection, containment performance, and waste handling on paint containing toxic metals removal projects. The Contractor shall provide documentation of the competent person's qualifications, including experience and records of training as specified in SSPC-QP2. The competent person shall hold a current SSPC C3 Competent Person Certificate or current C5 refresher, a certificate of completion of 29 CFR 1926.62(1) Lead in Construction Training, and shall be accredited in conformance with COMAR 26.16.01.
- (c) Certified Industrial Hygienist (CIH).** The Contractor shall provide the services of a CIH when the work involves the disturbance or removal of paints containing toxic metals. The Contractor shall provide evidence that the CIH has the following qualifications and insurance requirements:

- (1) Certification by the American Board of Industrial Hygiene.**



- (2) Field sampling and oversight experience involving removal of paint containing toxic metals on bridges.
- (3) \$1 000 000 errors and omissions insurance coverage for this type of work.

All field sampling and testing shall be performed by the CIH or by an employee working under the direct supervision of the CIH, and shall be witnessed by a representative of the Administration. The Contractor shall notify the Bridge Inspection and Remedial Engineering Division a minimum of 24 hours prior to sampling and testing.

The CIH shall review all results of sampling and testing performed on the project. The CIH, or a person working under the direction of the CIH, shall prepare written reports interpreting these results for compliance to the applicable regulations. The Contractor shall submit a copy of all reports, analysis, etc., to the Engineer. All copies shall be submitted within five working days after sampling unless otherwise approved by the Engineer.

A written certification shall be submitted within five days after the end of each month stating that the Contractor has complied with the Plans of Action and Compliance Programs specified within this Specification for worker protection, environmental protection, and waste handling and has addressed any deficiencies found. The certification shall be prepared and signed by the CIH or a person working under the direction of the CIH.

436.03.03 Quality Control (QC) Plan, Inspection Procedures, and Recording Systems. The Contractor shall submit a Quality Control Plan for providing daily job quality control in conformance with SSPC-QP1 for surface preparation and painting operations. Work is prohibited until the submittals are approved by the Administration. The Quality Control Plan shall at least include the following:

- (a) Records of standards and specifications for coating inspection work and their utilization.
- (b) System for filing inspections reports.
- (c) Demonstration that inspection equipment and calibration standards and procedures for calibrating the inspection equipment are available.
- (d) Procedures to stop nonconforming work.
- (e) Procedures for verifying proper coating application.
- (f) Procedures to ensure that each major operation is inspected and the inspection results documented. Contractor QC inspections shall at least include:



- (1) Effectiveness of protective coverings to control project debris, paint spatters, overspray, drips, paint spills, etc., while painting over roadways, waterways, machinery areas, and areas in the vicinity of abutments and private properties.
- (2) Ambient conditions.
- (3) Compressed air cleanliness, and if required, acceptability for breathing.
- (4) Surface preparation (solvent cleaning, pressure washing, hand/power tool or abrasive blast cleaning, etc.).
- (5) Coating application (specified materials, mixing, thinning, and wet film thickness).
- (6) Dry film thickness per coat.
- (7) Recoat times and cleanliness between coats.
- (8) Coating continuity and coverage (freedom from runs, sags, overspray, dryspray, pinholes, shadow-through, skips, misses, etc.).

Copies of the Contractor's daily job quality control records shall be maintained on site and made available to the Engineer at any time. Records from any on site audits shall be submitted to the Administration.

436.03.04 Inspection Equipment. The Contractor shall provide for the exclusive use of the Engineer, the following equipment for the QA observations of the Contractor's cleaning and painting operations. All equipment shall be maintained by the Contractor in a condition that is satisfactory to the Engineer, and shall remain the property of the Contractor at the conclusion of the Contract.

- (a) The latest editions of SSPC-Vis 1, SSPC-Vis 3, SSPC-Vis 4, or SSPC-Vis 5, as applicable to the project, or other approved visual standards.
- (b) SSPC Manual Volumes 1 and 2 (Latest Edition).
- (c) Spring Micrometer with Coarse and Extra Course Surface Profile Replica Tape.
- (d) Electric or Sling Psychrometer, F.
- (e) U.S. Weather Bureau Psychrometric Tables.
- (f) Surface Thermometer, 0 to 150 F.
- (g) Probe Thermometer for Paint Temperature.



- (h) High/Low Thermometer for Paint Storage Area.
- (i) Wet Film Thickness Gauge.
- (j) Digital Magnetic Dry Film Coating Thickness Gauge (SSPC-PA 2, Type 2).
- (k) Plastic Calibration Shims for Digital Magnetic Dry Film Thickness Gauge.
- (l) Inspector's Mirror.
- (m) Wind Meter.
- (n) Clean, White, Lint-Free, Absorbent Rags.
- (o) Light meter for measuring light intensity during surface preparation/painting and inspection work.
- (p) Commercially available putty knife of a minimum thickness of 40 mils and a width of 1 to 3 in.

436.03.05 Paint Quality Assurance (QA) Inspector Notification. The Contractor shall notify the Bridge Inspection and Remedial Engineering Division a minimum of five working days prior to beginning field cleaning and painting of new and existing steel. The Bridge Inspection and Remedial Engineering Division will provide a paint inspector to assist the Engineer in performing the QA observations of the cleaning and painting portion of the work. Failure to comply with this notification shall be cause for not accepting the work performed. Paint applied to steel surfaces without QA acceptance may be required to be removed and reapplied at no additional cost to the Administration. Any test to determine acceptance will be at no additional cost to the Administration. No additional work will be permitted until a determination has been made.

436.03.06 Floodlighting. The Contractor shall provide floodlighting, including power sources, to supply adequate illumination to all surfaces being prepared, painted, or inspected, including the underside and inside of the containment system, when containment is employed for surface preparation or coating application. The floodlighting shall conform to SSPC Technology Guide No. 12, shall be maintained in good working condition, and of a design approved by the Engineer. The floodlighting shall be adjusted to avoid glare that may blind marine and vehicular traffic.

436.03.07 Field Cleaning and Painting. Portions of the existing structure and the appropriate cleaning and painting requirements shall be as specified in the Contract Documents.



436.03.08 Painting Sequence. The outside facing surfaces of beams shall not be painted until all concrete has been placed and parapet form brackets removed. However, the primer coat may be applied to these areas prior to placing the form brackets provided that it is properly touched up prior to placing the next coat of paint. The Contractor shall protect concrete from being stained by painting operations. Painted or stained concrete surfaces shall be restored to originally intended color without damage to the concrete, as directed by the Engineer.

Cleaning and painting shall proceed by sections, bays or other readily identifiable part of the work as approved by the Engineer. The work shall start at the top and proceed toward the bottom.

436.03.09 Surface Preparation. Surfaces shall be prepared as specified in the pertinent SSPC Specifications and the Contract Documents. Surface conditions shall conform to the pertinent SSPC-VIS Standards, and the test plates/sections specified in 436.03.11.

436.03.10 Methods of Cleaning. Methods shown in the following table apply to both shop and field cleaning and shall be performed in the order shown. The methods are invoked based on the Paint System specified in the Contract Documents:

PAINT SYSTEM	SUBSTRATE	METHOD OF CLEANING
C & D	Abrasive blast cleaned steel	Existing Paint to be Removed - Localized (a) and (b) and complete (h)
E, F & H	Overcoating existing paint	Existing Paint to be Overcoated - Localized (a) and complete (c) followed by (d) and (e)

(a) Solvent Cleaning. Solvents, emulsions, cleaning compounds, steam cleaning, or similar materials and methods approved by the Engineer shall be used in conformance with SSPC-SP 1 to remove grease, oil, diesel smoke residue, soot, and similar surface contaminants. Soap steam cleaning shall be used in cleaning steel open grid decks and walkways and machinery areas of drawbridges. Contaminated solvent shall be removed before it evaporates by wiping or rinsing with clean solvents to prevent a film of contaminants from remaining on the surface. Solvent wiping may be required between coats. All solvent shall be approved in writing by the paint manufacturer.

(b) Low Pressure Water Cleaning (Power Washing) Prior to Blast Cleaning or for Removing Contaminants between Coats. Low pressure water cleaning (LPWC) with potable water shall be performed on all bearings, transverse and longitudinal joints, and beam ends prior to abrasive blast cleaning to remove salts, pigeon droppings, dirt and debris. Distances defined in 436.01.01(d) shall be followed for the washing of beam ends. LPWC shall also be performed as necessary between coats to remove surface contamination.



LPWC shall be performed in conformance with SSPC-SP 12 except that nozzle pressures of 2000 to 2500 psi shall be used together with a rotating tip. The pressure washer shall be equipped with easily accessible gauges and pressure regulator to ascertain and regulate the water pressure. The LPWC shall be performed no longer than 96 hours prior to blast cleaning. This method shall also be used to remove concrete spatter, dirt, debris, salt contaminants, grease, oil, and similar surface interference material from newly coated structures prior to the application of additional coats. Should the surface not be blast cleaned within 96 hours, the Engineer will determine any additional preparation that may be required.

When the water is to be recycled and the coating being cleaned contains toxic metals, it shall be tested for toxic metals (e.g. lead, arsenic, cadmium, etc.) before reuse. Water exceeding the threshold value for any toxic metal (e.g. 5 mg/l for lead) shall not be reused.

- (c) **High Pressure Water Cleaning (Power Washing) Prior to Overcoating Existing Coating.** High pressure water cleaning (HPWC) with potable water shall be performed on existing structures prior to hand and power tool cleaning in preparation for overcoating to remove loose paint, loose rust, loose mill scale, salts, bird droppings, dirt, debris, grease, oil, hydrocarbons, diesel smoke residue, soot, chalk, and similar surface interference material.

