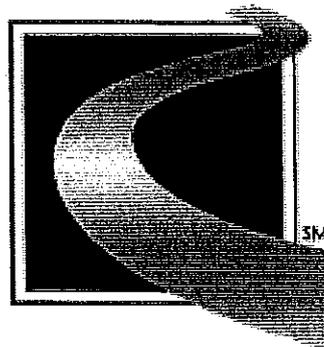


**MARYLAND TRANSPORTATION AUTHORITY**  
*Baltimore, Maryland*

*Invitation for Bids*

**BALTIMORE HARBOR TUNNEL  
FORT MCHENRY TUNNEL**



**Maryland  
Transportation  
Authority**

Contract No. MA 2264-000-002

**RADIATING COAXIAL CABLE  
INSTALLATION**

**Baltimore City**

**January 2010**



**TABLE OF CONTENTS**

	<u>Page No.</u>
Important Information Regarding MBE Utilization and Bidding Requirements .....	1-3
Dual Certification Procurement Information .....	4
Notice to Bidders/Offerors.....	5-6
Apprenticeship Training Fund .....	7-11
National Cooperative Highway Research Program (NCHRP) Report 350 Implementation Schedule for Devices Used in the Maintenance of Traffic.....	12-13
Occupying Wetlands.....	14
High Visibility Safety Apparel Policy .....	15-16
Invitation for Bids.....	17
Special Provisions .....	18-25
Revisions to General Provision.....	26-33
Revisions to Terms and Conditions .....	34-46
Revisions to Technical Requirements:	
Category 100:	
Section 104 Maintenance of Traffic.....	47-50
Category 800:	
Section 820 General Electrical Work and Testing.....	51-59
Section 831 Miss Utility .....	60
Section 890 General Information and Contract Provisions .....	61-63



		<u>Page No.</u>
Section 891	Radiating Coaxial Cable .....	64-70
Section 892	System Testing and Evaluation.....	71-72
Section 893	Construction Sequencing .....	73
Wage Rates .....		74-80
Contractor Affirmative Action Program.....		81-97
Affirmative Action Requirements Utilization of Minority Business Enterprises for Straight State Contracts.....		98-104
Proposal Form.....		105
Schedule of Prices.....		106-107
Contract Time and Bonding.....		108
Buy American Steel Act .....		109-111
MDOT MBE FORMS – State-Funded Contracts (Bids Only) Certified MBE Utilization and Fair Solicitation Affidavit .....		112-122
Bid/Proposal Affidavit.....		123-133
Escrow Account For Retained Funds .....		134
Proposal Guaranty.....		135
Bid Guarantee .....		136-137
Bid Bond .....		138-140

# IMPORTANT INFORMATION REGARDING MBE UTILIZATION AND BIDDING REQUIREMENTS

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

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

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

## ATTACHMENT A

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

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

## ATTACHMENT B Part 2

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

- Prime Contractor's name, address and phone number.
- Project description.
- Project number/Solicitation Number.
- List the minority firm name(Column 1), certification number and MBE Classification (Column 2), Total sub contract dollar amount (Column 3) and NAICS Codes of the services to be performed or products to be supplied (Column 4)
- Clarify for each sub-contractor if it will provide services, is a supplier or will supply and install (Column 5)
- It is the Contractor's responsibility to ensure that the proposed subcontractors are certified to perform the proposed work. All Contractors are to submit an approvable MBE plan at time of bid. Approvable means, the subcontractors are certified in the applicable NAICS Codes through MDOT and can perform the proposed services for the required participation goal. Contractors pending MBE certification at time of bid are **not** eligible for participation. If you submit a firm that is not certified to perform the proposed services and your contract falls short of the established MBE goal, your firm will be considered **non-responsive or not reasonably susceptible of being selected for award.**
- Prime Contractors are strongly encouraged to check the MDOT database at [www.mbe.mdot.state.md.us](http://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.

## Dual Certification Procurement Information

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

### **WARNING – PLEASE READ:**

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

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

Example:

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

## NOTICE TO BIDDERS

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

- When submitting your completed bid, do not separate the book. Submit the whole book including all addenda acknowledgment pages.
- Make sure that all addenda letters are attached outside of the front cover of the bid book.
- If the addendum has revised the Schedule of Prices, make sure that you have included the revised pages in your bid. Your price should reflect any and all changes.
- Prices must be written numerically and in words, unless approved substitute forms are used (Refer to GP-2.06). Don't leave any items blank.
- When tabulating your final price, make sure all your calculations are correct.
- Minority Business Enterprise Attachments A and B must be completed and submitted with your bid. If either of these attachments is missing your bid is non-responsive. Attachments C and D **should not** be submitted at time of bid.  
**For additional information on how to complete the MBE Attachments, please see the insert named "Important Information regarding MBE Utilization and Bidding Requirements" located in the IFB.**
- The Bid/Proposal Affidavit must be completely filled out and signed by all the parties as indicated.
- If Escrow is being offered in a contract, the contractor must indicate whether or not they wish to utilize an Escrow Account for Retained Funds on the provided form.
- A bid bond must accompany all bids of One Hundred Thousand Dollars (\$100,000.00) or more. The bid bond document must be completely filled out and have an original Power of Attorney form attached.
- If the document is too large for the envelope that we have provided, you can place the document in another form of packaging that can be sealed and submitted. If the document is too large for the bid box, you should alert the receptionist.
- Make sure that your company's name, address, the contract number and the bid date appears on the front of the packaging.
- When submitting bid packages via US Mail, Federal Express, DHL, UPS or any other delivery service it is your responsibility to make sure that the bid reaches the bid box before the time deadline. It may be in your best interest to send the package 24 hours in advance of the deadline. Also, when sending packages this way, make sure that the labeling specifies that it is a bid submission.

## **Notice to Bidders/Offerors**

### **eMaryland Marketplace Fee**

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

For registration requirements, visit:  
[www.eMarylandMarketplace.com](http://www.eMarylandMarketplace.com).



**CONTRACT PROVISIONS**  
**APPRENTICESHIP TRAINING FUND**

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

**Definitions.** The following terms have the meanings indicated.

**(a) Terms Defined.**

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



**CONTRACT PROVISIONS**  
APPRENTICESHIP TRAINING FUND

CONTRACT NO. MA 2264-000-002  
2 of 5

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

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

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

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

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

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

**Contributions to the Fund.**

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



**CONTRACT PROVISIONS**  
APPRENTICESHIP TRAINING FUND

CONTRACT NO. MA 2264-000-002  
3 of 5

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

**Contractor/Subcontractor Obligations Relating to Approved Apprenticeship Program.**

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

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



**CONTRACT PROVISIONS**  
APPRENTICESHIP TRAINING FUND

CONTRACT NO. MA 2264-000-002  
4 of 5

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

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

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

**Enforcement Procedures.**

- (a) The Commissioner may investigate whether Subtitle 6 of Title 17 of the State Finance and Procurement Article, Annotated Code of Maryland, has been violated:
  - (1) On the Commissioner's own initiative;
  - (2) On receipt of a written complaint; or
  - (3) On referral from another State agency.
- (b) The Commissioner may require a contractor, subcontractor, or an approved apprenticeship program to produce records as part of its investigation.
- (c) The Commissioner may enter a place of business to:
  - (1) Interview individuals; or
  - (2) Review and copy records.
- (d) If after an investigation, the Commissioner determines that there is a violation of Subtitle 6, Title 17 or a regulation adopted to carry out the title, the Commissioner shall issue a citation that shall:
  - (1) Describe in detail the nature of the alleged violation;
  - (2) Cite the provision of law or regulation that is alleged to have been violated; and



**CONTRACT PROVISIONS**  
APPRENTICESHIP TRAINING FUND

CONTRACT NO. MA 2264-000-002  
5 of 5

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



**NOTICE TO ALL HOLDERS OF THIS CONTRACT DOCUMENT**

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

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

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

**Category 1 Devices**

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

**Category 2 Devices**

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

**Category 3 Devices**

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

**Category 4 Devices**

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

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

CONTRACT NO. MA2264-000-002  
2 of 2

<b>WORK ZONE DEVICES</b>	<b>IMPLEMENTATION SCHEDULE TO CONFORM TO NCHRP REPORT 350 CRITERIA</b>
<p><b>CATEGORY 1</b> 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><b>CATEGORY 2</b> 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><b>CATEGORY 3</b> (a) Truck Mounted Attenuators (TMAs); Trailer Truck Mounted Attenuators (TTMAs) (b) Temporary Barriers     (1) Concrete Barrier     (2) Traffic Barrier W Beam and Water Filled Barrier     (3) Steel/Aluminum Barrier (c) Temporary End Treatments</p>	<p>All devices shall conform to NCHRP Report 350 criteria.</p>
<p><b>CATEGORY 4</b> 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>



**CONTRACT PROVISIONS**  
**OCCUPYING WETLANDS**

CONTRACT NO. MA-2264-000-002

1 of 1

**OCCUPYING WETLANDS**

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

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

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



Maryland  
Transportation  
Authority

**CONTRACT PROVISIONS**  
**HIGH VISIBILITY SAFETY APPAREL POLICY**

CONTRACT NO. MA-2264-000-002

1 of 2

**NOTICE TO ALL HOLDERS OF THIS CONTRACT DOCUMENT**

**HIGH VISIBILITY SAFETY APPAREL POLICY**

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

**STATEMENT OF POLICY.**

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

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

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



Maryland  
Transportation  
Authority

**CONTRACT PROVISIONS**  
**HIGH VISIBILITY SAFETY APPAREL POLICY**

CONTRACT NO. MA-2264-000-002

2 of 2

- (d) Retro-reflective material color for non-Authority employee apparel shall either be orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors, and be visible at a minimum distance of 1,000 feet. The retro-reflective safety apparel shall be designed to clearly recognize and differentiate the wearer from the surrounding work environment.

