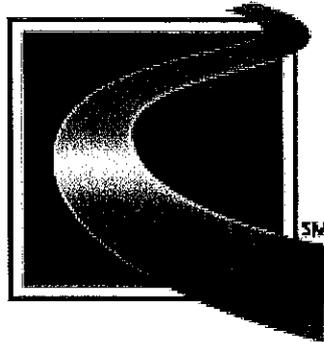


***MARYLAND TRANSPORTATION AUTHORITY***  
***Baltimore, Maryland***  
***Invitation for Bids***

**Francis Scott Key Bridge, Governor Harry W. Nice Memorial Bridge,  
and William Preston Lane Jr. Memorial (Chesapeake Bay) Bridge**



**Maryland  
Transportation  
Authority**

**Contract No. MA-2081-000-006**

**Renovation to Navigational Aids at Various Facilities  
Baltimore City, Baltimore County, Anne Arundel County,  
Charles County, and Queen Anne's County**

**October 2009**



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## NOTICE TO BIDDERS

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

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

# 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.

Updated  
2/23/2009

## 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.

Updated  
2/23/2009

- Attachment B must be signed and dated.
- If you are the apparent low bidder, you will receive a letter from the Authority requesting your MBE Attachment C (Outreach Efforts Compliance Statement) and Attachment D (Subcontractor Project Participation Affidavit). You will have ten (10) working days to submit the attachments to the Authority. If you requested a waiver at time of bid, all of the back up documentation that complies with COMAR 21.11.03.11, must be submitted within the ten working days with Attachments C & D.
- If the apparent low bidder fails to return the required documentation within the allotted ten (10) days, the Procurement Officer may determine that the apparent low bidder is not responsible and therefore not eligible for contract award.



**NOTICE TO 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. MA 2081-000-006  
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-2081-000-006

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.



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

**HIGH VISIBILITY SAFETY APPAREL POLICY**

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

**STATEMENT OF POLICY.**

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

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

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



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

CONTRACT NO. MA-2081-000-006  
2 of 2

**REFERENCES.**

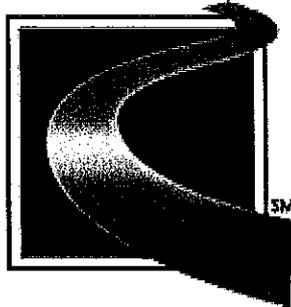
- (a) ANSI/ISEA 107/2004 standard – American National Safety Institute/International Safety Equipment Association
- (b) MUTCD 2003 – Manual for Uniform Traffic Control Devices - Sections 6D.03B and 6E.02
- (c) Visibility Research – The VCTR 1989 report concludes that fluorescent colors, when compared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

**DEFINITIONS.**

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

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

**Francis Scott Key Bridge, Governor Harry W. Nice Memorial  
Bridge, and William Preston Lane Jr. Memorial (Chesapeake  
Bay) Bridge**



**Maryland  
Transportation  
Authority**

Contract No. MA-2081-000-006

**Renovation to Navigational Aids at Various Facilities  
Baltimore City, Baltimore County, Anne Arundel County,  
Charles County, and Queen Anne's County**

**October 2009**

**NOTICE TO BIDDERS**

A "Pre-Bidding Session" for the purpose of answering or obtaining answers to questions of parties interested in constructing the work relative to Right-of-Way, Utilities, Design, and Construction Details will be conducted at 10:00 a.m. on November 3, 2009, in the Conference Room, 1<sup>st</sup>. Floor of Francis Scott Key Bridge Engineering/Finance 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.



## SP 1-1 PROJECT DESCRIPTION

**CONTRACT NO.:** MA-2081-000-006

**TITLE:** Renovation to Navigational Aids at Various Facilities

**FACILITY:** Francis Scott Key Bridge ("FSK"), Governor Harry W. Nice Memorial Bridge ("NMB"), and William Preston Lane Jr. Memorial Bridge ("LMB")

**LOCATION:** Baltimore City, Baltimore County, Anne Arundel County, Charles County, and Queen Anne's County

**ADVERTISED:** October 20, 2009

**PRE-BID MEETING:** November 3, 2009 at 10:00 a.m. in the Conference Room at the Maryland Transportation Authority, 300 Authority Drive, 1st floor, Engineering Building, Baltimore, MD 21222

**PROJECT CONTACT:** Project Manager: David Dabkowski (410) 537-7852  
Contract Administration: Ms. Maggie Johnson (410)-537-7807

**BIDS DUE:** 12 Noon, November 17, 2009, in the Bid Box on the 1<sup>st</sup>. floor of the Maryland Transportation Authority, Engineering Building, 300 Authority Drive, Baltimore, MD 21222

**CLASSIFICATION:** Class - D (\$1,000,001 - \$2,500,00)

**CONTRACT TIME:** Three Hundred Fifteen (315) Calendar Days

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

**MINIMUM MBE GOALS:** Overall 35%  
No subgoals

**BID DOCUMENTS:** \$25.00 - 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.



### **SP 1-1 DESCRIPTION**

This project is at three MdTA Facilities, FSK in Baltimore County and city, LMB in Anne Arundel and Queen Anne's Counties, and NMB in Charles County.

On the FSK the foghorns, aerial beacons, and navigational lights on the main span piers shall be replaced. On the NMB the navigation lights, aerial beacon, and electrical distribution system shall be replaced. Also on the NMB, a packaged electrical generator and automatic transfer switch shall be furnished and installed. On the LMB, the foghorn on the south structure (eastbound span) shall be disconnected and removed, and the foghorn on the north structure (westbound span) shall be repaired.

This work also includes interconnection cables, connections, and splices to existing cables, conduits, and installation of other appurtenances. All work, materials necessary to provide complete and functioning systems shall be included.

### **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 or visiting the site should contact David Dabkowski at (410) 537-7852.

### **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 Director of Construction of the dispute. The Director of Construction or his representative will verbally contact the prime Contractor within 48 hours to ascertain whether or not a performance dispute exists which necessitates non-payment to the Subcontractor. If a performance dispute exists, the prime Contractor must demonstrate that there is a valid basis to withhold payment from the Subcontractor. If the prime Contractor withholds payment from a Subcontractor, the prime Contractor shall provide to the Subcontractor written notice of the withholding of payment. The notice shall detail the reasons for withholding payment as well as the amount. A copy of the notice shall be provided to the Surety and the Authority. If no valid dispute exists, the prime Contractor will be directed to make immediate payment to the Subcontractor. The Subcontractor will be responsible for notifying the Director of Construction if this payment is not made. Upon receipt of notification, the Director of Construction will schedule a meeting with the Contractor and Subcontractor to verify and discuss the non-payment issue. This meeting will be held at the Authority's offices within 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 in "Maintenance of Traffic" for lane closures and other work hour restrictions.

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.

Except for the above restrictions, the Contractor will be permitted to work 24 hours a day, 7 days a week. However, no lane or bridge closures will be permitted during high winds (greater 25 mph), rain, snow or other precipitation event, when ice or snow is on the roadway or the potential for fog, as determined by the Authority.



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



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

### **Criminal Fraud Provisions:**

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

### **SP 1-8 PROGRESS SCHEDULE REQUIREMENTS**

Refer to Section 109 of the Standard Specifications.

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

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

To accomplish the required registration, a foreign corporation must request and complete "Qualification Application Forms" which can be obtained from the Department of Assessment and Taxation, State Office Building, Room 803, 301 West Preston Street, Baltimore, Maryland 21201. Forms can be obtained via the Maryland Department of Assessments and Taxation website 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 times.

While working in the Tunnels or on one of the major bridges of the Authority, Contractor's personnel shall have an ID decal displayed on their hardhat. These decals will be provided by the Authority. All 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. 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.



**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.



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

**GP 1.05 - DEFINITIONS**

Add the following definitions:

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



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

**GP 2.04 SITE INVESTIGATION**

Revise the paragraph to read as follows:

The Contractor acknowledges that 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.



**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 he 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 Administrations and, as a minimum, contain the following information.

- (1) State Contract No.;
- (2) State Item Nos.;
- (3) State's Proposed Quantities;
- (4) Description of Items;
- (5) Unit Price;
- (6) Total Cost of Each Item; 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  
Chief of Engineering Procurement  
Maryland Transportation Authority  
300 Authority Drive  
Baltimore, Maryland 21222



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

**GP 2.23 - BID PROTESTS**

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

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

All protests relating to this solicitation, the selection, and/or award must be filed in writing with the Authority's Procurement Officer, within the time limitations set forth in COMAR 21.10.07 and 21.10.02. Bid protests shall be filed not later than 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 8  
PROSECUTION AND PROGRESS**

**GP 8.09 - LIQUIDATED DAMAGES**

**Delete:** Section GP 8.09 in its entirety

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

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

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



**GENERAL PROVISIONS  
GP SECTION 9  
PAYMENT**

**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 [ddabkowski@mdta.state.md.us](mailto:ddabkowski@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: David Dabkowski

**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:

1. The Contract number.
2. The 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:

1. The first five characters must be the first five characters of the contract number. For example, for contract MA435-000-006, the first five characters of the file name must be MA435.
2. The sixth character must be a dash.



3. The seventh 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 tenth character must be a dash.
5. The eleventh through thirteenth characters must be the submittal number, e.g., 001.
6. In the event of a re-submittal, the 14<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. MA435-SUB-001-Conduit.pdf
  - ii. MA435-SUB-001R2-Conduit.pdf
  - iii. MA434-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 pro-rata 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  
304 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



## SPECIAL PROVISIONS

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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



## SPECIAL PROVISIONS

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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".

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

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



**TC SECTION 7  
PAYMENT**

**TC-7.06 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

## Maryland Transportation Authority

### RENOVATIONS TO NAVIGATIONAL AIDS AT VARIOUS FACILITIES

**SPECIAL PROVISIONS**

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### CATEGORY 100 PRELIMINARY

#### SECTION 100-02 – WORK RESTRICTIONS FOR PEREGRINE FALCONS

##### 100-02.01 GENERAL

Peregrine falcons are known to be nesting under most of MdTA bridge decks. In particular, the Peregrine falcons are currently known to be nesting at three MdTA Facilities, FSK in Baltimore County and city, LMB in Anne Arundel and Queen Anne's Counties, and NMB in Charles County. Peregrines are ranked "In Need of Conservation" in Maryland.

Bridge construction or repair work within the immediate area of the nesting Peregrine Falcons will disturb the birds and can cause nest abandonment. This could result in the death of eggs or young. Adult peregrine falcons aggressively defend their nests, which may also pose safety problems for bridge workers. It should be understood that these falcons are aggressive, are known to dive bomb intruders during mating seasons, prior to egg hatching, and while the offspring are young. These birds fly at speeds up to 200 MPH. The nesting season for peregrine falcons in Maryland extends from 1 March through 30 June each year.

To comply with regulations of the Maryland Department of Environment and the Maryland Department of Natural Resources, the Contractor should avoid work in areas where Peregrine Falcons are nesting during mating and egg hatching seasons. A time-of-year restriction for repair or construction on the bridge is in place for any work within  $\frac{1}{4}$  mile (all directions) of nest sites beginning March 1 and ending 30 June of all years. Most nests are located on the anchorage piers on either sides of the main channels. The U.S. Fish & Wildlife Service maintains current information on nesting locations. The restriction can be waived for any nests not being used.

When nests are encountered by the Contractor, the Project Engineer should be contacted immediately to be made aware, and to determine a viable work around to minimize cost and schedule impacts. The Contractor is required to also contact the Maryland DNR (POC: Glenn Therres, Telephone: 410.260.8572, [gtherres@dnr.state.md.us](mailto:gtherres@dnr.state.md.us)) to provide specifics on the location where the Peregrines were encountered.

The Contractor, when bidding this job, should understand that no work can take place between 1 March and 30 June within  $\frac{1}{4}$  mile of active nesting locations on the Nice Bridge where nesting is active.

##### 100-02.02 MEASUREMENT AND PAYMENT

This item will not be measured for payment. Costs for these restrictions should be factored into all bid items involving work on the various MdTA bridges.