HPWC shall be performed in conformance with SSPC-SP 12, WJ-4, except that nozzle pressures of 4000 to 6000 psi shall be used together with a rotating tip. A biodegradable detergent may be added to the water for the removal of grease, oil, and hydrocarbons if approved by the Engineer. The pressure washer shall be equipped with easily accessible gauges and pressure regulator to ascertain and regulate the water pressure. The cleaning shall be performed at close range to the surface, approximately 6 in., using a pattern of overlapping drops followed by cross-hatching with the same overlap. At the end of cleaning, the swirling patterns created by the rotating tip shall not be visible on the surface. The HPWC shall be performed no longer than 96 hours prior to the application of first coat. Should the surface not be painted within 96 hours, the Engineer will determine any additional preparation that may be required.

When the water is to be recycled, and the coating being cleaned contains toxic metals, it shall be tested for toxic metals (e.g. lead, arsenic, cadmium, etc.) before reuse. Water exceeding the threshold value for any toxic metal (e.g. 5 mg/l for lead) shall not be reused.

- (d) **Power Tool Cleaning.** Power tool cleaning shall conform to SSPC-SP 3. The use of 40 grit sanding discs is recommended.
- (e) **Hand Tool Cleaning.** Hand tool cleaning shall conform to SSPC-SP 2. The use of 60 grit sanding paper is recommended.



- (f) **Power Tool Cleaning to Bare Metal.** Power tool cleaning to bare metal shall conform to SSPC-SP 11 with a minimum surface profile of 1.0 mil.
- (g) **Brush Off Blast Cleaning.** Expendable abrasives or steel grit propelled through nozzles or steel grit propelled by centrifugal wheels shall be utilized unless otherwise directed by the Bridge Inspection and Remedial Engineering Division. The end surface condition shall conform to SSPC-SP 7, Brush Off Blast Cleaning. Abrasives shall be dry and free of oils, grease, and other harmful materials such as lead dust, etc., at the time of use.
- (h) **Near White Metal Abrasive Blast Cleaning.** Expendable or recyclable abrasives shall be utilized unless otherwise approved by the Bridge Inspection and Remedial Engineering Division. Steel shot shall not be used in the field. When steel shot is used in the shop, a sufficient amount of steel grit shall be added to the shot and the mixture maintained to produce an etched surface texture as opposed to the peened surface texture that results when blast cleaning with shot alone. The end surface condition shall conform to SSPC-SP 10, Near White. Abrasives shall be dry and free of oils, grease, and other harmful materials such as lead dust, etc. at the time of use.

436.03.11 Test Plates/Sections. When abrasive blast cleaning is specified, the Contractor shall furnish two 12 x 12 x 1/4 in. steel test plates that shall be cleaned by the Contractor in conformance with SSPC Vis Standards and the Contract Documents. These standard test plates shall be given a clear protective coating and used as a job sample standard for cleaning operations. When approved by the Engineer as an alternative to the test plates, portions of an actual work piece may be used in order to reach agreement on the degree of cleaning before production surface preparation begins. When the SSPC visual standards accurately depict the agreed upon degree of cleaning on the test section, the prepared section does not have to be sealed and retained for future reference. When the SSPC visual standards do not accurately depict the degree of cleaning, the test section shall be sealed and retained, or the test plates utilized. For the production cleaning operations, the written requirements of this Specification, the SSPC definitions, the test plates, and the SSPC visual standards shall be used in that order for determining compliance with the contractual requirements.

436.03.12 Removal of Vegetation, Planking, and Signage. Vegetation overhanging or fouling the structure shall be removed prior to surface preparation.

When the structure to be painted has planking (timber or plywood) between the beams, it shall be carefully removed in the areas of work operations. The Contractor shall be responsible for storing and maintaining the planking in good condition and disposing of all debris on the planking. Unless otherwise directed by the Engineer, the planking will not have to be reinstalled until cleaning and painting operations are complete. The Engineer may direct the Contractor to reinstall portions of the planking prior to opening any restricted lane to traffic during the same working day. The Engineer may also direct the Contractor to reinstall planking during periods of work stoppage.



When the fascia webs of the structure contain street signs identifying the name of the street crossing the structure, they shall be permanently removed during before cleaning operations begin in the area. Areas exposed as a result of the sign removal including bolt holes, etc., shall be cleaned and painted. The Contractor shall notify the Engineer who will notify the Office of Traffic and Safety, Traffic Operations Division whenever the sign is removed. Street signs may be reinstalled by the Office of Traffic and Safety utilizing the Contractor's maintenance of traffic. The Office of Traffic and Safety will coordinate this work with the Contractor.

436.03.13 Rust Scale, Pack Rust, Fins and Slivers. Regardless of the method of cleaning, surface imperfections such as sharp fins and slivers, rust scale, and pack rust shall be removed by a combination of cleaning procedures such as using hand or power impact tools (using chipping hammers or scaling hammers), blast cleaning, etc., without scarring good steel.

436.03.14 Feathering and Removal of Defects in Existing Coating. For projects involving the touch up or overcoating of newly installed steel or existing coatings in the field, regardless of the method used for cleaning, the Contractor shall feather the edges of old paint permitted to remain so that the repainted surface can have a reasonably smooth appearance. Portions of paint on previously painted surfaces that are chalky, powdered, cracked, or otherwise unacceptable shall be removed. Runs and sags in the existing paint on the outside facing surfaces of fascia beams over highways shall be removed to provide a smooth streamline appearance after the application of the new coating.

436.03.15 Surface Condition Prior to Painting. Residual dust, dirt, and grease shall be removed as the final procedure prior to painting. This applies to existing coatings that have been prepared for overcoating, surfaces that have been cleaned to bare metal, and between coats whenever the coating is contaminated. Cleaning includes all dust, puddles, grease, oil, exhaust from trucks, debris, and other foreign matter on the surfaces being painted. Debris on surfaces adjacent to those being painted shall also be removed. Cleaning shall involve vacuuming, solvent cleaning, and pressure washing as appropriate. Should an area of steel that had previously been cleaned become soiled, contaminated, or rusted, the Contractor shall reclean the area prior to painting. The cleaning shall be performed to the satisfaction of the Engineer at no additional cost to the Administration.

Prior to the application of paint, the Contractor's QC personnel shall inspect the surfaces and establish that they have been prepared in conformance with the Specifications. Upon acceptance by the Contractor's QC, the Contractor shall obtain approval from the Engineer that the surfaces to be painted during that day have been cleaned as specified.

436.03.16 Paint Storage and Mixing. Paints and thinners shall be stored in well ventilated areas not subject to excessive heat, open flames, electrical discharge, and direct rays of the sun. The Contractor shall adhere to all manufacturer's recommendations. Materials susceptible to damage by low temperatures shall be stored in heated areas when necessary. All materials shall be used on a rotating stock basis and remain closed until used. Paints that cannot be stirred to



attain normal consistency shall not be used. Paint not in actual use shall be stored in tightly covered containers at an ambient temperature not less than 45 F. Containers used for storage of coating shall be maintained in a clean condition, free of foreign materials and residue.

Thin skins formed in the container shall be cut loose and discarded. Material that has livered, gelled, thick skinned, or become questionable shall not be used unless approved by the Engineer.

Paints shall be mixed in conformance with the manufacturer's instructions and as approved by the Engineer. Thinning of the paint is prohibited unless authorized by the paint manufacturer and approved by the Engineer. The Engineer shall be present whenever the paint is thinned. Materials shall not be used beyond their pot life or shelf life.

Waste chemical solutions, oily rags, and other waste shall be removed daily. All necessary precautionary measures shall be taken to ensure that workmen and work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing, and application of materials.

436.03.17 Paint Representative. The paint representative shall be a technical representative of the paint manufacturer. The paint representative shall be present during the initial execution of the work to approve with the Engineer the degree of cleanliness prior to painting, and the method of application of the coating system. The Engineer may stop paint operations for failure to conform to this requirement regardless of reasons. Areas that have been cleaned prior to ceasing paint operations shall be recleaned if required.

436.03.18 Field Painting. The Contractor shall conform to SSPC-PA 1 for painting application and 436.03.19 thru .22.

436.03.19 Time Restrictions for Field Painting. Field paint shall not be applied between December 15 and April 15 unless approved by the Engineer.

436.03.20 Weather Restrictions for Field Painting. All surfaces to be painted shall be sound and cleaned in conformance with the Specification. Paint shall not be applied when:

- (a) There is rain, snow, fog, or mist dampening the surface.
- (b) The relative humidity shall be below the maximum humidity specified by the paint manufacturer.
- (c) The ambient air temperature in the shade is below 40 F.
- (d) The surface temperature shall not be below the minimum temperature specified by the paint manufacturer; however, no paint shall be applied when the surface temperature is less than 35 F, regardless of the paint manufacturer's recommendations.



- (e) The surface temperature is expected to drop to 32 F or below before the paint has dried.
- (f) The surface temperature is less than 5 F above the dew point.
- (g) The steel is hot enough to cause the paint to blister, produce a porous film, or otherwise be detrimental to the life of the paint.

Whenever it is suspected that moisture is condensing upon the surface, the psychrometer shall be used to check dew point. If the conditions measured by the psychrometer are marginal, the Engineer may permit a well defined area of the surface to be lightly moistened with a damp cloth and observed. If the dampness evaporates in 15 minutes, the surface shall be considered satisfactory for the application of paint. Regardless of any environmental test results, when fresh paint is damaged by the elements, the paint shall be replaced or repaired by the Contractor at no additional cost to the Administration.