**REFERENCES.**

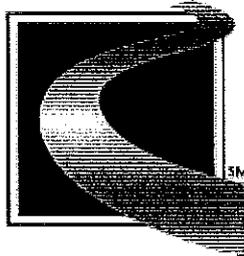
- (a) ANSI/ISEA 107/2004 standard – American National Safety Institute/International Safety Equipment Association
- (b) MUTCD 2003 – Manual for Uniform Traffic Control Devices - Sections 6D.03B and 6E.02
- (c) Visibility Research – The VCTR 1989 report concludes that fluorescent colors, when compared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

**DEFINITIONS.**

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

***MARYLAND TRANSPORTATION AUTHORITY***  
***Baltimore, Maryland***  
***Invitation for Bids***

**BALTIMORE HARBOR TUNNEL**  
**FORT MCHENRY TUNNEL**



**Maryland**  
**Transportation**  
**Authority**

**CONTRACT NO. MA-2264-000-002**

**RADIATING COAXIAL CABLE INSTALLATION**

**BALTIMORE CITY**

**JANUARY 2010**

**NOTICE TO BIDDERS**

A "Pre-Bidding Session" for the purpose of answering or obtaining answers to questions of parties interested in constructing the work relative to Right-of-Way, Utilities, Design, and Construction Details will be conducted at 10:00am on February 9, 2010, in the Conference Room, 1<sup>st</sup> Floor of Francis Scott Key Bridge Engineering Building at 300 Authority Drive in Dundalk, Maryland. While attendance at the Pre-Bid conference is not mandatory, this is the offeror's opportunity to raise questions and/or issues of concern regarding the project.



Maryland  
Transportation  
Authority

SPECIAL PROVISIONS

Contract No. MA-2264-000-002

Page 1 of 8

**SP 1-1 PROJECT DESCRIPTION**

CONTRACT NO.: MA-2264-000-002

TITLE: Radiating Coaxial Cable Installation

FACILITY: Baltimore Harbor Tunnel and Fort McHenry Tunnel

COUNTY: Baltimore City

ADVERTISED: January 26, 2010

PRE-BID MEETING: **10:00am on February 9, 2010** in the Conference Room at the Maryland Transportation Authority, 300 Authority Drive, 1<sup>st</sup> Floor, Engineering/Finance Building, Baltimore, MD 21222

PROJECT CONTACT: Project Manager: Mr. Kataw Say at (410) 537-7853  
Contract Administration: Ms. Maggie Johnson at (410) 537-7807

BIDS DUE: **12 Noon, March 26, 2010**, in the Bid Box on the 1<sup>st</sup> floor of the Maryland Transportation Authority, Engineering Building, 300 Authority Drive, Baltimore, Maryland 21222.

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

CONTRACT TIME: One (1) Year

LIQUIDATED DAMAGES: Eight Hundred Dollars (\$800.00) per Calendar Day

MBE GOALS: Overall 30%

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



Maryland  
Transportation  
Authority

## SPECIAL PROVISIONS

Contract No. MA-2264-000-002

Page 2 of 8

The work to be performed under this contract is located at Baltimore Harbor Tunnel (BHT) and Fort McHenry Tunnel (FMT).

This project is to remove the existing FM rebroadcast system "Twin Lead", and install a new Radiating Coaxial System (RCS) for FM rebroadcast in the Baltimore Harbor Tunnel (BHT) and Fort McHenry Tunnel (FMT) bores.

Overall Project construction would be expected to take **One (1) Year** from the Notice to Proceed.

### **SP 1-2 SPECIFICATIONS**

All work on this project shall conform to the Maryland Department of Transportation, State Highway Administration's Specifications entitled, "Standard Specifications for Construction and Materials" dated July 2008, revisions thereof, or additions thereto, and the Special Provisions included in this Invitation for Bids.

### **SP 1-3 ORIGINAL FACILITY PLANS AND SITE VISITS**

The original facility plans are on file at the Engineering/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. Kataw Say, at (410) 537-7853. Parties interested in visiting the site should contact Mr. Jeff Robson at (410) 537-1274.

### **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 Authority.

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

If the Subcontractor does not receive payment within the required ten (10) days, the Subcontractor shall notify the Project Engineer in writing of the amount in dispute including the item numbers and payment quantity for each. The Project Engineer will then notify the Chief of Construction of the dispute. The Chief of Construction or his representative will verbally contact the prime



Maryland  
Transportation  
Authority

**SPECIAL PROVISIONS**

Contract No. MA-2264-000-002

Page 3 of 8

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

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

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

**SP 1-5 WORK HOURS**

Refer to Section 104, "Maintenance of Traffic" for times permitted for lane closures and construction for the Baltimore Harbor Tunnel, Fort McHenry Tunnel.

The Contractor shall cooperate with any other Contractors that are on site during the term of the project, as stated in GP-5.06 of the Standard Specifications.



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

a) Worker's Compensation and Employer's Liability

The Contractor shall, at all times, maintain and keep in force such insurance as will protect him from claims under the Worker's Compensation Act of the State of Maryland and maintain and keep Employer's Liability Insurance at a limit of One Hundred Thousand Dollars (\$100,000.00). The Contractor shall also maintain United States Long Shore and Harbors Act coverage, if such exposure exists.

b) Comprehensive General Liability Insurance

The Contractor shall maintain Comprehensive General Liability Insurance in the amount of at least One Million Dollars (\$1,000,000.00) Combined Single Limit for Bodily Injury Liability and Property Damage Liability Insurance per occurrence and in the aggregate. Such insurance shall specifically include the Comprehensive General Liability Broad Form Endorsement and indicate explosion, collapse, and underground damage coverage.



c) Comprehensive Automobile Liability Insurance

The Contractor shall maintain Comprehensive Automobile Liability Insurance (including all automotive equipment owned, operated, rented, or leased), in the amount of at least Five Hundred Thousand 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 for default or convenience.
6. There will be no special payment for the insurance as required by this contract and all costs incidental thereto shall be included in the Lump Sum for "Mobilization", (refer to Section 108), or if the Contract does not include such an item, the insurance costs are to be included in pay items for the Proposal.

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

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

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

The Contractor shall:

1. Identify specific work categories appropriate for subcontracting;
2. At least ten (10) days before bid opening, solicit Minority Business Enterprises, through written notice that:



- a) Describe the categories of work; and
  - b) Provide information regarding the type of work being solicited and specific instructions on how to submit a bid.
3. Attempt to make personal contact with Minority Business firms;
  4. Assist Minority Business Enterprises to fulfill bonding requirements or to obtain a waiver of these requirements; and
  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/offerer is unable to achieve the specified overall contract goal or subgoals for each certified MBE classification, the bidder/offerer must request, in writing, on Attachment A, (Certified MBE Utilization and Fair Solicitation Affidavit), a waiver 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 110 of the Standard Specifications.



Maryland  
Transportation  
Authority

SPECIAL PROVISIONS

Contract No. MA-2264-000-002

Page 7 of 8

### **SP 1-9 CORPORATE REGISTRATION**

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

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

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

### **SP 1-10 CONTRACTOR'S EMPLOYEE IDENTIFICATION**

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

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

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

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

While working in the Tunnels or on one of the major bridges of the Authority, Contractor's personnel shall have an ID decal displayed on their hardhat. These decals will be provided by the Authority. All of the Contractors' vehicles shall have a parking decal, attached to the rear view mirror. These parking decals will also be provided by the Authority and a distribution list will be maintained. At the time of project completion these decals shall be returned to the Authority.



Maryland  
Transportation  
Authority

**SPECIAL PROVISIONS**

Contract No. MA-2264-000-002

Page 8 of 8

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

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

**SP 1-12 ESTIMATED QUANTITIES**

All construction items and quantities in these Special Provisions are provided in the Contract for use when and as directed by the Engineer. The quantities for these items are established for the purpose of obtaining a bid price. The quantities for these items may be increased or decreased without any adjustment to the Contract Unit Price for the item(s) or they may be deleted entirely from the Contract by the Engineer without negotiation. The Contractor will not be allowed to submit a claim against the Authority for any adjustment to the Contract Unit Price should the item(s) be increased, decreased, or eliminated.



**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 Technology all references to the Maryland State Highway Administration’s offices and positions shall mean the Authority’s corresponding offices and positions.



