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01 -

SM No. CBR9371010011

PROPOSAL AND CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

01
Bascule Bridge Rehabilitation on SR 605 over Industrial Waterway (Bridge No. 3.5), known as Federal Aid Project No. BR-9371-01(001) / 107505301 in Harrison County.

Project Completion: 344 Working Days

(STATE DELEGATED)

NOTICE

BIDDERS MUST COMPLETE AN ONLINE REQUEST FOR PERMISSION TO BID THIS PROJECT.

Electronic addendum updates will be posted on www.gomdot.com

SECTION 900

OF THE CURRENT 2017 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION

JACKSON, MISSISSIPPI

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
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OF SECTION 905 AS ADDENDA)

06/30/2020 03:13 PM

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 901 - ADVERTISEMENT

Electronic bids will be received by the Mississippi Transportation Commission at 10:00 o'clock A.M., Tuesday, August 25, 2020, from the Bid Express Service and shortly thereafter publicly read on the Sixth Floor for:

Bascule Bridge Rehabilitation on SR 605 over Industrial Waterway (Bridge No. 3.5), known as Federal Aid Project No. BR-9371-01(001) / 107505301 in Harrison County.

The attention of bidders is directed to the Contract Provisions governing selection and employment of labor. Minimum wage rates have been predetermined by the Secretary of Labor and are subject to Public Law 87-581, Work Hours Act of 1962, as set forth in the Contract Provisions.

The Mississippi Department of Transportation hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, sex, age, disability, religion or national origin in consideration for an award.

The award of this contract will be contingent upon the Contractor satisfying the DBE requirements.

Contractors may request permission to bid online at http://shopmdot.ms.gov at no cost. Upon approval, Contractors shall be eligible to submit a bid using Bid Express at http://bidx.com. Specimen proposals may be viewed and downloaded online at no cost at http://mdot.ms.gov or purchased online at http://shopmdot.ms.gov at a cost of Ten Dollars ($10.00) per proposal plus a small convenience fee. Cash or checks will not be accepted as payment.

Plans must be purchased online at <https://shopmdot.ms.gov>. Costs of plans will be on a per sheet basis plus a small convenience fee. If you have any questions, you can contact the MDOT Plans Print Shop at (601) 359-7460, or e-mail at plans@mdot.state.ms.us. Plans will be shipped upon receipt of payment. Cash or checks will not be accepted as payment.

Bid bond, signed or countersigned by a Mississippi Agent or Qualified Nonresident Agent, with Power of Attorney attached, a Cashier's check or Certified Check for five (5%) percent of bid, payable to STATE OF MISSISSIPPI, must accompany each proposal.

The attention of bidders is directed to the provisions of Subsection 102.07 pertaining to irregular proposals and rejection of bids.

MELINDA L. MCGRATH
EXECUTIVE DIRECTOR

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1 **CODE: (IS)**

DATE: 03/01/2017

SUBJECT: Governing Specifications

The current (2017) Edition of the Standard Specifications for Road and Bridge Construction adopted by the Mississippi Transportation Commission is made a part hereof fully and completely as if it were attached hereto, except where superseded by special provisions, or amended by revisions of the Specifications contained within this proposal. Copies of the specification book may be purchased from the MDOT Construction Division, or online at shopmdot/default.aspx?StoreIndex=1.

A reference in any contract document to controlling requirements in another portion of the contract documents shall be understood to apply equally to any revision or amendment thereof included in the contract.

In the event the plans or proposal contain references to the 2004 Edition of the Standard Specifications for Road and Bridge Construction, it is to be understood that such references shall mean the comparable provisions of the 2017 Edition of the Standard Specifications.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2 **CODE: (IS)**

DATE: 03/01/2017

SUBJECT: Status of Right-of-Way

Although it is desirable to have acquired all rights-of-way and completed all railroad agreements, utility adjustments and work to be performed by others prior to receiving bids, sometimes it is not considered to be in the public interest to wait until each and every such clearance has been obtained. The bidder is hereby advised of possible unacquired rights-of-way, relocates, railroad agreements and utilities adjustments which have not been completed.

The status of right-of-way acquisition, utility adjustments, encroachments, potentially contaminated sites, railroad facilities, improvements, and asbestos contamination are set forth in the following attachments.

In the event right of entry is not available to ALL parcels of right-of-way and/or all work that is to be accomplished by others on the date set forth in the contract for the Notice to Proceed is not complete, the Department will issue a restricted Notice to Proceed.

ASBESTOS CONTAMINATION STATUS OF BUILDINGS
TO BE REMOVED BY THE CONTRACTOR
BR-9371-01(001)
107505/301000
Harrison County
April 13, 2020

Reference is made to notices to bidders entitled "Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP)" and "Removal of Obstructions".

The following pertinent information is furnished concerning asbestos containing materials (ACMs), if any, found in buildings to be removed by the Contractor.

There is no Right of Way required for this project. There are no buildings to be removed by the contractor.

STATUS OF POTENTIALLY CONTAMINATED SITES
BR-9371-01(001)
107505/301000
Harrison County
April 13, 2020

THERE IS NO RIGHT OF WAY REQUIRED FOR THIS PROJECT. NO INITIAL SITE ASSESSMENT WILL BE PERFORMED. IF CONTAMINATION ON EXISTING RIGHT OF WAY IS DISCOVERED, IT WILL BE HANDLED BY THE DEPARTMENT.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

Inter-Departmental Memorandum

TO: Trudi Loflin
Right of Way Division

DATE: April 8, 2020

FROM: Keith Steele KRS
District Preconstruction Engineer

SUBJECT OR PROJECT NO: BR-9371-01(001)
107505/301000

INFORMATION COPY TO:
File

COUNTY: Harrison

District Status Report

1. **STATUS OF RIGHT OF WAY:** All work to be done within existing ROW.
2. **RIGHT OF WAY CLEARANCE:** There are no encroachments.
3. **STATUS OF AFFECTED RAILROAD OPERATING FACILITIES:** None affected.
4. **STATUS OF REQUIRED UTILITY RELOCATIONS:** No utility conflicts
5. **STATUS OF CONSTRUCTION AGREEMENT:** None required.

Improvements to be included in Notice to Bidders to be removed by the Construction Contractor
FMS Construction Project No: 107505-301000
External ROW No: BR-9371-01(001)

Parcel No:
Station No:
Property Owner:
Description/Pictures:

NA

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 9 **CODE: (IS)**

DATE: 03/01/2017

SUBJECT: Federal Bridge Formula

Bidders are hereby advised that the latest revision of Federal Highway Administration Publication No. FHWA-HOP-06-105, **BRIDGE FORMULA WEIGHTS**, dated August 2006, is made a part of this contract when applicable.

Prior to the preconstruction conference, the Contractor shall advise the Engineer, in writing, what materials, if any, will be delivered to the jobsite via Interstate route(s).

Copies of the **BRIDGE FORMULA WEIGHTS** publication may be obtained by contacting:

Federal Highway Administration
400 7th Street, SW
Washington, DC 20590
(202) 366-2212

or

http://www.ops.fhwa.dot.gov/Freight/publications/brdg_frm_wghts/bridge_formula_all_rev.pdf

An on line **BRIDGE FORMULA WEIGHTS CALCULATOR** is available at

http://ops.fhwa.dot.gov/freight/sw/brdgcalc/calc_page.htm

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 113 **CODE: (SP)**

DATE: 04/18/2017

SUBJECT: Tack Coat

Bidders are advised that in addition to the products listed on the Department's APL as referenced in Subsection 401.03.1.2 on page 256, the Contractor may use one of the following as a tack coat.

- CSS-1
- CSS-1h
- SS-1
- SS-1h

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 296 **CODE: (SP)**

DATE: 07/25/2017

SUBJECT: Reduced Speed Limit Signs

Bidders are advised that when the plans or contract documents require the speed limit on a project to be reduced, the Contractor shall begin work within 48 hours of installing the reduced speed limit signs. Should the Contractor not start work or have no plans to start work within 48 hours of installing the signs, the reduced speed limit signs shall be covered and existing speed limit signs uncovered.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 445 **CODE: (SP)**

DATE: 10/10/2017

SUBJECT: Mississippi Agent or Qualified Nonresident Agent

Bidders are hereby advised of the requirements of Subsections 102.08, 103.05.2, and 107.14.2.1 of the *2017 Standard Specifications for Road and Bridge Construction* as it refers to bonding agents. Proposal guaranties, bonds, and liability insurance policies must be signed by a **Mississippi Agent or Qualified Nonresident Agent.**

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 480 **CODE: (SP)**

DATE: 11/09/2017

SUBJECT: Bridge Repair Permits (Nationwide Permit No. 3)

The Department has acquired Nationwide Permit General Conditions and Special Conditions, Nationwide Permit No. 3, for repair and maintenance of bridge(s).

Copies of said permit(s) are available at the below referenced link for the appropriate letting date under the column titled "Permit Doc."

http://mdot.ms.gov/Applications/BidSystem/Home.aspx

Securing a permit(s) for the filling of any other regulated site, the purpose of which is temporary construction for the convenience of the Contractor, shall be the responsibility of the Contractor.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 516 **CODE: (IS)**

DATE: 11/28/2017

SUBJECT: Errata and Modifications to the 2017 Standard Specifications

Page	Subsection	Change
16	102.06	In the seventh full paragraph, change "Engineer" to "Director."
33	105.05.1	In the sixth sentence, change "Contract Administration Engineer" to "Contract Administration Director."
34	105.05.2.1	In subparagraph 2, change "SWPPP, ECP" to "SWPPP and the ECP"
35	105.05.2.2	In subparagraphs 2, add " and" to the end of the sentence. In subparagraph 3, remove ", and" and add ".".
90	109.04.2	In the last paragraph of subparagraph (a), place a period "." at the end of the sentence.
93	109.04.2	In the last paragraph of subparagraph (g), place a period "." at the end of the sentence. Also, in the first paragraph of subparagraph (h), place a period "." at the end of the sentence.
97	109.07	Under ADJUSTMENT CODE, subparagraph (A1), change "HMA mixture" to "Asphalt mixtures."
98	109.11	In the third sentence, change "Engineer" to "Director."
219	308.04	In the last sentence of the last paragraph, change "Contractor's decision" to "Engineer's decision."
300	405.02.5.9	In the first sentence of the second paragraph, change "Hot Mix Asphalt" to "Asphalt Mixtures."
502	630.01.1	In the first paragraph, change "AASHTO" to "AASHTO's LRFD".
636	646.05	Change "each" to "per each" for the pay item units of payment.
640	656.02.6.2	In item 7), change "down stream" to "downstream".
688	630.03.2	Change the subsection number from "630.03.2" to "680.03.2."

725	702.08.3	In the second sentence of the first paragraph, change "hot-mix" to "asphalt."
954	804.02.13.1.6	In the definition for "M" in the % Reduction formulas, change "paragraph 7.3" to "paragraph 5.3."

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 977 **CODE: (IS)**

DATE: **07/25/2018**

SUBJECT: DUNS Requirement for Federal Funded Projects

Bidders are advised that the Prime Contractor must maintain a current registration in the System for Award Management (http://www.sam.gov) at all times during this project. A Dun and Bradstreet Data Universal Numbering System (DUNS) Number (http://www.dnb.com) is one of the requirements for registration in the System for Award Management.

Bidders are also advised that prior to the award of this contract, they MUST be registered, active, and have no active exclusions in the System for Award Management.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1225 **CODE: (SP)**

DATE: 11/13/2018

SUBJECT: Early Notice to Proceed

Bidders are advised that if an early notice to proceed is allowed by the Department and the Contractor experiences problems or delays between the early notice to proceed date and the original notice to proceed date, this shall not be justification for any monetary compensation or an extension of contract time.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1226 **CODE: (IS)**

DATE: 11/16/2018

SUBJECT: Material Storage Under Bridges

Bidders are advised that Subsection 106.08 of the Standard Specifications allows the Contractor to store materials and equipment on portions of the right-of-way. However, the Contractor will not be allowed to store or stockpile materials under bridges without written permission from the Project Engineer. The Contractor shall submit a detailed request of all proposed materials to be stored under bridges to the Engineer a minimum of 14 calendar days prior to anticipated storage. This detail shall include, but not limited to, bridge location, material type, material quantity, and duration of storage. The Project Engineer and any other needed Division will review this information and determine whether to grant approval. The Contractor shall not store any material under any bridge without written approval from the Project Engineer.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1241 **CODE: (IS)**

DATE: 11/27/2018

SUBJECT: Fuel and Material Adjustments

Bidder's attention is brought to the last paragraph of Subsection 109.07 of the Standard Specifications which states that no fuel or material adjustment will be made after the completion of contract time. Any fuels consumed or materials incorporated into the work during the monthly estimate period falling wholly after the expiration of contract time will not be subject a fuel or material adjustment.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2206 **CODE: (IS)**

DATE: 01/14/2020

SUBJECT: MASH Compliant Devices

Bidders are hereby advised that compliance associated with the requirements of meeting either the National Cooperative Highway Research Program (NCHRP) Report 350 or the Manual for Assessing Safety Hardware (MASH) for installations of certain traffic control devices and permanent safety hardware devices (guardrails, guardrail terminals, permanent portable barriers, cast-in-place barriers, all other permanent longitudinal barriers, crash cushions, cable barriers, cable barrier terminals, bridge rails, bridge rail transitions, all other terminals, sign supports, and all other breakaway hardware) as listed throughout the Standard Specifications and/or the Standard Drawings, or both, is now replaced with the requirements of meeting the 2016 version of MASH after December 31, 2019. This change applies to new permanent installations and to full replacements of existing installations.

At the preconstruction conference or prior to starting any work on the project, the Contractor shall submit a letter stating that the traffic control devices and permanent safety hardware devices as outlined within the paragraph above that are to be used on the project are certified to meet MASH 2016.

When a MASH 2016-compliant device does not exist for the new permanent installations and/or full replacement installations of permanent safety hardware devices, as listed above, a MASH 2009-compliant or a NCHRP 350-compliant device may be proposed by the Contractor for the project. A written request for such instances must be submitted by the Contractor either at the preconstruction conference or prior to starting any work on the project. The Contractor shall submit the following items to the Project Engineer: (1) a detailed list of the proposed devices and locations thereof; and (2) certification letters indicating that the proposed devices are compliant with either MASH 2009 or NCHRP 350.

When a MASH 2016-compliant device does not exist for the temporary work zone traffic control devices (Category 1, Category 2, and Category 3 devices) , a MASH 2009-compliant or a NCHRP 350-compliant device may be proposed by the Contractor for the project. Temporary work zone traffic control devices (Category 1, Category 2, and Category 3 devices) that are MASH 2009-compliant or NCHRP 350–compliant that have been in use prior to December 31, 2019, and that have a remaining service life may be proposed for use throughout their normal service life on the project by the Contractor. For either of these scenarios for temporary work zone traffic control devices, a written request must be submitted by the Contractor either at the preconstruction conference or prior to starting any work on the project. The Contractor shall submit the following items to the Project Engineer: (1) a detailed list of the proposed devices and locations thereof; and (2) certification letters indicating that the proposed devices are compliant with either MASH 2009 or NCHRP 350.

Work will only be allowed to proceed after the Department has granted written concurrence(s) with the proposed request(s) as listed above.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2207 **CODE: (IS)**

DATE: 01/08/2020

SUBJECT: Reflective Sheeting for Signs

Bidders are hereby advised that the retroreflective sign sheeting used for signs on this project shall be as listed below and shall meet the requirements of Subsection 721.06.

Temporary Construction Signs

Temporary traffic control (orange) sign sheeting shall be a minimum Type IX Fluorescent Orange sheeting as shown in Special Provision 907-721.

Permanent Signs

Permanent signs, except signs on traffic signal poles/mast arms, shall be as follows:

- Brown background sheeting on guide signs shall be a minimum Type VIII sheeting,
- Green and blue background sheeting on guide signs shall be a minimum Type IX sheeting, and
- All white, yellow, fluorescent yellow, and fluorescent yellow/green sheeting shall be Type XI sheeting.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2273 **CODE: (SP)**

DATE: 02/12/2020

SUBJECT: Mississippi Special Fuel Tax Law

Bidder's attention is brought to the second paragraph of Subsection 107.02 of the Standard Specifications which states that all Contractors and Subcontractors must comply with all requirements contained in the Mississippi Special Fuel Tax Law, Section 27-55-501, *et seq*. Attached are two Fact Sheets provided by the Mississippi Department of Revenue (MDOR) with additional information.

DEPARTMENT OF REVENUE
STATE OF MISSISSIPPI

Gasoline and Dyed Diesel Used for Non-Highway Purposes

Mississippi provides a reduced rate for gasoline and dyed diesel used for non-highway purposes. The reduced rates are 6.44 cents per gallon and 5.75 cents per gallon of gasoline or dyed diesel. These fuels are generally taxed at 18 cents per gallon if for on road use.

Gasoline Used for Non-Highway Purposes

You may be entitled to a refund of 11.56 cents per gallon (making this an equivalent to a tax rate of 6.44 cents per gallon) if you desire to purchase gasoline to be used off road. The gasoline must be used for agricultural, maritime, industrial, manufacturing, domestic or non-highway purposes only.

Examples of non-highway include gasoline used in boats, golf carts, machinery used for manufacturing or farm equipment used exclusively in plowing, planting or harvesting farm products.

Refund Gasoline User

The refund is based on the amount of gallons used. Before a refund is issued, you are required to…

1. Obtain a refund gasoline user's permit and a certificate for refund booklet from the Department of Revenue;
2. Have a storage tank marked "REFUND GASOLINE"; and,
3. Purchase the gasoline from someone who holds a refund gasoline dealer's permit.

No refund will be allowed for gasoline used in motor vehicles owned or operated by a government entity or used in Mississippi government contracts.

Refund Gasoline Dealer

You must obtain a refund gasoline dealer's permit from the Department of Revenue before selling refund gasoline. At no time should the gasoline be delivered to a tank that is not properly marked. The gasoline must be dyed a distinctive mahogany color at the time of delivery.

The Department of Revenue may waive the dye requirement if the dye may cause damage to the equipment. The refund gasoline user is required to obtain the waiver from the Department of Revenue.

Dyed Diesel Used for Non-Highway Purposes

Unlike gasoline, you are not required to apply for a refund if you desire to purchase dyed diesel to be used off road. Mississippi provides a reduced rate of 5.75 cents per gallon on dyed diesel used off road. Diesel used on road is subjected to 18 cents per gallon. Dyed diesel used in motor vehicles owned or operated by a government entity or used in Mississippi government contracts will be subjected to 18 cents per gallon.

Dyed Diesel Used on the Highway

Any person who purchases, receives, acquires or uses dyed diesel for highway use will be liable to pay 18 cents per gallon and subject to a penalty in the amount of $1000.

Identifying Dyed Diesel

Storage facilities for dyed diesel must be plainly marked "NONHIGHWAY DIESEL FUEL" or "NONHIGHWAY KEROSENE". Retailers are also required to mark all pumps or dispensing equipment.