The Contractor's operations shall be scheduled so that all cleaned surfaces are painted within 24 hours. If rust bloom appears or the air or steel temperature falls below five degrees above the dew point after cleaning and prior to application of the primer coat, the Contractor shall reclean the affected areas to the satisfaction of the Engineer at no additional cost to the Administration.

436.03.21 Application of Prime, Intermediate, and Finish Coats. All surfaces shall comply with the specified degree of preparation prior to the application of the paint system.

All paint shall be applied in conformance with the manufacturer's recommendations. Spray painting will be permitted provided the location and method of spray application are approved by the Engineer. All areas adjacent to machinery or mechanical components, etc., shall be painted by brush application unless the Engineer approves spray application. Surfaces inaccessible for painting by regular means shall be painted using sheepskin daubers or by other means as necessary to ensure coverage of the proper coating thickness.

All coats shall be applied to the thicknesses specified in 912.05. The thickness measuring instrument shall be maintained, calibrated, adjusted, and measurements taken in conformance with SSPC-PA 2. With the exception of Paint System H, all edges, corners, crevices, rivets, bolts, nuts, and washers shall be stripe coated prior to the application of the prime and intermediate coats. Stripe coats shall be applied by brush or dauber. For Paint System H, Coats II and III shall be stripe coated.

Each coat shall be free of shadow-through, skips, misses, and thin or heavy coating thickness. All defects shall be repaired prior to the application of the next coat at no additional cost to the Administration. The steel shall be kept dust free during painting operations, and care shall be taken to protect newly coated surfaces from cleaning operations. When an area that had previously been cleaned or painted becomes soiled, contaminated, or rusted, the area shall be recleaned to the specified condition and completely recoated at no additional cost to the Administration.



Each coat shall be applied within 30 days after the prior coat unless approved in writing by the paint manufacturer. If the recoat window is exceeded, the surface shall be recleaned as approved by the paint manufacturer and the Engineer.

436.03.22 Control of Overspray and Spills. The Contractor shall protect the environment from paint droplets, overspray, and spills by providing containment for the paint application area, and be fully responsible for any damage resulting from wind or the cleaning and painting operations. Up to 2 in. of overspray will be permitted onto the adjacent surface of the bridge deck next to the top flange. No other overspray will be permitted including, but not limited to, the concrete surfaces of any substructure units, backwalls, slope protection, sidewalks, curbs, etc. Whenever the method of protection fails to function at the required level of efficiency during the execution of the work, the Contractor shall immediately suspend all operations except those associated with minimizing adverse impact to the environment. Operations shall not resume until modifications have been made to correct the cause of the failure. Containment screens, curtains, and tarpaulins shall be fire retardant.

Paint operations may be stopped by the Engineer due to wind but shall stop if the wind velocity exceeds 20 mph, unless specific precautions are taken (e.g., specially designed containment system) to prevent the escape of paint droplets and overspray, and the proposed methods are approved by the Engineer.

436.03.23 Caulking. The Contractor shall caulk the following areas with a material approved by the paint manufacturer. Caulking shall be installed between the intermediate and finish coats and at no additional cost to the Administration:

- (a) Areas of plate delamination that are 1/8 in. or greater that cannot be cleaned and sealed during the application of the coatings.
- (b) Gaps between steel members that are 1/8 in. or greater that cannot be cleaned and sealed during the application of the coatings.
- (c) Interface between the steel and concrete surfaces where through-girders penetrate the concrete. Caulking shall be applied to the above deck surfaces only. Below deck surfaces at the through-girder/concrete interface shall not be caulked.
- (d) Gaps at the interface of steel and concrete surfaces that cannot be cleaned and painted.

436.03.24 Defective Work. The Contractor shall be responsible for the satisfactory application of paint and neither conditions during application nor Laboratory acceptance of paint shall relieve the Contractor of responsibility of obtaining a satisfactory paint system. Painting shall be done in a neat and workmanlike manner. When rusting occurs or a paint coat lifts, blisters, wrinkles, or shows evidence of having been applied under unfavorable conditions, the workmanship is poor, impure or unauthorized paint has been used, or for any other reason the



painting is unsatisfactory, the affected paint shall be removed and the steel thoroughly cleaned and repainted at no additional cost to the Administration. These areas shall provide a uniform appearance throughout the structure.

436.03.25 Repair of Damaged Coatings due to Contractor Operations. Coatings that are damaged as a result of the Contractor's operations shall be repaired at no additional cost to the Administration. The Bridge Inspection and Remedial Engineering Division shall be notified to determine the methods of cleaning and painting to be used.

436.03.26 Final Identification. When the final coat of paint is dry, the Contractor shall stencil on the structure a legend indicating the type of paint used in each coat and the month and year in which each application was completed. The letters of the stencil shall be 2 to 2-1/2 in. high and shall be applied with black paint inside a fascia beam near the abutment at a location selected by the Engineer. When more than one paint system is used, additional stencils shall be applied.

436.03.27 Field Cleaning Waste Containment. The Contractor shall comply with the SSPC Guide 6 containment levels specified in 436.03.28 and .29. Applicable portions of these requirements apply to shops when existing steel coated with hazardous material is being cleaned in the shop. With the exception of paint removal on the top flanges of members in preparation for deck replacement, a written Containment System Plan in conformance with 436.03.28 shall be provided unless otherwise directed by the Engineer.

436.03.28 Field Cleaning Containment System Plan Guidelines. Unless otherwise directed by the Engineer, the following submittal requirements apply when a containment system is specified, regardless of the presence of toxic metals. Even if a written Containment Plan is not required, the Contractor shall still comply with the technical requirements listed below when containment is used. All submittals shall be provided to the Office of Bridge Development, Working Drawing Review Section. Work is prohibited until the submittals are approved by the Administration. The following shall be provided:

- (a) Working drawings of the proposed containment system, showing the design of the paint removal, containment, rigging, and ventilation system (if applicable), including all calculations and assumptions. The working drawings shall:
 - (1) Indicate which structures are covered by the plans submitted and show the containment system in plan and elevation views including details of clips and hangers.
 - (2) Identify all containment system components on the plan sheets.
 - (3) Indicate the type and size of scaffolding or rigging to be used.



- (4) Indicate sizes of the containment areas, and when ventilation is specified, the capacity of the dust collectors, equipment data sheets, and types of airflow systems to be provided including volume of air from ventilation fans and minimum velocity of air movement.
- (b) The containment system or equipment shall not encroach upon the minimum structure clearances shown within the Contract Documents, unless otherwise approved by the Engineer.
- (c) All curtains, screens, or tarpaulins used for containment shall be secured. Connections to the steel work of the structure shall be made with clamps or other devices approved by the Engineer. Drilling holes anywhere into the existing structure or welding to the existing steel work will not be permitted. Attachments or fasteners to the structure shall not be permanent. No load shall be attached to the structure railings unless details and calculations showing loading have been approved by the Administration.
- (d) Containment curtains, screens, and tarpaulins shall be fire retardant.
- (e) Indicate maximum permissible waste load permitted on the containment system expressed in inches of debris.
- (f) Indicate all restrictions on the structure and if it is posted.
- (g) When the containment or rigging system or methods of erection will apply a load to the structure (e.g., suspended platform) the submittals shall include an analysis of the load that will be added to the existing structure by the containment system, blast waste, etc. When vehicles containing surface preparation materials (e.g., water or abrasive) or waste will be stationed on the structure, indicate allowable load and location. The load analysis shall be performed and signed and sealed by a professional engineer registered in the State of Maryland. The analysis shall ensure that the system will not induce a load on the structure that will create an overstress condition, or otherwise effect the structural integrity of the structure.

When the containment or rigging system does not impose a load to the structure (e.g., tarpaulin materials suspended from the structure at an abutment or cables and picks used for access), a professional engineer analysis and review of the drawings will not required.

- (h) All drawings requiring a professional engineer review and seal as defined in (g) above shall be prepared and issued in conformance with Section 499. Drawings not requiring a professional engineer review and seal can be provided on standard paper, but shall be neat and legible.



Submit 10 copies of each drawing. When a professional engineer stamp is required, each sheet shall be signed and sealed by the professional engineer. The submittal letter shall be on company letterhead. At least one copy of the submittal shall have an original seal.

- (i) When the structure is over water, show a skimming boom for emergency backup.

436.03.29 Containment System Requirements by Method of Preparation. Refer to 436.03.10.

- (a) **Washing.** When power washing newly installed steel coated only with inorganic zinc primer, the surfaces may be washed without any containment or collection of the water. The Contractor shall prevent spray and runoff water from entering traveled roadways, walkways, railroads, etc.

Whenever power washing is being performed on other painted surfaces, paint chips are prohibited from falling into rivers, streams, wetlands, wetland buffers, or other bodies of water, and when specified, from falling onto the ground. Should inadvertent spills or releases of paint chips occur, they shall be cleaned up before the end of the shift, or immediately if directed by the Engineer.