Maryland  
Transportation  
Authority

SPECIAL PROVISIONS

Contract No. MA-2264-000-002

Page 1 of 1

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

**GP-1.05 DEFINITIONS**

Add the following definitions:

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



Maryland  
Transportation  
Authority

SPECIAL PROVISIONS

Contract No. MA-2264-000-002

Page 1 of 1

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

**GP-2.04 SITE INVESTIGATION**

Revise the paragraph to read as follows:

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



Maryland  
Transportation  
Authority

SPECIAL PROVISIONS

Contract No. MA-2264-000-002

Page 1 of 1

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

**GP-2.06 PREPARATION OF THE BID**

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

The Contractor may elect to submit its bid on forms it has generated in the development of its 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 Administration 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; and
- (7) Total Bid Amount.

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

Should the Contractor elect to submit bids on the Contractor's own forms, the Contractor shall submit a sample of the form to the Administration at least two (2) weeks prior to the scheduled opening of bids. The use of Contractor generated forms shall be approved, in writing, prior to their use. If the Contractor's forms were previously approved in writing on another Administration project and have not changed, they need not be resubmitted for this project.

Sample forms shall be submitted to:

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



Maryland  
Transportation  
Authority

SPECIAL PROVISIONS

Contract No. MA-2264-000-002

Page 1 of 1

**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 seven (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.



**GENERAL PROVISIONS  
GP SECTION 4  
SCOPE OF WORK**

**GP-4.10 WARRANTY OF CONSTRUCTION**

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

**Delete:** The first paragraph in its entirety.

**Insert:** The following:

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



**GENERAL PROVISIONS  
GP SECTION 5  
CONTROL OF WORK**

**GP-5.12 FAILURE TO MAINTAIN ENTIRE PROJECT**

**Delete** Section GP-5.12 in its entirety

**Insert:** Revise the paragraph to read as follows:

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



**GENERAL PROVISIONS  
GP SECTION 9  
PAYMENT**

**GP-9.05 LATE PAYMENTS**

**ADD the following:**

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



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

**TC 4.01 – SHOP PLANS AND WORKING DRAWINGS**

**DELETE SECTION (a) IN ITS ENTIRETY AND REPLACE WITH THE FOLLOWING**

**ADD:**

- (a) General. The Plans will be supplemented by working drawings, catalog cuts, schematics, material data, installation plans and manuals, user manuals, and other data necessary to demonstrate to the Engineer adequate control of the work, proper installation and handling, conformance to the specifications, and that the proposed materials and equipment is suitable for the intended use. All authorized alterations affecting the requirements and information given on the working drawings shall be in writing to the Engineer. Any deviations from the Specifications, Special Provisions, or Plans shall be clearly highlighted and explained. When reference is made to the working drawings, the interpretation shall be the working drawings as affected by all authorized alterations then in effect. When reference is made to the working drawings, the interpretation shall be that working drawings include working drawings, catalog cuts, schematics, material data, installation plans and manuals, user manuals, and other data necessary to demonstrate to the Engineer adequate control of the work, proper installation and handling, conformance to the specifications, and that the proposed material or equipment is suitable for the intended use.

Working drawings will show details of all structures, lines, grades, typical cross section of roadway, general cross sections, location and designation of all units and elements. Cabinet drawings shall be to-scale showing the location of all equipment proposed to be mounted within the cabinet. One-line diagrams and schematics shall be provided for equipment cabinets showing the interconnection of all devices located therein. Equipment layouts shall include rack-level elevation views as well as floor plans for all equipment racks. All working drawings, regardless if submitted as specified or submitted as equal substitutes, shall be furnished with complete, specific, detailed information from the manufacturer or supplier for the material or equipment the Contractor proposes to furnish, in which the requirements of the Specifications and Special Provisions shall be clearly shown to be met.

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 the material or equipment specified, all working drawings shall conform to the following requirements, conditions, and procedures:

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.
3. If the substitute material or equipment requires any re-design or affects other aspects of the project, the Contractor shall be responsible to provide such re-design including details and to adjust elements as necessary to achieve the re-design at no additional cost to the Administration. Cost saving re-designs will be considered under the value engineering specifications.

If incomplete or irrelevant data is submitted as evidence of compliance with Specifications, Special Provisions, or Plans, the data will be returned and the request for approval of working drawings will be denied.

The Contractor shall provide, at no additional cost to the Administration, all required working drawings and shall have them adequately checked, after which they shall be submitted to the Engineer for review. The Engineer may reject working drawings and return them for revisions, in which case the Contractor shall submit revised working drawings as required. No items involving working drawings shall be incorporated into the work until working drawings have been accepted by the Engineer, however, acceptance shall not relieve the Contractor of any responsibility in connection with the working drawings.

The working drawings shall be prepared on sheets no smaller than 8.5” x 11” and no larger than 22” x 36”. The sheet size and scale of the drawings shall be appropriate for the work depicted.



All working drawings shall be submitted by the Contractor, no working drawings submitted directly by subcontractors, fabricators, suppliers, etc. shall be accepted. Acceptance of a material source or equipment source by the Engineer or Administration shall NOT constitute approval of the material or equipment nor approval of the materials or equipment as a substitute or an "equal" product.

**ADD:**

(b) The working drawings shall be submitted electronically as files (FAXES are NOT acceptable). Electronic submission may be made via email for small submissions. Email is the preferred submission method. The email submissions shall be made to the email addresses provided by the Administration upon notice to proceed of the project and shall include [ksay@mdta.state.md.us](mailto:ksay@mdta.state.md.us). Where electronic submittals are larger than email can support (currently about 8MB), the submission may be made using one or more of the following alternatives:

1. Posted on a contractor supported FTP server, or other via another service that may be accessed by the administration as long as an email notice is made with the 'cover' sheet.
2. Copied onto a CD, DVD, or other supported data media and submitted to the Administration via standard mail. At least five (5) copies of the media shall be provided for in-house distribution. The address to mail such media transfers is:

Maryland Transportation Authority  
Engineering Division  
300 Authority Drive  
Baltimore, MD 21222  
ATTN: Kataw Say

**ADD:**

(c) Electronic Submittal Format. All electronic submittals shall be in a format readable by the Administration. The submittals shall be in Adobe portable document format (PDF) compatible with version 6.0 of Adobe Acrobat.

Each submittal shall be a single file. Multi-file submittals shall not be accepted.

The first page of each submittal shall be a cover page. The cover page must be in the 8.5 x 11" sheet format. The cover page must include:



Maryland  
Transportation  
Authority

**SPECIAL PROVISIONS**

Contract No. MA-2264-000-002

Page 4 of 5

1. Contract number.
2. Contract title.
3. Submittal Number. For each project (Contract), a sequential number starting with number 1 shall be used. Where a submittal is rejected, or otherwise requires resubmittal or replacement, the Submittal number shall be appended with an "R" followed by the revision number.
4. The Contractor's name, mailing address, contact phone number, contact email address.
5. The relevant line items in the contract that the submittal is associated with.
6. A brief description of the materials or data represented in the submittal package.
7. The date of the submittal.
8. The manufacturer's name, web site address, mailing address, and contact phone number, if applicable.
9. The vendor's or reseller's name, web site address, mailing address, and contact phone number if applicable.
10. The cover page must contain a 6" x 3" blank space where engineering stamps may be placed (electronically) without covering data in the page.

The electronic file must not be secured. The review process for electronic submittals will place electronic stamps and may include electronic comments in the electronic submittals by the Contractor. Any security or compatibility problems that prevent the use of the electronic stamps or electronic commenting will render the submittal unacceptable. The returned file may be secured to prevent accidental changes.

**ADD:**

- (d) File Naming Conventions and rules. It is necessary and required that file naming conventions and rules be followed to lend to organization and reduce confusion regarding the electronic submissions. Submittals that do not follow the file naming conventions described herein will be rejected without review. Strict adherence to the file naming rules is required. The file names for electronic submissions shall follow these rules:



Maryland  
Transportation  
Authority

**SPECIAL PROVISIONS**

Contract No. MA-2264-000-002

Page 5 of 5

1. The first six characters must be the first six characters of the contract number. For example, for contract MA2264-000-002, the first five characters of the file name must be MA435.
2. The seventh character must be a dash.
3. The eighth through ninth characters shall be the text "SUB," which is short for submittal. Which is used to indicate that the file is a submittal from a Contractor.
4. The eleventh character must be a dash.
5. The twelve through fourteenth characters must be the submittal number, e.g., 001.
6. In the event of a re-submittal, the 15<sup>th</sup> character will be an R followed by the re-submittal number.
7. The remaining filename characters may be any short descriptive characters that may be useful to identify the nature of the submittal (fewer than 40 additional characters).
8. Examples of filenames:
  - i. MA2264-SUB-001-Conduit.pdf
  - ii. MA42264-SUB-001R2-Conduit.pdf
  - iii. MA2264-SUB-015-Fiber Optic Cable.pdf
9. After the submittal has been reviewed, the text 'SUB' will be replaced by the text 'TRN' by the administration and the electronic file with electronic stamps and possibly containing electronic comments will be returned to the contractor via email, CD, DVD, or similar electronic file transfer.