Petroleum Tax Bureau
P. O. Box 1033
Jackson, MS 39215-1033
Phone: (601) 923-7150

DEPARTMENT OF REVENUE
STATE OF MISSISSIPPI

Special Fuel Used on Government Contracts

State and Local Government Contracts

Special fuel purchased, acquired or used in performing contracts with the State of Mississippi, counties, municipalities or any political subdivision is taxed at a rate of 18 cents per gallon. Special fuel includes but is not limited to the following:

- Dyed diesel fuel;
- Kerosene;
- Undyed diesel fuel; and,
- Fuel oil.

State and local government contracts include construction, reconstruction and maintenance or repairs of projects such as roads, bridges, water systems, sewer systems, buildings, drainage canals and recreational facilities. The Department of Revenue may require contractors to remit the excise tax directly to the state in lieu of paying the tax to a distributor.

Special Fuel Direct Pay Permit

Contractors that remit the excise tax to the state will be issued a Special Fuel Direct Pay Permit. This permit relieves the distributor from collecting the tax and requires the contractor to file a monthly special fuel return. The distributor should include the contractor's permit number on all invoices that are related to tax-free sales.

The contractor is required to furnish a surety or cash bond guaranteeing the payment of the excise tax prior to receiving the Special Fuel Direct Pay Permit. The Department of Revenue may accept a contractors tax bond if the bond covers the excise tax levied on special fuel.

Special Fuel Distributors

If the contractor does not have a Special Fuel Direct Pay Permit, distributors are required to collect the 18 cents excise tax and remit the tax to the Department of Revenue. The additional 12.25 cents levied on special fuel (excluding undyed diesel) should be reported on schedules 5F and 5G of the special fuel return.

Environmental Protection Fee

Special fuel distributors are required to collect the environmental protection fee even if the contractor has a Special Fuel Direct Pay Permit. The fee is levied at 4/10^{ths} of a cent per gallon. The fee is suspended or reinstated when the trust fund has exceeded or fallen below the obligatory balance.

Penalties

Any person who knowingly and willfully purchases untaxed fuel for use in equipment utilized on a road or highway construction site in this state is guilty of a misdemeanor and, upon conviction, shall be fined not less than $1,000 or more than $100,000, or imprisoned in the county jail for not more than one year, or both.

Petroleum Tax Bureau
P. O. Box 1033
Jackson, MS 39215-1033
Phone: (601) 923-7150

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO NOTICE TO BIDDERS NO. 2611

DATE: 05/02/2020

The goal is 1 percent for the Disadvantaged Business Enterprise. All Bidders are required to submit Form OCR-481 for all DBEs. Bidders are advised to check the bid tabulation link for this project on the MDOT website at:

https://mdot.ms.gov/portal/current_letting

Bid tabulations are usually posted by 3:00 pm on Letting Day.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2611 **CODE: (IS)**

DATE: 05/21/2020

SUBJECT: Disadvantaged Business Enterprises In Federal-Aid Highway Construction

This contract is subject to the "Moving Ahead for Progress in the 21st Century Act (MAP-21)" and applicable requirements of "Title 49, Code of Federal Regulations, Part 26." Portions of the Act are set forth in this Notice as applicable to compliance by the Contractor and all of the Act, and the MDOT DBE Program, is incorporated by reference herein.

The Department has developed a Disadvantaged Business Enterprise Program that is applicable to this contract and is made a part thereof by reference.

Copies of the program may be obtained from:

Office of Civil Rights
Mississippi Department of Transportation
P. O. Box 1850
Jackson, Mississippi 39215-1850

POLICY

It is the policy of the Mississippi Department of Transportation to provide a level playing field, to foster equal opportunity in all federally assisted contracts, to improve the flexibility of the DBE Program, to reduce the burdens on small businesses, and to achieve that amount of participation that would be obtained in a non-discriminatory market place. In doing so, it is the policy of MDOT that there will be no discrimination in the award and performance of federally assisted contracts on the basis of race, color, sex, or national origin.

ASSURANCES THAT CONTRACTORS MUST TAKE

MDOT will require that each contract which MDOT signs with a sub-recipient or a Contractor, and each subcontract the Prime Contractor signs with a Subcontractor, includes the following assurances:

"The Contractor, sub-recipient or Subcontractor shall not discriminate on the basis of race, color, sex, or national origin in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR 26 in the award and administration of federally assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as MDOT deems appropriate."

DEFINITIONS

For purposes of this provision the following definitions will apply:

"Disadvantaged Business" means a small business concern: (a) which is at least 51 percent owned by one or more socially and economically disadvantaged individual(s) or in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more socially and economically disadvantaged individual(s); and (b) whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individual(s) who own it. It is important to note that the business owners themselves must control the operations of the business. Absentee ownership or title ownership by an individual who does not take an active role in controlling the business is not consistent with eligibility as a DBE under 49 CFR Part 26.71.

CONTRACTOR'S OBLIGATION

The Contractor and all Subcontractors shall take all necessary and reasonable steps to ensure that DBE firms can compete for and participate in the performance of a portion of the work in this contract and shall not discriminate on the basis of race, color, sex, or national origin. Failure on the part of the Contractor to carry out the DBE requirements of this contract constitutes a breach of contract and after proper notification the Department may terminate the contract or take other appropriate action as determined by the Department.

When a contract has a zero percent (0%) DBE goal, the Contractor still has the responsibility to take all necessary and reasonable steps to ensure that DBE firms can compete for and participate in the performance of the work in the contract. In this case, all work performed by a certified DBE firm is considered to be a "race neutral" measure and the Department will receive DBE credit towards the overall State goals when the DBE firm is paid for their work. If the Prime Contractor is a certified DBE firm, the Department can receive DBE credit only for the work performed by the Prime Contractor's work force or any work subcontracted to another DBE firm. Work performance by a non-DBE Subcontractor is not eligible for DBE credit.

CONTRACT GOAL

The goal for participation by DBEs is established for this contract in the attached Supplement. The Contractor shall exercise all necessary and reasonable steps to ensure that participation is equal to or exceeds the contract goal.

If the percentage of the contract that is proposed for DBEs is 1% or greater, the Contractor shall agree to meet or exceed the contract goal on the last bid sheet of the proposal.

All Bidders shall submit to the Office of Civil Rights Form OCR-481, signed by the Prime Contractor and the DBE Subcontractors, no later than the 3rd business day after opening of the bids.

Form OCR-481 is available on the MDOT website at www.mdot.ms.gov under the Civil Rights tab, or by calling 601-359-7466.

The OCR-481 Form must contain the following information:

The name and address of each certified DBE Contractor / Supplier;

The Reference Number, percent of work to be completed by the DBE subcontractor and the dollar amount of each item. If a portion of an item is subcontracted, a breakdown of that item including quantities and unit price must be attached, detailing what part of the item the DBE firm is to perform and who will perform the remainder of the item.

If the DBE Commitment shown on the last bid sheet of the proposal, does not equal or exceed the contract goal, the bidder must submit, to MDOT Contract Administration Division prior to bid opening, information to satisfy the Department that adequate good faith efforts have been made to meet the contract goal.

Failure of the lowest bidder to furnish acceptable proof of good faith efforts, submitted to MDOT Contract Administration Division prior to bid opening, shall be just cause for rejection of the proposal. Award may then be made to the next lowest responsive bidder or the project may be re-advertised.

GOOD FAITH EFFORTS

The following factors are illustrative of matters the Department will consider in judging whether or not the bidder has made adequate good faith effort to satisfy the contract goal.

(1) Whether the bidder attended the pre-bid meeting that was scheduled by the Department to inform DBEs of subcontracting opportunities;

(2) Whether the bidder advertised in general circulation, trade association, and minority-focus media concerning the subcontracting opportunities;

(3) Whether the bidder provided written notice to a reasonable number of specific DBEs that their interest in the contract is being solicited;

(4) Whether the bidder followed up initial solicitations of interest by contacting DBEs to determine with certainty whether they were interested;

(5) Whether the bidder selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the contract goal;

(6) Whether the bidder provided interested DBEs with adequate information about the plans, specifications and requirements of the contract;

(7) Whether the bidder negotiated in good faith with interested DBEs and did not reject them as unqualified without sound reasons based on a thorough investigation of their capabilities; and

(8) Whether the bidder made efforts to assist interested DBEs in obtaining any required bonding or insurance.

(9) Whether the bidder has written notification to certified DBE Contractors soliciting subcontracting for items of work in the contract.

(10) Whether the bidder has a statement of why an agreement was not reached.

(11) Proof of written notification to certified DBE Contractors by certified mail that their interest is solicited in subcontracting the work defaulted by the previous DBE or in subcontracting other items of work in the contract.

The bidder's execution of the signature portion of the proposal shall constitute execution of the following assurance:

> The bidder hereby gives assurance pursuant to the applicable requirements of "Moving Ahead for Progress in the 21st Century Act (MAP-21)" and applicable requirements of "Title 49, Code of Federal Regulations, Part 26" that the bidder has made a good faith effort to meet the contract goal for DBE participation for which this proposal is submitted.

DIRECTORY

A list of "Certified DBE Contractors" which have been certified as such by the Mississippi Department of Transportation and other Unified Certification Partners (UPC) can be found on the Mississippi Department of Transportation website at www.mdot.ms.gov. The list is in the top left corner of the current Letting Calendar under Contracts & Letting. The DBE firm must be certified at the time the project is let and approved by MDOT to count towards meeting the DBE goal.

REPLACEMENT

If a DBE Subcontractor cannot perform satisfactorily, and this causes the OCR-481 commitment to fall below the contract goal, the Contractor shall take all necessary reasonable steps to replace the DBE with another certified DBE Subcontractor or submit information to satisfy the Mississippi Department of Transportation that adequate good faith efforts have been made to replace the DBE. The good faith efforts outlined previously in this document still apply. The replacement DBE must be a DBE who was on the Department's list of "Certified DBE Contractors" when the job was let, and who is still active. All DBE replacements must be approved by the Department.

Under no circumstances shall the Prime or any Subcontractor perform the DBE's work (as shown on the OCR-481) without prior written approval from the Department. See "Sanctions" at the end of this document for penalties for performing DBE's work.

When a Contractor proposes to substitute/replace/terminate a DBE that was originally named on the OCR-481, the Contractor must obtain a release, in writing, from the named DBE explaining why the DBE Subcontractor cannot perform the work. A copy of the original DBE's release must be attached to the Contractor's written request to substitute/replace/terminate along with appropriate Subcontract Forms for the substitute/replacement/terminated Subcontractor, all of which must be submitted to the DBE Coordinator and approved, in advance, by MDOT.

PRE-BID MEETING

A pre-bid meeting will be held in the Commission Room on the 1st Floor of the MDOT Administration Building in Jackson, at 2:00 P.M. on the day preceding the date of the bid opening.

This meeting is to inform DBE firms of subcontracting and material supply opportunities. Attendance at this meeting is considered of prime importance in demonstrating good faith effort to meet the contract goal.

PARTICIPATION / DBE CREDIT

Participation shall be counted toward meeting the goal in this contract as follows:

(1) If the Prime Contractor is a certified DBE firm, only the value of the work actually performed by the DBE Prime can be counted towards the project goal, along with any work subcontracted to a certified DBE firm.

(2) If the Contractor is not a DBE, the work subcontracted to a certified DBE Contractor will be counted toward the goal.

(3) The Contractor may count toward the goal a portion of the total dollar value of a contract with a joint venture eligible under the standards of this provision equal to the percentage of the DBE partner in the joint venture.

(4) Expenditures to DBEs that perform a commercially useful function may be counted toward the goal. A business is considered to perform a commercially useful function when it is responsible for the execution of a distinct element of the work and carries out its responsibilities by actually performing, managing, and supervising the work involved.

(5) The Contractor may count 100% of the expenditures for materials and supplies obtained from certified DBE suppliers and manufacturers that produce goods from raw materials or substantially alters them for resale provided the suppliers and manufacturers assume the actual and contractual responsibility for the provision of the materials and supplies. The Contractor may count sixty percent (60%) of the expenditures to suppliers that are not

manufacturers, provided the supplier performs a commercially useful function in the supply process. Within 30 days after receipt of the materials, the Contractor shall furnish to the DBE Coordinator invoices from the certified supplier to verify the DBE goal.

(6) Any work that a certified DBE firm subcontracts or sub-subcontracts to a non-DBE firm will not count towards the DBE goal.

(7) Only the dollars actually paid to the DBE firm may be counted towards the DBE goal. The participation of a DBE Firm cannot be counted towards the Prime Contractor's DBE goal until the amount being counted towards the goal has been paid to the DBE.

AWARD

Award of this contract to the low bidder will be contingent upon the following conditions:

(1) Concurrence from Federal Highway Administration, when applicable.

(2) All Bidders must submit to the Office of Civil Rights for approval, Form OCR-481 (DBE Commitment) no later than the 3rd business day after opening of the bids to satisfy the Department and that adequate good faith efforts have been made to meet the contract goal. For answers to questions regarding Form OCR-481, contact the MDOT Office of Civil Rights at (601) 359-7466.

(3) Bidder must include OCR-485 information with their bid proposal listing all firms that submitted quotes for material supplies or items to be subcontracted. OCR-485 information must be signed and included with the bid proposal. If the OCR-485 information is not included as part of bid proposal, your bid will be deemed irregular.

Prior to the start of any work, the bidder must notify the Project Engineer, in writing, of the name of the designated "DBE Liaison Officer" for this project. This notification must be posted on the bulletin board at the project site.

DEFAULT

If the contract goal established by MDOT in this proposal is 1% or greater, it must be met to fulfill the terms of the contract. The Contractor may list DBE Subcontractors and items that exceed MDOT's contract goal, but should unforeseen problems arise that would prevent a DBE from completing its total commitment percentage, the Contractor will meet the terms of the contract as long as it meets or exceeds MDOT's Contract Goal. For additional information, refer to "Replacement" section of this Notice.

DBE REPORTS

(1) OCR-481: Refer to "CONTRACT GOAL" section of this Notice to Bidders for information regarding this form.

(2) OCR-482: At the conclusion of the project, before the final estimate is paid and the project is closed out, the Prime Contractor will submit to the Project Engineer for verification of quantities and further handling Form OCR-482 whereby the Contractor certifies to the amounts of payments made to all Contractors / Suppliers over the life of the contract. The Project Engineer shall submit the completed Form OCR-482 to the DBE Coordinator (Office of Civil Rights). Final acceptance of the project is dependent upon Contract Administration Division's receipt of completed Form OCR-482 which they will receive from the Office of Civil Rights.

(3) OCR-483: The Project Engineer/Inspector will complete Form OCR-483, the Commercially Useful Function (CUF) Performance Report, in accordance with MDOT S.O.P. No. OCR-03-05-02-483. Evaluations reported on this form are used to determine whether or not the DBE firm is performing a CUF. The Prime Contractor should take corrective action when the report contains any negative evaluations. DBE credit may be disallowed and/or other sanctions imposed if it is determined the DBE firm is not performing a CUF. This form should also be completed and returned to the DBE Coordinator (Office of Civil Rights).

(4) OCR-484: Each month, the Prime Contractor will submit to the Project Engineer OCR-484 that certifies payments to all Subcontractors and shows all firms even if the Prime Contractor has paid no monies to the firm during that estimate period (negative report). The Project Engineer will attach the form to the monthly estimate before forwarding to the Contract Administration Division for further processing. Failure of the Contractor to submit the OCR-484 will result in the estimate not being processed and paid.

(5) OCR-485: ALL BIDDERS must submit signed form with bid proposal of all firms that submitted quotes for material supplies or items to be subcontracted. If the OCR-485 information is not included as part of bid proposal, the bid will be deemed irregular.

(6) OCR-487: Only used by Prime Contractors that are certified DBE firms. This form is used in determining the exact percentage of DBE credit for the specified project. The low Bidder should return this form to MDOT with the OCR-481 form, or can also be returned with the Permission to Subcontract Forms (CAD-720, CAD-725 and CAD-521).

DBE Forms, can be obtained from the Office of Civil Rights Division, MDOT Administration Building, 401 North West Street, Jackson, MS, or at www.mdot.ms.gov under the Civil Rights tab.

SANCTIONS

The Department has the option to enforce any of the following penalties for failure of the Prime Contractor to fulfill the DBE goal as stated on the OCR-481 form or any violations of the DBE program guidelines:

(1) Disallow credit towards the DBE goal

(2) Withhold progress estimate payments

(3) Deduct from the final estimate or recover an amount equal to the unmet portion of the DBE goal which may include additional monetary penalties as outlined below based on the number of offenses and the severity of the violation as determined by MDOT.

1st Offense	10% of unmet portion of goal	or	$5,000 lump sum payment	or	Both
2nd Offense	20% of unmet portion of goal	or	$10,000 lump sum payment	or	Both
3rd Offense	40% of unmet portion of goal	or	$20,000 lump sum payment	or	$20,000 lump sum payment and debarment

(4) Debar the Contractor involved from bidding on MDOT federally funded projects for a period of up to 12 months after notification by certified email.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2624 **CODE: (SP)**

DATE: 06/11/2020

SUBJECT: Contract Time

PROJECT: BR-9371-01(001) / 107505301 – Harrison County

The completion of work to be performed by the Contractor for this project will not be a specified date but shall be when all allowable working days are assessed, or any extension thereto as provided in Subsection 108.06. It is anticipated that the Notice of Award will be issued no later than ***September 8, 2020*** and the date for Notice to Proceed / Beginning of Contract Time will be ***October 8, 2020***.

Should the Contractor request a Notice to Proceed earlier than ***October 8, 2020*** and it is agreeable with the Department for an early Notice to Proceed, the requested date will become the new Notice to Proceed date. Regardless of whether or not an early Notice to Proceed is granted, contract time will start at the original Notice to Proceed date.

All requests for an early Notice to Proceed shall be sent to the Project Engineer who will forward it to the Contract Administration Division.

344 Working Days have been allowed for the completion of work on this project.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2625

DATE: 06/09/2020

SUBJECT: Specialty Items

PROJECT: BR-9371-01(001)/107505301 - HARRISON

Pursuant to the provisions of Section 108, the following work items are hereby designated as "Specialty Items" for this contract. Bidders are reminded that these items must be subcontracted in order to be considered as specialty items.