**CATEGORY 100  
PRELIMINARY**

**SECTION 103 — ENGINEERS OFFICE**

**103.03 CONSTRUCTION.**

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

**INSERT:** The following.

**103.03.06 Microcomputer System for all Offices.**

**(a) Desktop Unit.**

- (1) IBM compatible with an Intel Pentium 4 or AMD processor.
- (2) Minimum microprocessor speed of 3.0 GHz.
- (3) Minimum hard drive storage of 80 GB (gigabyte).
- (4) Minimum of 2.0 GB RAM (Random Access Memory).
- (5) Enhanced 101 key keyboard with wrist rest.
- (6) Super Video Graphics Accelerator (SVGA) with minimum 64MB memory.
- (7) Modem 56K BPS, ITU V.92 compliant – required for remote dial-in to the computer to provide MCMS system administration
- (8) Full Duplex Sound Card (Sound Blaster Pro & Windows Compatible)
- (9) Audio Speakers
- (10) Mouse with mouse pad.
- (11) One CDRW/DVDRW combo drive. Min Speed = 48X
- (12) One Parallel Port, One Serial Port, Two USB Ports

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

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

**(d) Printer.** HP Compatible Laser Jet Printer with minimum resolution of 1200 DPI (dots per in.) and a minimum of 8 MB of RAM. Officejets and Bubblejets will not be



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accepted. Printer shall have a minimum print speed of 10 PPM (pages per minute) network capable.

**(e) Software.**

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

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

**(g) Accessories.**

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

**(h) Notes.**

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



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**103.03 CONSTRUCTION.**

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

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

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

**103.04 MEASUREMENT AND PAYMENT**

All pay items shall include all materials, labor, any mobilization and equipment necessary to furnish and install a complete, operational, and acceptable system as specified herein and as shown on the plans. Payment of items shall include all testing and guarantee required by the specifications and special provisions. Any requirements of the specifications, special provisions or plans not specifically detailed or mentioned in a payment item shall be considered incidental to the pay items below.

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

<b>ITEM NUMBER</b>	<b>DESCRIPTION OF ITEM</b>	<b>UNIT</b>
103	ENGINEERS OFFICE TYPE C	LUMP SUM.



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CATEGORY 100 PRELIMINARY

SECTION 104 - MAINTENANCE OF TRAFFIC

104.01 TRAFFIC CONTROL PLAN (TCP).

104.01.01 DESCRIPTION.

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

INSERT: The following.

AGENCY CONTACTS

Pre-Construction/Existing Contract Coordination

Table with 3 columns: CONTACT, TITLE, PHONE NUMBER. Rows include Gary Jackson, Ken Cimino, Charles F. Raycob, Thomas Crouch, Bruce Smith, David Shirk, Roxane Y. Mukai, David Dabkowski, Kip McKenzie, Bobby Wojcik.

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



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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.

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 SCHEDULES

FRANCIS SCOTT KEY BRIDGE

Table with 3 columns: TIME OF DAY, DAYS OF THE WEEK, ALLOWED CLOSURES. Rows include 9:00AM-3:00PM, 8:00PM-5:00AM, and 8:00PM-5:00AM with corresponding days and closure types.

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

New Years Day
Good Friday
Easter Sunday

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.



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Contractor's request for changes to the allowed hours of closure must be submitted to the Engineer. Requested changes cannot be approved without the approval of the FSK Administrator and the Authority's Traffic Manager.

The contractor will permit:

- 1) Emergency lane opening for traffic incidences at facility or for traffic diverted to facility.
2) Wide load access during work periods.

GOVERNOR HARRY W. NICE MEMORIAL BRIDGE

Table with 3 columns: TIME OF DAY, DAYS OF THE WEEK, ALLOWED CLOSURES. Rows include 9:00AM-3:00PM (Monday-Thursday), 9:00AM-12:00 Noon (Friday), 8:00PM-5:00AM (Monday-Thursday), and 10:00PM-5:00AM (Sunday).

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

- New Years Day, Memorial Day, Thanksgiving Day, Good Friday, Independence Day, Christmas Day, Easter Sunday, Labor Day

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

The Contractor must provide an approved and signed Traffic Control Plan ("TCP") then Harry W. Nice Memorial Bridge maintenance staff will provide lane closure set up for the contractor, after establishing the closure maintenance staff will monitor the alternating times and have the ability to "suggest" how it is done. With the bridge and its sight restrictions, the contractor shall try to keep the closure within a half mile.

The Contractor must provide a means of communication to the HNB Police detachment and the NMB Administrator as a safety requirement and to facilitate coordination of flagging operations. Acceptable forms of communication shall consist of a mobile telephone, citizens band or portable two-way radio.



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During flagging operations, the Contractor shall monitor traffic conditions in order to balance shifts between northbound and southbound traffic with observed traffic demand. The Contractor shall be prepared to receive and respond to specific direction from the NMB Administrator and the Authority's Traffic Manager regarding flagging operations.

WILLIAM PRESTON LANE JR. MEMORIAL BRIDGE

October 1 through April 30\*:

Table with 3 columns: TIME OF DAY, DAYS OF THE WEEK, ALLOWED CLOSURES. Rows include various time slots and days of the week with corresponding closure types like 'Single Lane Eastbound' and 'Double Lane Westbound'.

No lane closures permitted from December 23 through January 2.

Any eastbound closure will require implementation of contra-flow operation on the westbound bridge.

May 1 through September 30\*:

Table with 3 columns: TIME OF DAY, DAYS OF THE WEEK, ALLOWED CLOSURES. Rows include various time slots and days of the week with corresponding closure types like 'Single Lane Eastbound' and 'Single Lane Westbound'.

Any eastbound closure will require eastbound contra-flow operation on the westbound bridge.

\* Between the hours of 5:00AM and 9:00PM no more than one of the existing five traffic lanes may be closed at any time.

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



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New Years Day  
Good Friday  
Easter Sunday  
Memorial Day  
Columbus Day

Veterans Day (if it falls on a Friday or Monday).  
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. If a holiday happens to fall between May 1 and September 30, no closures will be permitted during the week of the holiday without the express approval of the William Preston Lane Jr. Memorial (Chesapeake Bay) Bridge (Facility) Administrator.

No lane or shoulder closures will be permitted without written approval of the Facility Administrator.

The Contractor will not be permitted to use any portions of the existing roadway or interfere with or impede the free flow of traffic in any manner during prohibited hours. All existing lanes of traffic along US Route 50/301 must be completely open during these hours.

The Contractor must provide a means of communication to the William Preston Lane Jr. Memorial (Chesapeake Bay) Bridge Police detachment as a safety requirement. Acceptable forms of communication shall consist of a mobile telephone, citizens band or two-way radio.

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

The Traffic Control Plan ("TCP") for work consists of a staged Maintenance of Traffic (MOT) Plan (included in the contract drawings) which will be employed to perform all work in the Contract. The Engineer reserves the right to modify or expand the methods of traffic control or working hours as specified in the Contract Documents. Any request from the Contractor to modify the work restrictions shall be in writing and shall require written approval from the Engineer at least seventy-two (72) hours prior to implementing the change. The Contractor shall submit a copy of the original work restrictions with the written request.

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.



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When a temporary lane or shoulder closure is in effect, work shall begin within one (1) hour after the lane or shoulder is closed. Any delay longer than one hour with no work in progress shall require the Contractor to remove the lane or shoulder closure at no additional cost to the Authority. The Contractor's Traffic Manager shall attend pre-construction meetings and shall discuss traffic control and the Traffic Control Plan (TCP) including procedures to be implemented for lane/shoulder closures.

All closures shall be in conformance with the approved TCP and under the direction of the Contractor's Certified Traffic Manager and the Engineer. No travel lanes shall be reduced to less than eleven (11) feet (3.4 meters).

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

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

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

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

Prior to opening the closed lane or shoulder, the Contractor shall clear the lane or shoulder of all material, equipment, and debris.



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

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

104.01.04 MEASUREMENT AND PAYMENT.

**INSERT:** The following:

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

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

ITEM NUMBER	DESCRIPTION OF ITEM	UNIT
104	MAINTENANCE OF TRAFFIC (SECTION 104)	LUMP SUM



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### RENOVATIONS TO NAVIGATIONAL AIDS AT VARIOUS FACILITIES

**SPECIAL PROVISIONS**

Contract No. MA-2081-000-006

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#### **CATEGORY 100 PRELIMINARY**

#### **SPECIAL PROVISION 150 – SELECTIVE DEMOLITION**

**150.01 DESCRIPTION.** This project is located on the Governor Harry W. Nice Memorial Bridge (NMB) in Charles County, Francis Scott Key Bridge (FSK) in Baltimore County, and on the William Preston Lane Jr. Memorial Bridge (LMB) in Anne Arundel and Queen Anne's Counties and Baltimore City.

**150.01.01** The work for the NMB is along the entire length of the bridge both under and above the roadway. This work consists of demolishing equipment mounted to the bridge structure including navigation lights, the aerial beacon, electrical distribution equipment. This work includes demolishing interconnection cables, connections, and splices to existing cables, conduits, and other appurtenances. All work and materials necessary to protect existing structures and make electrically safe shall be included.

**150.01.02** The work for the FSK is on the bridge pier structures and on top of the bridge structure at each end and the center. This work consists of demolishing the fog signal emitters, drivers, power supplies, and navigation lights on the pier structures and demolishing the aerial beacons, on top of the bridge structure. This work includes demolishing interconnection cables, conduits, connections, and splices to existing cables, conduits, and other appurtenances. Demolish all conduit and wire mounted to bridge below the roadway and demolish conduit and cable above the roadway as needed. All work and materials necessary to protect existing structures and make electrically safe shall be included.

**150.01.03** The work for the LMB on the east span of the **south** structure is above the roadway. This work consists of demolishing the existing fog signal emitters, drivers and power supplies. This work includes the removal of interconnection cables, conduits, connections, and splices to existing cables. All work and materials necessary to protect existing structures and make electrically safe shall be included.

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#### SPECIAL PROVISIONS

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#### 150.01.04 WORK RESTRICTIONS

**150.01.04.01** The contractor may not work in poor weather conditions. Poor weather conditions shall include rain, snow, sleet, ice, fog or any other form of precipitation. Poor weather will include wind above 25mph or gusts above 35mph.

**150.01.04.02** Contractors, when on bridges, shall at all times keep a means of contact with MdTA communication. Cellular phone or radio shall be acceptable.

**150.01.04.03** See Section 104 for MOT restrictions.

**150.01.05 GENERAL** This work includes contacting, coordinating and cooperating with MdTA for traffic control on the bridge. Plans are diagrammatic locations of cables, conduits, and other utilities. They are approximate and do not show every detail. Provide working drawings, shop drawings, and catalog cuts, etc., which show final details of the installation.

**150.01.06 CODES AND STANDARDS** All work shall be performed in accordance with the codes and standards listed below. Materials and construction shall meet the minimum requirements and recommendations of the codes, standards, and organizations listed in paragraph 820.01.01 of Specification Section 820 – General Electrical Work and Testing. Unless otherwise stated, the latest edition, revision, or supplement, as of the date of advertisement, of the specified codes shall be used.

**150.01.06.01** The entire demolition will be inspected by the MdTA Chief Electrical Inspector or his appointed representative. Contact the Electrical Inspector at least 48 hours before needed inspections. All demolition shall be inspected at completion.

**150.01.06.02** 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".

**150.01.07 QUALITY CONTROL AND QUALITY ASSURANCE** The contractor must provide qualified labor to perform demolition. Where licenses or certifications are available or required by local jurisdictions, state jurisdictions, or federal jurisdictions for certain skilled

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#### SPECIAL PROVISIONS

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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.

**150.01.07.01** Electrical work shall be supervised by an electrician whom is licensed in the state of Maryland. Anytime, electrical work is performed the contractor shall provide a full time electrician for on site supervision.

**150.01.07.02** The contractor shall inspect all existing structures and materials furnished or installed in the vicinity items being demolished and shall bring any damage, failure, or other problem to the attention of the project inspector prior to incorporation into the work.

**150.02 MATERIALS** Not applicable.

#### 150.03 CONSTRUCTION

##### 150.03.01 Examination

**150.03.01.01** Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

**150.03.01.02** When unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Engineer.

**150.03.01.03** Perform surveys as the work progresses to detect hazards resulting from selective demolition activities.