**ADD:**

- (e) Upon completion of the project, all electronic files that have been transmitted to the Contractor (TRN's) shall be transferred to CD's, DVD's or other media by the Contractor and provided to the Administration along with as-built data. Data provided shall include any original files in original format, used to generate the PDF submittals, these may include CADD, Visio, Word, Excel, MathCad, Access/DataBase, HTML, JPG/Pictures, Power point, or any other format that may have been used as the originating document. Provide three (3) copies of all media.



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

**TC-4.02 FAILURE TO ADEQUATELY MAINTAIN PROJECT.**

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

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

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

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

The deduction will be equal to the daily prorated share of the lump sum price bid for Maintenance of Traffic or One Thousand Dollars (\$1,000.00) per day, whichever is more for each day or portion thereof that the deficiencies exist, and will continue until the deficiencies and proper assumption of the required maintenance provisions are satisfactorily corrected and accepted by the Engineer. The amount of monies deducted will be a permanent deduction and are not recoverable. Upon satisfactory correction of the deficiencies, payment of the Maintenance of Traffic lump sum item will resume.



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

**TC-5.01 INSURANCE.**

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

**INSERT:** The following.

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

The Contractor shall maintain in full force and effect third party legal liability insurance necessary to cover claims arising from the Contractor's operations under this agreement which cause damage to the person or property of third parties. The insurance shall be under a standard commercial general liability ("CGL") form endorsed as necessary to comply with the above requirements; or other liability insurance form deemed acceptable by the State. The State of Maryland shall be listed as an additional named insured on the policy. The limit of liability shall be no less than One Million Dollars (\$1,000,000.00) per occurrence/ Two Million Dollars (\$2,000,000.00) general aggregate. The insurance shall be kept in full force and effect until all work has been satisfactorily completed and accepted. The policies shall be endorsed to provide thirty (30) days notice of cancellation or non-renewal to:

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



**TERMS AND CONDITIONS**  
**TC SECTION 7**  
**PAYMENT**

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

**INSERT:** The following.

**TC-7.02 PAYMENT ALLOWANCES FOR STORED MATERIALS.**

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

- (a) For superstructure members delivered on the project site, an allowance of 100 percent of the material cost plus freight charges as invoiced may be made provided the cost does not exceed 90 percent of the Contract price of the applicable Contract item. The allowance will be based upon validated invoices or bills for material including freight charges, and a copy thereof shall be made a part of the documented records for the project.
- (b) For reinforcement steel, piling, pipe, traffic barrier, signs and sign assemblies, and other nonperishable material in storage on the project, but excluding aggregates, cement, seed, plants, fertilizer or other perishable items, an allowance of 100 percent of the invoiced cost of the material plus freight charges to the Contractor may be made provided the cost does not exceed 90 percent of the Contract price of the applicable Contract item. Such material shall be delivered and stock-piled at the project site, and have been tested by the Administration and found to have conformed to the Specifications or have been accepted under an approved certification program prior to the allowance.
- (c) No allowance will be made for fuels, form lumber, falsework, temporary structures or other materials of any kind which will not become an integral part of the finished construction.

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

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



- (d) Material for which an allowance is requested shall be stored in an approved manner in areas within the State of Maryland where damage is not likely to occur. If any of the stored materials are lost or become damaged in any manner, the Contractor shall be responsible for repairing or replacing the damaged materials. The value of the lost or damaged material will be deducted from the Contractor's subsequent estimates until replacement has been accomplished. The request for allowances for any materials stored on private property within the State of Maryland shall be accompanied by a release from the owner and/or tenant of such property agreeing to permit the removal of the materials from the property without cost to the State of Maryland.

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

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

When storage of the materials within the State of Maryland is not practical, approval shall be obtained from the District Engineer for storage elsewhere. Storage of materials outside the State of Maryland will be subject to the conditions set forth in this provision and limited to materials exceeding Twenty-Five Thousand Dollars (\$25,000.00), which are designed and fabricated exclusively for use on a specific project.

- (e) Material for which payment has been made, either wholly or partially, shall not be removed from the approved location until such time that it is to be incorporated into the work unless authorized by the Engineer.
- (f) The Contractor shall submit a written request for payment to the District Engineer at least two (2) weeks prior to the estimate cutoff date established by the District Engineer. The following items shall accompany the written request for payment:
- (1) Consent of surety specifying the material type and the item(s) in which the material is to be used.
  - (2) Validated invoices with the signature of an officer of the company supplying the material showing actual cost.



- (3) A notarized statement from the Contractor attesting that the invoices as submitted do not include charges or fees for placing, handling, erecting or any other charges or markups other than the actual material cost, sales tax(es), if applicable, and freight charges.
- (4) Bills of lading showing delivery of the material. The request for allowances for any materials stored on property outside the State of Maryland shall be accompanied by a release from the owner or tenant of such property agreeing to permit verification by the Inspector that the material is stored at the approved location, and to permit the removal of the materials from the property without cost to the State of Maryland.
- (5) Inspection test reports, certifications and/or a written statement from the Inspector attesting to the inspection and approval of the material.

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

- (6) A statement explaining why the material can not be stored on the project, if the Contractor is requesting to store material at a location other than the project site. The statement shall include the methods of storage, separation, and identification to be used by the Contractor. The Contractor shall provide a method of inventory control and withdrawal satisfactory to the Administration which shall be used by the Contractor to monitor materials not stored on the project.
- (7) A breakdown of the Contract line item bid unit price showing the relationship of the cost of the stored material to the costs of all other materials, labor, and components of the work included in the Contract line item unit price bid by the Contractor.

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

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

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



**TC-7.03 FORCE ACCOUNT WORK.**

**(e) Subcontracting.**

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

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

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

**INSERT:** The following.

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

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

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

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

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

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



Maryland  
Transportation  
Authority

**SPECIAL PROVISIONS**

Contract No. MA-2264-000-002

Page 2 of 2

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

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



Maryland  
Transportation  
Authority

CONTRACT NO. MA-2264-000-002

**TC-7.06 FINAL ACCEPTANCE AND PAYMENT**

Page 1 of 1

**TC SECTION 7  
PAYMENT**

**TC-7.06 FINAL ACCEPTANCE AND FINAL PAYMENT.**

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

**INSERT:** The following.

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



Maryland  
Transportation  
Authority

SPECIAL PROVISIONS  
104 – Maintenance of Traffic

CONTRACT NO. MA-2264-000-002

Page 1 of 4

**CATEGORY 100  
PRELIMINARY**

**SECTION 104 — MAINTENANCE OF TRAFFIC  
FORT MCHENRY TUNNEL AND BALTIMOR HARBOR TUNNEL**

**104.01 TRAFFIC CONTROL PLAN (TCP).**

**104.01.01 DESCRIPTION.**

149 **DELETE:** The fourth paragraph sentence “Refer to contract Documents for Work Restrictions.” in its entirety.

**INSERT:** The following.

**AGENCY CONTACTS**

<b>CONTACT</b>	<b>TITLE</b>	<b>PHONE NUMBER</b>
Dave Roehmer	Tunnel Administrator, MdTA	(410) 537-1310
Michael Darago	FMT Maintenance Supervisor, MdTA	(410) 537-1269
John Monk	BHT Maintenance Supervisor, MdTA	(410) 537-1315
Jeff Robson	Special Trades Supervisor, MdTA	(410) 537-1274
Roxane Y. Mukai	Traffic Manager, MdTA	(410) 537-7848
Bruce Quinn	BHT Maintenance, MDTA	410-537-1316
Kataw Say	Project Engineer, MdTA	(410) 537-7853

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



Maryland  
Transportation  
Authority

**SPECIAL PROVISIONS**

104 – Maintenance of Traffic

CONTRACT NO. MA-2264-000-002

Page 2 of 4

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

**ALLOWABLE LANE CLOSURE SCHEDULE  
BALTIMORE HARBOR TUNNEL  
(Two-Way Operation while Tunnel Bore is Closed)**

TIME OF DAY	DAYS OF THE WEEK	ALLOWED CLOSURES
8:00 PM – 5:00 AM	Monday – Thursday	North or Southbound

Maintenance of Traffic for Harbor Tunnel Bore Closures will be furnished by Baltimore Harbor Tunnel Maintenance staff.

**ALLOWABLE LANE CLOSURE SCHEDULES  
FORT MCHENRY TUNNEL  
(Tunnel Bore Closure)**

TIME OF DAY	DAYS OF THE WEEK	ALLOWED CLOSURES
8:00 PM – 5:00 AM	Monday – Thursday	North or Southbound

Maintenance of Traffic for Fort McHenry Tunnel Bore Closures will be furnished by the Fort McHenry Tunnel Maintenance staff. Only one bore/tube in each direction may be closed at any given time.

No bore, lane or shoulder closures are permitted 2 hours before, during or 2 hours after major traffic generating events in downtown Baltimore or during stadium events.