CATEGORY: CURBING, SIDEWALKS, GUTTERS

Line No	Pay Item	Description
0130	609-D008	Combination Concrete Curb and Gutter Type 3A

CATEGORY: DISPOSAL OF BUILDINGS, RIGHT OF WAY CLEARING & GRUBBING

Line No	Pay Item	Description
0040	202-B241	Removal of Traffic Stripe

CATEGORY: EROSION CONTROL

Line No	Pay Item	Description
0060	213-C001	Superphosphate
0070	216-A001	Solid Sodding
0080	219-A001	Watering

CATEGORY: FENCE, GATES

Line No	Pay Item	Description
0570	607-B035	96" Type I Chain Link Fence, Class I

CATEGORY: LANDSCAPING

Line No	Pay Item	Description
0090	230-B022	Tree Planting, Crape Myrtle

CATEGORY: PAVEMENT STRIPING AND MARKING

Line No	Pay Item	Description
0330	626-A002	6" Thermoplastic Double Drop Traffic Stripe, Skip White
0340	626-B001	6" Thermoplastic Double Drop Traffic Stripe, Continuous White
0350	626-C001	6" Thermoplastic Double Drop Edge Stripe, Continuous White
0360	626-D002	6" Thermoplastic Double Drop Traffic Stripe, Skip Yellow
0370	626-E002	6" Thermoplastic Double Drop Traffic Stripe, Continuous Yellow
0380	626-F002	6" Thermoplastic Double Drop Edge Stripe, Continuous Yellow
0390	626-G004	Thermoplastic Double Drop Detail Stripe, White
0400	626-G005	Thermoplastic Double Drop Detail Stripe, Yellow

CATEGORY: PAVEMENT STRIPING AND MARKING

Line No	Pay Item	Description
0410	626-H001	Thermoplastic Double Drop Legend, White
0420	627-K001	Red-Clear Reflective High Performance Raised Markers
0430	627-L001	Two-Way Yellow Reflective High Performance Raised Markers
0440	628-L002	High Performance Cold Plastic Legend, White
0490	907-624-A002	6" Inverted Profile Thermoplastic Traffic Stripe, Skip White
0500	907-624-B002	6" Inverted Profile Thermoplastic Traffic Stripe, Continuous White
0510	907-624-D002	6" Inverted Profile Thermoplastic Traffic Stripe, Continuous Yellow
0520	628-G001	6" High Performance Cold Plastic Traffic Stripe, Skip White
0530	628-H001	6" High Performance Cold Plastic Traffic Stripe, Continuous White
0540	628-J001	6" High Performance Cold Plastic Traffic Stripe, Continuous Yellow

CATEGORY: TRAFFIC CONTROL - TEMPORARY

Line No	Pay Item	Description
0160	619-A1007	Temporary Traffic Stripe, Continuous White, Type 1 or 2 Tape
0170	619-A2008	Temporary Traffic Stripe, Continuous Yellow, Type 1 or 2 Tape
0180	619-C6001	Red-Clear Reflective High Performance Raised Marker
0190	619-C7001	Two-Way Yellow Reflective High Performance Raised Marker
0200	619-E1001	Flashing Arrow Panel, Type C
0210	619-F1001	Concrete Median Barrier, Precast
0220	619-F1002	Portable Median Barrier
0230	619-F2001	Remove and Reset Concrete Median Barrier, Precast
0240	619-F2002	Remove and Reset Portable Median Barrier
0250	619-G4005	Barricades, Type III, Single Faced
0260	619-G5001	Free Standing Plastic Drums
0270	619-G7001	Warning Lights, Type "B"
0280	619-H1001	Traffic Signals
0290	619-J1001	Impact Attenuator, 40 MPH
0300	619-J2001	Impact Attenuator, 40 MPH, Replacement Package
0310	619-J3001	Remove and Reset Impact Attenuator
0450	907-619-E3001	Changeable Message Sign

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 – NOTICE TO BIDDERS NO. 2626 **CODE: (SP)**

DATE: 06/15/2020

SUBJECT: Lane Closure Restrictions

PROJECT: BR-9371-01(001) / 107505301 - Harrison County

Bidders are advised to pay special attention to general note #11 regarding Coast Guard and general notes #18, 19 and 20 and notes regarding traffic gate configuration during northbound and southbound lane closure notes on GENERAL NOTES sheet GN-1.

"General Decision Number: MS20200133 01/03/2020

Superseded General Decision Number: MS20190133

State: Mississippi

Construction Type: Highway

County: Harrison County in Mississippi.

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.80 for calendar year 2020 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.80 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2020. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional

information on contractor requirements and worker protections

under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/03/2020

SUMS2010-056 08/04/2014

	Rates	Fringes
CARPENTER (Form Work Only)	$ 14.43	0.00
CEMENT MASON/CONCRETE FINISHER	$ 15.25	0.00
ELECTRICIAN	$ 25.57	6.79
HIGHWAY/PARKING LOT STRIPING: Truck Driver (Line Striping Truck)	$ 14.75	0.00
INSTALLER - SIGN	$ 13.41	0.00
INSTALLER: Guardrail	$ 11.78	0.00
IRONWORKER, REINFORCING	$ 17.33	0.00
LABORER: Asphalt, Includes Raker, Shoveler, Spreader and Distributor	$ 12.27	0.00
LABORER: Common or General	$ 11.00	0.00
LABORER: Flagger	$ 11.16	0.00
LABORER: Grade Checker	$ 15.63	0.00
LABORER: Landscape	$ 12.00	0.00

LABORER: Luteman.....$ 12.88 0.00

LABORER: Mason Tender -
Cement/Concrete.....$ 13.14 0.00

LABORER: Pipelayer.....$ 15.00 0.00

LABORER: Laborer-Cones/
Barricades/Barrels -
Setter/Mover/Sweeper.....$ 13.19 0.00

OPERATOR: Asphalt Spreader.....$ 14.83 0.00

OPERATOR:
Backhoe/Excavator/Trackhoe.....$ 15.62 0.00

OPERATOR: Bobcat/Skid
Steer/Skid Loader.....$ 11.86 0.00

OPERATOR: Broom/Sweeper.....$ 14.25 0.00

OPERATOR: Bulldozer.....$ 15.47 0.00

OPERATOR: Concrete Saw.....$ 14.96 3.27

OPERATOR: Crane.....$ 15.89 0.00

OPERATOR: Distributor.....$ 13.87 0.00

OPERATOR: Grader/Blade.....$ 16.44 0.00

OPERATOR: Loader.....$ 14.38 0.00

OPERATOR: Mechanic.....$ 19.33 0.00

OPERATOR: Milling Machine.....$ 15.44 0.00

OPERATOR: Oiler.....$ 12.22 0.00

OPERATOR: Paver (Asphalt,

Aggregate, and Concrete).....$ 15.81 0.00

OPERATOR: Roller (All Types)....$ 14.23 0.00

OPERATOR: Scraper.....$ 14.00 0.00

OPERATOR: Tractor.....$ 12.29 0.00

TRUCK DRIVER: Flatbed Truck.....$ 14.72 0.00

TRUCK DRIVER: Lowboy Truck.....$ 11.00 0.00

TRUCK DRIVER: Mechanic.....$ 12.31 0.00

TRUCK DRIVER: Water Truck.....$ 17.08 0.00

TRUCK DRIVER: Dump Truck (All
Types).....$ 14.32 0.00

TRUCK DRIVER: Semi/Trailer
Truck.....$ 14.36 0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is

like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing

this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

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SUPPLEMENT TO FORM FHWA-1273

DATE: 12/17/2018

SUBJECT: Federal **Contract Provisions for Subcontracts** and Cargo Preference Act

Federal Contract Provisions for Subcontracts

All subcontracts shall be in writing and contain all pertinent provisions and requirements of the prime contract.

Each "Request for Permission to Subcontract" (Mississippi Department of Transportation Form CAD-720) shall include a copy of the subcontract. The federal contract provisions (FHWA-1273, SUPPLEMENT TO FORM FHWA-1273, NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246), DAVIS-BACON AND RELATED ACT PROVISIONS (WAGE RATES)) must be physically incorporated as part of the subcontract. A completed Mississippi Department of Transportation Form CAD-521 and Form CAD-725 must be attached to the CAD-720.

Cargo Preference Act

The Contractor is hereby advised of the requirements set forth in the following Attachment (Title 46 - Shipping) as it pertains to the implementation of Cargo Preference Act (CPA) requirements in the Federal-aid Highway Program.

By signing this contract, the Contractor agrees to conform to the requirements of the CPA.

Attachment

Title 46- Shipping

Volume: 8
Date: 2014-10-01
Original Date: 2014-10-01
Title: Section 381.7 - Federal Grant, Guaranty, Loan and Advance at Funds Agreements.
Context: Title 46- Shipping. CHAPTER II- MARITIME ADMINISTRATION, DEPARTMENT OF TRANSPORTATION. SUBCHAPTER J - MISCELLANEOUS. PART 381 - CARGO PREFERENCE-U.S.-FLAG VESSELS.

§ 381.7 Federal Grant, Guaranty, Loan and Advance of Funds Agreements.

In order to insure a fair and reasonable participation by privately owned United States-flag commercial vessels in transporting cargoes which are subject to the Cargo Preference Act of 1954 and which are generated by U.S. Government Grant, Guaranty, Loan and/or Advance of Funds Programs, the head of each affected department or agency shall require appropriate clauses to be inserted in those Grant. Guaranty$_1$ Loan and/or Advance of Funds Agreements and all third party contracts executed between the borrower/grantee and other parties, where the possibility exists for ocean transportation of items procured, contracted for or otherwise obtained by or on behalf of the grantee, borrower, or any of their contractors or subcontractors. The clauses required by this part shall provide that at least 50 percent of the freight revenue and tonnage of cargo generated by the U.S. Government Grant, Guaranty, Loan or Advance of Funds be transported on privately owned United States-flag commercial vessels. These clauses shall also require that all parties provide to the Maritime Administration the necessary shipment information as set forth in § 381.3. A copy of the appropriate clauses required by this part shall be submitted by each affected agency or department to the Secretary, Maritime Administration, for approval no later than 30 days after the effective date of this part. The following are suggested acceptable clauses with respect to the use of United States-flag vessels to be incorporated in the Grant, Guaranty, Loan and/or Advance of Funds Agreements as well as contracts and subcontracts resulting therefrom:

(a) *Agreement Clauses.* "Use of United States-flag vessels:

"(1) Pursuant to Pub. L 664 (43 U.S.C. 1241(b)) at least 50 percent of any equipment, materials or commodities procured, contracted for or otherwise obtained with funds granted, guaranteed, loaned, or advanced by the U.S. Government under this agreement, and which may be transported by ocean vessel, shall be transported on privately owned United States-flag commercial vessels, if available.

"(2) Within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (a)(1) of this section shall be furnished to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590."

(b) *Contractor and Subcontractor Clauses.* "Use of United States-flag vessels: The contractor agrees --

"(1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

"(2) To furnish within 20 days following the date of loading for shipments originating within the United

States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b) (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

"(3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract."

(Reorganization Plans No.21 of 1950(64 Stat. 1273) and No. 7 of 1961 (75 Stat. 840) as amended by Pub. L 91.469 (84 Stat 1036) and Department of Commerce Organization Order 10-8 (38 FR 19707, July 23, 1973)) (42 FR 57126, Nov. 1, 1977]

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise

the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

NOTICE OF REQUIREMENTS FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

2. The goal for female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work, is 6.9%.

Until further notice	Goals for minority participation for each trade (percent)
SHSA Cities:	
Pascagoula - Moss Point	16.9
Biloxi - Gulfport	19.2
Jackson	30.3
SMSA Counties:	
Desoto	32.3
Hancock, Harrison, Stone	19.2
Hinds, Rankin	30.3
Jackson	16.9
Non-SMSA Counties:	
George, Greene	26.4
Alcorn, Benton, Bolivar, Calhoun, Carroll, Chickasaw, Clay, Coahoma, Grenada, Itawamba, Lafayette, Lee, Leflore, Marshall, Monroe, Montgomery, Panola, Pontotoc, Prentiss, Quitman, Sunflower, Tallahatchie, Tate, Tippah, Tishomingo, Tunica, Union, Washington, Webster, Yalobusha	26.5
Attala, Choctaw, Claiborne, Clarke, Copiah, Covington, Franklin, Holmes, Humphreys, Issaquena, Jasper, Jefferson, Jefferson Davis, Jones Kemper, Lauderdale, Lawrence, Leake, Lincoln, Lowndes, Madison, Neshoba, Newton, Noxubee, Oktibbeha, Scott, Sharkey, Simpson, Smith, Warren, Wayne, Winston, Yazoo	32.0
Forrest, Lamar, Marion, Pearl River, Perry, Pike, Walthall	27.7
Adams, Amite, Wilkinson	30.4

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and nonfederally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4.2(d). Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor, employer identification number of the subcontractor, estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is to the county and city (if any), stated in the advertisement.

5. The notification required in Paragraph 3 shall be addressed to the following:

Contract Compliance Officer
Mississippi Department of Transportation
P.O. Box 1850
Jackson, Mississippi 39215-1850

(12/04/2018)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-102-2 **CODE: (IS)**

DATE: 11/22/2017

SUBJECT: Bidding Requirements and Conditions

Section 102, Bidding Requirements and Conditions, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-102.01--Prequalification of Bidders. Delete the last sentence of the third paragraph of Subsection 102.01 on page 13, and substitute the following.

The Bidder's Certificate of Responsibility number must be on file with the Department's Contract Administration Division prior to request for permission to bid.

907-102.02--Contents of Proposal Forms. Delete the fourth paragraph in Subsection 102.02 on page 13, and substitute the following.

Prospective bidders must complete an online request for permission to be eligible to bid a project. Upon approval, the bidder will be authorized to submit a bid electronically using Bid Express at http://bidx.com.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-109-1 **CODE: (IS)**

DATE: 05/08/2019

SUBJECT: Measurement and Payment

Section 109, Measurement and Payment, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-109.01--Measurement of Quantities. Delete the sixth full paragraph of Subsection 109.01 on page 88, and substitute the following.

If appropriate based on the specific circumstances of the project, the Contractor may request that material specified to be measured by the cubic yard or ton be converted to the other measure. The Contractor must submit this request to the Engineer. The Engineer will provide an approval or denial in writing. The decision is in the sole discretion of the Engineer. If approved, factors for this conversion will be determined by the District Materials Engineer and agreed to by the Contractor. The conversion of the materials along with the conversion factor will be incorporated into the Contract by supplemental agreement. The supplemental agreement must be executed before such method of measurement is used.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-619-5 **CODE: (IS)**

DATE: 01/17/2018

SUBJECT: Traffic Control for Construction Zones

Section 619, Traffic Control for Construction Zones, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-619.02--Materials.

907-619.02.8--Traffic Signals and Flashers. Delete Subsection 619.02.8.1 on pages 452 thru 455, and substitute the following.

907-619.02.8.1-Portable Traffic Signals. Portable traffic signals shall be trailer or pedestal mounted units that provide for easy, legal transportation and quick setup and deployment. Each unit shall be self-contained. The types of portable traffic signals are as follows.

- Type 1 portable traffic signal shall include two signal heads per trailer with one signal head mounted on an overhead mast arm that can be extended over the travel lane, and the other signal head shall be mounted on the vertical upright of the trailer.

- Type 2 portable traffic signal shall include one signal head that is mounted on the vertical upright of the pedestal/cart or trailer. Pedestal/Cart mounted shall be designated as Type 2A and Trailer mounted shall be designated as Type 2B. Type 2 portable traffic signals shall be tested to MASH Standards or NCHRP Test Level 3 crash testing requirements by an accredited independent test facility, with supporting documentation available upon request.

- Type 3 portable traffic signal shall be the same as Type 1 mentioned above but with enhanced capabilities as mentioned in each applicable section below.

The portable traffic signals shall be MUTCD Compliant and utilize standard ITE signal heads, and adhere to the ITE Specifications and Standards for Vehicle Traffic Control Signal Heads, Light Emitting Diode (LED) Circular Signal Supplement. The units shall be battery powered with a solar charging system, and be equipped with an onboard battery charger capable of being used with a 120V AC power source. Portable traffic signals shall be able to communicate with other portable signals via 900 MHz or other accepted wireless communications. If wireless connectivity is not feasible, hardwired connectivity shall be an acceptable alternative, as approved by the Engineer. Portable Traffic Signals shall include all the major components listed below or be able to perform the functions of these components. The major components of the unit shall include, but are not limited to, the trailer or pedestal/cart, telescoping mast arm (on Type 1 and 3), signal head(s) and back plates, traffic signal controller with operating software, solar charging system with batteries, input and output devices, vehicle detection, flasher units, conflict monitor, relays,

communications system and other equipment required for the safe operation and installation of the unit.

907-619.02.8.1.1--Signal Heads. The signal heads and all applicable components of the portable traffic signal shall meet the physical display and operational requirements of conventional traffic signals as specific in the Manual on Uniform Traffic Control Devices (MUTCD). The signal heads shall be cast aluminum or polycarbonate and shall meet the requirements laid out in the Mississippi Standard Specification for traffic signal heads and associated MDOT material specifications for traffic signal heads. The signal heads shall accommodate standard 12-inch LED indications meeting the ITE Specification "Vehicle Traffic Control Signal Heads" and ITE Specifications and Standards for Vehicle Traffic Control Signal Heads, Light Emitting Diode (LED) Circular Signal Supplement.

For Type 1, Type 2 and Type 3 portable traffic signals, the signal heads shall have the ability to be rotated 180 degrees to face in the opposite direction and shall have the ability to rotate and lock in approximately 10 degree increments to position the signal head for the optimum visibility to motorists.

For Type 1 portable traffic signals, each unit shall contain two signal heads with one signal head mounted on an overhead mast arm that can be extended over the travel lane with a minimum clearance of 17 feet measured from the bottom of the signal head unit to the road surface. The lower signal head shall be mounted to the vertical upright of the trailer at a minimum height of eight feet (8') from the bottom of the signal head unit to the road surface.

For Type 2 portable traffic signals, the signal head shall be mounted to the vertical upright of the trailer at a minimum height of eight feet (8') from the bottom of the signal head unit to the road surface.

For Type 3 portable traffic signals, each unit shall be the same as Type 1 mentioned above but with enhanced capabilities as mentioned below.

907-619.02.8.1.2--Controller and Operating Requirements. The portable traffic signal (Types 1, 2, and 3) shall include a solid state Controller Unit (CU) that is in compliance with NEMA TS 5 Performance Standard. The CU shall have an easy to read front panel backlit display for viewing and programming the configuration settings and CU status. The CU shall be capable of operating the portable traffic signal system in a fixed time, traffic actuated or manual control mode. Multiple portable traffic signals shall have the capability to be interconnected to form a portable traffic signal system. Each portable traffic signal within a connected system shall have the capability to serve as either the master or remote signal. Each portable traffic signal shall include a Conflict Monitor Unit (CMU), or Malfunction Management Unit (MMU) to ensure phase conflicts do not exist during operation.

For Type 1 and Type 2 portable traffic signals, a minimum of five (5) automatic time-of-day timing plans within a 24-hour period should be available in fixed time mode. The CU should have the ability to control a minimum of four (4) traffic phases with programmable cycle time adjustments and user adjustable red, amber, minimum green and maximum green times. The CU shall have

the capability of programming green and red times from 1 to 999 seconds and yellow times up to 15 seconds in one-second increments. The CU shall also have the capability of facilitating standby modes of red, red flash and yellow flash.