- (1) When power washing paint containing toxic metals or inorganic zinc/vinyl systems, the containment shall conform to SSPC Class 2W. All wash water and debris shall be collected and disposed of in conformance with applicable regulations and 436.03.27 and .35, respectively. Paint chips are also prohibited from falling onto the ground.
 - (2) When power washing all other systems (systems other than inorganic zinc, inorganic zinc/vinyl, or systems that contain toxic metals), all dislodged paint chips shall be collected, but the water need not be captured. When dislodged chips are collected on containment screens suspended around and beneath the work area, the maximum mesh size openings shall be 17 mils. When working over ground, chips may be collected from the ground in lieu of utilizing the containment screens provided all chips are collected before the end of the shift. Collected paint chips and debris shall be disposed of in conformance with applicable regulations and 436.03.35.
- (b) **Power Tool and Hand Tool Cleaning.** Paint chips are prohibited from falling into rivers, streams, wetlands, wetland buffers, or other bodies of water, and when specified, from falling onto the ground. Should inadvertent spills or releases of paint chips occur, they shall be cleaned up before the end of the shift, or immediately if directed by the Engineer.
 - (1) The containment for open power tool cleaning paint containing toxic metals shall conform to SSPC Class 2P. Collected paint chips and debris shall be disposed of in conformance with applicable regulations and 436.03.35. Paint chips are also prohibited from falling onto the ground.



- (2) The containment for open power tool cleaning all other paint systems (systems that do not contain toxic metals) shall conform to SSPC Class 3P. Collected paint chips and debris shall be disposed of in conformance with applicable regulations and 436.03.35. Paint chips are also prohibited from falling onto the ground.

The use of vacuum-shrouded power tools may eliminate the need for the SSPC Class 3P containment if it can be demonstrated to the satisfaction of the Engineer that all paint chips and debris are sufficiently collected by the vacuum and that escaping detached paint chips are cleaned up from the ground at the end of the shift.

- (c) **Spot Abrasive Blast Cleaning or Brush Off Blast Cleaning.** Paint chips are prohibited from falling onto the ground or into rivers, streams, wetlands, wetland buffers, or other bodies of water. Should inadvertent spills or releases of abrasives or paint chips occur, they shall be cleaned up before the end of the shift, or immediately if directed by the Engineer.

With the exception of new steel installed with inorganic zinc primer, the containment for spot abrasive blast cleaning or brush off blast cleaning (regardless of the presence of toxic metals) shall comply with SSPC Class 2A. Collected paint chips and debris shall be disposed of in conformance with applicable regulations and 436.03.35.

Containment for spot abrasive blast cleaning or brush off blast cleaning newly installed inorganic zinc primer shall comply with SSPC Class 3A. Collected paint chips and debris shall be disposed of in conformance with applicable regulations and 436.03.35.

- (d) **Total Paint Removal by Abrasive Blast Cleaning.** Paint chips are prohibited from falling onto the ground or into rivers, streams, wetlands, wetland buffers, or other bodies of water. Should inadvertent spills or releases of abrasives or paint chips occur, they shall be cleaned up before the end of the shift, or immediately if directed by the Engineer.

When totally removing any coatings by abrasive blast cleaning (regardless of the presence of toxic metals), the containment shall comply with SSPC Class 2A. Collected paint chips, abrasive, and debris shall be disposed of in conformance with applicable regulations and 436.03.35.

The Contractor shall satisfy ambient air and worker exposure requirements established by the Maryland Department of the Environment and MOSH.

Containment systems shall be maintained while work is in progress and shall not deviate from the approved working drawings without approval of the Engineer. Public access to all rigging, scaffolding, containment systems, and work sites shall be denied at all times.



When cleaning structures over water, the Contractor shall provide a skimming boom for emergency backup consisting of a float with a skirt or other approved system that shall be employed immediately to collect floating debris. The skimming boom shall be cleaned at least once a day. Upon completion of the project, skimming materials shall be cleaned or if cleaning is not possible or practical, shall be disposed of as hazardous or nonhazardous waste as applicable.

436.03.30 Worker Protection and Exposure Monitoring. In addition to complying with all applicable OSHA and MOSH regulations, when the project involves coatings that contain toxic metals, the Contractor shall provide the services of a CIH conforming to 436.03.02(c) in the project and submit a Worker Protection Compliance Program as specified in 436.03.31. The CIH, or a technician working under the direction of the CIH shall monitor worker exposures during paint disturbance operations at each structure and provide worker protection oversight.

Regardless of the presence of toxic metals, the Contractor shall provide a hand wash station with soap and towels at each work site. As dictated by the monitoring results and the applicable OSHA standards, the Contractor shall also provide a clean up area with a shower, soap, hot and cold potable pressurized water; a change area with a locker for clean clothes, etc.; and an approved container for collection and disposing of waste at each work site. The hand wash and shower facilities shall be available for the Contractor's and the Administration's personnel. Hygiene facilities shall conform to the requirements specified in 29 CFR 1926.51, Sanitation Standard.

436.03.31 Worker Protection Compliance Program. A written Worker Protection Compliance Program is not required when the coatings being disturbed do not contain toxic metals.

The program shall be on company letterhead and shall conform to OSHA and the MOSH - Lead in Construction Standards, and other applicable toxic metal standards. The Compliance Program shall be reviewed and signed by the CIH and at least one copy of the submittal shall have an original CIH seal. The program shall include a commitment for the CIH, or a person working under the direction of the CIH, to provide written certification each month that the Contractor has complied with the Worker Protection Compliance Program, including biological monitoring. The letter shall be provided to the Contractor within five working days after the end of the month, and the Contractor shall provide the Engineer with a copy of the letter the following workday.

436.03.32 Environmental Protection. At the end of the shift each day and upon completion of all project activities, surrounding property, concrete, pavement, slope protection, soil, water, sediment, etc., shall be cleaned free of visible project debris resultant from the cleaning and painting activities.



436.03.33 Environmental Protection Plan of Action. A written Environmental Protection Plan of Action confirming that the environment is protected from contamination is required when the coatings are being abrasive blast cleaned (regardless of the presence of toxic metals), or the coating being disturbed contains toxic metals (regardless of the method of preparation). When a written Environmental Protection Plan of Action is required, it shall be reviewed and sealed by a CIH and shall include procedures for monitoring air, soil, and water.

The Environmental Plan of Action shall include a location plan showing the type and location of high volume ambient air monitors if applicable, the procedures that will be followed for visible emissions assessments, and inspections of the soil, water, surrounding property and structures, and pavement. Six copies of each plan signed and sealed by the CIH shall be submitted. All submittals shall be in writing and on company letterhead. At least one copy of the submittal shall have an original seal. The Environmental Plan of Action shall address the proposed procedures that will be implemented for the following as defined in 436.03.34:

- (a) For any paint disturbance using dry methods of preparation, the daily visual emissions observations that will be performed and the corrective action that will be implemented in the event emissions or releases occur.
- (b) When paint containing toxic metals is being disturbed, the provisions for high volume ambient air monitoring (TSP - Monitoring); monitor citing, calibration, and operation; filter handling and shipping; and laboratory analysis, including the name and qualifications of the laboratory. Test results shall be reviewed and summarized by the CIH, and provided to the Contractor within five days of sample collection, with copies provided to the Engineer the following work day after receipt.
- (c) For any paint disturbance, the visual assessments for soil/water/sediment that will be undertaken each day and upon project completion together with the proposed clean up activities.
- (d) A commitment for the CIH, or a person working under the direction of the CIH, shall be included to provide a written certification within five days after the end of the month that the Contractor has complied with the Environmental Protection Plan of Action, and that a copy of the letter will be provided to the Engineer the following work day after receipt.

436.03.34 Methods for Assessing Emissions. Unless otherwise directed in the Contract Documents or by the Engineer, the following requirements apply to all projects, regardless of the presence of toxic metals:

- (a) **SSPC Level 1 Visible Emissions.** The following Level 1 visible emissions criteria apply when any paint is being disturbed by dry methods such as blast cleaning, power tool cleaning, etc.



Level 1 Emissions are defined as random visible emissions of a cumulative duration of no more than 1 percent of the workday or approximately five minutes in an eight hour day. Level 1 is required for all structures. The Contractor's QC person, or Competent Person in the case of projects containing toxic metals, shall perform a minimum of two 15 minute documented observations during each work shift. In addition to the 15 minute observations, all Contractor personnel shall be directed to routinely observe the work area and to report unacceptable emissions to QC or supervisory personnel, or to the Competent Person. When unacceptable emissions are detected, the source of the emissions shall be located and immediately corrected. Records shall be retained on site and made available to the Engineer.

The visible emissions criteria are not required when the paint is being cleaned or disturbed using water. When water is used on existing coatings that contain toxic metals or on inorganic zinc/vinyl systems, all water shall be collected and emissions are prohibited. When water is used to clean all other coating systems, the water need not be collected and emissions are not restricted.

(b) Ambient Air Monitoring. Unless otherwise directed by the Engineer, ambient air monitoring shall be required when the coatings being disturbed contain toxic metals, and the paint removal operations are located within 500 ft of houses, schools, parks, playgrounds, shopping areas, or similar areas of public exposure.

(1) Abrasive Blast Cleaning. Daily ambient air monitoring at each structure being abrasive blast cleaned shall begin one day prior to beginning work and during the first 10 days of productive abrasive blast cleaning operations. When the results indicate that the containment is controlling emissions, full time monitoring may be discontinued unless otherwise directed by the Engineer. However, monitoring shall be repeated for two consecutive days every month thereafter during the work shift while blast cleaning or other dust producing operations are underway.

When the results of the original 10 days of monitoring or the periodic monthly tests are unacceptable, monitoring shall continue full time. Monthly monitoring shall be initiated or resume only upon approval of the Engineer, and only after the results of the testing indicates that the containment is controlling emissions.

Monitoring shall also be resumed at the direction of the Engineer when unacceptable visible emissions or residues are observed on the ground or water. The additional monitoring shall be performed at no additional cost to the Administration.