##### 150.03.02 Equipment

**150.03.02.01** The Contractor shall submit a list of equipment proposed for demolition. Approval of this equipment does not relieve the Contractor of the responsibility to complete the work as specified or as shown on the Contract Drawings.

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#### SPECIAL PROVISIONS

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**150.03.02.02** The Engineer reserves the right to direct the Contractor to use a different type of equipment if the equipment suggested by the Contractor is likely to cause damage to the structure. The equipment shall be provided at no extra cost to the Authority.

**150.03.02.03** Any damage caused by the Contractor, because of his equipment or procedure, shall be repaired by the Contractor to the satisfaction of the Engineer at no cost to the Authority.

**150.03.03 Utility Services** Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by the Engineer. Provide temporary services during interruptions to existing utilities, as acceptable to the Engineer. Provide not less than 72 hours notice to the Engineer if shutdown of service is required during changeover.

#### **150.03.04 Preparation**

**150.03.04.01** Conduct demolition operations and remove debris to ensure minimum interference with adjacent occupied and used facilities.

**150.03.04.02** Conduct demolition operations to prevent injury to people and damage to adjacent construction to remain. Ensure safe passage of people around selective demolition area. Erect temporary protection, such as walks, fences where required by the Engineer.

#### **150.03.05 Pollution Controls**

**150.03.05.01** Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

**150.03.05.02** Remove and transport debris daily in a manner that will prevent spillage on adjacent surfaces and areas.

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#### SPECIAL PROVISIONS

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**150.03.05.03** Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

**150.03.05.04** Perform all demolition in accordance with Maryland Department of Environment requirements for construction over bodies of water.

**150.03.06 Selective Demolition** Demolish and remove existing construction in entirety to the limits indicated. Use methods required to complete work within limitations of governing regulations and as follows:

**150.03.06.01** Proceed with selective demolition systematically.

**150.03.06.02** Maintain adequate ventilation when using cutting torches.

**150.03.06.03** Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

**150.03.06.04** Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

**150.03.06.05** Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

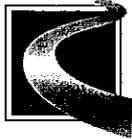
**150.03.06.06** Dispose of demolished items and materials promptly.

**150.03.06.07** Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.

#### **150.03.07 Disposal of Demolished Material**

**150.03.07.01** General: Dispose of demolished materials daily. Do not allow demolished materials to accumulate on-site.

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#### SPECIAL PROVISIONS

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**150.03.07.02** Burning: Do not burn demolished materials.

**150.03.07.03** Disposal: Transport demolished materials off Authority property and legally dispose of such materials.

#### 150.04 MEASUREMENT AND PAYMENT

Removal and Disposal of Existing Equipment will not be measured but will be paid for at the Contract lump sum price. All equipment not designated for removal and disposal in the Contract Documents will not be measured but the cost will be incidental to Section 150. The Authority reserves the right to eliminate from this item any or all equipment. For each piece of equipment eliminated from this item, the item will be credited to the extent of the cost eliminated, which will be determined from the breakdown submitted by the Contractor showing the tabulation of individual unit costs used in arriving at the Contract price for this item. A breakdown of the Contract lump sum price for Removal and Disposal of Existing Equipment shall be submitted to the Engineer prior to beginning work.

ITEM NUMBER	DESCRIPTION OF ITEM	UNIT
105	SELECTIVE DEMOLITION	LUMP SUM



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**LIGHTING RENOVATIONS AT THE I-95/I-395 AND I-95/I-895 INTERCHANGES**

**SPECIAL PROVISIONS INSERT**

**CONTRACT NO. MA-2801-000-006**

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**CATEGORY 800  
TRAFFIC**

**805 – ELECTRICAL CONDUIT AND FITTINGS**

627 **ADD:** The following sections:

**805.03.11 Pull Cord.** Pull cord shall be placed in all conduit runs (whether occupied or spare) for future use.

**805.03.12 Conduit Type.** All outdoor trenched conduits, unless otherwise noted, shall be PVC. All bored conduits under pavement structures shall be HDPE. All above ground or exposed conduits shall be rigid galvanized steel. All transitions to RGS are to be a minimum of 18" below finished grade.

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



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LIGHTING RENOVATIONS AT THE I-95/I-395 AND I-95/I-895 INTERCHANGES

SPECIAL PROVISIONS INSERT

CONTRACT NO. MA-2801-000-006

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CATEGORY 800  
TRAFFIC

809 – TRENCHING AND BACKFILLING

634 809.03 CONSTRUCTION

**CHANGE:** Text which reads: ‘...reads “CAUTION: ELECTRICAL LINE BURIED BELOW,” repeated every 36 in.’

**TO:** ‘...reads “BURIED ELECTRICAL LINE,” or other approved message, repeated every 36 inches and buried to a depth of at least 6” and not more than 12” below finished grade. The tape shall be terminated above grade and shall be secured to the same conduit or cable it is identifying. Securing shall be by sunlight resistant cable tie or other approved means. If terminating at a handhole or manhole the detector tape shall be brought 6” above grade along side the handhole or manhole.’

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

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

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

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

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

**Stake Out.** Stake out trenches prior to trenching and review the exact placement with the



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**Engineer.** Generally, keep trenches at least 3' behind guardrail and curb, and out of drainage ditches, gutters, culverts etc.. Run trenches in as straight a line as possible and parallel to the nearest roadway.

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

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

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

#### **809.04 MEASUREMENT AND PAYMENT**

**DELETE:** Text in its entirety.

**INSERT:** The following.

Trenching and backfilling will not be measured but the cost will be incidental to the Contract unit price for the installation of the pertinent conduit, detector tape, wire, or duct cable.

Trenching and backfilling shall include construction stake out and coordination, all excavation, backfill, trench marking tape, tamping, seeding, mulching, testing as specified in the Special Provisions and Specifications, etc. as required.



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#### CATEGORY 810 MATERIALS

#### SECTION 810.10-ELECTRICAL CABLE, WIRE, AND CONNECTORS

##### 637 810.03.10 Messenger Supported Aerial Cable.

INSERT: The following.

**810.03.10 Messenger Supported Aerial Cable.** Install messenger supported aerial cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible. Install conductor with a minimum of 24 inches of slack to accommodate any expansion on the bridge. Mounting locations of messenger cable to the bridge will need to be varied (not evenly spaced) to avoid harmonics developing on the messenger cable. The maximum distance between mounting locations is 22 feet. The aerial cable shall be fastened to the messenger cable with a high strength Cable Tie system. The spacing of the individual straps shall be spaced in accordance with the manufacturer's recommendations for the weight of the messenger supported aerial cable, and the messenger and aerial cables shall be separated by spacers.



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#### CATEGORY 800

#### TRAFFIC

#### 820 – GENERAL ELECTRICAL WORK AND TESTING

#### 646 820.01 DESCRIPTION

**ADD:** The following.

- (a) This work includes contacting, coordinating and cooperating with SMECO (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

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- (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.

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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.

**820.03.04** 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.

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

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

**820.03.07** 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.

**820.03.08** 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

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points. Ie: Phase A is the same Phase at all Phase A termination points and the phase rotation is the same at all points. Such testing shall be performed by the contractor and witnessed by the electrical inspector.

**820.03.09** 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.

**820.03.10** 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.

**820.03.11** 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.

**820.03.12** 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.

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

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

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**820.03.15 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.

**820.03.16 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.

#### **820.03.17 Construction Stakeout and Coordination**

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

**820.03.18 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.

**820.03.19 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.



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**CATEGORY 800**

**TRAFFIC**

**849 – MISCELLANEOUS ELECTRICAL REPAIRS AND/OR CONSTRUCTION**

**849.01 DESCRIPTION**

A contingent allowance of Sixty Thousand Dollars (\$60,000.00) has been included in the Proposal Form for miscellaneous electrical repairs and/or construction that may be deemed necessary by the Engineer during the construction period.

This work shall be performed only upon written direction of the Engineer. Upon the direction from the Engineer, the Contractor shall submit a written time and material cost for this task, for the Engineer’s review prior to commencing any work. The Contractor shall allow two (2) weeks for the review and notice of approval or rejection of the proposal. If the proposal is rejected, the contractor shall have no claim for time, materials, or other costs associated with the preparation of the proposal. If the proposal is approved, the costs, if any, associated with preparation of the proposal shall be incidental to the proposal.

In lieu of a proposal, the Engineer may direct the Contractor to perform the work in accordance with the requirements of “Force Account Work” Section GP9.02 of the Specifications.

**849.02 METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

All work performed under this item will be paid for on the basis of approved price proposals and/or force account records submitted in accordance with section GP9.02 of the Specifications and with the authorization of the Engineer.

The Approved amounts shall be full compensation for all labor, equipment, materials, and incidentals complete and in place as directed by the Engineer. The agreed upon or documented costs, only, shall be paid from a lump sum amount as specified in the schedule of prices.

<b>ITEM NUMBER</b>	<b>DESCRIPTION OF ITEM</b>	<b>UNIT</b>
849	MISCELLANEOUS ELECTRICAL REPAIRS AND/OR CONSTRUCTION	Lump Sum



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#### CATEGORY 800 TRAFFIC

#### SECTION 850 – FOG HORNS

**850.01 DESCRIPTION.** This project is located on the Francis Scott Key Bridge (FSK) in Baltimore County and Baltimore City, on the William Preston Lane Jr. Memorial Bridge (LMB) in Anne Arundel and Queen Anne's Counties, and Governor Harry W. Nice Bridge (NMB) in Charles County.

**850.01.01** The work for the FSK is on both sides of the shipping channel on bridge pier structures. This work consists of replacing the fog signal emitters, drivers, and power supplies with equal or better. This work includes interconnection cables, connections, and splices to existing cables, conduits, and installation of other appurtenances. Replace all conduit and cable mounted to the bridge structure that is located below the roadway, and replace conduit and cable above the roadway as needed. All work and materials necessary to provide complete and functioning systems shall be included.

**850.01.02** The work for the LMB on the east span of the **north** structure is beneath the roadway. This work consists of repairing the existing fog signal emitters, drivers, power supplies and furnishing and installing wiring from fog signal to traffic control box. This work includes the testing of equipment, connections, wiring, and parts pertaining to the operation of the fog horn. All work and materials necessary to provide complete and functioning systems shall be included.

**850.01.03** The work for the LMB on the east span of the **south** structure is above the roadway. This work consists of demolishing the existing fog signal emitters, drivers and power supplies. This work includes the removal of interconnection cables, connections, and splices to existing cables. Salvaged parts shall be made available to the Authority. The point of contact is Orlando Angeli at 410-537-6663. All work and materials necessary to disconnect and make safe shall be included.

**850.01.04** The work for the NMB is to strictly replace the existing power feeders. All of existing fog horn equipment mounted to bridge shall remain. This work includes interconnection cables, connections, and splices to existing cables, conduits, and installation of other appurtenances. Replace all conduit and cable mounted to the bridge structure. All work and materials necessary to provide complete and functioning systems shall be included.



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**850.01.04 WORK RESTRICTIONS**

**850.01.04.01** The contractor may not work in poor weather conditions. Poor weather conditions shall include rain, snow, sleet, ice, fog or any other form of precipitation. Poor weather will include wind above 25mph or gusts above 35mph.

**850.01.04.02** Contractors, when on bridges, shall at all times keep a means of contact with MdTA communication. Cellular phone or radio shall be acceptable.

**850.01.05 GENERAL** This work includes contacting, coordinating and cooperating with MdTA for traffic control on the bridge. Plans are diagrammatic locations of cables, conduits, and other utilities. They are approximate and do not show every detail. Provide working drawings, shop drawings, and catalog cuts, etc., which show final details of the installation.

**850.01.06 CODES AND STANDARDS** All work shall be performed in accordance with the codes and standards listed below. Materials shall meet the minimum requirements and recommendations of the codes, standards, and organizations listed below. Construction methods shall also meet the minimum requirements and recommendations of the codes, standards, and organizations listed below. Unless otherwise stated, the latest edition, revision, or supplement, as of the date of advertisement, of the specified codes shall be used.

**850.01.06.01** United States Coast Guard 33 CFR PART 67 - Aids to Navigation on Artificial Islands and Fixed Structures.