For Type 3 portable traffic signals, a minimum of ten (10) automatic time-of-day timing plans within a 24-hour period should be available in fixed time mode. The CU should have the ability to control a minimum of 16 traffic phases with programmable cycle time adjustments and user adjustable red, amber, minimum green and maximum green times. The CU shall have the capability of programming green and red times from 1 to 999 seconds and yellow times up to 15 seconds in one-second increments. The CU shall also have the capability of facilitating standby modes of red, red flash and yellow flash.

The system shall also have the ability to operate in vehicle actuation mode when vehicle detection components are used. The operating system shall have the capability to allow the Portable Traffic Signal to be connected to and controlled by a standard NEMA controller.

The system shall have the capability to be controlled remotely using a hardwired or wireless remote. The wireless radio remote shall be capable of communicating at a clear line of site distance up to ¼ mile from the master.

The CU shall have the capability of interfacing with a Remote Monitoring System (RMS) capable of reporting signal location, battery voltage, and system faults. The RMS shall include a password-protected web site, viewable via an internet connection. In the event of a system fault, the RMS shall provide specific information concerning the cause of the system fault (example: "red lamp on signal number 1 out"). The RMS shall immediately contact previously designated individuals via SMS text messaging or email, upon a fault event.

The active timing program operating the PTS system shall be available and viewable through the RMS website at all times. The RMS shall maintain a history of the operating system in each signal including total operating hours, alerts, and the location of the PTS trailer.

907-619.02.8.1.3--Wireless Communications. The portable traffic signals shall communicate with other portable traffic signals within the signal system via license-free wireless 900 MHZ radio link communications as specified in Subsection 662.02.2 of the radio Interconnect System specification. The radio units shall maintain communications at a minimum distance of one (1) mile. The radio system shall conform to the applicable Federal Communications Commission requirements and all applicable state and local requirements.

The portable traffic signals shall be in direct communication at all times either by wireless or hardwire connection to provide for the required conflict monitoring / malfunction management system.

907-619.02.8.1.4--Power Requirements. Each Portable Traffic Signal shall be equipped with a power source consisting of a solar collection array, solar controller and/or charging unit and batteries sufficient to operate the signal system. The number and size of batteries shall be sufficient to operate the Type 1 and Type 3 signals for a minimum of 30 days and Type 2A signals for

minimum of five (5) days, and Type 2B signals for minimum of 15 days without additional charging or assist from the solar array. An on-board battery charger shall be compatible with both the solar array and with a 120V AC power source.

For Type 1 signals, the solar panel array shall provide for a minimum of 440 watts of solar collection capability.

For Type 2A signals, the solar panel array shall provide for a minimum of 90 watts of solar collection capability.

For Type 2B signals, the solar panel array shall provide for a minimum of 110 watts of solar collection capability.

For Type 3 signals, the solar panel array shall provide for a minimum of 480 watts of solar collection capability and shall include a tilt and rotate system to optimally position the panels.

All instrumentation for the electrical system and battery compartment shall be contained in a lockable weatherproof enclosure. Solar panels shall be secured to the mounting brackets for theft prevention.

907-619.02.8.1.5--Trailer and Lift System. The trailer or pedestal/cart and all mounted components shall conform to the wind loading requirements as follows: 100 mph minimum for Type 1 portable traffic signals, 55 mph minimum for Type 2A portable traffic signals, 75 mph minimum for Type 2B portable traffic signals, and 90 mph minimum for Type 3 portable traffic signals as described in the AASHTO *Standard Specifications for Highway Signs, Luminaries and Traffic Signals*, as specified in the plans including all interims and updates. At the request of the Engineer, proof of conformance to these wind load ratings shall be verified by a third-party. No additional loose ballast shall be used to meet these wind load requirements. The trailer shall be made of structural steel and shall include four (4) leveling/stabilizer jacks capable of lifting the trailer a minimum of six inches (6").

The trailer or pedestal shall be equipped with a mechanical, hydraulic or electric lift system sufficient for one person to be able to raise and lower the vertical upright and/or horizontal mast arm to and from the operating position.

For Type 1, 2B, and Type 3 signals, the trailer shall be equipped to provide legal and safe transport on the public highway system at speeds up to 55 mph.

All exterior metal surfaces, except signal heads and back plates, shall be powder-coat painted highway safety orange.

907-619.02.9--Impact Attenuators. Delete the sentence in the first paragraph of Subsection 619.02.9 on page 455, and substitute the following.

Impact attenuators must be listed on the Department's APL.

907-619.02.11--Snap-Back Delineators. Delete the sentence in the paragraph of Subsection 619.02.11 on page 456, and substitute the following.

Snap-back delineators shall be selected from the list of surface mounted flexible delineator posts as shown on the Department's APL.

907-619.02.14--Changeable Message Sign.

907-619.02.14.5--PCMS Controller and Storage Cabinets. Delete the fifth sentence in the first paragraph of Subsection 619.02.14.5 on pages 462 and 463, and substitute the following.

The controller cabinet shall be illuminated.

907-619.05--Basis of Payment. Add the following to the list of pay items ending on page 480.

907-619-E3: Changeable Message Sign ***** - per each

907-619-H2: Traffic Signal, Portable, Type ___ - per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-624-1 **CODE: (SP)**

DATE: 01/17/2017

SUBJECT: Inverted Profile Thermoplastic Traffic Stripe

Section 907-624, Inverted Profile Thermoplastic Traffic Stripe, is hereby added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

907-624.01--Description. Inverted profile thermoplastic pavement markings consists of furnishing materials and placing inverted profile thermoplastic pavement markings in reasonably close conformity with these specifications and the details shown on the plans or established.

Inverted profile thermoplastic pavement markings, high contract, shall consist of furnishing materials and placing inverted profile thermoplastic pavement markings over a black thermoplastic pavement marking in order to enhance the marking's visibility.

907-624.02--Materials.

907-624.02.1--General. The inverted profile thermoplastic marking material shall consist of an alkyd/maleic or hydrocarbon based formulation. The material shall be so manufactured as to be applied to the pavement in a molten form, with internal and surface application of glass spheres, and upon cooling to normal pavement temperature, shall produce an adherent, reflectorized pavement marking of specified thickness and width, capable of resisting deformation.

Materials shall be obtained from approved sources as listed on the Department's "List of Approved Sources" for Inverted Profile Thermoplastic Pavement Marking Materials. The material shall not scorch, break down, discolor, or deteriorate when held at the application temperature for four hours or when reheated four times to the application temperature. Temperature-vs-viscosity characteristics of the plastic material shall remain constant when reheated four times, and shall be the same from batch to batch.

The thermoplastic material shall be a product especially compounded for pavement markings. The pavement markings shall maintain their original dimension and shall not smear or spread under normal traffic at temperatures below 140ºF. The markings shall have a uniform cross section. Pigment shall be evenly dispersed throughout its thickness. The exposed surface shall be free from tack and shall not be slippery when wet. The material shall not lift from pavement in freezing weather. Cold ductility of the material shall be such as to permit normal movement with the pavement surface without chipping or cracking.

Black thermoplastic compound for the placement of inverted profile thermoplastic pavement markings, high contract, shall consist of a hydrocarbon or alkyd/maleic based formulation.

The manufacturers of the thermoplastic compound, glass beads and epoxy primer sealer shall furnish to the Engineer three copies of certified test reports showing results of all tests specified herein and shall further certify that the materials meet all requirements. The Contractor shall provide the warranty as specified herein to the Engineer.

907-624.02.2--Inverted Profile Thermoplastic Material. The thermoplastic material shall consist of homogeneously mixed pigments, fillers, resins and glass beads, and shall be available in both white and yellow. The material shall be free from all skins, dirt, and foreign objects**.** Materials shall conform to AASHTO M 249 with the following modifications:

907-624.02.2.1--Intermixed Glass Beads. The thermoplastic material shall contain a minimum of 40 percent Class H glass beads by weight. Class H glass beads shall meet the requirements of ASTM D 1155, and shall be coated with an adhesion promoting coating which shall also provide moisture resistance as tested by AASHTO M 247, Section 4.4.2. Class H beads shall have a minimum of 70 percent true spheres and the +20 sieve shall be tested visually.

The gradation of the Class H beads shall meet the following:

U. S. Standard Sieve	% Passing
12	100
14	95 - 100
16	80 - 100
18	30 - 100
20	15 - 100
30	10 - 100
50	0 - 50
100	0 - 5

907-624.02.2.2--Binder Content. The binder content of the thermoplastic material shall be 19 percent minimum.

907-624.02.2.3--Titanium Dioxide. The titanium dioxide shall meet ASTM D 476, Type II, Rutile grade - 10 percent minimum titanium content.

907-624.02.2.4--Yellow Pigment. The yellow pigment for the yellow thermoplastic material shall be five (5) percent minimum.

907-624.02.2.5--Specific Gravity. The specific gravity of the thermoplastic pavement marking material shall not exceed 2.35.

907-624.02.2.6--Flow Characteristics.

907-624.02.2.6.1--Flowability. After heating the thermoplastic material for four (4) hours ±5 minutes at 425 ±3ºF and testing flowability, the white thermoplastic shall have a maximum percent residue of 22 percent and the yellow thermoplastic shall have a maximum residue of 24 percent.

907-624.02.2.6.2--Flow Resistance. The material shall exhibit a maximum flow of 10%. The material's ability to form ribs on the markings shall be evaluated by casting a disc of material approximately 3.5 inches wide by 1.0 inch long by and 0.60 inch deep. After the material is cooled to ambient temperature, measure the exact height. The material shall then be stored at 190ºF for four (4) hours. After the material is cooled to ambient temperature, re-measure the exact height and express the flow resistance as a flow percentage.

907-624.02.2.7--Reflectivity. The initial reflectance for the in-place marking shall have a minimum reflectance value of 450 mcd/fc/sq. ft. for white and 350 mcd/fc/sq. ft. for yellow, when measured with a Mirolux Ultra 30 retroreflectometer, or approved equal.

907-624.02.2.8--Wet Reflectivity. The initial reflectance for the in-place marking when wet shall have a minimum reflectance value of 200 mcd/fc/sq. ft. for white and 175 mcd/fc/sq. ft. for yellow, when measured with an approved retroreflectometer. The stripe shall be wetted utilizing a pump type sprayer for five (5) seconds. After 30 seconds, place the retroreflectometer on the stripe and measure the reflectance.

907-624.02.2.9--Inverted Profile. The thermoplastic pavement marking material shall be applied to have individual profiles having a minimum height of 0.140 inches with the recessed inverted profiles having a thickness of 0.025 to 0.050 inches. The profiles shall be well defined, spaced approximately one (1) inch apart, and not excessively run back together.

907-624.02.3--Black Pavement Marking Material for High Contrast Inverted Profile Pavement Markings.

907-624.02.3.1--General. In the molten state, the material shall not give off fumes that are toxic or otherwise injurious to persons or property. The manufacturer shall provide material safety data sheets for the product.

The temperature versus viscosity characteristic of the plastic material shall remain constant and the material shall not deteriorate in any manner during three reheating processes. There shall be no obvious change in color of the material as a result of up to three reheatings, or in maintaining the material at application temperature up to an aggregate time of four (4) hours, or from batch to batch. The maximum elapsed time after application at which normal traffic will leave no impression or imprint on the new stripe shall be 30 seconds when the air and road surface temperature is approximately 68 ±5°F. The applied stripe shall remain free from tack and shall not lift from the pavement under normal traffic conditions within a road temperature range of -20°F to 150°F. The stripe shall maintain its original dimensions and placement. Cold ductility of the material shall be such as to permit normal dimensional distortion as a result of tire impact within the temperature range specified.

The material shall provide a stripe that has a uniform thickness throughout its cross section.

907-624.02.3.2--Binder. The binder shall be hydrocarbon or alkyd/maleic based. The binder shall consist of a homogeneous mixture of pigment, fillers, resins, waxes and plasticizers. The total

binder content shall be well distributed throughout the compound. The binder shall be free from all foreign objects or ingredients that would cause bleeding, staining or discoloration. The binder shall be 19 percent minimum by weight of the thermoplastic compound.

907-624.02.3.3--Pigment. The pigment used for black pavement marking compound shall be as required and shall be uniformly distributed throughout the marking compound.

907-624.02.3.4--Filler. The filler to be incorporated with the resins shall be a white calcium carbonate, silica or any approved substitute.

907-624.02.3.5--Specific Gravity. The specific gravity of the marking compound shall not exceed 2.0.

907-624.02.3.6--Softening Point. After heating the marking compound for 4 hours ±5 minutes at 375 ±3°F and testing in accordance with ASTM E 28, the material shall have a minimum softening point of 180°F as measured by the ring and ball method.

907-624.02.3.7--Tensile Bond Strength. After heating the marking compound for 4 hours ±5 minutes at 375 ±3°F, the tensile bond strength shall exceed 180 psi when tested in accordance with ASTM D 4806. The material shall be applied to unprimed, sandblasted Portland cement concrete block at a thickness of 0.0625-inch and at a temperature of 375 ±3°F. The test shall be conducted at room temperature.

907-624.02.3.8--Impact Resistance. After heating the marking compound for 4 hours ±5 minutes at 375 ±3°F, the impact resistance shall be a minimum of 50 inch-pounds minimum when tested in accordance with ASTM D 2794. No cracks or bond loss shall occur when a 0.0625-inch thick film drawdown is made at 375 ±3°F on an unprimed sandblasted Portland cement concrete block. The sample is tested with a male indentor 5/8-inch and no female Die at room temperature.

907-624.02.3.9--Identification. Each package of material shall be stenciled with the manufacturer's name, the type of material and specification number, the month and year the material was packaged and lot number. The letters and numbers used in the stencils shall be a minimum of 1/2 inch in height.

907-624.02.3.10--Packaging. The material shall be packaged in suitable containers that will not adhere to the product during shipment and storage. The container of pavement marking material shall weigh approximately 50 lbs. Each container shall designate the color, type of resin, type of application and user information. The label shall warn the user that the material shall be heated in the range of 350° to 425°F.

907-624.02.3.11--Storage Life. The material shall meet the requirements of this specification for a period of one year. The material must also meet uniformly with no evidence of skins or unmelted particles for this one-year period. The manufacturer shall replace any material not meeting the above requirements.

907-624.02.3.12--Certifications. The material manufacturer shall furnish a certified copy of material test reports to the Engineer.

907-624.02.4--Drop-On Glass Beads. Drop-on glass beads shall be separated into two (2) classes, as follows:

907-624.02.4.1--Class G Glass Beads. Class G glass beads shall be coated with an adhesion promoting coating which shall also provide moisture resistance as tested by AASHTO M 247, Section 4.4.2 and shall exhibit the following characteristics:

- **Color and Clarity:** The glass beads shall be colorless and clear, and shall be free of carbon residues.
- **Index of Refraction:** minimum 1.50
- **Roundness**: The glass beads shall have a minimum of 80% true spheres per screen for the two highest sieve quantities, determined visually, and a maximum of 3% angular particles per sieve, determined visually. The remaining sieves shall have a minimum of 75% true spheres, determined visually per aspect ratio using microfiche reader.
- **Air Inclusions:** 10% maximum
- **Specific Gravity:** The specific gravity of the glass beads shall be a minimum of 2.50.
- **Gradation:** The gradation of Class G glass beads shall be as follows:

U. S. Standard Sieve	% Passing
12	100
14	100 - 95
16	100 - 80
18	100 - 20
20	90 - 20
30	100 - 50
Pan	100 - 90

All Class G glass beads shall be coated with an adhesion promoting coating.

907-624.02.4.2--Class H Glass Beads. Class H glass beads shall meet the requirements of ASTM D 1155, and shall be coated with an adhesion promoting coating which shall also provide moisture resistance as tested by AASHTO M 247, Section 4.4.2. Class H beads shall have a minimum of 70 percent true spheres and the +20 sieve shall be tested visually.

The gradation of the Class H beads shall meet the following:

U. S. Standard Sieve	% Passing
16	99 - 100
20	75 - 100
30	55 - 95
50	10 - 35
100	0 - 5

907-624.03--Construction Requirements.

907-624.03.1--Equipment. The application equipment shall be specifically designed for placing thermoplastic material in a hot molten state on the pavement surface utilizing a pressure type application method. The thermoplastic stripe shall be formed by a die that is allowed to drag along in proximity with the pavement surface. The die is pulled forward by a special linkage that will allow it to automatically level itself as to float and remain parallel with the pavement surface. The traffic stripe shall be formed by reason that the hot thermoplastic material is forced under pressure through four sides to the die onto the pavement surface. The top of the die shall be enclosed and provide entry means for the hot molten thermoplastic material to enter the die cavity. The bottom of the die shall contain a movable door that is remote controlled so as to start or stop the flow of thermoplastic material onto the pavement surface. When the movable door is open, thermoplastic material can flow through the die and will apply a thermoplastic stripe that will be formed rearward of the advancing die. The pavement surface shall be at the bottom of the die enclosure. Thermoplastic material shall be fed to the die under pressure through flexible oil-jacketed stainless steel hoses. The thermoplastic material must be either pumped or fed from a pressure vessel to the die under pressure in order to obtain the proper adhesion with the pavement surface.

The system shall consist of a low pressure drop-on type glass bead gun, (bead coat #1). The thermoplastic die shall be oil-jacketed on four (4) sides and is formed from a single solid block of steel. The glass bead gun shall dispense glass beads onto the hot thermoplastic stripe from a height of approximately one (1) inch above the pavement surface. The point at which the glass beads strike the surface of the stripe shall be approximately three inches (3") behind the strike point of the thermoplastic material itself. This reflective bead coat #1 shall utilize Class G glass beads as specified herein, and shall provide a surface coating of 50 percent of the thermoplastic stripe surface. Of this 50 percent stripe coverage, at least 50 percent of the beads shall be embedded to a depth of 60 percent of their diameter.

A second curtain coater, low pressure drop-on type glass bead gun capable of applying a continuous sheet or ribbon of glass beads, shall follow at an interval of approximately 10 inches behind the first bead gun. This second glass bead gun shall apply bead coat #2 which will form a continuous drop-on coat of Class H glass beads immediately in front of the profiling device. This second curtain of glass beads shall have a low impact speed so that they are not forced into the stripe under pressure.