(2) Hand and Power Tool Cleaning. Daily ambient air monitoring at each structure shall begin one day prior to beginning work, and during the first five days of hand tool cleaning or power tool cleaning. When the results indicate that the containment is controlling emissions, unless otherwise directed by the Engineer, full time monitoring may be discontinued. Monitoring shall be resumed when visible residues are observed



on the ground or in the water, or visible dust is observed exceeding the Visible Emissions criteria established above. The additional monitoring shall be performed at no additional cost to the Administration.

- (3) Monitor Placement and Reporting.** Total suspended particulate (TSP) monitors shall be placed in areas of potential public exposure (e.g., adjacent to homes, businesses, parks, or pedestrian walkways) that are within 500 ft of each project site during cleaning operations in conformance with Method D of SSPC Guide 6. The CIH shall provide for Engineer acceptance, the proposed monitoring locations in advance, together with the rationale for the selection of each site. Monitoring shall be conducted a minimum of seven hours per work shift. All TSP monitoring samples shall be analyzed using Method 40 CFR 50 Appendix B and G by a laboratory approved by the American Board of Industrial Hygiene.

The CIH shall use an Adjusted Daily Allowance (ADA) as described in SSPC Guide 6 (not an average daily allowance) for evaluating the TSP monitoring results. The CIH, or a person working under the direction of the CIH, shall provide the Contractor with a written report and analysis of monitoring results, including the relevant acceptance criteria based on the ADA, within five days of sample collection. The Contractor shall provide the results to the Engineer the following work day after receipt from the CIH.

- (c) Removal of Visible Project Debris.** At the end of the shift each day and upon completion of all project activities, surrounding property, concrete, pavement, slope protection, soil, water, sediment, etc. shall be cleaned free of visible project debris.

Paint chips and abrasives shall not become deposited onto surrounding property, concrete, pavement, slope protection, soil, water, sediment, etc. Releases or spills of dust and debris that have become deposited on surrounding property, structures, equipment or vehicles, or bodies of water are unacceptable. When there are spills or releases, the Contractor shall immediately shut down the emissions producing operations, clean up the debris; and change work practices, modify the containment, or take other appropriate corrective action as needed to prevent similar releases from occurring in the future. Water used for washing paint containing toxic metals or existing inorganic zinc/vinyl systems shall be contained and collected. Water used to wash all other paint systems need not be contained and may contact the ground and water.

436.03.35 Field Cleaning Waste Disposal. All project waste, regardless of the presence of toxic metals shall be stored in roll-offs or sealed 55 gal drums. Containers shall be labeled with the structure number, Contract number, Contractor's name, contents, and the date. Refer to 436.03.36 thru .41.



When the waste is hazardous, the Contractor shall comply with SSPC Guide 7. Each day the Contractor shall collect the clothing and other waste material in approved containers and seal them. When drums are used they shall be sealed 55 gal open head type drums conforming to I.C.C. Specification 17-H. All containers shall be in new condition and approved for use by the Engineer.

436.03.36 Waste Handling Plan of Action. A Waste Handling Plan of Action is required for the handling, storage, and disposal of all hazardous waste, regardless of the presence of toxic metals. When the project involves the removal of paint containing toxic metals, the program shall be signed and sealed by the CIH. At least one copy of the submittal shall have an original seal.

The Plan of Action shall address the following:

- (a) Names, addresses, and licenses for the proposed hazardous waste transporters and disposal facilities.
- (b) Hazardous waste handling and storage procedures.
- (c) Waste and waste water sampling and analysis procedures.
- (d) All test results shall be provided to the Engineer within five days of sample collection.

436.03.37 Waste Sampling and Analysis. When the project involves hazardous waste, the Contractor's CIH, or an employee working under the direct supervision of the CIH, shall take a minimum of four samples of the accumulated residues of each waste stream collected at each structure or a sample from every third drum, whichever is greater. All sampling shall be random and representative.

The samples shall be analyzed for TCLP as outlined in COMAR 26.13.02 and the EPA Test Procedure Manual, SW-846 for all RCRA 8 Metals. Waste shall not accumulate longer than 30 days before sampling. The representative samples collected shall be analyzed by an approved laboratory and the results returned to the Engineer within five working days of collection. Additional samples may be required if the average test results for lead exceed 3.5 mg/l. For allowable concentrations of other toxic metals, refer to COMAR and EPA procedures. The disposal method will be based on the results of these analyses, except that waste generated using steel abrasives shall be handled, stored, and disposed of as hazardous waste regardless of the test results.

436.03.38 Temporary Waste Storage Site. At the end of each working day, the Contractor shall haul the waste material away from the work site to an approved temporary storage site that has been obtained by the Contractor and approved by the Engineer. The storage site shall be capable of preventing the migration of the contaminated material into the environment. The storage area shall provide protection from vandalism and unauthorized access by the general



public. The waste shall be removed from the temporary storage site within 75 days from the initial date of accumulation or before the completion of work, whichever comes first. When the Contract Documents specify that the Contractor's waste containers shall be stored at a particular facility owned by the Administration, the Contractor shall contact that facility to schedule delivery.

436.03.39 Waste Water Disposal. Waste water collected from bridge washing and hygiene facilities shall be tested for toxic metals (e.g. lead, arsenic, cadmium, etc.) Tests shall be performed using EPA Method 6010 by a laboratory approved by the American Board of Industrial Hygiene.

The Contractor shall provide the Engineer with the test results and written plans for the disposal of the water, including the name and address of the licensed transporter and disposal facility that will be used. If the local publicly owned treatment works (POTW) authorizes the disposal of the water down the sanitary sewer system, the Contractor shall provide the Engineer with a letter from the POTW authorizing the disposal.

436.03.40 Hazardous Waste Transportation and Disposal. Maryland law provides that when samples tested using TCLP exceed the threshold value (e. g. 5 mg/l for lead), they shall be considered hazardous waste and shall be removed under manifest by a licensed hazardous waste transporter to a permitted disposal facility. When tested waste material is determined to be hazardous waste, the Contractor shall request through the Administration an EPA identification number as specified in COMAR 26.13.03.03. The Contractor shall provide the Engineer with written plans for the transportation and disposal of the waste, including the name and address of the licensed transporter and disposal facility.

Waste containing less than the threshold value by the TCLP test, including the confidence interval, shall be disposed of in conformance with 436.03.41 for RCA 8 Metals.

The Contractor shall prepare a manifest for hazardous waste to be transported from the approved temporary storage site. The manifests shall be prepared and shall contain the information stipulated in COMAR 26.13.03.04 and as otherwise required by State regulations. The manifests shall be forwarded to the Bridge Inspection and Remedial Engineering Division.

Drums of other wastes, such as solvent contaminated rags, disposable protective clothing, disposed dust collector filters, and other contaminated substances shall be sampled individually and tested appropriately.

COMAR 26.13.03.05 stipulates the "Pre-Transport" requirements and the amount of time permitted for the accumulation of hazardous waste. Waste shall be transported by a certified waste hauler to any landfill permitted to accept this material.



The Contractor can obtain a list of certified haulers and other information regarding handling and disposal of blast waste by contacting the Department of Environment, Hazardous Waste Administration.

436.03.41 Nonhazardous Waste Disposal. Waste containing less than the threshold value (refer to 436.03.40) by the TCLP test, including the confidence interval, may be disposed of as an industrial waste at any landfill permitted to accept this material. All waste shall be disposed of in conformance with Federal, State, County and local regulations. Waste containers/dumpsters shall be covered when not in an active filling process.

436.04 MEASUREMENT AND PAYMENT. The Contract unit price for the item specified in the Contract Documents will be full compensation for all permits, working drawings, daily quality control records, professional engineer's services used for containment, industrial hygienist services, air monitoring, sampling and testing materials for toxic metal content, including any revisions, resubmissions of the Containment Plan and Systems that may be required during the execution of the work, and all other incidentals necessary to complete all cleaning and painting operations including providing safe access for inspections, hand wash station/clean up area, floodlighting, test plates, drums, collection and storage at the temporary storage site, hauling and disposal at an approved industrial waste site or hazardous waste site, removing and replacing planking, removal of debris, and all material, labor, equipment (including test equipment), tools, and incidentals necessary to complete the work.

436.04.01 Cleaning and painting new structural steel will not be measured but the cost will be incidental to the pertinent Structural Steel or Repair item.

436.04.02 Cleaning and painting existing structural steel will not be measured but will be paid for at the Contract lump sum price for the pertinent Cleaning and Painting item.

436.04.03 All costs associated with repair of existing coatings due to new construction, repairs, and damage caused by the Contractor's operations will not be measured but will be incidental to the pertinent Repair, Structural Steel, or Cleaning and Painting items included in the Contract Documents.

**CATEGORY 500
PAVING****SECTION 522 – PORTLAND CEMENT CONCRTE PAVEMENT REPAIRS****522.01 DESCRIPTION:**

ADD: The following after the existing paragraph.

The repairs to the roadway are to include full depth repairs and partial depth repairs. The full depth repairs require the existing pavement to be removed, new dowels and reinforcing steel to be installed and concrete placed. The partial depth repairs require the spall to be removed to a minimum depth of 3” and concrete to be placed.

522.03 CONSTRUCTION:**522.03.03 Saw Cuts and Removal of Existing Slab:**

ADD: The following after the existing paragraphs.

The contractor shall saw cut the pavement sections to be replaced on week nights, and lift the sections out on the weekend. The contractor will be allowed to saw cut only those sections of pavement that can be reasonable expected to be removed during the following weekend.

The partial depth repairs shall consist of the contractor saw cutting the pavement sections to be replaced on a 10 degree angle to a depth of 2”. The contractor shall remove all concrete by jack hammering (30 lb maximum) all concrete within the limits of the saw cuts to sound concrete and a minimum depth of 3”. The bottom surface shall be left rough.