- ANSI American National Standards Institute
- ASTM American Society for Testing and Materials
- IEEE Institute of Electrical and Electronic Engineers
- NEC National Electrical Code (NFPA70)
- NEMA National Electrical Manufacturers Association
- NESC National Electrical Safety Code
- NFPA National Fire Protection Association
- UL Underwriters' Laboratories
- TIA Telecommunications Industry Association

**850.01.06.02** All materials supplied by the contractor shall be new and UL listed where such listing is possible.

**850.01.06.03** The entire installation will be inspected by the MdTA Chief Electrical Inspector or his appointed representative. Contact the Electrical Inspector at least 48 hours before needed



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inspections. All equipment shall be inspected at rough in.

**850.01.06.04** 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".

**850.01.06.05** Unless clearly specified otherwise, all voltages indicated are AC (alternating current), shall be at 60 Hz, and stated as RMS values.

**850.01.07 QUALITY CONTROL AND QUALITY ASSURANCE** 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.

**850.01.07.01** Electrical work shall be supervised by an electrician whom is licensed in the state of Maryland. Anytime, electrical work is performed the contractor shall provide a full time electrician for on site supervision.

**850.01.07.02** 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.

#### **850.02 MATERIALS**

**850.02.01 Fog Signal Emitters, Drivers and Power Supplies** The fog horns shall be the FA-232/2 sound Signal System by Automatic Power consisting of two 390 Hz emitters arranged in a vertical array or approved equal.

**850.02.01.01** The control equipment, power supply, and transformer for both horns shall be housed in the same NEMA 4X enclosure provided by the fog horn manufacturer. The transformer shall allow the equipment to accept 480 volt power.

**850.02.01.02** The proposed emitters, drivers, and power supplies shall be United States Coast Guard approved, and comply with the recommendations of the International Association of Lighthouse. In the event the proposed items are not previously tested to the satisfaction of



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United States Coast Guard, and National Lighthouse Authority, the manufacturer will be required to submit proof that the items meet the specified power input, power output, frequency and sound pressure level.

**850.02.01.03** The emitter shall produce the sound pressure level required by United States Coast Guard 33 CFR PART 67 - Aids to Navigation on Artificial Islands and Fixed Structures for range of 2-miles.

**850.02.01.04** The emitters shall be constructed of materials suitable for the marine environment.

**850.02.01.05** The emitter's coil shall be fixed in the center section, and not oscillate flexing the coil wires. The diaphragms shall seal the coils from the atmosphere.

**850.02.01.06** The emitter, drivers, and power supplies shall be listed by Underwriters Laboratories, Inc. as suitable for use in Class I, Division 2, Group D Hazardous Locations as described by the National Electrical Code.

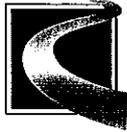
**850.02.01.07** Grounding shall be in accordance with section 804 of the Specifications.

**850.02.01.08** The fog horn mounting bracket assembly shown on the drawings shall be as recommended and supplied by the fog horn manufacturer.

#### **850.02.02 Remote Fog Signal Contactor and Controller**

**850.02.02.01** Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a) Allen-Bradley/Rockwell Automation.
- b) ASCO Power Technologies, LP; a division of Emerson Electric Co.
- c) Eaton Electrical Inc.; Cutler-Hammer Products.
- d) GE Industrial Systems; Total Lighting Control.
- e) Grasslin Controls Corporation; a GE Industrial Systems Company.
- f) Hubbell Lighting.
- g) Lithonia Lighting; Acuity Lighting Group, Inc.
- h) MicroLite Lighting Control Systems.
- i) Square D; Schneider Electric.
- j) TORK.
- k) Touch-Plate, Inc.



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- l) Watt Stopper (The).
- m) MdTA approved equivalent.

**850.02.02.02 Description:** Electrically operated and electrically held, combination type with Hand-Off-Auto switch, complying with NEMA ICS 2 and UL 508.

- a) **Current Rating for Switching:** Listing or rating consistent with type of load served, including tungsten filament, inductive, and high-inrush ballast (ballast with 15 percent or less total harmonic distortion of normal load current).
- b) **Fault Current Withstand Rating:** Equal to or exceeding the available fault current at the point of installation.
- c) **Enclosure:** Comply with NEMA 12.
- d) Provide with control and pilot devices as indicated on Drawings, matching the NEMA type specified for the enclosure.

#### 850.03 CONSTRUCTION

**855.03.01 Examination** Examine areas, equipment foundations, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting fog horn performance. Proceed with installation only after unsatisfactory conditions have been corrected.

**855.03.02 Installation** Comply with the fog horn manufacturers' written installation and alignment instructions.

**855.03.03 Electrical Wiring:** Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted. Verify that electrical wiring is installed according to manufacturers' submittal and installation requirements in Section 810. Proceed with equipment startup only after wiring installation is satisfactory.

**855.03.04 Ground equipment -** tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

#### 850.03.05 Fog Horn Repair

**850.03.05.01** The Contractor shall test the operation and continuity of the following pieces of equipment pertaining to the fog horn assembly mounted on the eastern channel span of the North structure of the LMB:



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1. Fog Signal Receiver
2. Fog Signal Receiver Power Unit
3. Fog Signal Control
4. Contactors
5. Relays
6. Circuit Breakers
7. All Internal Cabinet Wiring and Connections
8. Fog Signal Emitter
9. All Ground Connections

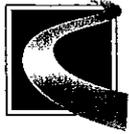
**850.03.05.02** The Contractor shall generate a diagnostic report of the fog horn equipment and submit the report to the MdTA for review. The report shall identify the finding from the requirements outlined in 850.03.01.01 and provide recommendations for repairing and replacing parts and equipment. The report shall include a breakdown of prices for each repair and replacement.

**850.03.05.03** The Contractor shall replace and/or repair any piece of equipment found to be defective and approved by the MdTA.

**850.03.05.04** Replace all gaskets on enclosures and equipment.

**850.03.06 Testing** The following tests shall be completed after installation of fog signal system.

1. Primary supply voltages, currents, and power factors of fog signal at standby condition and on.
2. Test the sound levels, and verify that fog signal complies with United States Coast Guard 33 CFR PART 67. These tests shall be measured in dB both 1 meter north and south of fog signal's emitters. These sound level tests shall be conducted with calibrated sound level meter that meets IEC651 and ANSI S1.4 specifications for a type 2 sound meter. The meter shall be calibrated, in compliance with OSHA, using Acoustical Calibrator.
3. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections, and to assist in testing. Report results in writing.
4. At William Preston Lane Jr. Memorial Bridge (LMB), test using existing traffic control computer system. Verify that relay in traffic cabinet is activated upon command. Verify that fog signal functions when the relay activated.



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**850.04 MEASUREMENT AND PAYMENT**

All pay items shall include all materials, labor, and equipment necessary to furnish and install a complete, operational, and acceptable system as specified herein and as shown on the plans. Payment of items shall include all testing and guarantee required by the specifications and special provisions. Any requirements of the specifications, special provisions or plans not specifically detailed or mentioned in a payment item shall be considered incidental to the pay item below.

The contractor's quality assurance and quality control responsibilities shall be incidental to the pay items below. Construction stake out and coordination shall be incidental to the items listed below. Testing as specified in the Special Provisions and Specifications shall be incidental to the pay items listed below.

**850.04.01 Fog Signal Emitters, Drivers and Power Supplies**

Each Fog Signal Emitter, incidental Drivers, support racks, conduit, wiring and Power Supplies and all work associated with installing, testing, and inspecting, shall be paid per unit item.

ITEM	DESCRIPTION OF ITEM	UNIT
836	FOG HORN SYSTEM	EACH
845	CONTACTOR AND CONTROLLER	EACH
846	REPAIR OF FOG HORN	EACH



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#### SECTION 851 – NAVIGATION LIGHTS

**851.01 DESCRIPTION.** Navigational lights shall be provided to properly mark the bridge to approaching marine traffic. Each light will consist of a Fixture (marine Lantern), Internal Assembly, and Mountings, all as described herein. Each light (Red, Green and White) must have sufficient candela output to provide a minimum of 2000 yards range for the background lighting and atmospheric conditions in the vicinity of the bridge and a minimum of 25 candelas in Red and Green is required. On the Governor Harry W. Nice Bridge (NMB), the navigation lights will operate from 120 VAC, single phase electric power, and on the Francis Scott Key Bridge (FSK) will operate from solar/battery combination units.

**851.02 MATERIALS** Lights that mark the channel center and suspended below the bridge deck shall show a Fixed Green Light visible all-round the horizon. Lights that mark the channel center shall be mounted above the bridge deck or pier structure and show a Fixed White light through 180 degrees (towards approaching vessels). Lights that mark the channel limits shall be suspended below the bridge deck or pier structure and show a Fixed Red light through 180 degrees (towards approaching vessels). Navigation Lights shall show through a vertical angle of at least 20 degrees and shall conform to the Red and Green Chromaticity Standards for U.S. Coast Guard Marine Signal Lanterns.

**851.02.01 Fixture** Lantern shall have a cast aluminum base and top section with a molded single-piece cylindrical glass 200mm Fresnel lens. Lantern to be hinged for easy access to the lamps and internal assembly and closed by captive toggle bolts and the watertight gasket. Closure bolts, lens tie rods, and attachment hardware will be of stainless steel.

**851.02.02 Internal Lamp Assemblies** An array of White, Red, or Green light emitting diodes (LEDs) shall be symmetrically arranged around the lens focal point. The LED array shall be contained within a cylindrical diffuser to maximize horizontal uniformity of the Light beam. A special power supply, located within the Lantern base, will accept the 120 VAC mains input and provide proper current-limited DC voltage to the LED array. [Although White, Red, and Green LEDs require different operating voltages, the power supply must accommodate either color array and be interchangeable between the White, Red, and Green Lanterns.]



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**851.02.02.01** LED life shall exceed 50,000 hours. Array to be mounted on an internal shock and vibration isolator assembly. A lightning surge suppressor, capable of absorbing multiple strikes without replacement, shall be incorporated in the circuit.

**851.02.03 Solar Panel** The solar panel configuration shall consist of two 5-watt multi-crystalline type modules. The solar module efficiency shall be a minimum of 14%, and have a microprocessor controlled charging regulation.

**851.02.04 Batteries** the batteries shall be replaceable Sealed Lead Acid in NEMA 4X housing.

**851.03 CONSTRUCTION** A lantern Elbow (upright on the bridge truss) is required for the six center channel White Lights, and Swivel Hinge is required for the two center channel Green Lights. These shall be galvanized steel 2-inch pipe and shall support the lantern in the operation and service position. Elbow to serve as conduit for the Light power cable.

**851.04 MEASUREMENT AND PAYMENT** Furnishing and installing Navigational Lighting will be measured and paid for at the contract unit price. Work will include all labor, materials, including all lenses, housing, door, gasket, visor, reflector, wiring, solar panel, batteries, and lamp socket, and complete, operational and incidental connections and testing, in order to assure operation, as approved by the Authority and development of shop drawings.

ITEM	DESCRIPTION OF ITEM	UNIT
832	RED LED NAVIGATION LIGHT	EACH
833	WHITE LED NAVIGATION LIGHT	EACH
834	GREEN LED NAVIGATION LIGHT	EACH
835	RED SOLAR LED NAVIGATION LIGHT	EACH



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#### CATEGORY 800 TRAFFIC

#### SECTION 852 – FLASHING AERIAL BEACON

**852.01 DESCRIPTION** Aerial beacons shall be provided to properly mark the Francis Scott Key Bridge (FSK) in Baltimore County and Baltimore City and the Governor Harry W. Nice Bridge (NMB) in Charles County. Synchronized red flashing aerial beacons shall be provided and replace the existing beacons at each end and at the highest point of FSK and at the center of the NMB.

**852.01.01 Standards** Flashing Aerial Beacons shall meet the FAA requirements for L-864, Flashing Red Obstruction Light standard.

**852.02 MATERIALS** Flashing aerial beacons shall have an effective intensity of 1,500 to 2,500 candelas, a vertical beam spread of at least 3 degrees, and they shall flash in unison at the rate of between 20 and 40 flashes per minute with a flash duration lasting 1/2 to 2/3 of the period. Each assembly shall be complete and self-contained. The assembly shall consist of the Beacon, a LED Light Control Unit, and Supports.