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

- New Years Day
- Martin Luther King Day
- Good Friday
- Easter Sunday



Maryland  
Transportation  
Authority

SPECIAL PROVISIONS  
104 – Maintenance of Traffic

CONTRACT NO. MA-2264-000-002

Page 3 of 4

Memorial Day  
Independence Day  
Labor Day  
Thanksgiving Day  
Christmas Day

If a holiday happens to fall on a Thursday, Friday or Monday, no closures will be permitted during that weekend. No lane closures are permitted during the week of Thanksgiving and Christmas Day holidays.

The MDTA reserves the right to cancel any scheduled closure for any reason. Typically, cancellations will be made for inclement weather and unusual traffic conditions. For the purposes of maintaining a CPM schedule and for the purposes of delay claims, the following applies:

- A workday shall be any day that the contractor is permitted to work as stated above, excluding the impact of MDTA cancellations.
- A cancellation is any event where the MDTA cancels or refuses to permit work on a workday that the contractor has requested access to work
- The contractor shall assume that 20% of the workdays, rounded up to the nearest full workday, are unavailable each month due to MDTA cancellations.
- No delay claims shall be permitted as long as the overall number of cancelled work days over the life of the project is 20% or less.

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

As directed by the Engineer, temporary lane and shoulder closures will not be permitted during periods of falling precipitation, in heavy fog or otherwise poor visibility, or in the event of emergencies such as serious traffic accidents or unusually severe traffic congestion. In the event that a temporary lane or shoulder must be reopened as directed by the Engineer or authorized Authority staff, the Contractor shall evacuate all equipment, materials and personnel from the lane within thirty (30) minutes.

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



Maryland  
Transportation  
Authority

**SPECIAL PROVISIONS**  
104 – Maintenance of Traffic

CONTRACT NO. MA-2264-000-002

Page 4 of 4

Failure to complete construction activities in time 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.

<b>ELAPSED TIME, MINUTES</b>	<b>DEDUCTION</b>
1 - 5	\$ <u>75.00</u>
Over 5	\$ <u>75.00</u> per Minute (In addition to the Original 5 minutes)



## **820 GENERAL ELECTRICAL WORK AND TESTING**

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

### **820.01 DESCRIPTION**

**ADD:** The following.

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

#### **820.01.01 Codes, Standards, Inspection, and Documentation**

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



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

#### **820.01.02 Quality Assurance and Quality Control**

The contractor shall inspect all materials furnished or installed under this contract and shall bring any damage, failure, or other problem to the attention of the project inspector prior to incorporation into the work. The contractor shall provide his own quality assurance and quality control for the work performed in the contract. The inspectors operating on behalf of the state are not a replacement for contractor's management and the contractor's own quality assurance and quality control.



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

### **820.03 CONSTRUCTION**

#### **820.03.01 GENERAL**

**ADD:** The following.

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

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

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

**ADD:** The following just prior to paragraph 820.04.

#### **820.03.04 Testing Fiber Optic Cables**

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

- (a) All cables shall have ST connectors installed prior to testing. All testing, for purposes of acceptance of the system, shall be conducted on fully installed and assembled fiber optic cables.
- (b) Upon completion of testing, replace or repair any failed cable(s) with a new fiber or cable, and test the new cable to demonstrate acceptability.



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

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

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



Maryland  
Transportation  
Authority

SPECIAL PROVISIONS

CONTRACT NO. MA2264-000-002

Page 820-5 of 9

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

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

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

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

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

(a) Lengths not exceeding 3' shall be used to connect transformers over 5KVA and motors.

(b) Lengths not exceeding 6' may be used for the final connection of light fixtures used in ceilings.

(c) Lengths not exceeding 6" may be used for the final connection devices that may be subject to minor vibration or minor movement perhaps from temperature expansion and contraction.

(d) Other lengths as clearly specified on the plans or as approved by the Engineer.

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

**820.03.13** Unless specifically shown otherwise on the plans, wiring derived from different system voltages shall be installed in separate conduits. Wiring of different voltages derived from the same system (i.e. Control wiring) may be permitted to be installed in the same conduit or junction box provided that all requirements of the NEC are maintained.



**820.03.14** No wiring other than the primary voltage indicated shall be installed in electrical panels and Safety/Disconnect Switches. Exception may be granted for wiring that terminates on a device within the panelboard or safety/disconnect switch that is integral to the operation of that device. Enclosures for switches or overcurrent devices shall not be used as junction boxes, auxiliary gutters, or raceways for conductors feeding through or tapping off to other switches or overcurrent devices.

**820.03.15** Branch Circuits: Any circuits supplying more than 50% non-linear loads shall have a dedicated neutral conductor

**820.03.16** Conduit or tubing 1" and larger shall be provided with a suitable insulating bushing.

**820.03.17** Panel Board Labeling. All circuits installed or modified by the contractor in any way shall be properly labeled in the associated panel board panel schedule. This work shall include verifying that the existing load on the affected circuit(s) is also correctly identified. The label shall identify the type of load(s) served (e.g.: receptacles, lighting, appliances, motors, pumps, etc..) and the location (e.g.: room 103, sump pit#1, etc...). Where changes are minor (e.g. Two circuits or less being changed), the existing panel schedule may be modified as approved by the Electrical Inspector. Larger changes shall require a new panel schedule typed, neat in appearance. The new schedule may copy the identifying labels of the old schedule provided that the contractor has not made any changes to those circuits. To clarify, replacing a panel board, moving circuits within a panel board, or similar changes shall be considered modifying the circuit and shall require testing to verify the connections of all such circuits and coordinating the panel schedule with the existing conditions.

**820.03.18** Fire Stopping. All penetrations into fire walls or core holes between floors and walls must be properly fire-stopped in accordance NEC requirements for fire stopping. Penetrations into the surface of any firewall or presumed firewall should be only slightly larger than the conduit, cable or cables that will need to pass through it. This will make fire stopping easier and allow the wall to maintain a better over all structural integrity.

**820.03.19** Construction Stakeout and Coordination

- (a) The Contractor shall coordinate this work with the work of other trades to avoid conflicts. Electrical cables and equipment damaged by the execution of work of other trades shall be completely removed and replaced with new.
- (b) The Contractor shall keep an up-to-date set of as-built red lined drawings on the job site. Submit as-built drawings upon completion of the work. The Contractor shall note the exact location of trenches at 100-foot intervals on the as-built drawings by station,



Maryland  
Transportation  
Authority

**SPECIAL PROVISIONS**

CONTRACT NO. MA2264-000-002

Page 820-7 of 9

and offset from the roadway. The Contractor shall show only the work that is part of the final project on as-built drawings.

**820.03.20** Boxes and Cabinets. Unless specified otherwise, junction boxes, pull boxes, disconnect switches, cabinets, and other boxes installed outdoors and above ground shall be NEMA4X rated; except cabinets and boxes requiring ventilation which shall be NEMA3X rated.

**820.03.21** Rodent stopping. All conduits that connect to exterior mounted cabinets shall be stuffed with copper mesh at the cabinet end point to deter rodent egress through the conduit. The copper mesh shall be installed after all wires and cables have been installed. The mesh shall be removable and the mesh and installation and removal technique shall not damage wires or cables.

**820.03.22** Conduit Fill. All conduit, new or existing, shall not exceed conduit fill requirements as specified in ANSI/NECA/BICSI-568-2006. Discrepancies shall be brought to the attention of the engineer prior to incorporation into the work.



Maryland  
Transportation  
Authority

SPECIAL PROVISIONS

CONTRACT NO. MA2264-000-002

Page 820-8 of 9

**ATTACHMENT 820-A**

**SAMPLE FIBER OPTIC CABLE TEST REPORT**

(To be filled out after installation is complete)

<b>Job Name:</b> <b>Job ID:</b>	<b>Fiber Cable:</b>
<b>Location (A):</b>	<b>Location (B):</b>

**ANSI/EIA/TIA 568A: Cable Loss Factor (CLF); 1km=3280.83 feet**

3.75 db/km (**0.00114 db/ft**) @ 850 nm for 62.5/125 μm MM

0.50 db/km (**0.00045 db/ft**) @ 1300 nm for 62.5/125 μm MM

0.50 db/km (**0.00015 db/ft**) @ 1310 nm and 1550 nm for OSP SM

1.0 db/km (**0.00030 db/ft**) @ 1310 nm and 1550 nm for ISP SM

0.5 Connector Loss (CL) = 0.75 db per pair of connectors

Splice Loss (SL) = 0.3 db each

**To calculate ACCEPTABLE LOSS (db): Multiply cable length x (CLF) + (CL) + (SL) = DB margin: \_\_\_\_**

Cable Length	Strand No.	A to B	B to A	Fiber ID
Feet	1			Blue
850 NM-MM	2			Orange
dB	3			Green
	4			Brown
	5			Slate
	6			White
	7			Red
	8			Black
	9			Yellow
	10			Violet
	11			Rose
	12			Aqua



Maryland  
Transportation  
Authority

SPECIAL PROVISIONS

CONTRACT NO. MA2264-000-002

Page 820-9 of 9

Cable Length	Strand No.	A to B	B to A	Fiber ID
Feet	1			Blue
1300 NM MM	2			Orange
dB	3			Green
	4			Brown
	5			Slate
	6			White
	7			Red
	8			Black
	9			Yellow
	10			Violet
	11			Rose
	12			Aqua

Cable Length	Strand No.	A to B	B to A	Fiber ID
Feet	1			Blue
1550 NM MM	2			Orange
dB	3			Green
	4			Brown
	5			Slate
	6			White
	7			Red
	8			Black
	9			Yellow
	10			Violet
	11			Rose
	12			Aqua

Technician: \_\_\_\_\_ Date: \_\_\_\_\_



**CATEGORY 800  
UTILITIES**

**SECTION 831 – MISS UTILITY**

**831.01 DESCRIPTION.**

This work shall consist of contacting Miss Utility as required by Law and providing evidence of Miss Utility Marking of the construction area.