A special rotatable wheel profiling device shall be located approximately eight (8) inches behind bead gun #2. This rotatable wheel device shall be approximately seven (7) inches in diameter and shall have a plurality of spaced projections located around its circumference. The profiling device shall be wider than the stripe being applied in order that the stripe shall be adequately covered. The projections on the rotatable profiling device shall have an angular profiling surface set at an angle to the pavement surface. The rotatable profile device shall be mounted with an automatic leveling device to the same carriage assembly as the thermoplastic gun. This is required so that a traffic stripe of accurate and uniform definition can be obtained. The inverted profile grooves shall be pressed into the hot molten thermoplastic stripe within one (1) second of the thermoplastic material application in order to insure proper bead adhesion to the stripe. Using rollers to place grooves in the traffic stripe utilizing a separate vehicle or grooves that are not pressed within one

(1) second of the thermoplastic material application will not be allowed. To insure that no thermoplastic material adheres to the wheel as it rotates and profiles the stripe, a small air atomizer water jet shall apply a thin mist coat of water to the rotatable profile wheel. It is the intent of this specification that a minimum amount of water be used and that no water puddles greater than ¼ inch in diameter be allowed to accumulate on the pavement surface in proximity to the freshly placed stripe. Excess water on the pavement surface can cause bond failure of the thermoplastic material.

All parts of the thermoplastic holding tank including manifolds, hoses, pipes, dies, etc., shall be oil-jacketed to insure accurate temperature control. The thermoplastic material shall be preheated in kettles designed specifically for that purpose. Each kettle of preheated thermoplastic material shall be properly mixed and heated to the correct application temperature. The preheated material shall then be fed to the thermoplastic gun for application.

The striping machine shall contain enough glass beads and water to apply one full kettle of thermoplastic material.

907-624.03.2--Cleaning of Pavement Surface. Immediately before application, the areas to receive markings shall be cleaned thoroughly using equipment capable of cleaning without damaging the pavement surface. This will include, but not be limited to, all vegetation, loose soil, oils, and other debris. On areas of pavement cured with compound, the membrane shall be removed completely by "shot" blasting, sand blasting or other approved method. Striping shall follow as closely as practical after the pavement surface has been cleaned.

907-624.03.3--Application Over Existing Striping. Where shown on the plans or directed by the Engineer, the existing traffic stripe shall be removed by grinding or sandblasting. When placing inverted profile thermoplastic pavement markings on existing pavement that has more than one light coat (pavement not showing through stripe) of striping material, the existing stripe shall be removed to the point that 80 percent of the pavement surface is visible.

Removal of existing stripe will be paid for as a separate item of work.

Where unsatisfactory striping performed by the Contractor must be removed and replaced in accordance with these specifications, the Contractor shall use the removal method described above. No payment will be made for removal or replacement of the Contractor's unsatisfactory striping.

907-624.03.4--Surface Conditions. When placing inverted profile thermoplastic pavement markings, no striping shall be permitted when the pavement surface temperature is less than 60ºF. A non-contact infrared pyrometer shall be furnished by the Contractor for use by the Engineer for verification of the temperature. Striping shall not be performed when there is moisture on the pavement surface or when winds exceed 12 mph. When unseen moisture is suspected to be present, a moisture test shall be performed. The test shall be as follows:

1) Place a piece of roofing felt on the pavement surface.
2) Pour 0.5 gallon of thermoplastic material at application temperature onto the paper.

3) After two (2) minutes, lift the paper and inspect to see if moisture has been drawn from the pavement.
4) If moisture is present, striping is not to begin until the surface is moist free.

Documentation of weather and pavement conditions shall be recorded as part of completing the MDOT Inverted Profile Thermoplastic Pavement Marking Inspectors Report.

907-624.03.5--Application. Prior to the placement of pavement markings, the Contractor shall furnish the Engineer three copies of the manufacturer's warranty stating that the manufacturer will guarantee the pavement marking to meet the requirements of this specification.

The thermoplastic material shall be preheated and thoroughly mixed. The application temperature of the thermoplastic material shall be between 400ºF and 430ºF. A digital thermometer complete with a 24-inch probe shall be furnished by the Contractor for use by the Engineer for verification of the temperature.

When measured at the highest point of the profile, the cold thickness of the in-place thermoplastic stripe shall be a minimum of 0.140 inch for Inverted Profile Thermoplastic Pavement Markings. The thickness of the thermoplastic material in the bottom of the profiles shall range from 0.025 to 0.050 inch. The individual profiles shall be located transversely across the stripe at intervals of approximately one (1) inch. The bottoms of these intervals shall be between 3/32 inch and 5/16 inch wide. In order to drain water and to reflect light, it is normal for the top surface of the inverted profiles to be irregular. The application rate of thermoplastic material for Inverted Profile Thermoplastic Pavement Markings shall be a minimum of 2700± pounds per mile for a continuous 6-inch stripe.

The application rate for Class G glass beads (bead coat #1) shall be 300± pounds per mile for 6-inch continuous stripe.

The application rate for Class H glass beads (bead coat #2) shall be 300± pounds per mile for 6-inch continuous stripe.

The thickness of the striping materials shall be verified periodically (at least every 1320 feet) and any thickness more than five (5) percent under the designated thickness shall be reworked. A consistent, uncorrected under-run will not be allowed and the Contractor will be required to install the specified minimum thickness of 0.140 inch. A wet thickness gauge and cold thickness gauge shall be furnished by the Contractor for use by the Engineer for the verification of film thickness.

When striping over existing painted stripe (one light coat), on old oxidized asphalt, on all concrete surfaces or on asphalt surfaces when ambient temperatures are below 70ºF, a two component epoxy primer sealer shall be used and installed as recommended in writing by the thermoplastic material manufacturer. The epoxy primer sealer shall be EX255/EX256 as manufactured by Crown Paint Company of Oklahoma City, Oklahoma, or approved equal. The Contractor shall furnish certification of compatibility of the epoxy primer sealer to be used with the thermoplastic material supplied. If an alternate epoxy primer sealer to the EX255/EX256 is used, the Contractor

shall furnish a mill analysis and proof of adequate performance of the alternate epoxy primer sealer when used with thermoplastic pavement markings.

907-624.03.6--Inverted Profile Thermoplastic Traffic Stripe, High Contrast. Before applying the black pavement marking material, the Contractor shall remove any dirt, glaze, grease or any other material that would reduce the adhesion of the thermoplastic to the pavement.

The pavement marking material shall be installed in a molten state by the spray method at a minimum temperature of 350°F and a maximum temperature of 425°F. Scorching or discoloration of material shall be cause for rejection by the Engineer. The machinery shall be constructed so that all mixing and conveying parts, up to and including the thermoplastic gun, maintain the material in the molten state.

The pavement marking materials shall not be applied when air and pavement surface temperatures are below 60°F or when the surface of the pavement contains any evidence of moisture.

The pavement marking material shall be applied at a thickness of not less than 0.040-inch.

The equipment used to install hot applied pavement marking material shall provide continuous mixing and agitation of the material while maintaining a minimum temperature exceeding 400°F. A strainer shall be in place between the main material reservoir and the gun to prevent accumulation and clogging. The equipment shall be constructed for easy accessibility to parts requiring cleaning and maintenance.

After the black thermoplastic pavement markings are applied, inverted profile thermoplastic markings shall be placed over the black thermoplastic pavement markings in accordance with the specifications and to the dimensions and details shown on the plans or established.

907-624.03.7--Warranty. The manufacturer shall warrant that the inverted profile thermoplastic markings will meet the minimum performance level of 150 mcd/fc/sq. ft. dry and 75 mcd/fc/sq. ft. wet for a period of 48 months from the date of final inspection when exposed to normal roadway conditions regardless of the average daily traffic. Failure to meet this requirement will result in the total replacement of the portion of the stripe shown to be below these minimums. All costs of labor, material and other incidentals necessary for the replacement of unacceptable pavement markings shall be at no additional costs to the State.

Compliance will be determined by an average brightness reading over a minimum zone marking length of 300 linear feet, using an approved reflectometer. The zone of measurement referred to includes centerline stripe, edge lines and skip lines.

Performance Requirements:	**White**		**Yellow**	
	Dry	**Wet**	**Dry**	**Wet**
Initial Reflectivity, mcd/fc/sq. ft.	450	200	350	175
48-Month Retained Reflectivity	150	75	150	75

The measurement procedure for this warranty will entail a visual night inspection by a manufacturer representative and a MDOT representative to identify areas of the installation, which appear to be below the specified minimum, warranted reflectance value. All reflectance measurements for dry conditions shall be made on a clean dry surface at a minimum temperature of 40°F. All reflectance measurements for wet conditions shall be made using the setting conditions of Subsection 907-624.02.2.8 at a minimum temperature of 40°F.

Measurement intervals for installations with areas less than, or equal to, three (3) miles shall be at a minimum of three (3) check points for each zone. These check points should include the start point, approximate mid-point and the end point.

Measurement intervals for installations with areas greater than three (3) miles shall be at a minimum of three (3) check points, one at the start point, one at the end point and additional measurements spaced at 3-mile intervals between the start and end points of the area in question.

The number of measurements at each check point for each zone will be as follows:

(A) Skip Lines: Eighteen (18) measurements, distributed over six (6) skip lines, shall be made at each check point.

(B) Center Lines and/or Edge Lines: Eighteen (18) measurements shall be made over 300 linear feet of continuous stripe.

When taking reflectivity measurements, the value of the measurement shall be determined by averaging three measurements; one at the left edge of the stripe, one at the center of the stripe and one at the right edge of the stripe.

In addition, the reflectance values measured at each check point shall be averaged by zone to determine conformance to the minimum warranted reflective values.

907-624.04--Method of Measurement. Inverted profile thermoplastic traffic stripe of the type specified will be measured by the mile or by the linear foot, as indicated, from end-to-end of individual stripes. In the case of skip lines the measurement will include skips. The length used to measure centerline and edge stripes will be the horizontal length computed along the stationed control line. Inverted profile thermoplastic detail traffic stripe will be measured by the linear foot from end-to-end of individual stripes. Measurements will be made along the surface of each stripe and will exclude skip intervals where skips are specified. Stripes more than six (6) inches in width will be converted to equivalent lengths of six-inch widths.

907-624.05--Basis of Payment. Inverted profile thermoplastic traffic stripe, measured as prescribed above, will be paid for at the contract unit price per mile or linear foot, as applicable, which shall be full compensation for completing the work.

Payment will be made under:

907-624-A:	6" Inverted Profile Thermoplastic Traffic Stripe, Skip White *	- per linear foot or mile
907-624-B:	6" Inverted Profile Thermoplastic Traffic Stripe, Continuous White *	- per linear foot or mile
907-624-C:	6" Inverted Profile Thermoplastic Traffic Stripe, Skip Yellow *	- per linear foot or mile
907-624-D:	6" Inverted Profile Thermoplastic Traffic Stripe, Continuous Yellow *	- per linear foot or mile
907-624-E:	Inverted Profile Thermoplastic Detail Traffic Stripe, Color *	- per linear foot

* High Contrast may be specified

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-701-2 **CODE: (IS)**

DATE: 01/08/2020

SUBJECT: Hydraulic Cement

Section 701, Hydraulic Cement, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-701.01--General. In the first sentence of the second paragraph of Subsection 701.01 on page 718, change "mills" to "plants."

In the second sentence of the sixth paragraph of Subsection 701.01 on pages 718 and 719, change "shall" to "will."

907-701.02--Portland Cement.

907-701.02.1-General.

907-701.02.1.2--Alkali Content. Delete the sentence in Subsection 701.02.1.2 on page 719, and substitute the following.

The Equivalent alkali content for all cement types in this Subsection shall not exceed 0.60%.

907-701.02.2--Replacement by Other Cementitious Materials. Delete the paragraph in Subsection 701.02.2 on page 719, and substitute the following.

The maximum replacement of cement by weight is 25% for fly ash or 50% for ground granulated blast furnace slag (GGBFS). Replacement contents below 20% for fly ash or 45% for GGBFS may be used, but will not be given any special considerations, such as the maximum acceptance temperature for portland cement concrete containing pozzolans in Subsection 804.02.13.1.5. Special considerations shall only apply for replacement of cement by fly ash or GGBFS.

Delete Subsection 701.02.2.1 on pages 719 and 720, and substitute the following.

907-701.02.2.1--Portland Cement Concrete Exposed to Soluble Sulfate Conditions or Seawater.

When portland cement concrete is exposed to moderate or severe soluble sulfate conditions, or to seawater, cement types and replacement of cement by Class F fly ash or GGBFS shall be as follows in Table 1. Class C fly ash shall not be used as a replacement for cement in any of the sulfate exposure conditions listed in Table 1.

Table 1- Cementitious Materials for Soluble Sulfate Conditions or Seawater

Sulfate Exposure	Water-soluble sulfate (SO_4) in soil, % by mass	Sulfate (SO_4) in water, ppm	Cementitious material required
Moderate and Seawater	0.10 - 0.20	150 - 1,500	Type I cement with one of the following replacements of cement by weight: 24.5 - 25.0% Class F fly ash, or 49.5 - 50.0% GGBFS or Type II*,** cement
Severe	0.20 - 2.00	1,500 - 10,000	Type I cement with a replacement by weight of 49.5 - 50.0% GGBFS, or Type II* cement with one of the following replacements of cement by weight: 24.5 - 25.0% Class F fly ash, or 49.5 - 50.0% GGBFS

* Type III cement conforming to AASHTO M85 with a maximum 8% tricalcium aluminate (C_3A) may be used in lieu of Type II cement as allowed in Subsection 701.02.1; this cement is given the designation "Type III(MS)."

** Class F fly ash or GGBFS may be added as a replacement for cement as allowed in Subsection 907-701.02.2.

Delete Subsection 701.02.2.2 on page 720, and substitute the following.

907-701.02.2.2--Portland Cement for Soil Stabilization Exposed to Soluble Sulfate Conditions or Seawater. When portland cement for use in soil stabilization is exposed to moderate or severe soluble sulfate conditions, or to seawater, cement types and replacement of cement by Class F fly ash or GGBFS shall meet the requirements of Subsection 701.02.2.1.

907-701.04--Blended Hydraulic Cement.

907-701.04.1--General. Delete Subsection 701.04.1.1 on page 720, and substitute the following.

907-701.04.1.1--Types of Blended Hydraulic Cement. Blended hydraulic cements (blended cements) shall be of the following types and conform to AASHTO M 240:

Type IL – Portland-limestone cement
Type IP – Portland-pozzolan cement
Type IS – Portland blast-furnace slag cement

Blended cement Types IL, IP, and IS meeting the "MS" sulfate resistance requirement listed in AASHTO M 240, Table 3 shall have the "(MS)" suffix added to the type designation.

907-701.04.1.2--Alkali Content. Delete the sentence in Subsection 701.04.1.2 on page 720, and substitute the following.

All blended cement types shall be made with clinker that would result in cement meeting the requirements of Subsection 701.02.1.2 when used in the production of AASHTO M 85, Type I or Type II cement.

907-701.04.2--Replacement by Other Cementitious Materials. Delete the paragraph in Subsection 701.04.2 on page 720, and substitute the following.

The maximum replacement of blended cement Type IL by weight is 35% for fly ash or 50% for GGBFS. Replacement contents below 20% for fly ash or 45% for GGBFS may be used, but will not be given any special considerations, such as the maximum acceptance temperature for blended cement concrete containing pozzolans in Subsection 804.02.13.1.5. Special considerations shall only apply for replacement of blended cement by fly ash or GGBFS.

No additional cementitious materials, such as portland cement, blended cement, fly ash, GGBFS, or others, shall be added to or as a replacement for blended cement Types IP and IS.

Delete Subsection 701.04.2.1 on pages 720 and 721, and substitute the following.

907-701.04.2.1--Blended Cement Concrete Exposed to Soluble Sulfate Conditions or Seawater. When blended cement concrete is exposed to moderate or severe soluble sulfate conditions, or to seawater, cement types and replacement of cement by Class F fly ash or GGBFS shall be as follows in Table 2. Class C fly ash shall not be used as a replacement for cement in any of the sulfate exposure conditions listed in Table 2.

Table 2- Cementitious Materials for Soluble Sulfate Conditions or Seawater

Sulfate Exposure	Water-soluble sulfate (SO_4) in soil, % by mass	Sulfate (SO_4) in water, ppm	Cementitious material required
Moderate and Seawater	0.10 - 0.20	150 - 1,500	Type IL (MS)* cement, Type IL cement with one of the following replacements of cement by weight: 24.5 - 35.0% Class F fly ash, or 49.5 - 50.0% GGBFS, Type IP (MS) cement, or Type IS (MS) cement
Severe	0.20 - 2.00	1,500 - 10,000	Type IL cement with a replacement of cement by weight of 49.5 - 50.0% GGBFS, or Type IL (MS) cement with one of following replacements of cement by weight: 24.5 - 35.0% Class F fly ash, or 49.5 - 50.0% GGBFS

* Class F fly ash or GGBFS may be added as a replacement for cement as allowed in Subsection 907-701.04.2.

Delete Subsection 701.04.2.2 on page 721, and substitute the following.

907-701.04.2.2--Blended Cement for Soil Stabilization Exposed to Soluble Sulfate Conditions or Seawater. When blended cement for use in soil stabilization is exposed to moderate or severe soluble sulfate conditions, or to seawater, cement types and replacement of cement by Class F fly ash or GGBFS shall meet the requirements of Subsection 701.04.2.1.

Delete Subsection 701.04.3 on page 721.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-702-4 **CODE: (IS)**

DATE: 09/11/2018

SUBJECT: Bituminous Materials

Section 702, Bituminous Materials, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-702.04--Sampling. Delete the sentence in Subsection 702.04 on page 722, and substitute the following.

Sampling of bituminous materials shall be as set out in AASHTO R 66.

907-702.07--Emulsified Asphalt. Delete the last sentence in Subsection 702.07 on page 724, and substitute the following.

Asphalt for fog seal shall conform to the requirements of Subsection 907-702.12, Table V.

907-702.12--Tables. Delete Table V in Subsection 702.12 on page 729, and substitute the following.

TABLE V
SPECIFICATION FOR FOG SEAL

	LD-7		CHPF-1		
Test Requirements	**Min.**	**Max.**	**Min.**	**Max.**	**Test Method**
Viscosity, Saybolt Furol, @ 25°C, Sec.	10	100	-	100	AASHTO T 72
Storage Stability Test, 24 hr, %	-	1	-	1	AASHTO T 59
Settlement, 5 day, %	-	5	-	-	AASHTO T 59
Oil Distillate, %	-	1	-	-	AASHTO T 59
Sieve Test, % *	-	0.3	-	0.1	AASHTO T 59
Residue by Distillation, %	40	-	40	-	AASHTO T 59
Test on Residue from Distillation					
Penetration @ 25°C, 100g, 5 sec	-	20	40	90	AASHTO T 49
Softening Point, °C	65	-	-	-	ASTM D 36
Solubility in trichloroethylene, %	97.5	-	-	-	AASHTO T 44
Elastic Recovery @ 25°C, %	-	-	40	-	AASHTO T 301
Original DSR @ 82° (G*/Sinδ, 10 rad/sec)	1	-	-	-	AASHTO T 111

* The Sieve Test result is tested for reporting purposes only and may be waived if no application problems are present in the field.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-703-1 **CODE: (IS)**

DATE: 06/13/2018

SUBJECT: Gradation

Section 703, Aggregates, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-703.03--Course Aggregates for Hydraulic Cement Concrete.