522.03.04 Base and Subgrade Preparation:

ADD: The following at the end of the paragraph.

Compact any portions of the sub-base that was disturbed during removal.

522.03.07 Reinforcement:

ADD: The following after the existing paragraphs:

An automated rig shall be used to drill multiple holes simultaneously into the existing slab for the dowels. Bar mats shall be pre-tied so that they can be dropped into place.



The contractor shall add 6 x 6 -W1.4 x W1.4 mesh to all partial depth repairs with 2" cover. Welded wire fabric shall be secured to existing concrete with mechanical anchors and welded wire fabric clips at 18" center to center spacing maximum each way.

INSERT: The following.

522.03.15 Glare Shields. The Contractor shall remove and reinstall all existing glare shields on top of the concrete parapets as required to place concrete for repairs during Phases IA and IB. Any glare shields which are broken during the removal and resetting, or during removal and repairs to the pavement shall be replaced at no additional cost to the Authority.

522.04 MEASUREMENT AND PAYMENT:

ADD: The following after the first paragraph:

Adjustment of existing visible manholes, valve boxes, inlets or other structures will not be measured but the cost will be incidental to the Portland Cement Concrete Pavement Repair Items.

INSERT: The following.

522.04.10 Plain Portland Cement Concrete Pavement Partial Depth Repairs per square yard.

522.04.11 Glare Shields will not be measured, but the cost will be considered incidental to the appropriate Portland Cement Concrete Pavement Type I Repairs or Plain Portland Cement Concrete Pavement Partial Depth Repair item.



**CATEGORY 500
PAVING**

SECTION 557 – SNOWPLOWABLE RAISED PAVEMENT MARKERS

557.01 DESCRIPTION. This work shall consist of furnishing and installing 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 the reflector lens shall be removed without damage to the lens surface. It shall be the contractor's responsibility to clean each contaminated casting by sand blasting, wire brushing or other procedure approved by



the Engineer to remove all foreign matter prior to installation. The use of chemicals to remove rust from the castings is prohibited.

- (f) The contractor shall replace at no additional cost to the Administration any incorrect groove cut and any incorrect casting placement. An additional test strip may be required by the Engineer in the event of incorrect installations. Incorrect installations, as determined by the Engineer, shall be corrected and repaired by the contractor at no additional cost to the Administration.

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

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

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

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

New Installation.

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

Replacement.

- (a) Casting Replacement. The re-use of damaged or removed castings is prohibited.
- (b) Pavement Marker Reflector Lens Replacement. The Contractor shall remove and dispose of any damaged reflector lens and replace with a new lens. Previously installed undamaged castings



which are missing a reflector lens shall have a new reflector lens installed. The replacement lenses shall be installed per manufacturer's written instructions.

- (c) **Casting Groove Cut Replacement and Accuracy.** The re-use of existing groove cuts is prohibited; castings shall only be installed in new groove cuts. Previously used groove cuts shall be permanently patched in accordance with applicable sections of 504, 505 and 522 or as directed by the Engineer. The location of the replacement groove cut shall be within 10 percent longitudinally in front (with the direction of traffic) and no lateral deviation exceeding 1½ in.

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

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

Quality Assurance/Quality Control. 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.

- (a) Snowplowable Raised Pavement Markers will be paid for at the Contract unit price per each. Furnishing and installing SRPM includes the casting, reflector, adhesive and grooving.
- (b) Removal of existing Castings, excluding any incorrect installation by the Contractor, and repair of Groove Cuts will be paid for at the Contract unit price per each.
- (c) Replacement of Pavement Marker Reflector Lenses will be paid for at the Contract unit price per each.



**CATEGORY 500
PAVING**

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

559.01 DESCRIPTION. 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.

553.03.04 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 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.

**CATEGORY 500
PAVING****500-1 DIAMOND GRIND CONCRETE PAVEMENT**

500-1.01 DESCRIPTION. This work shall consist of the diamond grinding of existing cement concrete surfaces as indicated or directed.

500-1.02 MATERIALS. – NOT USED

500-1.03 CONSTRUCTION.

Use a power driven, self-propelled machine having diamond blades and capable of grinding the surface of the pavement to the specified smoothness tolerances and texture. Do not use equipment that causes spalls at joints or cracks, or fractures the aggregate at the surface.

- (a) **Grinding.** Grind the pavement in the longitudinal direction beginning and ending at lines normal to the pavement centerline. Grind in either direction unless it is otherwise determined by the Representative that traffic safety considerations mandate grinding with traffic flow. Provide a uniform finished surface, eliminate joint or crack faults, and provide positive lateral surface drainage. Operate grinding machine parallel to centerline. Texture the entire pavement surface; however, do not perform extra depth grinding to eliminate minor depressions. Do not exceed 2 inches of overlap.

Remove slurry or residue resulting from the grinding in a continuous operation. Do not allow grinding slurry to flow across lanes occupied by traffic or to flow into gutters or other drainage facilities. Satisfactorily clean the pavement surface.

- (b) **Texture.** Provide a surface texture consisting of parallel grooves between 0.99 inch and 0.13 inch wide with a "land area" between grooves of 0.060 inch to 0.110 inch and a difference between the peaks of the ridges and the bottom of the grooves of approximately 1/16 inch.

(c) **Tolerance.**

1. **Transverse Tolerance.** Restore original pavement cross slope. Maintain a uniform cross slope. Check the uniformity of cross slope at 100-foot intervals longitudinally.

Correct any areas with deviations greater than 1/4 inch in 12 feet. Provide a positive cross slope such that the pavement drains.

Provide the Representative with documentation recording the test location and the maximum depth of depression or slope misalignment at that location.



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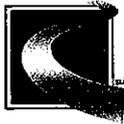
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2. **Longitudinal Tolerance.** Supply and operate a certified California Profilograph for all longitudinal roughness tests. Test the pavement surface roughness in the longitudinal direction and submit the record of the information to the Inspector-in-Charge before beginning any pavement rehabilitation work. Following grinding of the pavement surface, test the longitudinal roughness in 0.25 lane-mile segments.

Regrind pavement segments with roughness in excess of 15 inches/mile and/or bumps greater than 0.4 inch in 25 feet.

Supply the engineer with the test strips from the Profilograph within one day of the testing.

500-1.04 MEASUREMENT AND PAYMENT. Diamond Grind Concrete Pavement will be measured and paid for at the Contract unit price per square yard. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.



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**CATEGORY 600
SHOULDERS**

SECTION 604 – CONCRETE TRAFFIC BARRIERS

604.04 MEASUREMENT AND PAYMENT.

516 **DELETE**: The first paragraph, “The payment will...complete the work.” in its entirety.

INSERT: The following.

The payment will be full compensation for all concrete, test panels, excavation, removal of existing pavement including saw cuts, disposal of excess or unsuitable material, concrete footer, forms, reinforcement, drilled holes, drainage, appurtenances, geotextile, No. 57 aggregate, conduit, boxes and fittings, backfilling, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.



**CATEGORY 600
SHOULDERS**

DELETE: SECTION 605 — METAL TRAFFIC BARRIERS in its entirety.

INSERT: The following.

SECTION 605 — METAL TRAFFIC BARRIERS

605.01 DESCRIPTION. This work shall consist of constructing metal traffic barriers as specified in the Contract Documents or as directed by the Engineer.

605.02 MATERIALS.

Brown Polyester Coating	917.03
W Beam	918.01
Metal Posts	918.02
Traffic Barrier Hardware	918.03
Timber Posts	918.04
Wood Offset Blocks	918.04
Wire Rope	918.05
Rub Rail	A 36, Galvanized, A 123
Thrie Beam	M 180, Class A, Type 2
Reflective Delineators	As approved by the Office of Traffic and Safety
Recycled Composite Material Offset Blocks	As specified by the manufacturer

605.03 CONSTRUCTION.

605.03.01 Post Erection. Posts shall be driven unless otherwise permitted by the Engineer. The method of driving shall avoid battering or distorting the posts. Posts not driven shall be set in holes of sufficient diameter to allow tamping of the backfill. Postholes shall be backfilled with materials approved by the Engineer and placed in horizontal layers not to exceed 6 in. loose depth, then thoroughly compacted. When it is necessary to place posts in existing paving, all loose material shall be removed and the paving replaced. Prior to erection of the rail or cable elements, the post shall be properly aligned and be within a 1/4 in. tolerance of line and grade. Posts shall be plumb.

When rock is encountered at a depth less than the specified footing depth, a 12 in. diameter hole shall be drilled a minimum of 20 in. into the rock or to the planned footing depth, whichever is less. If the 20 in. depth is achieved prior to reaching the planned footing depth, the post shall be cut to the appropriate length. The cut edge shall be painted with an approved galvanizing repair paint prior to placement in the hole. After setting the post, the hole shall be backfilled with materials approved by the Engineer and placed in horizontal layers not to exceed 6 in. loose depth, then thoroughly compacted. The use of concrete or grout is prohibited.

605.03.02 Rail Assembly. Rail elements shall conform to the Contract Documents and be erected in a manner resulting in a smooth, continuous installation with laps in the direction of traffic flow. All bolts shall be drawn tight.



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605.03.03 Offset Blocks. New traffic barrier W beam shall be installed with either wood or recycled composite offset blocks. The mixing of different types of manufactured composite blocks and the mixing of composite and wood blocks is prohibited. Offset blocks shall be routed or grooved to prevent them from rotating on the posts.

When an existing steel offset bracket is damaged, it shall be replaced with a steel bracket.