**852.02.01** The Beacon shall be hinged for easy access to the lamps and Internal Assembly and closed by captive toggle bolts and the watertight gasket. Closure bolts, lens tie rods, and attachment hardware shall be of stainless steel. The fixture shall be equipped with a GPS radio antenna and synchronizing system.

**852.02.02** The Light Control Unit shall be housed in a stainless steel NEMA-4X enclosure and shall consist of all needed power supply and synchronizing circuits. The unit shall include a transformer-rectifier in order to accept 208 VAC input. A GPS synchronization system is required.

**852.02.03** A special power supply, located within the base, shall accept the 208 VAC mains input and provide proper current-limited DC voltage to the LED array.

**852.02.04** The lens shall be an aviation red, acrylic lens which shall be attached to the base using a hinged lens ring. A bird spike shall be provided at the top of the optic. The housing shall meet IP-56 standards.

**852.02.05** All mounting hardware shall be stainless steel.



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**852.03 CONSTRUCTION** Beacon and Light Control Unit are to be mounted to a 4-foot tall galvanized steel support stanchion provided by the Contractor. All Assembly wiring and hardware shall be included. Array to be mounted on an internal shock and vibration isolator assembly. A lightning surge suppressor, capable of absorbing multiple strikes without replacement, shall be incorporated in the circuit.

**852.03.01** Install light units on the same horizontal plane at the highest portion or edge of prominent obstructions. Lights should be placed to ensure that the light is visible to a pilot approaching from any direction. The beacons shall be installed in accordance with the requirements of FAA – Advisory Circular 70-7460-1k “Obstruction Marking and Lighting”.

**852.04 MEASUREMENT AND PAYMENT** Furnishing and installing Aerial Beacons will be measured and paid for at the contract unit price. Work will include all labor, materials, including all lenses, housing, door, gasket, visor, reflector, wiring, and lamp socket, support stanchions, and complete, operational and incidental connections and testing, in order to assure operation, as approved by the Authority and development of shop drawings.

ITEM	DESCRIPTION OF ITEM	UNIT
837	LED Flashing Aerial Beacon	EACH



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#### CATEGORY 800 TRAFFIC

#### SECTION 855 - PACKAGED ENGINE GENERATOR

##### 855.01 GENERAL

**855.01.01 Related Documents** Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

##### 855.01.02 Summary

**855.01.02.01** This Section includes packaged diesel-engine generator sets with the following features and accessories:

1. Air-intake silencer.
2. Battery charger.
3. Engine generator set.
4. Muffler.
5. Exhaust piping external to set.
6. Outdoor enclosure.
7. Starting battery.

**855.01.02.02** Related Sections include the following:

1. Special Provision 856-Transfer Switch for transfer switches, including sensors and relays to initiate automatic-starting and -stopping signals for engine generator sets.

##### 855.01.03 Definitions

**855.01.03.01** Standby Rating: Power output rating equal to the power the generator set delivers continuously under normally varying load factors for the duration of a power outage.

**855.01.03.02** Operational Bandwidth: The total variation from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.

**855.01.03.03** Steady-State Voltage Modulation: The uniform cyclical variation of voltage within the operational bandwidth, expressed in Hertz or cycles per second.



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#### 855.01.04 Submittals

**855.01.04.01 Product Data:** Include data on features, components, ratings, and performance. Include the following:

1. Dimensioned outline plan and elevation drawings of engine generator set and other components specified.
2. Thermal damage curve for generator.
3. Time-current characteristic curves for generator protective device.

**855.01.04.02 Shop Drawings:** Indicate fabrication details, dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1. Design Calculations: Signed and sealed by a qualified professional engineer. Calculate requirements for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.
2. Vibration Isolation Base Details: Signed and sealed by a qualified professional engineer. Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include base weights.
3. Wiring Diagrams: Detail wiring for power and control connections and differentiate between factory-installed and field-installed wiring.

**855.01.04.03 Qualification Data:** For firms and persons specified in "Quality Assurance" Article.

**855.01.04.04 Field Test and Observation Reports:** Indicate and interpret test results and inspection records relative to compliance with performance requirements.

**855.01.04.05 Certified summary of prototype-unit test report.**

**855.01.04.06 Certified Test Reports:** For components and accessories that are equivalent, but not identical, to those tested on prototype unit.

**855.01.04.07 Certified Summary of Performance Tests:** Demonstrate compliance with specified requirement to meet performance criteria for sensitive loads.

**855.01.04.08 Factory Test Reports:** For units to be shipped for this Project, showing evidence of compliance with specified requirements.

**855.01.04.09 Exhaust Emissions Test Report:** To show compliance with applicable regulations.

**855.01.04.10 Sound measurement test report.**



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**855.01.04.11** Certification of Torsional Vibration Compatibility: Comply with NFPA 110.

**855.01.04.12** Field test report of tests specified in 855.03.

**855.01.04.13** Maintenance Data: For each packaged engine generator and accessories to include in maintenance manuals. Include the following:

1. List of tools and replacement items recommended to be stored at the Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.
2. Detail operating instructions for both normal and abnormal conditions.

#### **855.01.05 Quality Assurance**

**855.01.05.01** Manufacturer Qualifications: Maintain a service center capable of emergency maintenance and repairs at the Project with eight hours' maximum response time.

**855.01.05.02** Testing Agency Qualifications: Testing agency as defined by OSHA in 29 CFR 1910.7 or a member company of the InterNational Electrical Testing Association and that is acceptable to authorities having jurisdiction.

**855.01.05.03** Source Limitations: Obtain packaged engine generator and auxiliary components specified in this Section through one source from a single manufacturer.

**855.01.05.04** Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

**855.01.05.05** Comply with NFPA 70.

**855.01.05.06** Comply with NFPA 99.

**855.01.05.07** Comply with NFPA 110 requirements for Level 2 emergency power supply system.

**855.01.05.08** Engine Exhaust Emissions: Comply with applicable state and local government requirements.

**855.01.06 Delivery, Storage, and Handling** Deliver engine generator set and system components to their final locations in protective wrappings, containers, and other protection that will exclude



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dirt and moisture and prevent damage from construction operations. Remove protection only after equipment is safe from such hazards.

#### 855.01.07 Warranty

**855.01.07.01 General Warranty:** Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

**855.01.07.02 Special Warranty:** Written warranty, executed by manufacturer agreeing to repair or replace packaged engine generator and auxiliary components that fail in materials or workmanship within specified warranty period.

**855.01.07.03 Warranty Period:** Five years from date of Substantial Completion.

**855.01.08 Maintenance Service** At Substantial Completion, begin 12 months' full maintenance by skilled employees of the manufacturer's designated service organization. Include quarterly exercising to check for proper, starting, load transfer, and running under load. Include routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Maintenance agreements shall include parts and supplies as used in the manufacture and installation of original equipment.

**855.01.09 Extra Materials** Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

**855.01.09.01 Fuses:** One for every ten of each type and rating, but not less than one of each.

**855.01.09.02 Indicator Lamps:** Two for every six of each type used, but not less than two of each.

**855.01.09.03 Filters:** One set each of lubricating oil, fuel, and combustion-air filters.

#### 855.02 MATERIALS

**855.02.01 Available Manufacturers:** Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:



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1. Caterpillar, Inc.; Engine Div.
2. Generac Corp.
3. Kohler Co; Generator Division.
4. MagneTek, Inc.
5. Onan Corp; Industrial Business Group.
6. Penn Detroit Allison.
7. Spectrum Detroit Diesel.
8. Stewart & Stevenson Services, Inc.
9. Western Diesel Services.

#### **855.02.02 Engine Generator Set**

**855.02.02.01** Furnish a coordinated assembly of compatible components.

**855.02.02.02** Output Connections: Three phase, four wire, 120/208 volt.

**855.02.02.03** Safety Standard: Comply with ASME B15.1.

**855.02.02.04** Nameplates: Each major system component is equipped with a conspicuous nameplate of component manufacturer. Nameplate identifies manufacturer of origin and address, and model and serial number of item.

**855.02.02.05** Resistance to Seismic Forces: Supports for internal and external components, and fastenings for batteries, wiring, and piping are designed and constructed to withstand static or anticipated seismic forces, or both, in any direction. For each item, use a minimum force value equal to weight of item.

**855.02.02.06** Limiting dimensions indicated for system components are not exceeded.

**855.02.02.07** Power Output Ratings: 150 kW, with capacity as required to operate as a unit as evidenced by records of prototype testing.

**855.02.02.08** Skid: Adequate strength and rigidity to maintain alignment of mounted components without depending on a concrete foundation. Skid is free from sharp edges and corners. Lifting attachments are arranged to facilitate lifting with slings without damaging any components.

**855.02.02.09** Rigging Diagram: Inscribed on a metal plate permanently attached to skid. Diagram indicates location and lifting capacity of each lifting attachment and location of center of gravity.



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#### 855.02.03 Generator-Set Performance

**855.02.03.01** Steady-State Voltage Operational Bandwidth: 4 percent of rated output voltage from no load to full load.

**855.02.03.02** Steady-State Voltage Modulation Frequency: Less than 1 Hz.

**855.02.03.03** Transient Voltage Performance: Not more than 20 percent variation for 50 percent step-load increase or decrease. Voltage recovers to remain within the steady-state operating band within three seconds.

**855.02.03.04** Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.

**855.02.03.05** Steady-State Frequency Stability: When system is operating at any constant load within rated load, there are no random speed variations outside the steady-state operational band and no hunting or surging of speed.

**855.02.03.06** Transient Frequency Performance: Less than 5 percent variation for a 50 percent step-load increase or decrease. Frequency recovers to remain within the steady-state operating band within five seconds.

**855.02.03.07** Output Waveform: At no load, harmonic content measured line to line or line to neutral does not exceed 5 percent total and 3 percent for single harmonics. The telephone influence factor, determined according to NEMA MG 1, shall not exceed 50.

**855.02.03.08** Sustained Short-Circuit Current: For a three-phase, bolted short circuit at system output terminals, the system will supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to any generator system component.

**855.02.03.09** Start Time: Comply with NFPA 110, Type 10, system requirements.

#### 855.02.04 Service Conditions

**855.02.04.01** Environmental Conditions: Engine generator system withstands the following environmental conditions without mechanical or electrical damage or degradation of performance capability:



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1. Ambient Temperature: Minus 15 to plus 40 deg C.
2. Relative Humidity: 0 to 95 percent.
3. Altitude: Sea level to 1000 feet (300 m).

**855.02.04.02** Unusual Service Conditions: Engine generator equipment and installation are required to operate under the following conditions:

1. High salt-dust content in the air due to sea-spray evaporation.

#### **855.02.05 Engine**

**855.02.05.01** Comply with NFPA 37.

**855.02.05.02** Fuel: Fuel oil, Grade DF-2.

**855.02.05.03** Rated Engine Speed: 1800 rpm.

**855.02.05.04** Maximum Piston Speed for Two-Cycle Engines: 1725 fpm (8.8 m/s).

**855.02.05.05** Maximum Piston Speed for Four-Cycle Engines: 2250 fpm (11.4 m/s).

**855.02.05.06** Lubrication System: Pressurized by a positive-displacement pump driven from engine crankshaft. The following items are mounted on engine or skid:

1. Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.
2. Thermostatic Control Valve: Controls flow in system to maintain optimum oil temperature. Unit is capable of full flow and is designed to be fail-safe.
3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps or siphons or special tools or appliances.

**855.02.05.07** Engine Fuel System: Comply with NFPA 37. System includes the following:

1. Main Fuel Pump: Mounted on engine. Pump ensures adequate primary fuel flow under starting and load conditions.
2. Relief/Bypass Valve: Automatically regulates pressure in fuel line and returns excess fuel to source.

**855.02.05.08** Coolant Jacket Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment.



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**855.02.06 Governor Type:** Mechanical.

#### **855.02.07 Engine Cooling System**

**855.02.07.01 Description:** Closed loop, liquid cooled, with radiator factory mounted on engine generator-set skid and integral engine-driven coolant pump.

**855.02.07.02 Radiator:** Rated for specified coolant.

**855.02.07.03 Coolant:** Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.

**855.02.07.04 Expansion Tank:** Constructed of welded steel plate and equipped with gage glass and petcock.

**855.02.07.05 Temperature Control:** Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.

**855.02.07.06 Coolant Hose:** Flexible assembly with inside surface of nonporous rubber and outer covering of aging-, ultraviolet-, and abrasion-resistant fabric.