This work shall include written notification to the Maryland Transportation Authority at least seventy-two (72) hours in advance of excavation for each site.

**831.03 CONSTRUCTION.**

The Contractor shall contact Miss Utility and assure that all construction areas are marked where excavation or other work affecting or possibly affecting underground utilities will take place. The Contractor shall maintain the markings. The Contractor shall pay any Miss Utility fees. The Contractor shall submit copies of Miss Utility tickets to the Engineer as evidence of this work.

The Contractor shall provide a written notification of intent to excavate or disturb the earth in an area to the Maryland Transportation Authority at least seventy-two (72) hours in advance of such activity. The Maryland Transportation Authority is not a subscriber to utility marking services. This notification shall permit the Authority to mark any Authority owned utilities within the excavation or disturbance area. The written notification shall be provided to the Authority's Project Manager and a copy provided to the Administrator at the affected facility as indicated below:

Name	Phone	Fax
Dave Roehmer, BHT	410-537-1310	410-537-1304
Dave Roehmer, FMT	410-537-1310	410-537-1304
Charles Raycob, FSK	410-537-7513	410-537-7503
Gary Jackson, HWN	410-537-6807	301-259-0411
George Fish, JFK, TJH	410-537-1101	410-537-1105
Ken Cimino, WPL	410-295-8156	410-295-8151

The Contractor shall maintain markings of utilities until excavation and disturbance work is complete. Existing marked utilities shall not be damaged or disturbed without permission of the owner of the utility.

**831.04 MEASUREMENT AND PAYMENT.**

This work will not be measured or paid separately, but shall be considered incidental to other work on the project.



## SECTION 890 – GENERAL INFORMATION AND CONTRACT PROVISIONS

### 890.00 General Requirements

The contractor shall remove the existing FM rebroadcast system "Twin-lead", and install a new Radiating Coaxial System (RCS) for FM rebroadcast in the Fort McHenry Tunnel (FMT) and Baltimore Harbor Tunnel (BHT) bores. The proposed replacement will include the coaxial cable, mounting hardware, coaxial connectors, and terminators to provide a functional rebroadcast subsystem. The subsystem shall provide rebroadcast coverage of the FM Broadcast band and when installed (by Others) the new Statewide Public Safety Wireless 700MHz LMR signals.

The FMT is comprised of four separate tunnel bores, namely:

- Bores 1 and 2, normally for southbound I-95 traffic.
- Bores 3 and 4, normally for northbound I-95 traffic.

The BHT is comprised of two separate tunnel bores, namely:

- Bore 1, normally for southbound I-895 traffic,
- Bore 2, normally for northbound I-895 traffic.

### 890.01 Vent Building and Bore Components

The existing FM Rebroadcast system just installed is utilizing the "Twin Lead" broadcast cables still in the tunnel bores and associated signal feeder lines. All associated "Twin-Lead" components, signal lines, and mounting materials are to be removed and disposed of under this task. This work will be performed in the four bores of the FMT and the two bores of the BHT. Coaxial feeder cables for the Maryland Statewide Public Safety Wireless (700MHz) will be left coiled in the designated areas of the FMT West Vent building and the BHT Fairfield and Canton Vent Buildings. The FMT East Vent building currently has the FM Rebroadcast equipment and cabinets installed, and only the additional combiners/splitters will be required in this facility.

### 890.02 General Scope of the Project

The scope of the project includes, but is not limited to:

- The removal of the existing FM rebroadcast system "Twin Lead" and components in all four bores of the Fort McHenry Tunnel including the East and West Vent buildings as appropriate (old coax feeders as required).
- The removal of the existing FM rebroadcast system "Twin Lead" components in both bores of the Baltimore Harbor Tunnel including the Fairfield and Canton Vent buildings as required (including old coaxial feeders).
- Repair of the tunnel wall tiles where any/all "twin lead" mounting hardware has been removed. Repair shall be made with MdTA Project Engineers approved epoxy materials and done in a professional manner which is acceptable to MdTA.



- Repair of Vent buildings and/or exhaust duct walls/ceilings with MdTA approved materials for any feeder line which is removed. The repair shall utilize material that is fire retardant or fire proof and shall be at the direction of MdTA Project Engineer or appointed representative.
- Installation of the new radiating coaxial cable from a point approximately 200 feet inside the bore from the entrance to a point 200 feet from the bore exit (approximately 6800 feet) within each bore of the Fort McHenry Tunnel.
- Installation of the new radiating coaxial cable from a point approximately 200 feet inside the bore from the entrance to a point 200 feet from the bore exit (approximately 7250 feet) within each bore of the Baltimore Harbor Tunnel.
- Installation of new feeder coaxial cable from the designated equipment areas in the East and West Vent buildings of the Fort McHenry Tunnel to the appropriate Radiating Coaxial cable feed point as shown on the plans.
- Installation of new feeder coaxial cable from the designated equipment areas in the Fairfield and Canton Vent buildings of the Baltimore Harbor Tunnel to the appropriate Radiating Coaxial cable feed point as shown on the plans.
- Each Vent Building Coaxial Feeder cable shall be left in the designated equipment areas with at least 100 feet of slack coiled and bound and terminated for future connection to the equipment cabinets if the installation of this system is completed prior to the installation of the Public Safety 700MHz wireless equipment.
- Connection of the coaxial feeder cable to the Radiating Coaxial cable at each point. Termination and interconnection of the radiating coaxial cable at each section end or termination point, as directed by the Project Engineer. Termination and connection of the coaxial feeder cable at all points required to complete the task.
- Provide, install and connect all coaxial grounding kits as required or directed by the project engineer at designated locations.
- Test the Radiating Coaxial System and coaxial feeders for frequency and loss. Test results (RF Sweep Test, TDR test, etc.) shall be provided to the Project Engineer in electronic format on CD media, 2 copies each.

Equipment and components deployed for this project will be subjected to environmental extremes. This includes vehicle exhaust and seasonal temperature extremes. All materials used shall be capable of handling these extremes.

### **890.03 Safety and Protection**

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

- All persons on the work site or who may be affected by the work.
- All of the work, materials, and equipment to be incorporated therein, whether in storage on or off the site.



- Other property at the site or adjacent thereto, including trees, shrubs, pavements, roadways, structures, utilities, and underground facilities not designated for removal, relocation, or replacement in the course of construction.

#### **890.04 Codes and Regulations**

In addition to the requirements of these plans and specifications, material and work shall conform to the latest requirements of NFPA No. 70, National Electrical Code, and ANSI C2, National Electrical Safety Code, the Standards of IEEE, NFPA, ASTM, ANSI, NEMA, RMA, MUTCD, OSHA, UL, ITE, IMSA, EIA, TIA, and Bellcore, except where superseded by applicable laws. The term code, as referred to in this document, shall be the NFPA No. 70, National Electrical Code, and ANSI C2, National Electrical Safety Code.

Except as otherwise noted on these Plans and Specifications all work shall be in accordance with the Maryland State Highway Administration's (MSHA) Book of Standards for Highways and Incidental Structures, current edition, available online at:

<http://www.sha.state.md.us/businesswithsha/bizStdsSpecs.asp?id=B157+B159> .

Except as otherwise specified in these special provisions, specifications or plans, all conduit supplied shall not exceed the fill requirements for AC conductors as specified in the National Electrical Code (latest revision). Additionally, all communications signal lines or cabling shall be placed in separate conduit from that carrying AC conductors. All conduit used outside shall be Galvanized rigid steel. Refer to the specific sections (i.e. DMS, LCS) for conduit sizes required. No conduit shall be used on this project that is below the size of 1 inch.

Installation shall comply with all applicable local, State, and federal government rules, regulations, codes, and laws.

#### **890.05 Measurement and Payment**

Payment for General Requirements will not be measured, but the cost will be incidental to each Radiating Coaxial cable furnished and installed; each feeder coaxial signal furnished and installed; and shall include all items necessary for the installation, testing, and acceptance of the complete Radiating Coaxial System. Costs for all electrical material needed under this contract will be incidental to the items stated in this document. Actual costs for furnishing, installation and testing of the new Radiating Coaxial System shall be paid for under contract Item 8003 for the Fort McHenry Tunnel and under contract Item 8004 for the Baltimore Harbor Tunnel as described in Section 891.06.