907-703.03.2--Detail Requirements.

907-703.03.2.4--Gradation. In the table in Subsection 703.03.2.4 on page 734, add 100 for the percent passing by weight on the 1½-inch sieve for Size No. 67 aggregates.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-705-1 **CODE: (IS)**

DATE: 06/13/2018

SUBJECT: Stone Riprap

Section 705, Stone Blanket Protection and Filter Blanket Materials, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-705.04--Stone Riprap. Delete the last sentence of the first paragraph of Subsection 705.04 on page 750, and substitute the following.

Quality requirements for rock to be furnished under these specifications will come from a pre-approved source and be visually approved prior to use.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-707-2 **CODE: (IS)**

DATE: **06/05/2019**

SUBJECT: **Joint Materials**

Section 707, Joint Materials, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-707.02.3--Wood. Delete paragraph (b) of Subsection 707.02.3 on page 755, and substitute the following:

(b) Dimensions shall be as shown on the plans Dimensions shown on the plans are "dressed" sizes in accordance with Table 3 of the American Softwood Lumber Standard, SP-20. At the discretion of the Engineer, a 3/4-inch dressed board may be used in lieu of a 1-inch dressed board. A tolerance of plus or minus 1/16 inch thickness and plus or minus 1/8 inch width will be permitted. For slip-form paving a tolerance of minus 1/4 inch on each end in length will be permitted.

907-707.06--Flexible Plastic Gasket for Joining Conduit. Delete the third paragraph of Subsection 707.06 on page 756, and substitute the following.

The Department may require the performance test described in ASTM C 990.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-711-2 **CODE: (IS)**

DATE: 09/11/2018

SUBJECT: Plain Steel Wire

Section 711, Reinforcement and Wire Rope, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-711.02--Deformed and Plain Carbon-Steel Bars for Concrete Reinforcing.

907-711.02.3--Steel Welded and Non-Welded Wire Reinforcement, Plain and Deformed, for Concrete.

907-711.02.3.1--Plain Steel Wire. Delete the sentence in Subsection 711.02.3.1 on pages 780 and 781, and substitute the following.

Plain steel wire and plain steel welded wire shall conform to the requirements of AASHTO M 336.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-720-2 **CODE: (IS)**

DATE: 09/11/2018

SUBJECT: Acceptance Procedure for Glass Beads

Section 720, Pavement Marking Materials, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-720.01--Glass Beads.

907-720.01.4--Acceptance Procedures. Delete the last sentence of the paragraph in Subsection 720.01.4 on page 841, and substitute the following.

Acceptance sampling and testing of glass beads will be in accordance with the Department's Materials Division Inspection, Testing, and Certification Manual, Section 2.9.2 -- Glass Beads.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-721-2 **CODE: (IS)**

DATE: 01/08/2020

SUBJECT: Materials for Signing

Section 721, Materials for Signing, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-721.06--Reflective Sheeting.

907-721.06.2--Performance Requirements. Delete Table 4 and Table 5 in Subsection 721.06.2 on pages 860 & 861, and substitute the following.

MINIMUM COEFFICIENTS OF RETROREFLECTION
Candela per foot candle per square foot (cd/fc/ft^2)
Per ASTM Designation D4956

TABLE 4
Type IX Sheeting

Observation Angle	Entrance Angle	White	Yellow	Green	Red	Blue	Fluorescent Yellow/Green	Fluorescent Yellow	Fluorescent Orange
0.2°	-4.0°	380	285	38	76	17	300	230	115
0.2°	+30.0°	215	162	22	43	10	170	130	65
0.5°	-4.0°	240	180	24	48	11	190	145	72
0.5°	+30.0°	135	100	14	27	6.0	110	81	41
1.0°	-4.0°	80	60	8.0	16	3.6	64	48	24
1.0°	+30.0°	45	34	4.5	9.0	2.0	36	27	14

TABLE 5
Type XI Sheeting

Observation Angle	Entrance Angle	White	Yellow	Green	Red	Blue	Brown	Fluorescent Yellow/Green	Fluorescent Yellow	Fluorescent Orange
0.2°	-4.0°	580	435	58	87	26	17	460	350	175
0.2°	+30.0°	220	165	22	33	10	7.0	180	130	66
0.5°	-4.0°	420	315	42	63	19	13	340	250	125
0.5°	+30.0°	150	110	15	23	7.0	5.0	120	90	45
1.0°	-4.0°	120	90	12	18	5.0	4.0	96	72	36
1.0°	+30.0°	45	34	5.0	7.0	2.0	1.0	36	27	14

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-804-9 **CODE: (IS)**

DATE: 05/21/2020

SUBJECT: Concrete Bridges and Structures

Section 804, Concrete Bridges and Structures, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-804.02--Materials.

907-804.02.3—Non-Quality Control / Quality Assurance Concrete.

Delete the third sentence of the first paragraph on page 936 and substitute the following.

The Contractor is required to submit mixture designs to accomplish this work in accordance with Section 804 and perform normal Quality Control functions in accordance with Table 4, Contractor's Minimum Requirements for Quality Control, Items A and B.

907-804.02.6--Classification and Uses of Concrete. After the last class of concrete listed in Section 804.02.6 on page 938, add the following.

10) Class BDX - Concrete for bridge decks (4,500 psi)

907-804.02.10--Hydraulic Cement Concrete Mixture Design. Add the following to Table 3 in Subsection 804.02.10 on page 941.

BDX	Bridge Deck [1]	57 or 67	0.42-0.45	4500	5 [-2.5]	4.5±1.5 6.5±1.5	N/A

Delete footnote 1 of Table 3 in Subsection 804.02.10 on pages 941 & 942 and substitute the following.

[1] An approved synthetic structural fiber meeting the requirements of Subsection 711.04 shall be incorporated into the mixture at 1.25 times the approved dosage rate. For each additional pound of fibers per cubic yard added in excess of the requirement stated above, an additional inch of slump will be allowed up to a maximum permitted slump of eight (8) inches.

For Class BD, the maximum cementitious material content shall be 550 pounds per cubic yard

For Class BDX, the maximum cementitious material content shall be 564 pounds per cubic yard.

Delete footnote 3 of Table 3 in Subsection 804.02.10 on page 942 and substitute the following:

[3] The design slump selected by the Contractor for the mixture design approval is the maximum slump permitted.

Delete the last sentence of the first paragraph on page 942 and substitute the following.

Other hydraulic cements may be used in accordance with the specifications listed in Section 701. Other small coarse aggregate sizes meeting the requirements of Subsection 703.03.2.4 may be used in conjunction with the coarse aggregate sizes listed in Table 3.

907-804.02.13.1.4--Yield. Delete the first sentence of Subsection 804.02.13.1.4 on page 953 and substitute the following.

If the yield of the concrete mixture is more than plus or minus three percent (±3%) of the design volume, the mixture design shall be adjusted by a Class III Certified Technician representing the Contractor to yield the correct volume, plus or minus three percent (±3%).

907.804.02.13.1.7--Static Segregation. Delete the second sentence of Subsection 804.02.13.1.7 on page 954 and substitute the following.

If the static segregation of the concrete mixture design exceeds this requirement, the mixture design shall be adjusted by a Class III Certified Technician representing the Contractor to ensure a static segregation in conformance with the requirement in Table 3.

907-804.03--Construction Requirements. Delete Subsection 804.03.16.1 on pages 970 & 971, and substitute the following.

907-804.03.16.1--Cold Weather Concreting. Cold weather is defined as three consecutive days when there is a probability that the daily average of the highest and lowest ambient temperatures is expected to be less than 40°F. This three-day forecast shall be based on the latest information available from the National Weather Service.

907-804.03.16.1.1--Mixture Acceptance Temperature. For the purpose of job site acceptance temperature in accordance with Subsection 804.02.13.1.5, in cold weather, the acceptance temperature of the concrete when delivered to the job site shall conform to the temperature limitations of "Temperature Limitations on Concrete when Delivered to Job Site" listed in Table 8 below.

TABLE 8
COLD WEATHER TEMPERATURE LIMITATIONS ON CONCRETE WHEN DELIVERED TO JOB SITE

Section thickness in the least dimension inches	Jobsite Acceptance Temperature Range °F
Less than 12	55 to 75
12 to 36	50 to 70
36 to 72	45 to 65
Greater than 72	40 to 60

907-804.03.16.1.2--Structure Concrete Protection. The Contractor shall assume all risk and added cost connected with the placing and protecting of concrete during cold weather. Permission given by the Engineer to place concrete during such time will in no way relieve the Contractor of responsibility for satisfactory results. Protection of the concrete shall be accomplished in accordance with the requirements in Subsection 907-804.03.16.1.2.1. If approved by the Engineer, the protection of the concrete may be accomplished in accordance with the requirements in Subsection 907-804.03.16.1.2.2. In either case, should it be determined at any time that the concrete placed under such conditions is unsatisfactory, it shall be removed and replaced with satisfactory concrete by the Contractor without extra compensation.

Before placing concrete, all ice or frost shall be removed from the forms and reinforcement.

In the case of concrete placed directly on or in the ground, such as for footings or bottom slabs, protection and curing during cold weather may be provided as set for concrete pavement under Subsection 501.03.20.3.

907-804.03.16.1.2.1--Enclosure Method. The Contractor shall have available on the project the approved facilities necessary to enclose uncured concrete and to keep the temperature of the air inside the enclosure between 50°F and 100°F for the duration of the cold weather period. The Contractor shall use such heating equipment such as stoves, salamanders, or steam equipment as deemed necessary to protect the concrete. When dry heat is used, means of maintaining atmospheric moisture shall be provided.

The Contractor shall install the temperature sensors and other appurtenances to measure and record the temperature history of the air inside the enclosure. The Contractor shall be able to determine the temperature history of air inside the enclosure while remaining outside the enclosure

In the event that the Contractor's enclosure method does not successfully maintain the air temperature within the required range, the Contractor shall suspend additional concrete placements until either 1) such time that changes in the enclosure method are demonstrated to successfully maintain the required temperatures during other periods of cold weather, or 2) such time that concrete placements are not conducted during periods of cold weather.

If the air temperature inside the enclosure at the end of the protection period is more than 20°F greater than the ambient temperature, the Contractor shall 1) stop using heating equipment, 2) leave the enclosure undisturbed, and 3) allow the air temperature inside the enclosure to decrease to within 20°F of the ambient temperature before disturbing or removing the enclosure.

907-804.03.16.1.2.2--Insulating Blanketing Method. At the option of the Contractor with the approval of the Engineer, an approved insulating blanketing material capable of maintaining the temperature of the concrete at or above 40°F may be used to protect the work. The insulating blanketing material shall remain in place until both 1) the required concrete strength in Table 6 is achieved as determined using the Maturity Method in accordance with Subsection 804.03.15, and 2) the temperature differential between the ambient temperature and the internal concrete temperature determined by the maturity meter does not exceed 20°F.

In the event the Engineer does not approve of using the Insulating Blanketing Method, the Contractor shall use the Enclosure Method per Subsection 907-804.03.16.1.2.1.

907-804.03.16.1.2.3--Batching Considerations. One or more of the aggregates and/or mixing water may be heated. The aggregates may be heated by steam, dry heat, or by placing in the mixing water that has been heated. Frozen aggregates shall not be used. When either aggregates or water are heated above 100°F, the aggregates and water shall be combined first in the mixer before the cement is added to avoid flash set. Cement shall not be mixed with water or with a mixture of water and aggregate having a temperature greater than 100°F.

The use of salt or other chemical admixtures in lieu of heating will not be permitted.

907-804.03.17--Curing Concrete.

907-804.03.17.1--Water with Waterproof Cover. In the second sentence of the fourth paragraph of Subsection 804.03.17.1 on page 973, delete the word "due".

Delete the first sentence of the fifth paragraph of Subsection 804.03.17.1 on page 973, and substitute the following.

The Contractor shall maintain the burlap in a fully wet condition using powered fogging equipment, such as a commercially available pressure washer, which is capable of producing a fog spray of atomized droplets of water (i.e., producing a very fine and gentle mist that looks like a foggy morning) until the concrete has gained sufficient strength to allow foot traffic without the foot traffic marring the surface of the concrete.

Delete the seventh paragraph of Subsection 804.03.17.1 on page 973, and substitute the following.

If there is an unanticipated delay in the placement of the first layer of saturated burlap outside the time limit which is due to unforeseen events which are not a part of the Contractor's curing operations for meeting the requirements of this Subsection and which are outside the direct control of the Contractor, the struck-off and finished concrete shall be kept wet by use of the powered fogging equipment used to keep the burlap wet as described previously in the Subsection.

In the second sentence of the eighth paragraph of Subsection 804.03.17.1 on page 973, replace the word "like" with "such as".

907-804.03.17.1.2--Liquid Membrane. In the first sentence of the first paragraph of Subsection 804.03.17.1 on page 973, replace "polyethylene sheets" with "white polyethylene sheets."

907-804.03.19.7--Finishing Bridge Decks.

907-804.03.19.7.1--General. Delete the second paragraph of Subsection 804.03.19.7.1 on page 985, and substitute the following.

In the event a method is not designated on the plans, the Contractor may use either the Longitudinal Method in accordance with Subsection 907-804.03.19.7.2 or the Transverse Method in accordance

with Subsection 907-804.03.19.7.3.

907-804.03.19.7.2--Longitudinal Method. Delete the first sentence of the first paragraph of Subsection 804.03.19.7.2 on page 985, and substitute the following.

The longitudinal method may only be used for repairs to bridge decks or bridge widening projects.

907-804.03.19.7.3--Transverse Method. Before the first sentence of the first paragraph of Subsection 804.03.19.7.3 on page 986, add the following.

The transverse method shall be used for construction of new bridge decks and may be used for bridge deck repair or bridge widening.

907-804.05--Basis of Payment. Delete the first and second pay items listed on page 999, and substitute the following.

907-804-A: Bridge Concrete, Class _____ - per cubic yard

907-804-B: Box Bridge Concrete, Class _____ - per cubic yard

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-850-1 **CODE: (SP)**

DATE: 06/10/2020

SUBJECT: Mechanical Work

Section 907-850, Mechanical Work, is added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-850 – MECHANICAL WORK

907-850.01--Description. This article covers all apparatus, material and labor required to properly detail, manufacture, ship, install, adjust, test, paint and put into approved working order all parts of the bascule span operating machinery, movable fence assemblies and supports specified. The Contractor shall furnish, at no extra cost, any device, material, labor or effort not herein specified, yet required to complete or perfect the equipment in a manner suitable to the department.

907-850.02--Materials.

907-850.02.1--Shop Drawings. Dimensions given on the plans are nominal and intended for guidance. The Contractor shall make note of any variations from nominal dimensions on the shop drawings or The Contractor shall provide written notice to the Engineer. Where additional information is required or changes must be made; the Contractor shall prepare working, erection, and shop drawings and The Contractor shall submit to the department as specified.

907-850.02.1.1--General Requirements. Shop drawings shall detail and accurately dimension all parts. Shop drawings shall define limits of accuracy and tolerances required for machining, surface finishes and allowances for fits.

907-850.02.1.2--Manufacturer's Literature. The Contractor shall submit catalog cuts and detailed manufacturer's literature for all components not detailed in the shop drawings. The Contractor shall clearly mark such items with the item number corresponding to the mark shown on the assembly drawing and the full and complete part number, extended to completely define the part including all optional or custom features. If the same cut sheet is used to define more than one item, the Contractor shall submit multiple copies.

907-850.02.1.3--Material Certifications. The Contractor shall submit material certifications for all materials specified to require material testing within the plans and specifications or within a referenced material specification (e.g. ASTM, ANSI, or others).

907-850.02.1.4--Procedures. In addition to required detailed shop drawings, the Contractor shall submit to the Engineer for review various procedures described herein. The procedures shall be thorough and be supplemented by sketches, calculations, details, catalog cuts, photographs, etc. as required to demonstrate that the specified requirements can be met.

907-850.02.1.5--Notification of Shop Work. The Contractor shall provide advance written notification to the department for all shop work and shop testing for which the specifications require, or indicate that it is the intent of the department, to provide a representative to observe or witness such activities. The Contractor shall provide a minimum of 30 days advance written notice of such work.

907-850.02.2--Material Compatibility. The Contractor shall provide products which are compatible with other products of the operating machinery or movable fence assemblies and with other work requiring interface with the operating machinery or movable fence assemblies, including mechanical/electrical connections and control devices.

907-850.02.3--Nameplates. The Contractor shall provide each piece of movable fence equipment and apparatus with a permanent, corrosion-resisting metal nameplate on which is stamped the name of the manufacturer, the catalog or model number, and the rating or capacity of the equipment or apparatus. Nameplates on all proprietary elements must be readable, clean, and free of all paint before acceptance of the machinery.

907-850.02.4--Substitutions. Specification of a manufacturer's part number, product, and/or name is for the purpose of defining quality, configuration, rating and arrangement of parts. Part numbers shown in the contract documents are not necessarily complete numbers nor are they intended to describe details of the component beyond those that are required. Be aware that manufacturers may change product names and part numbers without advance notification. The Contractor shall select and provide manufactured products that meet the requirements and intent as shown in the contract documents. The Contractor shall provide complete, current part numbers for all proposed equipment and verify that the part as designated is appropriate for the intended function. Contractor is responsible for design changes resulting from substitutions.

907-850.02.5--Shop Inspection and Testing.

907-850.02.5.1--Notification. The Contractor shall provide sufficient written notice to the department prior to the beginning of work at foundries, forge and machine shops so that inspection may be arranged. The Contractor shall provide free access to all premises where preparation, manufacture, assembly and testing of raw materials, materials in process and assembly is conducted.

907-850.02.5.2--Responsibility. Such inspections are to facilitate work and avoid errors. It is understood that inspection by the department does not relieve the contractor of the responsibility for compliance with requirements of the contract documents or for replacing defective materials and workmanship.

907-850.02.5.3--Material Acceptance. The Contractor shall furnish to the department test results of all certifications required of the contract documents, including copies of chemical and physical tests and certifications of compliance. Initial acceptance of materials and finished parts and assemblies will not preclude subsequent rejection if found deficient. Replacement of such materials shall be the responsibility of the Contractor.

907-850.02.6--General Material Requirements. The Contractor shall provide materials as specified on the plans and in the specifications. Wherever materials are not shown or specified, the Contractor shall provide materials conforming to the current specifications as outlined in TABLE 1, Materials. An alternative material may be requested in writing; the request must provide complete data justifying suitability of the alternate materials and must be approved by the department prior to initiating manufacture or construction.