1. **Rating:** 50-psig (345-kPa) maximum working pressure with 180 deg F (82 deg C) coolant, and noncollapsible under vacuum.
2. **End Fittings:** Flanges or steel pipe nipples with clamps to suit piping and equipment connections.

#### **855.02.08 Fuel Supply System**

**855.02.08.01 Comply with NFPA 30 and NFPA 37.**

**855.02.08.02 Base-Mounted Fuel Oil Tank:** Factory-installed and -piped, listed and labeled fuel oil tank. Features include the following:

1. Tank level indicator.
2. Capacity: Fuel for SEVENTY hours continuous operation at 100 percent rated power output.
3. Vandal-resistant fill cap.



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4. Containment Provisions: Comply with requirements of authorities having jurisdiction.

**855.02.09 Muffler** Residential type, sized as recommended by engine manufacturer. Measured sound level at a distance of 10 feet (3 m) from exhaust discharge, is 95 dBA or less.

**855.02.10 Control and Monitoring** Functional Description: When the mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic-transfer switches initiate starting and stopping of the generator set. When the mode-selector switch is switched to the on position, the generator set manually starts. The off position of the same switch initiates generator-set shutdown. When the generator set is running, specified system or equipment failures or derangements automatically shut down the generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down the generator set.

**855.02.10.01 Configuration:** Operating and safety indications, protective devices, basic system controls, and engine gages are grouped on a common control and monitoring panel mounted on the generator set. Mounting method isolates the control panel from generator-set vibration.

**855.02.10.02 Indicating and Protective Devices and Controls:** Include the following:

1. AC voltmeter.
2. AC ammeter.
3. AC frequency meter.
4. DC voltmeter (alternator battery charging).
5. Engine-coolant temperature gage.
6. Engine lubricating-oil pressure gage.
7. Running-time meter.
8. Ammeter-voltmeter, phase-selector switch(es).
9. Generator-voltage adjusting rheostat.
10. Start-stop switch.
11. Overspeed shutdown device.
12. Coolant high-temperature shutdown device.
13. Coolant low-level shutdown device.
14. Oil low-pressure shutdown device.
15. Fuel tank derangement alarm.
16. Fuel tank high-level shutdown of fuel supply alarm.
17. Generator overload.



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**855.02.10.03** Supporting Items: Include sensors, transducers, terminals, relays, and other devices, and wiring required to support specified items. Locate sensors and other supporting items on engine, generator, or elsewhere as indicated. Where not indicated, locate to suit manufacturer's standard.

**855.02.10.04** Connection to Data Link: A separate terminal block, factory wired to Form C dry contacts, for each alarm and status indication is reserved for connections for data link transmission of indications to remote data terminals.

#### **855.02.11 Generator Over-current and Fault Protection**

**855.02.11.01** Generator Circuit Breaker: Molded-case, thermal-magnetic type; 100 percent rated; complying with NEMA AB 1 and UL 489.

1. Tripping Characteristic: Designed specifically for generator protection.
2. Trip Rating: Matched to generator rating.
3. Shunt Trip: Connected to trip breaker when generator set is shut down by other protective devices.
4. Mounting: Adjacent to or integrated with control and monitoring panel.

**855.02.11.02** Generator Protector: Microprocessor-based unit that continuously monitors current level in each phase of generator output, integrates generator heating effect over time, and predicts when thermal damage of the alternator will occur. When signaled by the protector or other generator-set protective devices, a shunt-trip device in the generator disconnect switch shall open the switch to disconnect the generator from the load circuits. Protector performs the following functions:

1. Initiates a generator overload alarm when the generator has operated at an overload equivalent to 110 percent of full-rated load for 60 seconds. Indication for this alarm is integrated with other generator-set malfunction alarms.
2. Under single or three-phase fault conditions, regulates the generator to 300 percent of rated full-load current for up to 10 seconds.
3. As heating effect on the generator of over-current approaches the thermal damage point of the unit, the protector switches the excitation system off, opens the generator disconnect switch, and shuts down the generator set.
4. Senses clearing of a fault by other over-current devices and controls recovery of rated voltage to avoid overshoot.

**855.02.11.03** Ground-Fault Indication: Comply with NFPA 70, Article 700-7(d). Integrate ground-fault alarm indication with other generator-set alarm indications.



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#### 855.02.12 Generator, Exciter, and Voltage Regulator

855.02.12.01 Comply with NEMA MG 1 and specified performance requirements.

855.02.12.02 Drive: Generator shaft is directly connected to engine shaft. Exciter is rotated integrally with generator rotor.

855.02.12.03 Electrical Insulation: Class H or Class F.

855.02.12.04 Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required.

855.02.12.05 Construction prevents mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.

855.02.12.06 Excitation uses no slip or collector rings, or brushes, and is arranged to sustain generator output under short-circuit conditions as specified.

855.02.12.07 Enclosure: Drip proof.

855.02.12.08 Instrument Transformers: Mounted within generator enclosure.

855.02.12.09 Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified.

1. Adjusting rheostat on control and monitoring panel provides plus or minus 5 percent adjustment of output- voltage operating band.

855.02.12.10 Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.

855.02.12.11 Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.

855.02.12.12 Subtransient Reactance: 12 percent, maximum.

855.02.13 **Outdoor Generator-set Enclosure** Description: Vandal-resistant, weatherproof steel housing, wind resistant up to 100 mph (160 km/h). Multiple panels are lockable and provide adequate access to components requiring maintenance. Panels are removable by one person without tools. Instruments and control are mounted within enclosure.



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**855.02.13.01** Muffler Location: Within enclosure.

**855.02.13.02** Engine Cooling Airflow through Enclosure: Adequate to maintain temperature rise of system components within required limits when unit operates at 110 percent of rated load for two hours with ambient temperature at top of range specified in system service conditions.

**855.02.13.03** Louvers: Fixed-engine cooling air inlet and discharge. Louvers prevent entry of rain and snow.

**855.02.13.04** Automatic Dampers: At engine cooling air inlet and discharge. Dampers are closed to reduce enclosure heat loss in cold weather when unit is not operating. Dampers shall be gravity type.

**855.02.13.05** GFI Receptacle: A GFI type duplex receptacle shall be mounted within the enclosure. The outlet shall be wired to remain energized at all times on its own single pole circuit.

**855.02.13.06** Lighting: A 110 lumens light output rated compact Fluorescent (CFL) bulb with 0 degrees Fahrenheit start, mounted to the inside a non-corrosive metal cage, top front portion of the enclosure. The light shall be activated by opening the access panels to the enclosure. The light and panel switch shall be on its own circuit, and the panel switch shall only control the light.

**855.02.13.07** Distribution Panel: A 100 amp main circuit breaker, 208/120 volts electrical distribution panel shall be mounted within the enclosure. All items requiring constant power such as receptacle, lighting, battery charger, lube-oil heater, strip heater, etc. shall be factory wired to the distribution panel.

**855.02.14** Vibration Isolation Pad: The generator shall be outfitted with a pad to isolate electric components from the motor vibration.

**855.02.15 Finishes** Outdoor Enclosures: Manufacturer's standard enamel over corrosion-resistant pretreatment and compatible standard primer.

#### **855.02.16 Source Quality Control**

**855.02.16.01** Factory Tests: Include prototype testing and Project-specific equipment testing (testing of equipment manufactured specifically for this Project).



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**855.02.16.02** Prototype Testing: Performed on a separate engine generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.

1. Tests: Comply with those required for Level 1 energy converters in Paragraphs 3.2.1, 3.2.1.1, and 3.2.1.2 of NFPA 110.
2. Generator Tests: Comply with IEEE 115.
3. Components and Accessories: Items furnished with installed unit that are not identical to those on tested prototype have been tested to demonstrate compatibility and reliability.

**855.02.16.03** Project-Specific Equipment Tests: Factory test engine generator set and other system components and accessories before shipment. Perform tests at rated load and power factor. Include the following tests.

1. Full load run for 4 hours.
2. Maximum power.
3. Voltage regulation.
4. Transient and steady-state governing.
5. Single-step load pickup.
6. Safety shutdown.

**855.02.16.04** Observation of Factory Tests: Provide 14 days' advance notice of tests and opportunity for observation of test by Owner's representatives.

**855.02.16.05** Report factory test results within 10 days of completion of test.

#### 855.03 CONSTRUCTION

**855.03.01 Examination** Examine areas, equipment foundations, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine generator performance.

**855.03.01.01** Proceed with installation only after unsatisfactory conditions have been corrected.

**855.03.01.02** Examine roughing-in of cooling-system piping systems and electrical connections. Verify actual locations of connections before packaged engine generator installation.

**855.03.02 Concrete Bases** Install concrete bases of dimensions indicated for packaged engine generators. Refer to 2008 SHA Standard Specification Section 801 Concrete Foundations.



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**855.03.03 Installation** Comply with packaged engine generator manufacturers' written installation and alignment instructions, and with NFPA 110.

**855.03.03.01** Set packaged engine generator set on concrete bases.

1. Support generator-set mounting feet on rectangular metal blocks and shims or on metal wedges having small taper, at points near foundation bolts to provide 3/4- to 1-1/2-inch (19- to 38-mm) gap between pump base and foundation for grouting.
2. Adjust metal supports or wedges until generator is level.

**855.03.03.02** Install packaged engine generator to provide access for periodic maintenance, including removal of drivers and accessories.

**855.03.03.03** Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted. Verify that electrical wiring is installed according to manufacturers' submittal and installation requirements in 2008 SHA Standard Specification Section 810. Proceed with equipment startup only after wiring installation is satisfactory.

#### **855.03.04 Connections**

**855.03.04.01** Electrical wiring and connections are specified in 2008 SHA Standard Specification Section 810.

**855.03.04.02** Ground equipment - tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

#### **855.03.05 Field Quality Control**

**855.03.05.01** Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections, and to assist in testing. Report results in writing.

**855.03.05.02** Testing: Owner will engage a qualified testing agency to perform field quality-control testing.

**855.03.05.03** Testing: Engage a qualified independent testing agency to perform field quality-control testing.



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**855.03.05.04** Testing: Perform field quality-control testing under the supervision of the manufacturer's factory-authorized service representative.

**855.03.05.05** Tests: Include the following:

1. Tests recommended by manufacturer.
2. InterNational Electrical Testing Association Tests: Perform each visual and mechanical inspection and electrical and mechanical test stated in NETA ATS for emergency engine generator sets, except omit vibration baseline test. Certify compliance with test parameters for tests performed.
3. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here including, but not limited to, the Single-step full-load pickup test.
4. Battery Tests: Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions. Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery. Verify acceptance of charge for each element of battery after discharge. Verify measurements are within manufacturer's specifications.
5. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
6. System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine generator system before and during system operation. Check for air, exhaust, and fluid leaks.
7. Exhaust-System Back-Pressure Test: Use a manometer with a scale exceeding 40 inches wg (120 kPa). Connect to exhaust line close to engine exhaust manifold. Verify that back pressure at full-rated load is within manufacturer's written allowable limits for the engine.
8. Exhaust Emissions Test: Comply with applicable government test criteria.
9. Voltage and Frequency Transient Stability Tests: Use recording oscilloscope to measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases, and verify that performance is as specified.
10. Harmonic-Content Tests: Measure harmonic content of output voltage under 25 percent and at 100 percent of rated linear load. Verify that harmonic content is within specified limits.

**855.03.05.06** Coordinate tests with tests for transfer switches and run them concurrently.

**855.03.05.07** Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.



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**855.03.05.08** Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.

**855.03.05.09** Test instruments shall have been calibrated within the last 12 months, traceable to standards of the National Institute for Standards and Technology, and adequate for making positive observation of test results. Make calibration records available for examination on request.

**855.03.06 Commissioning Battery Equalization:** Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.

**855.03.07 Cleaning** On completion of installation, inspect system components. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish. Clean components internally using methods and materials recommended by manufacturer.

**855.03.08 Demonstration** Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators as specified below:

1. Coordinate this training with that for transfer switches.
2. Train Owner's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment.
3. Review data in maintenance manuals.
4. Review data in maintenance manuals.
5. Schedule training with Owner, through Architect, with at least seven days' advance notice.
6. Minimum Instruction Period: Eight hours.