## SECTION 891 – RADIATING COAXIAL CABLE

### 891.00 Radiating Coaxial and Coaxial Feeder System

This work shall consist of removing any existing FM Rebroadcast System "twin lead" wiring, mounting components and feeder cables in the Fort McHenry Tunnel (FMT) and Baltimore Harbor Tunnel vent buildings and bores. The old "Twin-Lead" rebroadcast system cabling will be replaced with the new Radiating Coaxial and coaxial feeder cable. The Contractor shall furnish and install the new Radiating Coaxial System as detailed below and as directed by the Maryland Transportation Authority.

### 891.01 General Requirements

This item consists of furnishing and installing new Radiating Coaxial System with all necessary coaxial feeders, mounting hardware, crossband couplers, connectors and terminators and radiating coaxial cable in accordance with the Plans and Special Provisions, or as directed by the Engineer. The RCS shall operate with the newly installed FM Rebroadcast equipment installed in the FMT East Vent building.

The Contractor shall be responsible for providing the following as part of RCS package:

- Removal of any existing (old) FM Rebroadcast system "Twin-Lead" wiring and mounting components and feeder cables in the FMT and BHT tunnel bores.
- Disposal of the old FM Rebroadcast system "Twin-Lead" wiring, mounting hardware and feeder cable.
- Interconnection of the RCS to the FMT FM Rebroadcast system electronics with the coaxial feeder and coaxial radiating element in the various tunnel bores for both the FMT and BHT.
- Furnish and install the coaxial feeder cables from the RCS electronics head end to the various radiating coaxial cable sections in each of the FMT and BHT bores.
- Furnish and install all mounting hardware and materials for the radiating coaxial cables in the FMT and BHT bores,
- Furnish and install all radiating coaxial cable as specified below in each of the FMT and BHT bores as required and shown on the plans.



## **891.02 Radiating Coaxial System Requirement**

Equipment and components deployed for this project will be subjected to environmental extremes. This includes vehicle exhaust and seasonal temperature extremes. All materials used shall be capable of handling these extremes and shall also have fire retardant jacketing for the cabling utilized.

The radiating coaxial cable shall have two slots cut into the total length of the outer conductor that shall allow radio signals to be coupled from devices like two way portable radio into the cable, and conversely, radio signal which are emitted out of the cable and into a radio. The radiating coaxial cable shall have broadband capability (30MHz to 3GHz) and shall provide coverage across multiple frequency bands simultaneously and shall be capable of being used for both one-way and two-way communications. The radiating coaxial cable shall have an outside diameter of 1.625 inches and present a 50 ohm input impedance and a velocity of propagation of no less than 91%. The radiating coaxial cable shall not exceed 0.23 dB/100 feet attenuation @ 108 MHz and 0.68 dB/100 feet attenuation @ 700MHz. Coupling loss shall not be greater than 61 dB @ 108MHz and 64 dB @ 700MHz.

The radiating coaxial cable shall be constructed in such a manner that the center conductor has dielectric polyethylene discs between the conductor and the outer dielectric. The radiating coaxial cable shall be a hermetically sealed, fully bonded design that does not allow moisture migration. The center conductor shall be a pure solid copper tube, at least 0.7 inches in diameter with an outer conductor that is continuously formed and welded electrical grade aluminum tube. The dual longitudinal slots shall run the entire length of the cable in the outer conductor providing optimum coupling loss and attenuation to ensure excellent communication. The radiating coaxial cable shall make use of prep tools that allow connectorization to be accomplished in less than two minutes. All radiating coaxial cables shall be terminated with the appropriate 1.625 inch connector with the Type "N" female interface. All radiating coaxial cable connections shall be covered with at least six inches of 3" black heat shrink tubing that shall have a 2:1 shrink ratio to keep the connector/cable interface water tight.

The radiating coaxial cable shall have a fire retardant exterior jacket that is a very light gray or light beige in color, and shall be approved for use in underground mines as signal cable meeting MSHA 30 CFR. This jacket shall be low-smoke, non-halogenated, fire retardant jacket meeting IEC332-1, IEC332-3C and UL-1666, CMR. The radiating coaxial cable shall be able to operate in a temperature environment of -40 to 77 degrees Celsius.



### **891.03 Coaxial Feeder Cable**

The radiating coaxial cable shall be terminated with new coaxial feeder cable that connect the radiating coaxial cable in the different tunnel bores with the head end electronics, mid tunnel amplifiers (if required) and the FM Band/Public Safety 700MHz crossband couplers housed in the four vent buildings (as required). Each vent building which does not currently have hardware installed for the Public Safety 700MHz system, shall have at least 100 feet of the coaxial feeder cable rolled up and stored for future use, in the designated areas where the 700MHz equipment will be installed.

The coaxial feeder cable shall have broadband capability (30MHz to 3GHz) and shall provide coverage across multiple frequency bands simultaneously and shall be capable of being used for both one-way and two-way communications. The coaxial feeder cable shall have an outside diameter of 0.875 inches and present a 50 ohm input impedance and a velocity of propagation of no less than 91%. The coaxial feeder cable shall not exceed 0.33 dB/100 feet attenuation @ 100 MHz and 0.94 dB/100 feet attenuation @ 700MHz. The cable shall be rated for a minimum of 1000 Watts Average Power @ 3 GHz.

The coaxial feeder cable shall be constructed in such a manner that the center conductor has dielectric polyethylene discs between the conductor and the outer dielectric tube. The coaxial feeder cable shall be a hermetically sealed, fully bonded design that does not allow moisture migration. The center conductor shall be a pure solid copper tube, at least 0.383 inches in diameter with an outer conductor that is continuously formed and welded premium grade aluminum tube. The coaxial feeder cable shall virtually eliminate intermodulation interference by the use of the solid inner and outer conductors and silver-plated connector junctions. The coaxial feeder cable shall make use of prep tools that allow connectorization to be accomplished in less than two minutes. All coaxial feeder cables shall include the appropriate number of connectors and all feeder cable terminations shall be made with the .875 inch Type "N" Male connectors. All feeder coaxial cable connections shall be covered with at least three inches of 1" black heat shrink tubing that shall have a 2:1 shrink ratio to keep the connector/cable interface water tight.

The coaxial feeder cable shall have a fire retardant exterior jacket that is a very light gray or light beige in color, and shall be approved for use in underground mines as signal cable meeting MSHA 30 CFR. This jacket shall be low-smoke, non-halogenated, fire retardant jacket meeting IEC332-1, IEC332-3C and UL-1666, CMR. The coaxial feeder cable shall be able to operate in a temperature environment of -40 to 77 degrees Celsius. The coaxial feeder cable shall have a manufacturers warranty of 15 years for weatherproof stability.

The coaxial feeder cable shall follow the same path as the existing FM "Twin-Lead" feeder cables, or for those vent building with no FM Feeders, the coaxial feeders shall follow the same path as the cellular coax feeder cabling. The coaxial feeders should make use of existing cable trays and mounting points to the maximum extent possible. Where the coaxial feeder cables must pass through a concrete wall (i.e. between an existing stairwell and an exhaust vent wall)



the penetration and installation of the cable shall be as depicted in the plans, with firestop and galvanized steel pipe sleeves used for all such penetrations.

Contractor shall X-Ray (GPR) Concrete walls before drilling any penetrations to ensure that no buried pipe/conduit, etc shall be damaged from the wall penetration.

#### **891.04 Crossband Couplers**

The Radiating Coaxial System shall be equipped with crossband couplers which shall provide the interface for both the FM band (88 - 108MHz) and the Public Safety 700MHz band to utilize the same radiating coaxial cable for transmission and reception of the RF signals. The crossband couplers shall provide excellent inter-band isolation, low insertion loss and good intermodulation performance as described below. The crossband couplers shall be passive devices and shall meet the following minimum specifications:

- Low Pass frequency range of 0 - 250MHz
- High Pass frequency range of 380 - 2200 MHz
- Capability to handle up to 100 Watts of RF input for either band.
- Insertion loss shall not exceed 0.325 dB with a VSWR of no more than 1.35:1
- Isolation between band shall be greater than 48 dB
- The unit shall be equipped with Type "N" Female connectors for both input and output.
- Operating temperature ranges of -20 to +55 degrees Celsius.

The unit shall allow two-way communications in the 700MHz Public Safety band and shall not cause a large degradation of the received signal from a mobile or portable radio transmitting from within a tunnel bore.

The unit shall be sealed and shall be capable of meeting the IP65 standard. The unit shall meet a Mean Time between Failure of greater than 175,000 hours.



### **891.05 Radiating Coaxial Cable Mounting Details**

This work shall be for the installation of the radiating coaxial cable and attachment and additional drilling along the tunnel walls in each bore as indicated on the drawings and as directed by the Engineer. The Contractor shall provide all materials required to install the radiating coaxial 1 5/8" cable to the tunnel wall in accordance with the drawings and SHA Specifications, dated July 2008. The Contractor shall provide a sample of the mounting bracket and hardware. A limited number of replacement tiles may be provided by the Authority, but the Contractor is responsible for replacement cost of any tile broken/damaged during the mounting operation.