605.03.04 Brown Polyester Coated Traffic Barrier W Beam Using 6 Foot Post or 8 Foot Post. All components shall be padded and handled with nylon slings during loading, unloading, and installation.

The Contractor shall preserve the integrity of the polyester coating. If the polyester coating is chipped, scratched, blistered, or otherwise separated from the base metal, the Contractor shall repair the damaged areas using the repair kit supplied by the manufacturer. All repairs shall be completed to the satisfaction of the Engineer or be replaced at no additional cost to the Administration.

605.03.05 W Beam Barrier Reflective Delineators. Reflective delineators shall be installed on the traffic barrier W beam as specified in the Contract Documents.

605.03.06 Remove and Reset Existing Traffic Barrier. When the entire run or a portion of a run of traffic barrier is removed and reset, the metal offset brackets shall be replaced with either wood or recycled composite offset blocks. An 8 in. offset block shall be used when the entire run is removed and reset, and a 6 in. offset block shall be used when only a portion of a run is removed and reset. The holes in the blocks shall match the existing post holes. The posts shall be moved a minimum of 1 ft in either direction from the existing location. When resetting the rail, the height of the rail shall be measured to ensure it conforms to the current height shown on the Standards. The offset distance from the edge of the roadway shall be maintained unless otherwise directed by the Engineer.

605.03.07 Remove and Reset Existing Median Traffic Barrier W Beam. When the entire run or a portion of a run of median traffic barrier W beam is removed and reset, the metal offset brackets shall be replaced with either wood or recycled composite offset blocks. An 8 in. offset block shall be used when the entire run is removed and reset, and a 6 in. offset block shall be used when only a portion of a run is removed and reset. The holes in the blocks shall match the existing post holes. The posts shall be moved a minimum of 1 ft. in either direction from the existing location. When resetting the rail, the height of the rail shall be measured to ensure it conforms to the current height shown on the Standards. The offset distance from the edge of the roadway shall be maintained unless otherwise directed by the Engineer.

605.03.08 End Treatments. Refer to Section 606.

605.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for all rock excavation, components, restoration of grassed or paved areas, drilled post holes, assembly and erection of all component parts, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.



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605.04.01 Traffic Barrier W Beam Using 6 Foot Post or 8 Foot Post will be measured and paid for at the Contract unit price per linear foot. When a bottom W beam panel is specified for the Traffic Barrier W Beam item it will be measured and paid for at the Contract unit price per linear foot for Traffic Barrier W Beam Panel.

605.04.02 Traffic Barrier W Beam Median Barrier will be measured and paid for at the Contract unit price per linear foot.

605.04.03 Traffic Barrier Thrie Beam will be measured and paid for at the Contract unit price per linear foot.

605.04.04 Replacing 6 or 8 foot posts, installing additional 6 or 8 foot posts, splice joints, and replacing W beam panels will be measured and paid for at the Contract unit price as specified in the Contract Documents.

605.04.05 Removal and Disposal of Existing Traffic Barrier W Beam will be measured and paid for at the Contract unit price per linear foot.

605.04.06 Remove and Reset Existing Traffic Barrier will be measured and paid for at the Contract unit price per linear foot. Offset blocks will not be measured but the cost will be incidental to the item.

605.04.07 Remove and Reset Existing Median Traffic Barrier W Beam will be measured and paid for at the Contract unit price per linear foot. Offset blocks will not be measured but the cost will be incidental to the item.

605.04.08 Traffic Barrier W Beam Median Barrier with Bottom Panel will be measured and paid for at the Contract unit price per linear foot.

605.04.09 Remove and Reset Existing Median Traffic Barrier W Beam with Bottom Panel will be measured and paid for at the Contract unit price per linear foot.

605.04.10 W Beam Barrier Reflective Delineators will be measured and paid for at the Contract unit price per each.

605.04.11 The application of fusion bonded brown polyester coating to Traffic Barrier W Beam, as well as all special handling and touch up, will not be measured but the cost will be incidental to the item to which the coating is applied.



**CATEGORY 600
SHOULDERS**

**SECTION 606 — PERMANENT TRAFFIC
BARRIER END TREATMENT**

606.03 CONSTRUCTION.

606.03.01 End Treatments.

519 **INSERT:** The following.

(g) **Bull Nose W-beam End Treatment.** This system shall be installed in conformance with the manufacturer's recommendations. Contractor shall coordinate with the manufacturer to determine the construction details for this end treatment. Sample drawings provided as part of this specification are for information only.

606.03.02 Surface Adjustment.

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

INSERT: The following.

When surface adjustment is required for installation of Type B, C, D, E, F, and Bull Nose end treatments as specified on the Standards or in the Contract Documents, the Contractor shall use any class of excavation available on the project. When excavation is not available on the project site, the surface adjustment for end treatments shall be constructed using bank run gravel base, graded aggregate base, common borrow, or topsoil. The surface adjustment shall be completed within 48 hours.

606.04 MEASUREMENT AND PAYMENT.

521 **DELETE:** 606.04.01 in its entirety.

INSERT: The following.

606.04.01 Type A End Anchorage Terminal Either Option will be measured and paid for at the Contract unit price per each.

DELETE: 606.04.02 in its entirety.

INSERT: The following.

606.04.02 Type B through H, J, K, and Bull Nose W-beam Traffic Barrier End Treatments will be measured and paid for at the Contract unit price per each. Type L Traffic Barrier Anchorage will be measured and paid for at the Contract unit price per each.

606.04.03

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



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INSERT: The following.

Surface adjustment for Types B, C, D, E, F, and Bull Nose end treatments will be measured and paid for at the Contract unit price per cubic yard for the Surface Adjustment for Traffic Barrier End Treatment item. The payment will be full compensation for furnishing, adjusting embankment or aggregate material, compaction, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.



**CATEGORY 900
MATERIALS**

SECTION 901 — AGGREGATES

602 **DELETE:** Table 901 A in its entirety.

INSERT: The following.

**SPECIAL PROVISIONS INSERT
901 — AGGREGATES**

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TABLE 901 A

AGGREGATE GRADING REQUIREMENTS TEST METHOD T 27

MATERIAL	SIEVE SIZE																
	2-1/2"	2"	1-1/2"	1"	3/4"	1/2"	3/8"	No. 4	No. 8	No. 10	No. 16	No. 30	No. 40	No. 50	No. 100	No. 200	
CRUSHER RUN AGGREGATE CR-6 (f)(e)	—	100	90-100	—	60-90	—	—	30-60	—	—	—	—	—	—	—	—	0-15
BANK RUN GRAVEL — SUBBASE	100	—	—	90-100	—	60-100	—	—	—	35-90	—	—	20-55	—	—	—	5-25
GRADED AGGREGATE — BASE DESIGN RANGE (a)	—	100	95-100	—	70-92	—	50-70	35-55	—	—	—	12-25	—	—	—	—	0-8
TOLERANCE (b)	—	-2	±5	—	±8	—	±8	±8	—	—	—	±5	—	—	—	—	±3(c)
BANK RUN GRAVEL — BASE	100	—	—	85-100	—	60-100	—	—	—	35-75	—	—	20-50	—	—	—	3-20
COARSE AGGREGATE — PORTLAND CEMENT CONCRETE	—	—	100	95-100	—	25-60	—	0-10	0-5	—	—	—	—	—	—	—	—
PORTLAND CEMENT CONCRETE	—	—	—	100	90-100	—	20-55	0-10	0-5	—	—	—	—	—	—	—	—
CONCRETE	—	—	—	—	100	90-100	40-70	0-15	0-5	—	—	—	—	—	—	—	—
FINE AGGREGATE — PORTLAND CEMENT CONCRETE, UNDERDRAIN, and PNEUMATIC MORTAR (d)	—	—	—	—	—	—	100	95-100	—	—	45-85	—	—	5-30	0-10	—	—
COARSE AGGREGATE — LIGHTWEIGHT PORTLAND CEMENT CONCRETE	—	—	—	100	90-100	—	10-50	0-15	—	—	—	—	—	—	—	—	—
FINE AGGREGATE — LIGHTWEIGHT PORTLAND CEMENT CONCRETE (d)	—	—	—	—	—	—	100	85-100	—	—	40-80	—	—	10-35	5-25	—	—
FINE AGGREGATE/SAND MORTAR and EPOXIES (d)	—	—	—	—	—	—	—	100	95-100	—	—	—	—	—	—	0-25	0-10
MINERAL FILLER	—	—	—	—	—	—	—	—	—	—	—	100	—	95-100	—	—	70-100
CRUSHED GLASS (e)	—	—	—	—	100	—	—	0-55	—	—	45-85	—	—	—	0-10	—	—

- (a) To establish target values for design.
- (b) Production tolerance.
- (c) ±2 for field grading (omitting T 11)
- (d) Fine aggregate includes natural or manufactured sand.
- (e) Crushed glass shall not contain more than one percent contaminants by weight.
- (f) Not to be used in the structural part of any Administration project.
- (g) Recycled asphalt pavement may be used as a component not to exceed 15 percent and is not subject to aggregate physical property requirements in TABLE 901 B.
- (h) When this material is used for drainage applications, recycled concrete shall not be used.



TABLE 901 D

608 **DELETE:** Note (b) in its entirety.

INSERT: The following.

(b) PV shall be 5.5 when any aggregate being blended has a PV less than 5. Aggregate from no more than two sources may be blended. Proportions of blended aggregate shall be determined as specified in MSMT 416. Not applicable for Gap Graded surface mixes or any other surface mix requiring high polish aggregate.

DELETE: Note (e) in its entirety.