Materials and equipment must be essentially the standard catalogued products of manufacturers regularly engaged in production of such materials or equipment and must be the manufacturer's latest standard design that complies with the specification requirements. Materials and equipment must essentially duplicate items that have been in satisfactory commercial or industrial use at least two (2) years prior to bid opening. Where two units of the same class of equipment are required, these units must be products of the same manufacturer. However, the component parts of the system need not be the products of the same manufacturer. Each major component of equipment must have the manufacturer's name and address and the model and serial number on a nameplate securely affixed in a conspicuous place. The nameplate of the distributing agent will not be acceptable.

TABLE 1 - MATERIALS

Material	Description	Designation (ASTM unless otherwise noted)
Steel castings	Structural, high strength Carbon steel, general application	A148 A27
Iron castings	Gray iron	A48
Bronze castings	Bronze castings for bridges (max. sulphur content 0.08%, chemical analysis required for each heat)	B22
Forgings	Carbon steel for industrial use Alloy steel for industrial use	A668
Hot rolled steel	Special quality carbon steel bars	A675
Dowel pins	American National Standard Unhardened Ground Dowel Pins (64 ksi minimum ultimate shear strength)	ANSI B18.8.2
Cold rolled steel	Carbon steel bars	A311
Stainless Steel Shims	Stainless Steel	A666, Grade 304 or 316
Shapes, plates, and bars	Structural steel High strength, weathering steal	A36 or A709 A588
Stainless Steel (corrosion resistant) bolts or anchors	High Strength Stainless steel Fasteners	A193, Grade B8, A193, Grade B8M
Corrosion resistant shapes, bars, and plates	Stainless steel	A276, Type 316

907-850.02.7--Shafting and Pins. Rolled material may be used for shafting and pins up to four (4) inches in diameter. The Contractor shall use forged material for larger diameter shafts and those having integral flanges or pinions. Homogeneity of forgings is required; shafts must be

reduced to size from a single bloom or ingot at no less than red heat. The blooms or ingots must have a cross sectional area at least three times that required after finishing. The finished product must be free of injurious flaws such as seams, pipes or cracks. Forged shafts over eight (8) inches in diameter must have a hole bored lengthwise through the center. Make the diameter of the hole about 1/5 the diameter of the shaft.

The Contractor shall test shafting materials for mechanical properties and furnish certificates to the department.

The Contractor shall test all cold-finished shafting for its mechanical properties, and furnish a test certificate to the Engineer.

The Contractor shall provide dowel pins per American National Standard. Unless otherwise specified, the Contractor shall provide unhardened ground dowel pins with 64 ksi minimum ultimate shear strength. The Contractor shall provide hardened dowel pins with 120 ksi minimum ultimate shear strength.

907-850.02.8--Castings. Unless otherwise specified or shown in the plans, the Contractor shall use castings that conform to AASHTO Movable Specifications. Material grades shall be as specified or shown in the plans.

907-850.02.9--Forgings. Unless otherwise specified or shown in the plans, the Contractor shall use forgings that conform to AASHTO Movable Specifications. Material grades must be as specified or shown in the plans.

907-850.02.10--Fasteners.

907-850.02.10.1--High Strength Bolts. Unless otherwise specified, the Contractor shall provide fasteners used for connecting operating machinery parts to each other and to supporting steelwork that conform to the minimum specified physical requirements of high strength, ASTM A325 cut thread, washer faced, hexagonal head bolts. The Contractor shall use nuts that conform to ASTM A563 or A194, Grade DH or 2H, heavy hex series.

907-850.02.10.2--Turned Bolts. Where turned bolts are required in the plans, the Contractor shall provide fasteners conforming to the minimum specified physical requirements of high strength, ASTM A325 or ASTM A449 cut thread, washer faced, hexagonal head bolts. The Contractor shall provide threads for turned bolts that conform to the requirements of ASTM A325. Do not use ASTM A490 bolts. The Contractor shall use nuts that conform to ASTM A563 or A194, Grade DH or 2H, heavy hex series.

907-850.02.10.3--Bolt Dimensions. The Contractor shall dimension bolt heads, nuts and hexagonal cap screws in accordance with ANSI B18.2. Such fasteners shall be of the heavy series.

907-850.02.10.4--Socket Head Screws. The Contractor shall conform socket head cap screws, socket flat head cap screws and socket set screws to ANSI B18.3. Such screws shall be heat treated alloy steel. Unless otherwise specified, set screws shall be of the headless, safety type

and be of the coarse thread series and have cup points. Do not use set screws to transmit torque nor as a stop for equipment that provides stability or contributes to operation of the bridge. Class 2 coarse thread tolerances shall be required for all bolts, nuts and cap screws.

907-850.02.10.5--Locking of Fasteners. The Contractor shall provide approved type positive locks for cap screws and nuts on turned bolts unless noted otherwise in the plans. The Contractor shall use standard thickness nuts where double nuts are required in locations where occasional opening or adjustment is necessary. The Contractor shall use flat jam nuts only where space prohibits use of standard nuts. Lock washers shall be made of tempered steel and conform to regular SAE dimensions and specifications. The Contractor shall properly tension high strength bolts and nuts, which will create a self-locking effect. If wire is used for locking, it shall be stainless steel.

907-850.02.10.6--Washers. The Contractor shall use hardened steel, plain washers conforming to ASTM F436 at the rotated end of high strength ASTM A325 or A449 bolts.

907-850.02.10.7--Miscellaneous Fasteners and Hardware. Unless otherwise specified or shown in the plans, the Contractor shall provide miscellaneous fasteners and hardware, including cotter pins and lock wire of corrosion resistant stainless steel, with material composition of type 316.

907-850.02.10.8--Undercut Anchors. Where specified in the plans, the Contractor shall anchor supports to concrete using undercut anchors. The Contractor shall provide undercut anchors of length and diameter as indicated in the plans. When no length is specified, the Contractor shall calculate the length based on the information provided and the site-specific conditions. The Contractor shall specify undercut anchors to resist applied loads through bearing on the surface of the conical portion of the drilled hole. Wedge or sleeve anchors that rely on friction to resist applied loads will not be permitted at these locations.

Unless otherwise specified, the Contractor shall provide undercut anchors fabricated from the following materials:

Bolt ..... ASTM A 193 Grade B8M Class 2
Sleeve ..... AISI Type 316
Conical Nut ..... ASTM A 193 Grade B8M Class 2
Heavy Hex Nut ..... ASTM A 194 Grade B8M Strain Hardened
Washer ..... AISI Type 18/8

907-850.02.11--Bushings. Where required, the Contractor shall provide solid bushings, as shown in the plans of one piece bronze sleeve. Where required, the Contractor shall configure with spiral cut lubrication grooves.

The Contractor shall provide lubricant fittings for all rear lock items requiring lubrication.

907-850.02.12--Weldments. The Contractor shall fabricate weldments for support of machinery and/or movable fence assemblies from structural steel of the type and grade specified in the plans. Where the type and grade of steel is not specified in the plans, the Contractor shall

fabricate weldments from ASTM A709, Grade 50 structural steel. The Contractor shall use of steel plate larger than that denoted in the plans may be required to obtain the final required dimensions.

The Contractor shall provide a pair of lifting eye bolts either drilled and tapped into the weldment or through-bolted in a weldment plate to facilitate lifting and handling. Ensure that lugs have a minimum lifting capacity of five times the weight of the weldment.

Where epoxy leveling grout is called for in the plans, the Contractor shall provide leveling screws drilled and tapped through the weldment base plate for field leveling. The Contractor shall use leveling screws with adequate capacity to support the weldment and any other construction loads anticipated to be applied prior to the application of grout under the base plate.

Immediately following finish machining, the Contractor shall coat mounting surfaces with an approved temporary protective coating that prevents oxidation. The Contractor shall clean all base plate surfaces to be in contact with epoxy grout to SSPC SP-6 and prime with epoxy primer within 8 hours of cleaning. The Contractor shall apply primer only, to the weldment base surfaces, do not finish coat them.

The Contractor shall crate and skid the weldments, for protection during handling, shipment and storage.

907-850.02.13--Galvanizing. Where galvanizing of weldments is required, the Contractor shall hot dip galvanize in accordance with ASTM A123. Galvanize after welding, stress relief and machining. The Contractor shall provide lifting lugs and vent holes as needed for the galvanizing process. The Contractor shall mask surfaces to be machined as required. After fabrication and galvanizing of all weldments, the Contractor shall paint unprotected surfaces with an epoxy paint system for structural steel in accordance with the standard specifications.

907-850.02.14--Lubrication of Machinery.

907-850.02.14.1--Fittings. The Contractor shall provide button head fittings for use on all bearings and other machinery (not including gear teeth) requiring grease lubrication.

907-850.02.14.2--Lubrication Charts. The Contractor shall include the operating machinery and movable fence assembly lubrication information on the lubrication charts required for the leaf lubrication.

907-850.02.14.3--Lubrication Tubing. The Contractor shall use tubing of seamless brass pipe meeting the requirements of ASTM B43 and bronze fittings or ASTM A269 type 316 stainless steel tube with type 316 stainless steel fittings. The Contractor shall use stainless steel or corrosion resistant hardware to secure lubrication tubing and fittings. The Contractor shall provide one grease gun for each type fitting.

907-850.02.14.4--Shipping. Immediately after the completion of fabrication, the Contractor shall plug all grease fittings until components are installed and regular lubrication is started.

907-850.02.14.5--Sleeve Bearings. The lubricant chosen shall be approved for use in sleeve bearings by the lubricant manufacturer. The Contractor shall use NLGI No. 2 grease with rust and oxidation inhibiting additives, ASTM Drop Point, SUS 900 @ 100 °F, water resistant, anti-wear/extreme pressure.

907-850.02.14.6--Unpainted Contact Surfaces. The Contractor shall lubricate unpainted contact surfaces of dowel pins and rollers with a dry moly or other corrosion inhibiting lubricant.

907-850.02.14.7--Drive Chain. The Contractor shall lubricate movable fence drive chains with an aerosol type chain lubricant designed for roller chain applications.

907-850.02.15--Shims. The Contractor shall provide shims required for leveling and alignment that are full depth shims, drilled for all bolts that pass through, and trimmed to the dimensions of the assembled unit. The nominal shim pack thickness shall be ½ inch unless otherwise specified. The Contractor shall provide shim material ¼ inch and greater from ASTM A36, shim material less than ¼ inch from ASTM A666, type 316 stainless steel. Thin brass precision thickness shims shall be used for final adjustment. The Contractor shall provide sufficient thicknesses to permit 0.005 inch variations of the nominal shim thickness plus one full allowance shim. The Contractor shall provide the department with one full set of additional shims for each type of component.

907-850.02.16--Epoxy Grout. The Contractor shall use epoxy grout manufactured for use in thickness range shown in the plans or detailed in approved shop drawings for each application.

The Contractor shall use epoxy leveling grout having the following minimum properties:

Minimum compressive strength:	10,000 PSI
Minimum tensile strength	2,000 PSI
Fire resistance:	Self-extinguishing
Maximum linear shrinkage	0.0004 in/in

907-850.02.17--Paint for Machinery. The Contractor shall use paint for operating machinery, movable fence assemblies and related equipment in accordance with the 3-coat epoxy system specified for COATING EXISTING STRUCTURAL STEEL except as noted herein or as shown on the plans. The Contractor shall paint proprietary systems with coatings selected by the manufacturer for use in industrial applications.

907-850.02.19--Couplings. The Contractor shall provide all-metal, self-aligning, full flexible (in bending and torsion)grid-type couplings, unless otherwise specified on the plans. The Contractor shall provide couplings with steel hubs and alloy steel grids, and steel covers of shrouded bolt design. The Contractor shall provide couplings capable of accommodating misalignment between the shafts without introducing bending into the shafts, and with provisions for introducing lubricant to all contact surfaces.

Coupling halves shall be bored and keyed by the coupling manufacturer to the required size and tolerances. The Contractor shall provide ANSI B4.1, FN2 medium drive fit between the hubs and the shafts. The Contractor shall bore hubs concentric with the outside diameter of those

parts. The Contractor shall mount couplings on motor shafts in the shop of the manufacturer, as per coupling manufacturer's installation instructions. The Contractor shall mount couplings on speed reducers in the field by qualified Millwrights.

907-850.02.20--Keys and Keyways. The Contractor shall provide keys and keyways conforming to the dimensions and tolerances for square and flat keys of ANSI B17.1, Keys and Keyseats.

The Contractor shall provide keys machined from steel forgings, ASTM A668, Class K.

907-850.02.21--Plain Spherical Bearing. Where required, the Contractor shall provide plain spherical bearings of the self-aligning type that are sized to meet B-10 life (as defined by the AFBMA at which 90 percent of a group of bearings will survive the identical loading conditions) of 40,000 hours under the power requirements defined in the AASHTO Movable Bridge Specifications or shown in the plans. All pins and attachments shall be machined to the dimensions and tolerances as specified by the Bearing Manufacturer. The Contractor shall provide all plain spherical bearings with a means for grease lubrication and lip seals to retain the lubrication and guard the spherical surfaces from contamination.

907-850.02.22--Speed Reducer. The Contractor shall provide breather vent with porous bronze element with minimum 40 micron filtration rating. The Contractor shall provide seals as close to original style and material on the existing speed reducer. The Contractor shall provide lubrication approved by the Department maintenance office.

907-850.02.23--Brake Wheel. The Contractor shall supply brake wheels manufactured from ASTM A536 grade 65-45-12 ductile iron and disks manufactured from alloy steel. Machine and bore keyway per manufacturers recommendations. Drum shall be offset such that the brake, or brake weldment, does not interfere with the motor. Brake wheel shall be of the same manufacture as the brake assembly.

907-850.02.24--Neoprene Pad. The Contractor shall provide neoprene pad for slide gate track and gate wheel assembly with the following properties: temperature range: -40° to +220°F; tensile strength: 1500 psi; durometer: 70A; for outdoor use.

907-850.02.25--Slide Gate Operator. The Contractor shall provide slide gate operator to conform to list of items below.

- Conforms to Class IV, when tested in accordance with UL32.
- Operator Enclosure: Fully enclosed, NEMA 3R, weather-resistant, hinged, lockable, 16-gauge steel enclosure with baked-on high durability powder coat finish over a 7 gauge steel frame.
- Operator Motor: 1HP Continuous Duty motor with built-in overload protection operation for gates up to 1700 lbs. and 35ft. (Cantilever) in length.
- Minimum Gate Speed: 12 inches per second.

- Drive System: 20:1 gear reduction using worm-gear reduction in synthetic oil bath with a solenoid-activated brake system that prevents back-driving.

- Open and Close Limit Settings: Limit switches are modular and fully adjustable.

- Control circuit: low-voltage control inputs protected from external spikes and surges that provides long distance control of wiring runs over 1,000 ft. for connection of a full range of optional external devices including loop detectors, telephone entry systems, access control systems, and radio receivers.

- Additional required controls: Internally-mounted RF receiver tuned at 315MHz Inherent obstruction sensing providing separate, single force adjustments for both open and closed directions, allowing a closing gate to reverse to the opposite limit and stop when encountering an obstruction.

- External obstruction sensing providing separate open and close cycle input connections for external contact and non-contact sensors.

- Maglock control relay to activate and deactivate an optional magnetic lock for securing the gate.

- UL 325-compliant entrapment warning alarm system providing ability to offer a warning tone which begins 3-seconds prior to gate movement and continues during gate operation.

- Loop detector inputs allowing for the connection of exit, shadow, and interrupt loop detectors.

- Dual gate operation 2-wire control system that provides for the operation of two separate gate operators in unison at a single entrance and also provides the ability to connect accessories to either operator

- Timer-to-close providing adjustable timer settings between 1 and 180 seconds which resets upon receiving any additional open commands.

- Sequenced Access Management System providing ability to control a slide or swing gate operator in tandem with a barrier gate operator.

- Maximum run timer to protect gate and operator from damage by limiting run time to 120 seconds.

- Emergency Release: External manual release for manual operation of gate during emergencies and maintenance work.

- Emergency Stop: Stop button in a weather-tight outdoor enclosure to halt operation of the operator in an emergency situation.

- Accessory Power: One 24 VAC connection for operator accessories, including a radio receiver and loop detectors.

907-850.02.26--Slide Gate Rollers. All slide gate wheels and rollers shall be compatible with 2½-inch OD (2 3/8" OD actual size) pipe. Rollers shall have either self-lubricating bronze bushings or sealed roller bearings which do not require additional lubrication riding on a hardened shaft. Each slide gate wheel shall be capable of handling a dynamic load of 1000 lbs. minimum.

907-850.03--Construction.

907-850.03.1--General. The requirements of Section 810 of the Standard Specifications shall apply to this work. Construct in accordance with the requirements defined herein and in the plans and the provisions of the AASHTO Movable Specifications. Where a conflict exists between documents, the requirements of the plans and specifications shall govern over those of the AASHTO Movable Specifications.

Unless specified in the plans or herein, dimensions between machined surfaces have a tolerance of 0.010 inch and machined surfaces have a flatness tolerance of 0.040 inch.

907-850.03.2--Setting of Machinery. Operating machinery must be set, aligned and verified by experienced millwrights. Millwrights must have a minimum 10 years of experience in setting and aligning heavy machinery and must have completed installation of machinery for a minimum of five (5) bascule bridges. The Contractor shall submit to the Engineer for review the qualifications of the proposed millwrights.

The Contractor shall use appropriate means and methods in setting machinery bases and pedestals, such as leveling screws or precision jacks such that the required positioning tolerances are obtained. If steel shims are used between the concrete surface and the machinery or pedestal base, the Contractor shall remove the shims prior to tightening anchors. Where leveling grout is shown, the Contractor shall remove all other temporary support devices, including leveling screws, jacks, and shims, prior to tightening anchors.

Unless otherwise specified or shown in the plans, the Contractor shall position operating machinery to be within the following tolerances.

Horizontal position:	1/32 in.
Vertical position:	1/32 in.
Level (top of machined surface):	0.005 in./foot
Orientation (parallel to plan centerline:	0.5 degrees

907-850.03.3--Bolting. Unless otherwise specified or shown in the plans, drill bolt holes in machinery parts for connection to supporting steelwork in the shop 1/16 inch diameter larger than the finished bolt diameter or match mark and drill from solid at assembly.

Clean all contact surfaces of structural steel to which machinery is to be bolted, in accordance with the specifications for structural steel to be bolted together, before bolting.

Spot face bolt holes through unfinished, rough cast surfaces for the head and nut.

Except as noted herein or in the plans, the Contractor shall tension ASTM A325M and ASTM A449 bolts used for connecting steel machinery parts together or to structural steel and whose nominal threaded diameter is less than or equal to 1½ inches, in accordance with the bolted connection requirements of AASHTO and the standard specifications.

The Contractor shall tension bolts, cap screws, stainless steel and other threaded fasteners as follows:

For permanent connections: $Ft = 0.75 \times At \times Sp$

Where: Ft = fastener preload
At = tensile area of the fastener
Sp = fastener proof strength

Preload may be applied by direct hydraulic tensioning or torque. Where torque is used it may be calculated as follows:

$$T = K \times Ft \times d$$

Where: T = required wrench torque applied to fastener
K = constant dependent upon bolt size, material and lubrication
d = nominal fastener diameter

For mild-steel fasteners (SAE Grade 5 and lower) between ¼ and 1 inch diameter a value of K = 0.2 may be used for dry assembly. For other materials and sizes, the Contractor shall use manufacturer recommended values.