All work shall be performed in accordance with applicable sections of the SHA Specifications, dated July 2008 and as indicated herein. The Contractor shall ascertain and locate any existing utilities, including tunnel lighting, and other facilities in the vicinity of the project area, and take all precautions to fully protect the utilities. The Contractor shall provide all measures for protection in accordance with the National Electric Safety Code & the Occupational Safety and Health Administration's Regulations and as deemed necessary by the Engineer.

Drill holes to the appropriate depth into concrete and at locations for the proposed coaxial cable attachments as indicated on the drawings and as directed by the Engineer. The Contractor shall take all precautions to minimize tile breakage. The Contractor shall replace broken tiles in kind. The Contractor shall provide the Engineer with a brief summary in writing containing the thickness of tile/mortar, depth to concrete, difficulty of drilling in tile/mortar and concrete for all drilled holes, and recommendations for drilling procedures to minimize tile breakage. Install concrete expansion anchors, cable attachments, and coaxial cable as per the drawings and manufacturers requirements. If directed by the Engineer, drill additional holes within the same bore to a depth into concrete as indicated on the drawings. Additional drill testing may be required and shall be completed during the same shift as the installation of the cable and cable attachments.

The exact depth of the tile and mortar is not known. Field measurements through existing cable portals indicate a 2" thickness of tile and mortar to the concrete. The Contractor shall provide concrete anchors of sufficient length to ensure proper embedment into concrete beyond the tile finish. The Contractor shall provide material substitution requests with appropriate catalog cut sheets to the Engineer for approval prior to commencing work. The Contractor shall use Hilti Kwikbolts Stainless Steel Expansion Anchor or approved equivalent for mounting to the tunnel bore wall. The Hilti Kwikbolt shall be of sufficient length to allow between 3/4" to 1" to extend out from the face of the bore wall for mounting of the fiberglass unistrut.

Fiberglass Unistrut #F20P/V2000 or approved equivalent shall be used to mount the radiating coaxial cable to the tunnel bore wall. This material shall be cut in such a manner as to



Maryland  
Transportation  
Authority

SPECIAL PROVISIONS

CONTRACT NO. MA-2264-000-002

Page 6 of 7

provide a single mounting piece that is approximately eight (8) inches in length. The Unistrut mounts shall be placed along the tunnel bores approximately every four feet (48 inches) and located in a manner that allows attachment to the bore wall over a tile grout joint. This should help ensure minimum damage to the tile walls. The Unistrut Vertical Stop Lock, F200-4219 or approved equivalent shall be used above and below the Adjustable Pipe Clamp #200-3110 or approved equivalent as shown on the plans or as directed by the Engineer.

The radiating coaxial cable shall start approximately 200 feet from the entrance to the bore and continue until 200 feet from the exit of the bore. The Contractor shall provide termination and coaxial feeders inside the bore at designated locations, as required, for connection to Bi-directional Distribution Amplifiers.

The Fort McHenry Tunnel shall have the radiating coaxial cable installed about six inches below the ceiling and above the fluorescent lighting on the tunnel bore wall opposite the doors to the Tunnel Utility (TIF) Rooms.

The Baltimore Harbor Tunnel shall have the Fiberglass Unistrut mounting hardware mounted in such a manner that each light fixture is centered between two Unistrut mounts which shall be 60 inches apart. The space between the light fixtures is approximately 96 inches, and the distance between the unistrut mounting hardware shall be spaced evenly with a mount attached over a grout joint from 42 to 46 inches from the mount closest to a light fixture (see plan sheet detail).

In both the FMT and BHT, all radiating coaxial cable mounting hardware and drilling shall be accomplished prior to attaching the radiating coaxial cable to the bore walls.



**891.06 Measurement and Payment**

Removal of existing FM rebroadcast "Twin-Lead" and associated feeder cabling will be measured per each facility (FMT or BHT). Work shall include removal of the old FM Rebroadcast "Twin-Lead" wiring, removal of the "Twin-Lead" mounting hardware, repair of the tunnel bore wall where the "twin-lead" was mounted, and removal of the existing feeder cables, all incidentals, and delivery to site as determined by the Authority.

Payment shall be full compensation for all materials, labor, equipment and all other incidentals necessary for the installation of the new Radiating Coaxial System and to complete this work. The Authority will make payment for the following items only upon completion of the installation and commissioning of the Radiating Coaxial System and acceptance by the Authority.

- Item 8001 Fort McHenry Tunnel, all bores, removal of the FM Rebroadcast "Twin-Lead" wiring, associated feeder cables, mounting hardware and repair of bore walls.  
LUMP SUM
- Item 8002 Baltimore Harbor Tunnel, all bores, removal of the FM Rebroadcast "Twin-Lead" wiring, associated feeder cables, mounting hardware and repair of bore walls.  
LUMP SUM
- Item 8003 Fort McHenry Tunnel, Radiating Coaxial System with coaxial feeders  
LUMP SUM
- Item 8004 Baltimore Harbor Tunnel, Radiating Coaxial System with coaxial feeders  
LUMP SUM
- Item 8005 Crossband Couplers for the Radiating Coaxial System (FMT East & West Ventilation Building)  
LUMP SUM
- Item 8006 Crossband Couplers for the Radiating Coaxial System (BHT Canton & Fairfield Ventilation Building)  
LUMP SUM



## **SECTION 892 – SYSTEM TESTING AND EVALUATION**

### **892.00 TESTING**

The Contractor shall configure and test each Radiating Coaxial System after each tunnel bore installation is completed. The Contractor shall test all bores as described below as a minimum prior to acceptance of the system by the Authority. In the event any testing fails within a bore, the Authority may require additional testing to ensure that the Radiating Coaxial System fulfills all requirements and specifications.

Each tunnel bore shall also have a two-way radiating test conducted with the test frequency of 850 MHz used (due to current industry test equipment configurations).

The Contractor shall provide for each tunnel bore the following test in the following order:

- Time Domain Reflectometer test upon the complete section of radiating coaxial cable.
- Time Domain Reflectometer test upon the coaxial feeder cable and radiating coaxial cable combined
- Talk-Out test that shall provide a transmitter in the location of the crossband couplers and pass the signal through the complete radiating coaxial cable system with the receiver located in the bore.
- Talk-Back test that shall provide the transmitter in the bore and the receiver in the location of the crossband couplers.

### **892.01 Test Schedule**

The Contractor shall prepare a schedule for conducting tests and give a minimum of two (2) weeks advance notice to the Authority before conducting them. The notice shall clearly identify the type of test and exact location of the equipment to be tested.

### **892.02 Witnessing of Tests**

Tests conducted by the Contractor shall be witnessed by the Authority or a representative of the Authority.

### **892.03 Test Reports**

Following completion of each test for each bore, the Contractor shall provide a written report detailing all test results and a proposed course of action for resolving any anomalies.

In the event of a requirement deficiency requiring repair or replacement of a component, the Authority will require a full test to be repeated.

Test report shall be provided to the Authority and Engineer in either hard copy format or Electronic copy (CD) as directed by the Engineer.



Maryland  
Transportation  
Authority

SPECIAL PROVISIONS

CONTRACT NO. MA-2264-000-002

Page 2 of 2

**892.04 Traffic Operations during Testing**

All installation and testing activities shall be designed to have the least impact on traffic operations in the FMT and BHT and shall be conducted in close coordination with Authority Operations Center personnel. All installation and testing activities shall be performed by the Contractor and in accordance with Maintenance of Traffic requirements of the Authority.

The Contractor shall include the impact of traffic operations in the test procedures of these Specifications, including the schedule, sequence, and duration for which normal traffic flow may be disrupted at each bore.

**892.05 Measurement and Payment**

All Testing shall be consider as incidental and part of the overall price of the bid item for the Fort McHenry Tunnel and the Baltimore Harbor Tunnel.



## SECTION 893 – CONSTRUCTION SEQUENCING

### 893.00 General

All installation, testing, and other activities undertaken by the Contractor, shall be designed to have the least impact on traffic operations at the Fort McHenry Tunnel (FMT) and Baltimore Harbor Tunnel (BHT) and shall be conducted in close coordination with MdTA Police and Authority Operations personnel. Restrictions related to Maintenance of Traffic shall be as stipulated in Section 104 of the Special Provisions as amended in these Specifications.

It is necessary to plan and coordinate the Construction and Maintenance of Traffic (MOT) with MdTA concerning the sequencing schedule of this project.

### 893.01 Order of Construction

Order of construction shall be as follows:

1. All initial work involving removal of the FM Rebroadcast "Twin-Lead" wiring and feeders shall begin in the FMT Southbound Bore 1 and 2. The Contractor shall finish all work within a bore before moving to a new bore work zone.
2. Work will progress after Southbound Bores 1 and 2 to the FMT Northbound bores 3 and 4.
3. The Authority may shift the order of work with 48 hours of prior notification to the contractor, from the FMT bores to the BHT bores, if so required due to operational constraints. Otherwise the BHT bore shall be completed after all bores of the FMT are finished and tested.
4. The Contractor can work at both facilities at the same time weather permitting.
5. When the Contractor starts mounting the radiating coaxial cable in a bore, all work must be complete during work hours prior to the bore reopening. Under no circumstances shall any work materials be left in the bore which will impede the flow of traffic through the bore.