INSERT: The following.

(e) PV shall be 9.0 when any aggregate being blended has a PV less than 8. When carbonate rock is used, it shall have a minimum of 25 percent insoluble residue retained on the No. 200 sieve.



**CATEGORY 900
MATERIALS**

**SECTION 902 — PORTLAND CEMENT
CONCRETE AND RELATED PRODUCTS**

612 **DELETE:** 902.03 PORTLAND CEMENT in its entirety.

INSERT: The following.

902.03 PORTLAND CEMENT. Portland cement shall conform to M 85, with the fineness and the time of setting determined in conformance with T 153 and T 131, respectively.

902.10.03 Portland Cement Concrete Mixtures.

616 **DELETE:** Table 902 A in its entirety.

INSERT: The following.

TABLE 902 A

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

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

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



621 **DELETE:** 902.10.08 TESTING in its entirety.

INSERT: The following.

902.10.08 Testing. Sampling shall conform to T 141. Testing shall be performed as follows:

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

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



**CATEGORY 900
MATERIALS**

SECTION 908 – REINFORCEMENT STEEL

645 **DELETE:** 908.01 DEFORMED REINFORCEMENT in its entirety.

INSERT: The following.

908.01 DEFORMED REINFORCEMENT. Unless otherwise specified, reinforcement bars and reinforcement bars used as anchoring devices shall be deformed bars conforming to A 615 or A 706, Grade 60. Deformed bars shall be epoxy coated when specified in the Contract Documents. Epoxy powder shall conform to 917.02.

646 **DELETE:** 908.02 PLAIN REINFORCEMENT in its entirety.

INSERT: The following.

908.02 PLAIN REINFORCEMENT. Unless otherwise specified, dowel bars and dowel bars used as ties in PCC pavement expansion and contraction joints shall be plain round steel bars conforming to A 615, Grade 60 or A 36. Bars shall be epoxy coated. Epoxy powder shall conform to 917.02. All dowel bars used for traverse joints shall have a maximum pullout strength in conformance with M 254.

DELETE: 908.08 WIRE FABRIC FOR PNEUMATICALLY APPLIED MORTAR. in its entirety.

INSERT: The following.

908.08 WIRE FABRIC FOR PNEUMATICALLY APPLIED MORTAR. Wire fabric for pneumatically applied mortar and concrete encasement shall conform to A 185. It shall be fabricated either from size W1.4 wire on 3 in. centers in each direction or from W0.9 wire on 2 in. centers in each direction. It shall be galvanized as specified in 906.01.01.



**CATEGORY 900
MATERIALS**

SECTION 950 - TRAFFIC MATERIALS

950.03 REFLECTORIZATION OF SIGNS AND CHANNELIZING DEVICES.

DELETE: 950.03 REFLECTORIZATION OF SIGNS AND CHANNELIZING DEVICES. in its entirety.

INSERT: The following.

950.03 REFLECTORIZATION OF SIGNS AND CHANNELIZING DEVICES. Unless otherwise specified in the Contract Documents, retroreflective sheeting for permanent signs shall conform to 950.03.01 and 950.03.03. Retroreflective sheeting for temporary signs and channelizing devices shall conform to 950.03.02 or 950.03.03, and 950.03.04.

950.03.01 Permanent Signs Retroreflective Sheeting. Retroreflective sheeting for permanent signs shall conform to ASTM D 4956-05, except as modified below:

MINIMUM REFLECTIVE INTENSITY VALUES FOR RETROREFLECTIVE SHEETING Minimum Coefficient of Retroreflection (R_A) $cd/(lx \cdot m^2)$ Per ASTM E-810 (Average of 0 and 90 degree orientation)									
Observation Angle $^\circ$	Entrance Angle $^\circ$	White	Yellow	Fluor. Yellow	Fluor. Yellow-Green	Red	Green	Blue	Fluor. Orange
0.2	-4	570	425	340	455	114	57	26	170
0.2	30	215	160	130	170	43	21	10	64
0.5	-4	400	300	240	320	80	40	18	120
0.5	30	150	112	90	120	30	15	6.8	45
1	-4	120	90	72	96	24	12	5.4	36
1	30	45	34	27	36	9	4.5	2	14

950.03.02 Temporary Traffic Signs (TTS).

- (a) All rigid temporary traffic signs shall be fluorescent orange and conform to ASTM D 4956-05, Type VII or 950.03.01.
- (b) All temporary flexible rollup signs shall be fluorescent orange and conform to ASTM D 4956-05, Type VI.

950.03.03 Black Sheeting. Black sheeting shall be nonreflective.

950.03.04 Drums for Maintenance of Traffic. All drums for maintenance of traffic shall have retroreflective white and fluorescent orange reboundable sheeting and conform to ASTM D 4956-05 Type VII.



**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 Md MUTCD 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:



SPECIAL PROVISIONS INSERT

951.04 — REMOVABLE PAVEMENT MARKING TAPE

- (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.



SPECIAL PROVISIONS INSERT

951.04 — REMOVABLE PAVEMENT MARKING TAPE

- (3) Residue Remaining at Time of Removal (day and night) - minimum rating of 2.
- (4) Durability, Adhesion, Appearance, and Night Visibility - minimum weighted rating of 4. The manufacturer shall demonstrate that the properly applied blackout tape adheres to the roadway and existing stable roadway markings under climatic and traffic conditions normally encountered in the construction work zone.
- (5) Loss or Movement - minimum rating of 2.

Upon satisfactory completion of the field testing, the marking materials will be placed on OMT's Qualified Products List. The material shall conform to all criteria for a minimum period of 180 days to be considered satisfactory.

951.04.03 Packaging. Preformed pavement markings shipping package shall conform to the manufacturer's shipping requirements to prevent damage during delivery and unloading of all shipments. The shipping package shall be marked with the following information placed on each container:

- (a) Description of item.
- (b) Date of manufacture.
- (c) Successful Bidder's Name.
- (d) Purchase Order Number.
- (e) Lot Number.
- (f) Color.
- (g) Installation instructions.



SPECIAL PROVISIONS INSERT

951.05 — PLOWABLE RAISED PAVEMENT MARKERS & RECESSED PAVEMENT MARKERS

1 of 3

**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 1.7 in.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.



SPECIAL PROVISIONS INSERT

951.05 — PLOWABLE RAISED PAVEMENT MARKERS & RECESSED PAVEMENT MARKERS

2 of 3

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.

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.



SPECIAL PROVISIONS INSERT

951.05 — PLOWABLE RAISED PAVEMENT MARKERS & RECESSED PAVEMENT MARKERS

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The manufacturer shall certify that any recessed pavement marker materials supplied during the Contract conforms to the identical composition of the samples submitted for evaluation on any NTPEP Test Deck, and identify the recessed pavement marker materials by referring to the code used on the deck. Recessed pavement marker materials which fail to conform will be rejected.

The manufacturer shall also provide the following:

- (a) Material Safety Data Sheets for all materials submitted for testing and use.
- (b) A facility, in operation, capable of producing the materials in the quantity and quality required by the Administration.
- (c) A laboratory capable of performing the required tests. This laboratory will be subject to the Administration's approval.



SPECIAL PROVISIONS INSERT

951.07 — PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT (PPRP) MARKING MATERIAL

1 of 2

**CATEGORY 900
MATERIALS**

SECTION 951 – PAVEMENT MARKING MATERIALS

951.07 PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT (PPRP) MARKING MATERIAL. The material shall be capable of adhering to hot mix asphalt and portland cement concrete surfaces, and to any existing pavement markings in accordance with manufacturer's recommendations by a pre-coated pressure sensitive adhesive. A primer shall be used to precondition the surface if recommended by the manufacturer. The markings shall be capable of being inlaid in new hot mix asphalt surfaces during the paving operation.

The material shall be highly durable and retroreflective and shall be fabricated of a polymeric material designed for longitudinal and legend/symbol markings subjected to high traffic volumes and severe wear conditions, such as shear action from crossover or encroachment on typical longitudinal configurations, and where high levels of reflectivity are required to ensure the safety of the motoring public.

The material shall be of good appearance and free from cracks. Edges shall be true, straight and unbroken. Line marking material shall be in rolls having no more than three splices per 150 ft of length. All marking materials shall be packaged in conformance with accepted commercial standards and shall have a minimum shelf life of one year.

The material shall remain in place on the pavement surface without being displaced by traffic, and shall not be affected by weather conditions.

951.07.01 Permanent Preformed Patterned Reflective Pavement Marking Material Components.

Composition. The material shall consist of a mixture of polymeric materials, pigments and reflective spheres distributed throughout the base cross-sectional area and reflective spheres bonded to the topcoat surface to provide immediate and continuing retroreflection.

Restrictions. The combined total of lead, cadmium, mercury and hexavalent chromium shall not exceed 100 ppm. Diarylide based pigments and non-leachable lead pigmentation are not acceptable. The presence of these compounds shall be tested for compliance to the specification by X-ray diffraction, ICP, or another comparable method, capable of this level of detection.

951.07.02 Permanent Preformed Patterned Reflective Pavement Marking Material Physical Requirements.

- (a) **Reflectance.** The manufacturer shall certify that the white and yellow materials shall have the minimum initial retroreflectance values of 350 mcd/L/m² for white and 250 mcd/L/m² for yellow markings in any 528 ft section. Reflectance shall be measured using a reflectometer with CEN 30-meter geometry (88.76 degree entrance angle and 1.05 degree observation angle).



SPECIAL PROVISIONS INSERT

951.07 — PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT (PPRP) MARKING MATERIAL **2 of 2**

- (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.