**851.04 MEASUREMENT AND PAYMENT** Furnishing and installing Packaged Engine Generator will be measured and paid for at the contract unit price. Work will include all labor, materials, including enclosure, distribution panel, wiring, and complete, operational and incidental connections and testing, in order to assure operation, as approved by the Authority and development of shop drawings.

ITEM	DESCRIPTION OF ITEM	UNIT
839	150kW PACKAGED GENERATOR	EACH



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#### CATEGORY 800 TRAFFIC

#### SECTION 856 – AUTOMATIC TRANSFER SWITCH

##### 856.01 GENERAL

##### 856.01 Related Documents

**856.01.01 Related Documents** Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

**856.01.02 Summary** This Section includes transfer switches rated 600 V and less, including the following:

1. Automatic transfer switch.
2. Automatic closed-transition transfer switch.
3. Bypass/isolation switch.
4. Nonautomatic transfer switch.

##### 856.01.03 Submittals

**856.01.03.01 Product Data:** Include ratings and dimensioned plans, sections, and elevations showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material lists for each switch specified.

**856.01.03.02 Wiring Diagrams:** Detail wiring for transfer switches and differentiate between manufacturer-installed and field-installed wiring. Show both power and control wiring.

**856.01.03.03 Single-Line Diagram:** Show connections between transfer switch, bypass/isolation switch, power sources, and load; and show interlocking provisions for each combined transfer switch and bypass/isolation switch.

**856.01.03.04 Product Certificates:** Signed by manufacturer certifying that products furnished comply with requirements and that switches have been tested for load ratings and short-circuit closing and withstand ratings applicable to units for Project.

**856.01.03.05 Qualification Data:** For firms and persons specified in "Quality Assurance" Article.

**856.01.03.06 Field Test Reports:** Indicate and interpret test and inspection results for compliance with performance requirements.



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**856.01.03.07 Maintenance Data:** For each type of product to include in maintenance manuals. Include all features and operating sequences, both automatic and manual. List all factory settings of relays and provide relay-setting and calibration instructions, including software, where applicable.

#### **856.01.04 Quality Assurance**

**856.01.04.01 Manufacturer Qualifications:** Maintain a service center capable of providing emergency maintenance and repairs at Project site with an eight-hour maximum response time.

**856.01.04.02 Testing Agency Qualifications:** Testing agency as defined by OSHA in 29 CFR 1910.7 or a member company of the InterNational Electrical Testing Association and that is acceptable to authorities having jurisdiction. **Testing Agency's Field Supervisor:** Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies (Level 3 or higher), to supervise on-site testing specified in Section 856.03.

**856.01.04.03 Source Limitations:** Obtain automatic transfer switch, bypass/isolation switch, nonautomatic transfer switch, remote annunciators, and remote annunciator and control panels through one source from a single manufacturer.

**856.01.04.04 Electrical Components, Devices, and Accessories:** Listed and labeled as defined in NFPA 70, Article 100, for emergency service under UL 1008, by a testing agency acceptable to authorities having jurisdiction.

**856.01.04.05** Comply with NEMA ICS 1.

**856.01.04.06** Comply with NFPA 70.

**856.01.04.07** Comply with NFPA 99.

**856.01.04.08** Comply with NFPA 110.

**856.01.04.09** Comply with UL 1008, unless requirements of these Specifications are stricter.

#### **856.02 MATERIAL**

**856.02.01 Manufacturers** Subject to compliance with requirements, provide products by one of the following:

1. Caterpillar, Inc.; Engine Division.
2. Emerson Electric Co.; Automatic Switch Co. Subsidiary.



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3. Generac Corp.
4. Kohler Co.
5. Onan Corp.; Electrical Products Division.
6. Spectrum Detroit Diesel.
7. Russelectric, Inc.
8. Zenith Controls, Inc.

#### 856.02.02 Automatic Transfer Switch

**856.02.02.01** Switching Arrangement: Double-throw type, incapable of pauses or intermediate position stops during normal functioning, unless otherwise indicated.

**856.02.02.02** Manual Switch Operation: Under load, with door closed and with either or both sources energized. Transfer time is the same as for electrical operation. Control circuit automatically disconnects from electrical operator during manual operation.

**856.02.02.03** Signal-before-Transfer Contacts: A set of normally open/normally closed dry contacts operates in advance of retransfer to normal source. Interval is adjustable from 1 to 30 seconds.

**856.02.02.04** Digital Communications Interface: Matched to capability of remote annunciator or annunciator and control panel.

**856.02.02.05** Transfer Switches Based on Molded-Case-Switch Components: Comply with NEMA AB 1, UL 489, and UL 869A.

**856.02.02.06** In-Phase Monitor: Factory-wired, internal relay controls transfer so it occurs only when the two sources are synchronized in phase. Relay compares phase relationship and frequency difference between normal and emergency sources and initiates transfer when both sources are within 15 electrical degrees, and only if transfer can be completed within 60 electrical degrees. Transfer is initiated only if both sources are within 2 Hz of nominal frequency and 70 percent or more of nominal voltage.

#### 856.02.03 Automatic Transfer Switch Features

**856.02.03.01** Undervoltage Sensing for Each Phase of Normal Source: Senses low phase-to-ground voltage on each phase. Pickup voltage is adjustable from 85 to 100 percent of nominal, and dropout voltage is adjustable from 75 to 98 percent of pickup value. Factory set for pickup at 90 percent and dropout at 85 percent.



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**856.02.03.02** Time delay for override of normal-source voltage sensing delays transfer and engine start signals. Adjustable from zero to six seconds, and factory set for one second.

**856.02.03.03** Voltage/Frequency Lockout Relay: Prevents premature transfer to generator set. Pickup voltage is adjustable from 85 to 100 percent of nominal. Factory set for pickup at 90 percent. Pickup frequency is adjustable from 90 to 100 percent of nominal. Factory set for pickup at 95 percent.

**856.02.03.04** Time Delay for Retransfer to Normal Source: Adjustable from 0 to 30 minutes; factory set for 10 minutes. Provides automatic defeat of delay on loss of voltage or sustained undervoltage of emergency source, provided normal supply has been restored.

**856.02.03.05** Test Switch: Simulates normal-source failure.

**856.02.03.06** Switch-Position Pilot Lights: Indicate source to which load is connected.

**856.02.03.07** Source-Available Indicating Lights: Supervise sources via transfer-switch, normal- and emergency-source sensing circuits.

1. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."
2. Emergency Power Supervision: Red light with nameplate engraved "Emergency Source Available."

**856.02.03.08** Unassigned Auxiliary Contacts: Two normally open single-pole, double-throw contacts for each switch position, rated 10 A at 240-V ac.

**856.02.03.09** Transfer Override Switch: Overrides automatic retransfer control so automatic transfer switch will remain connected to emergency power source regardless of condition of normal source. Pilot light indicates override status.

**856.02.03.10** Engine Starting Contacts: One isolated, normally closed and one isolated, normally open, rated 10 A at 32-V dc minimum.

**856.02.03.11** Engine Shutdown Contacts: Instantaneous. Initiates shutdown sequence at remote engine-generator controls after retransfer of load to normal source.

**856.02.03.12** Engine Shutdown Contacts: Time delay adjustable from zero to five minutes; factory set for five minutes. Initiates shutdown at remote engine-generator controls after retransfer of load to normal source.



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**856.02.03.13 Engine-Generator Exerciser:** Solid-state, programmable-time switch starts engine-generator set and transfers load to it from normal source for a preset time, then retransfers and shuts down engine after a preset cool-down period. Initiates exercise cycle at preset intervals adjustable from 7 to 30 days. Running periods are adjustable from 10 to 30 minutes. Factory settings are for 7-day exercise cycle, 20-minute running period, and 5-minute cool-down period. Exerciser features include the following:

1. Exerciser Transfer Selector Switch: Permits selection of exercise with and without load transfer.
2. Push-button programming control with digital display of settings.
3. Integral battery operation of time switch when normal control power is not available.

**856.02.04 Finishes Enclosures:** Manufacturer's standard enamel over corrosion-resistant pretreatment and primer.

**856.02.05 Source Quality Control Factory Test Components, Assembled Switches, and Associated Equipment:** Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

#### 856.03 CONSTRUCTION

**856.03.01 Application Four-Pole Switches:** Where four-pole switches are indicated, install neutral switching.

**856.03.02 Wiring to Remote Components** Match type and number of cables and conductors to control and communications requirements of transfer switches as recommended by manufacturer. Increase raceway sizes at no additional cost to Owner if necessary to accommodate required wiring.

**856.03.03 Connections** Ground equipment as indicated and as required by NFPA 70.

#### 856.03.04 Field Quality Control

**856.03.04.01** Test transfer-switch products by operating them in all modes. Perform tests recommended by manufacturer under the supervision of manufacturer's factory-authorized service representative. Correct deficiencies and report results in writing. Record adjustable relay settings.

**856.03.04.02** Owner will engage a qualified testing agency to perform the following field quality-control testing:



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**856.03.04.03** Engage a qualified testing agency to perform the following field quality-control testing:

**856.03.04.04** Perform the following field quality-control testing under the supervision of the manufacturer's factory-authorized service representative in addition to tests recommended by the manufacturer:

1. Before energizing equipment, after transfer-switch products have been installed:
  - a. Measure insulation resistance phase-to phase and phase-to-ground with insulation-resistance tester. Include external annunciation and control circuits. Use test voltages and procedure recommended by manufacturer. Meet manufacturer's specified minimum resistance.
  - b. Check for electrical continuity of circuits and for short circuits.
  - c. Inspect for physical damage; proper installation and connection; and integrity of barriers, covers, and safety features.
  - d. Verify that manual transfer warnings are properly placed.
  - e. Perform manual transfer operation.
2. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least three times.
  - a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.
  - b. Simulate loss of phase-to-ground voltage for each phase of normal source.
  - c. Verify time-delay settings.
  - d. Verify pickup and dropout voltages by data readout or inspection of control settings.
  - e. Test bypass/isolation unit functional modes and related automatic transfer-switch operations.
  - f. Perform contact-resistance test across main contacts and correct values exceeding 500 microhms and values for one pole deviating by more than 50 percent from other poles.
  - g. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown sequence.

**856.03.04.05** Coordinate tests with tests of generator plant and run them concurrently.

**856.03.04.06** Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.



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**856.03.05 Cleaning**

**856.03.05.01** After completing equipment installation, inspect unit components. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish.

**856.03.05.02** Clean equipment internally, on completion of installation, according to manufacturer's written instructions.

**856.03.06 Demonstration**

**856.03.06.01** Engage a factory-authorized service representative to train Owner's personnel to adjust, operate, and maintain transfer switches and related equipment as specified below:

1. Coordinate this training with that for generator equipment.
2. Train Owner's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment.
3. Review data in maintenance manuals.
4. Schedule training with Owner, through Architect, with at least seven days' advance notice.
5. Provide a minimum of four hours of instruction.

**856.04 MEASUREMENT AND PAYMENT** Furnishing and installing the Automatic Transfer Switch will be measured and paid for at the contract unit price. Work will include all labor, materials, wiring, and connections, and complete, operational and incidental connections and testing, in order to assure operation, as approved by the Authority and development of shop drawings.

<b>ITEM</b>	<b>DESCRIPTION OF ITEM</b>	<b>UNIT</b>
844	800A AUTOMATIC TRANSFER SWITCH	EACH



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**CATEGORY 800  
TRAFFIC**

**SECTION 857 – GENERAL PURPOSE TRANSFORMERS**

**857.01 GENERAL**

**857.01.01** The Work specified in this Section consists of furnishing, installing and testing of General Purpose Transformers (600 volts and below).

**857.01.02 Related Documents**

**857.01.02.01** Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

**857.01.02.02** The publications listed below form a part of these Specifications to the extent referenced. The publications are referred to in the text by basic designation only. In case of conflict between provisions of codes, laws, ordinances, and these Specifications, including the Contract Drawings, the more stringent requirements will apply.

Materials and workmanship shall be in accordance with the following Standards and Codes to the extent specified herein.

1. American National Standards Institute (ANSI) Publications:
  - C2 National Electrical Safety Code
  - C57.12.01 General Requirements for Dry-Type Distribution and Power Transformers
  - C57.12.91 Test Code for Dry-Type Distribution and Power Transformers
  - C57.94 Recommended Practices for Installation, Application, Operation and Maintenance of Dry-Type General Purpose Distribution and Power Transformers
  - C57.96 Guide for Loading Dry-Type Transformers
  - Z55.1 Gray Finishes for Industrial Apparatus and Equipment
2. National Electrical Manufacturers Association (NEMA) Publication:
  - ST20 Dry Type Transformers for General Applications
3. National Fire Protection Association (NFPA) Publication:
  - 70 National Electrical Code
4. Underwriter's Laboratories Inc. (UL) Publications:
  - 1561 Dry-Type General Purpose and Power Transformers



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5. Institute of Electrical and Electronic Engineers (IEEE) Publication:  
P745 Guide of Conducting a Transient Voltage Analysis for a Dry-Type  
Transformer Coil

#### 857.01.03 Submittals

**857.01.03.01 Product Data:** Include ratings and dimensioned plans, sections, and elevations showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material lists for each transformer specified.

**857.01.03.02 Drawing of nameplate with data filled in.**

**857.01.03.03 Certified Laboratory Test Reports:** Submit to the Engineer, in triplicate, certified copies of reports for all tests required in accordance with referenced standards and as specified herein.

**857.01.03.04 Spare Parts Data:** As soon as practicable after acceptance of materials and equipment, furnish to the Engineer spare parts data for each different item of equipment listed. The data shall include a complete list of parts and supplies, with current unit prices and source of supply. The foregoing shall not relieve the Contractor of any responsibilities under the Warranty.

**857.01.03.05 Test procedures, detailing tests to be conducted, description of how tests will be performed, and what the expected results shall be.** Test reports shall conform to the criteria defined in NETA ATS-1995.

#### 857.02 MATERIAL

**857.02.01 Standards:** Shall conform to NEMA ST20. All characteristics, definitions, terminology, voltage designations and tests shall be in accordance with ANSI C57.12.01.

**857.02.02 Application:** Suitable for indoor application and step down of the incoming 480 volt to 208Y/120 volt or 120/240 volt utilization level.

**857.02.03 Listing:** Shall be UL listed.

**857.02.04 Type:** Two winding, low voltage, dry-type.

**857.02.05 Cooling:** Self-cooled.



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**857.02.06 Core and Coil Assembly:** Coils shall be of the continuous wound construction. Cores shall be constructed of high grade, non-aging, grain-oriented silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Magnetic flux densities shall be kept well below the saturation point. The core and coil assembly shall be completely encapsulated in a proportional mixture of resin and aggregate to provide a moisture-proof, shock resistant seal.

**857.02.07 Insulation System:**

<u>kVA Rating</u>	<u>Insulation</u>
2 and below	150°C, based on 80°C rise by resistance
3 thru 15	185°C, based on 115°C rise by resistance

**857.02.08 Enclosure:** Shall be constructed of heavy gauge, sheet-steel, totally enclosed, non-ventilated.

**857.03 CONSTRUCTION**

**857.03.01** Installation shall comply with ANSI C2, C57.94, C57.96, NFPA 70, and to the requirements specified herein.

**857.03.02** Make power cable and control wire connections in accordance with manufacturer's recommendations, 2008 SHA Standard Specification Section 810 and as shown on the drawings.

**857.03.03** Install transformers in position shown and in accordance with manufacturer's recommendations.

**857.03.04 Tests:** Before placing transformer(s) in service test transformer secondary voltage.

**857.03.05 Cleaning**

**857.03.05.01** After completing equipment installation, inspect unit components. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish.

**857.03.05.02** Clean equipment internally, on completion of installation, according to manufacturer's written instructions.

**857.04 MEASUREMENT AND PAYMENT** Furnishing and installing the General Purpose Transformer will be measured and paid for at the contract unit price. Work will include all labor, materials, including housing, gasket, wiring, and complete, operational and incidental connections



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and testing, in order to assure operation, as approved by the Authority and development of shop drawings.

ITEM NUMBER	DESCRIPTION OF ITEM	UNIT
841	10KVA, 208 V - 600 V SINGLE PHASE TRANSFORMER	EACH



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**CATEGORY 800**

**SECTION 899 – MEASUREMENT AND PAYMENT**

All pay items shall include all materials, labor, any mobilization and equipment necessary to furnish and install a complete, operational, and acceptable system as specified herein and as shown on the plans. Payment of items shall include all testing and guarantee required by the specifications and special provisions. Any requirements of the specifications, special provisions or plans not specifically detailed or mentioned in a payment item shall be considered incidental to the pay items below.

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

101	MOBILIZATION	LUMP SUM
102	CPM TYPE A SCHEDULE (SECTION 109)	LUMP SUM
103	ENGINEERS OFFICE TYPE C	LUMP SUM
104	MAINTENANCE OF TRAFFIC (SECTION 104)	LUMP SUM
105	SELECTIVE DEMOLITION	LUMP SUM
106	EACH OF DRUMS FOR MAINTENANCE OF TRAFFIC (SECTION 104.12)	PER UNIT DAY
801	3/4" RIGID GALVANIZED STEEL BRIDGE MOUNTED CONDUIT	LINEAR FEET
802	1" RIGID GALVANIZED STEEL BRIDGE MOUNTED CONDUIT	LINEAR FEET
803	2" RIGID GALVANIZED STEEL BRIDGE MOUNTED CONDUIT	LINEAR FEET
804	4" RIGID GALVANIZED STEEL BRIDGE MOUNTED CONDUIT	LINEAR FEET
805	2" PVC SCH. 80 CONDUIT DIRECT BURIED-TRENCHED	LINEAR FEET
806	4" PVC SCH. 80 CONDUIT BORED	LINEAR FEET
807	4" PVC SCH. 80 CONDUIT DIRECT BURIED-TRENCHED	LINEAR FEET



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808	2" PVC COATED RGS ELBOW	EACH
809	4" PVC COATED RGS ELBOW	EACH
810	2/C #2 AWG MESSENGER SUPPORTED CABLE	LINEAR FEET
811	4/C #2 AWG MESSENGER SUPPORTED CABLE	LINEAR FEET
812	500 KCMIL XHHW COPPER CONDUCTOR	LINEAR FEET
813	#2 AWG XHHW COPPER CONDUCTOR	LINEAR FEET
814	#6 AWG XHHW COPPER CONDUCTOR	LINEAR FEET
815	#8 AWG XHHW COPPER CONDUCTOR	LINEAR FEET
816	#10 AWG XHHW COPPER CONDUCTOR	LINEAR FEET
817	#12 AWG THWN COPPER CONDUCTOR	LINEAR FEET
818	#6 AWG GROUND CONDUCTOR	LINEAR FEET
819	#6 AWG BARE GROUND CONDUCTOR	LINEAR FEET
820	#8 AWG GROUND CONDUCTOR	LINEAR FEET
821	#10 AWG GROUND CONDUCTOR	LINEAR FEET
822	#12 AWG GROUND CONDUCTOR	LINEAR FEET
823	36"X12"X6" NEMA 4X JUNCTION BOX	EACH
824	12"X12"X6" NEMA 1 JUNCTION BOX	EACH
825	TYPE I CONNECTOR	EACH
826	TYPE II CONNECTOR	EACH
827	TYPE III CONNECTOR	EACH
828	TYPE IV CONNECTOR	EACH
829	20A TRIP, SINGLE-POLE, 600 V CIRCUIT BREAKER	EACH
830	60A TRIP, 2-POLE, 208 V CIRCUIT BREAKER	EACH
831	20A NON-FUSED DISCONNECT SWITCH	EACH



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832	RED LED NAVIGATION LIGHT	EACH
833	WHITE LED NAVIGATION LIGHT	EACH
834	GREEN LED NAVIGATION LIGHT	EACH
835	RED SOLAR LED NAVIGATION LIGHT	EACH
836	FOG HORN SYSTEM	EACH
837	LED FLASHING AERIAL BEACON	EACH
838	PIER MOUNTED EQUIPMENT PLATFORM	EACH
839	150KW PACKAGED GENERATOR	EACH
840	GENERATOR CONCRETE FOUNDATION	CUBIC YARDS
841	10KVA, 208 V - 600 V SINGLE PHASE TRANSFORMER	EACH
842	GROUND ROD	EACH
843	HAND HOLE	EACH
844	800A AUTOMATIC TRANSFER SWITCH	EACH
845	CONTACTOR AND CONTROLLER	EACH
846	REPAIR OF FOG HORN	EACH
847	NEMA 3R, STAINLESS STEEL DISCONNECT SWITCH, 2-POLE	EACH
848	NEMA 3R, STAINLESS STEEL DISCONNECT SWITCH, 3-POLE	EACH
849	MISCELLANEOUS ELECTRICAL REPAIRS AND/OR CONSTRUCTION	LUMP SUM



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#### CATEGORY 900

#### MATERIALS

#### SECTION 921 - MISCELLANEOUS

#### 782 921.07 CONDUITS

##### ADD:

This minimum size conduit for electrical raceway shall be  $\frac{3}{4}$ ". Larger sizes shall be used as indicated on the plans, within the special provisions or specifications, or as required by the NEC or other applicable code.

This minimum size conduit for communications raceway shall be 1". Larger sizes shall be used as indicated on the plans, within the special provisions or specifications, or as required by the NEC or other applicable code.

#### 783 921.07.01 Metallic Conduit

##### ADD:

- (a) All fittings (couplings, connectors, etc.) for metal conduit shall be steel, set screw or compression type. No malleable or aluminum fittings will be considered.
- (b) Fittings for all flexible metallic conduits shall be steel T&B Tite-Bite style or equivalent. No malleable or aluminum fittings will be considered.
- (c) All Conduit Outlet Bodies (LB's, T's, etc.) not subject to physical damage must be of Iron construction Crouse-Hinds Form 5, 7, 8, or equivalent shall be used. No Aluminum will be considered
- (d) All Conduit Outlet Bodies (LB's, T's, etc.) installed where subject to physical damage must be of Malleable Iron construction Crouse-Hinds Form 5 or equivalent shall be used. No Aluminum will be considered



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#### CATEGORY 900 MATERIALS

#### SECTION 921.07-CONDUITS

783 **INSERT**: The following.

##### **921.07.04 Liquid Tight Flexible Metallic Conduit.**

**921.07.04.1** Flexible metal conduit shall be constructed of galvanized steel. Where flexible conduit is exposed to the weather and where indicated on the drawings, liquid tight flexible conduit shall be used.

**921.07.04.2** Connectors for flexible conduit shall be steel insulated throat type with nylon insulators. Connector shall be secured to flexible conduit by metal teeth biting into conduit under pressure from connector bolt. Do not use squeeze type connector.

**921.07.04.3** Connectors for liquid tight flexible conduit shall be steel insulated throat type with nylon insulators. Connectors shall be of the screw-in ground cone type.

**CATEGORY 900  
MATERIALS**

**SECTION 950 - TRAFFIC MATERIALS**

**950.03 REFLECTORIZATION OF SIGNS AND CHANNELIZING DEVICES.**

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

**INSERT:** The following.

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

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

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

**950.03.02 Temporary Traffic Signs (TTS).**

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

**950.03.03 Black Sheeting.** Black sheeting shall be nonreflective.

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



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#### CATEGORY 900 MATERIALS

#### SECTION 950.06-ELECTRICAL CABLE AND WIRE

##### 795 950.06.10 Messenger Supported Aerial Cable.

INSERT: The following.

**950.06.10 Messenger Supported Aerial Cable.** Messenger supported aerial cable shall be multi-conductor, and rated for 600V. Cable shall meet or exceed the electrical and physical requirements of ICEA S-95-658/NEMA WC70. The conductors shall be annealed non-coated copper Compact Stranded per ASTM B-496, and the stranding shall be compact, Class B. The insulation thickness shall be 55-mil insulation level. The jacket shall be 80-mil insulation level Polyvinyl Chloride (PVC) and shall have UV protection. The Cable Tie system for fastening the aerial cable to the messenger cable shall consist of smooth straps and separate, compact plastic heads which enclosed stainless steel grippers. The material of the straps, heads, and spacers shall be UV-weather resistant.