907-850.03.4--Flexible Couplings. Finish boring and cutting of keyways in couplings shall be done by the coupling Manufacturer to limits specified on the Shop Drawings. The Contractor shall ship finished couplings to the proper location for installation on shafts by the Manufacturer of the connected component. Install coupling halves on reducer shafts and other shafts as per the coupling Manufacturer's installation instructions. Coupling-shaft fits shall conform to FN2 (H7/s6) fit. Manufacturer recommended coupling alignment tolerances shall apply. The Contractor shall confirm motor shaft dimensions and provide the equivalent interference fit to an FN2, though the shaft will not have tolerances meeting ANSI hole based fit dimensions.

907-850.03.5--Shafting and Pins. The Contractor shall provide all shafts and pins with accurate finishes. The Contractor shall provide shafting that is round, true, smooth and straight, and has round fillets at shoulders. The Contractor shall blend all fillets smoothly to adjacent surfaces without tool marks, steps or scratches.

The Contractor shall provide shafts conforming to tolerances in ASTM A29 unless otherwise indicated. Turned, ground and polished shafting straightness tolerances shall be 0.002 inch per foot for shafts up to and including 1½ inches in diameter and 0.003 inch per foot for shafts over 1½ inches in diameter.

Finished shafts shall be free of camber and run without vibration, noise or chatter at all speeds up to and including 120 percent of design speed.

Where shown on the plans, stepped shafts shall have fillets blended in smoothly to adjacent surfaces without tool marks or scratches. Unless otherwise required herein or on the plans to have a finer finish, the surfaces shall have maximum roughness of 125 μm.

Each end of all shafts, when finished to the required lengths, shall have a 60 degree lathe center, with clearance hole, at the exact center of the shaft. Shafts that are bored with an inspection hole or through hole shall have the hole located at the exact center of shaft for each end.

The Contractor shall machine and polish all journal bearing areas on shafts and pins, with no trace of tool marks or scratches on the journal surface or adjoining shoulder fillets. Burnishing of the shaft journal areas and adjoining shoulder fillets will be acceptable in lieu of polishing provided that the burnishing is done with a Stellite roller or equal, finished to a mirror surface.

907-850.03.6--Shaft Journals. The Contractor shall turn and polish journal bearing areas on shafts and pins with no trace of tool marks or scratches on the journal surface, and no step between the journal surface and fillet. The Contractor shall provide and install journals and bearings to the fit specified in the plans.

907-850.03.7--Keys and Keyways. All keys shall be effectively held in place, preferably by setting them into closed-end keyways milled into the shaft. The Contractor shall round the ends of all such keys to a half circle of diameter equal to the width of the key. Keyways shall have a radius in the inside corners. Keyways shall not extend into any bearing. If two keys are used in a hub, locate them 120 degrees apart and in line with wheel arms where practicable.

907-850.03.8--Bushings. For solid bushings, the Contractor shall provide fits between the bushing OD and housing and between the bore and the shaft as specified in the plans.

907-850.03.9--Welding and Weldments. Unless otherwise noted herein or in the plans, the Contractor shall perform all welding and weld inspection of rear locks in accordance with ANSI/AASHTO/AWS D1.5. Unless otherwise noted herein or in the plans, the Contractor shall treat all welded machinery members that support live load reactions as main members, all welds as subject to tension or stress reversal, and all welds as joining primary components. Do not perform field welding on these elements unless specifically required in the contract documents.

Unless otherwise shown in the plans, the Contractor shall connect elements of weldments by complete joint penetration welds. Do not use fillet welds where they would require machining to The Contractor shall provide clearance for machinery, fasteners, or other attachments. The Contractor shall clip stiffeners to avoid overlapping stiffener welds with welds at the intersection of main plates.

The Contractor shall stress-relieve weldments after welding and prior to final machining. Unless otherwise shown in the plans, the Contractor shall finish machined surfaces of weldments to flatness as required herein and parallel to each other and to the bottom of the base plate. The height of the weldment shall be per plan height ± 1/16 inch. All exposed edges of weldments shall be ground to a chamfer or radius to eliminate sharp edges and burrs. Weldment base plates which will be placed against concrete or grout shall have ¾-inch minimum radii on the corners.

The Contractor shall thoroughly coat finished mounting surfaces with an approved corrosion inhibitor and skid or crate for protection during handling, shipment and storage. The Contractor shall prime weldment base surfaces which will have concrete or grout cast against them, but do not finish coat them.

907-850.03.10--Epoxy Grout. The Contractor shall store, mix, place, and finish epoxy grout in strict accordance with the manufacturer's recommendations. Note that ambient temperature at storing, mixing and pouring shall be considered.

907-850.03.11--Testing. The Contractor shall operate movable fence assemblies a minimum of four (4) times each with the leaf in the lowered position.

907-850.03.12--Lubrication of Machinery. The Contractor shall connect grease fittings with tubing or fittings so that grease is introduced directly into the grease passages for distribution. Tubing shall be extended from the bearings to convenient lubrication stations. The Contractor shall install vibration absorbent braided stainless steel hose, 8-inch minimum length, between the pipe and the component lubricated in locations where vibration exists. The Contractor shall provide tubing supports at increments not to exceed three (3) feet between supports.

Immediately after erection and before operation, the Contractor shall lubricate all rotating and sliding parts and fill all gear housings with the approved lubricants specified on lubrication charts.

907-850.03.13--Startup Requirements. The Contractor shall implement startup procedures that protect the equipment from damage and ensure safe working conditions during bridge operations throughout construction.

907-850.03.14--Protection for Shipment. The Contractor shall coat all finished metal surfaces as soon as practical, after machining, with an approved rust-inhibiting compound. The Contractor shall completely protect rear locks parts from weather, dirt and foreign materials during manufacture and store indoors while awaiting erection. Assembled units, including bearings, operators and other devices having finished mounting surfaces will have those surfaces thoroughly coated with rust-inhibitor and shall be skidded or crated for protection during handling, shipment and storage. The Contractor shall bag mounting hardware and other small parts for shipment. The Contractor shall provide and secure tags, recording the part number, to each part with wire or plastic ties prior to shipment.

907-850.03.15--Protection of Equipment. During construction, all equipment must be protected from damage as a result of construction operations and contamination from dust and

debris. Should any equipment become contaminated, the Contractor shall immediately clean the equipment, re-lubricate, and protect from further contamination. The machinery must not be operated and no enclosed equipment opened during any period in which construction operations can contaminate the equipment.

907-850.03.16--Erection and Testing. The Contractor shall erect and assemble machinery in accordance with part numbers and match marks. The Contractor shall adjust all parts for precise alignment by means of shims and pull parts tightly against supporting members by use of clamps, temporary bolts, or other approved means before drilling and reaming holes for connecting bolts. Install rear locks within the specified tolerances and such that satisfactory operation is achieved. The Contractor shall utilize millwrights with demonstrated skill in this type work for all erection and adjustment of rear locks.

Unless otherwise approved by the Engineer prior to construction, the Contractor shall drill bolt holes in structural steel supports only after alignment of machinery. Do not install machinery unless mounting surfaces are clean of dirt, paint and other foreign materials. The Contractor shall securely tighten connecting screws, bolts and nuts to the specified torque values.

The Contractor shall maintain positive control of the leaf at all times. Temporary lock systems are permitted which secure the leaf in the closed position, in lieu of the permanent rear locks. Construction plans for all temporary locking systems sealed by a Registered Mississippi Professional Engineer, shall be submitted to the Department for approval. No temporary locking systems shall be allowed without the Contractor receiving written department approval.

907-850.03.17--Field System Testing. After the bridge systems have been completely installed, the Contractor shall conduct a full functional test of the operating machinery and movable fence assemblies. The Contractor shall include automatic and manual operations of both raising and lowering the span and opening and closing the movable fence.

The Contractor shall verify the fully extended and fully retracted indications at the control console for each of the movable fences.

907-850.03.18--Painting of Machinery. The Contractor shall clean and paint all unfinished, non-stainless or non-aluminum surfaces of operating machinery and movable fence equipment in accordance with the epoxy paint system specified for COATING EXISTING STRUCTURAL STEEL, except as noted herein and as shown on the plans. The Contractor shall apply the finish coat in the shop. The Contractor shall apply field touch-up paint to shop applied coatings that are damaged during construction and installation.

After completing the operating tests and acceptance of the operating machinery and movable fence, the Contractor shall wash with an appropriate solvent all accumulated oil, grease, dirt, and other foreign matter from exposed surfaces, except rubbing surfaces. The Contractor shall apply to the exposed surfaces a final field coat. Paint surfaces with the final field coat in the colors selected by the department. The Contractor shall provide color samples for the department to select these colors.

907-850.03.19--Submittals. The Contractor shall submit fully detailed shop drawings of all equipment. The Contractor shall fully dimension shop drawings and indicate adjustment tolerances, fits, finish, profiles, sizes, fasteners and accessories. The Contractor shall submit shop drawings indicating fits, finishes, profiles, sizes, weldments, castings, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. The Contractor shall include erection drawings, erection tolerances, elevations, rear lock power unit layout with component configuration, and details where applicable. Indicate welded connections using standard AWS welding symbols. The Contractor shall submit a proposed procedure for the installation of operating machinery and movable fence assembly. The Contractor shall provide Manufacturer's literature covering installation and maintenance procedures for operating machinery and movable fence assembly components.

907-850.03.20--Speed Reducer Recondition. Flushing and Cleaning: The Contractor shall contain and remove all debris collected from cleaning and flushing drive Speed Reducer. The Contractor shall dispose of debris in accordance with local and state regulations.

Replace Seals: The Contractor shall install seals by manufacturer's recommendations.

Inspection Cover Gasket: The Contractor shall fabricate and install neoprene gasket which is oil resistant. Gasket shall be adhered to the cover. Gasket shall have thru holes at the bolt locations which do not interfere with installation of the bolts.

Breather: The Contractor shall route breather vent lines such that vent in protected from moisture intrusion (i.e. vent opening is facing down).

Operation: Prior to operating the span, the Contractor shall ensure that the speed reducer is filled with the proper oil to a level that the bearings and gears are properly lubricated during operation. All open gear sets and bearing bushings shall be lubricated prior to operation of the span.

907-850.04--Method of Measurement. Mechanical Work will be measured on a lump sum basis. No separate measurement will be made for shop drawings, realignment or delivery of spare parts.

907-850.05--Basis of Payment. Mechanical Work, measured as prescribed above, will be paid for at the contract lump sum price, which price shall be full compensation for removing and installing the operating machinery and movable fence assemblies as described in this special provision and shown in the plans all labor, material, spare parts, testing, equipment, etc. necessary to complete the work.

Payment will be made under:

907-850-A: Mechanical Work - lump sum

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-851-1 **CODE: (SP)**

DATE: 06/10/2020

SUBJECT: Span Balancing

Section 907-851, Span Balancing, is added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-851 – SPAN BALANCING

907-851.01--Description. This work shall consist of furnishing labor and equipment necessary to maintain balance of each of the bascule leaves during construction and bridge painting through calculations and moving balance blocks. For the purposes of this section, the structure is considered to be a double leaf bridge with each leaf having 4 bascule girders, 2 counterweights, 2 machinery rooms, 2 sets of machinery, etc. Initial strain gage balance testing will be performed by the Engineer at the beginning of the project for use in balance calculations used to determine the balance condition of the leaves at all points during construction. Maintain balance through calculation to verify that the balance condition at no point exceeds the imbalance allowed for operation, as noted below. Final strain gage balancing shall be performed by the Engineer after all structural work has been completed. Balancing the span shall consist of modifying the existing counterweights by the addition or removal of concrete balance blocks in the adjustment pockets of the counterweight. All movement of the balance blocks or addition/removal of balance blocks to the counterweight is included in this pay item. The final desired seated balance condition shall be WX= 220 kip-ft ± 35 kip-ft with an alpha of -10 to +25 degrees from horizontal for each set of machinery. The maximum permissible imbalance at any time during construction for each set of machinery is WX= 0 to +650 kip-ft in the seated position and WX = -250 to 650 kip-ft at any angle of operation. The leaves shall not be counterweight heavy in the seated position at any time during construction without the use of restraints to prevent uplift of the leaves.

After all balancing has been performed install covers over the lower counterweight pockets as detailed in the plans.

907-851.02--Materials. Provide the materials as specified in the plans.

907-851.03--Construction Requirements.

907-851.03.1--Balance Of The Span. The Engineer will determine the imbalance of each bascule leaf using the dynamic strain gauge procedure. This data will be provided to the Contractor for use in maintaining span balance throughout the project through calculations prepared by the Contractor's professional engineer (licensed in the U.S.) having had prior hands-on experience with imbalance measurements by this method on at least 3 other bascule bridges.

The leaf imbalance moment (M) will be plotted versus angle of opening (θ) for opening and closing. An average curve $M = WL\cos(\theta+\alpha)$ will be fitted to the data and plotted giving the probable leaf imbalance moment at any angle of opening. In the foregoing equation:

M	=	imbalance moment
W	=	total weight of the leaf, including counterweight
Θ	=	angle of opening (preferably in degrees)
L	=	distance from center of mass to center of pinion shaft
α	=	angle between horizontal line and line passing through center of pinion shaft and center of mass

The Contractor will receive a stand-alone imbalance measurement report including values of WL, α and friction for each leaf, plots with fitted cosine curves and at least one annotated chart for each leaf.

The Contractor shall submit reports giving the inventory of balance blocks in each counterweight pocket at each stage of construction and bridge painting where span weight is affected and provide balance calculations as required to show interim balance conditions meet the requirements herein.

907-851.03.2--Span Balance Condition. The arrangement and quantity of existing counterweight system elements shown in the design plans is approximate based on cursory field observations. The Contractor shall perform a survey of the number of balance blocks, type and weight of blocks in the counterweight before proceeding with preparing a scheme for maintaining the balance. All balance calculations shall be performed by qualified personnel. All balance adjustments of each span shall be approved by the Engineer.

Until achieving acceptably balanced bascule leaves, take all precautions to assure that stability of each leaf is maintained during all interim construction states. Submit to the engineer procedures to be used for temporarily shoring unbalanced leaves. Submit to the engineer procedures to be use for any proposed moving of the bascule leaves during construction before they are final-balanced.

Existing balance condition of leaves from the previous rehabilitation were reported as follows:

South Span	North Span
WL=250 kip-ft	WL=375 kip-ft
Alpha=12 degrees	Alpha=52 degrees

907-851.03.3--Maintaining Span Balance. Based on the strain gauge tests performed by the Engineer, the Contractor shall remove, replace or install the balance blocks in the pockets as necessary so that the span is maintained within the balance condition, specified herein. Note that balance block adjustments may be required between the initial balance testing and the beginning of other field work.

Calculations shall account for the placement of new blocks, and repositioning of existing balance blocks throughout construction. Calculations shall be based on the initial test findings. Balance blocks may be used or dead loads of known weight may be positioned on the unused portion of

the span as required, to offset the weight of removed components from the span subject to the approval of the Engineer. Calculations prepared by the licensed Engineer shall be submitted verifying the adequacy of the structural members supporting the additional dead loads, if applicable.

Report the weight and C.G. of each component in Department terminology as follows:

1. Weight, W in kips (to the nearest 0.01kip).
2. Distances from center of trunnions to C.G., X (horizontal) and Y (vertical) in feet (to the nearest 0.01 ft).
3. The component contribution to unbalance torque in kip-ft shown as the products W•X and W•Y (to the nearest 0.1 kip-ft.)
4. The component weights and unbalanced torques shall be summed to produce totals for each Bascule Leaf.

Report the weight and C.G. of the sum total of all components for each Bascule Leaf in Department terminology as follows:

1. Weight, W in kips (to the nearest 1.0 kip).
2. Distances from center of trunnions to C.G., X (horizontal), Y (vertical) and L (radial) in feet (to the nearest 0.01 ft).
3. Angle, α, between a horizontal line through the trunnion axis and a line from the trunnion axis through the C.G. of the Bascule Leaf in degrees (accuracy to 0.01 degrees). The angle is measured positive (+) upwards from a horizontal line extending forward (toward the channel) of the trunnion axis.

In computing the vertical distances to the C.G.'s of the components, account for the vertical geometry of the Bascule Leaf (i.e., the roadway vertical curve profile and cross slope.) Compute dimensions with the bridge in the lowered (closed) position.

Final balance may be first achieved through calculation, but shall be verified by strain gauge balance test performed by the Engineer.

907-851.04--Method of Measurement. Span Balancing will be measured as a lump sum quantity, complete in place and accepted.

907-851.05--Basis of Payment. Span Balancing, measured as prescribed above, will be paid for at the contract lump sum price, which shall be full compensation for completing the work. The lump sum price for Span Balancing will include the cost of all labor, materials and equipment necessary to complete the work. The costs for all professional services of the licensed Professional Engineer will be included in the lump sum price. The costs for installation or removal of all blocks will be included in the lump sum price.

New Balance Plates will be paid for under a separate pay item.

Payment will be made under:

907-851-A: Span Balancing - lump sum

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-853-1 **CODE: (SP)**

DATE: 06/10/2020

SUBJECT: Electrical Work

Section 907-853, Electrical Work is added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-853 – ELECTRICAL WORK

907-853.01--Description. This special provision describes furnishing labor, tools, equipment and materials necessary for the manufacture, installation, finishing, testing, and making fully operational the electrical components and systems for the bascule span bridge. All additional special provisions provide further information, requirements, and guidelines that are applicable to the work paid for under the bid items addressed by this special provision.

Comply with all local codes, all laws applying to electrical installations in effect and with the regulations of the latest National Electrical Code, where such regulations do not conflict with the laws in effect and with the requirements of the utility company.

It is the intention of the contract plans to call for completely finished work, fully tested and ready for reliable and consistent operation. Furnish, deliver, and install any apparatus, appliance, materials, or work not shown on the plans but mentioned in the special provisions or vice versa, or any incidental accessories necessary to make the work complete in all respects and ready for operation, to be furnished, delivered, and installed without additional expense to the department.

907-853.01.1--Scope. The work under this item includes the following:

- Conduit, junction boxes, hand holes and wiring required for installation of all control cabinets, motors, brakes, rear locks, limits, gates, barriers, traffic signals, roadway lighting, CCTV, auxiliary equipment and bridge amenities (i.e. furnace, etc.) that require electrical connections.
- Lights and receptacles in bridge house, machinery rooms and on/in the bascule piers.
- Motor Disconnects and misc. electrical equipment not specified in other special provisions.
- Lighting transformer and Panelboards

907-853.01.2--Related Provisions. Unless otherwise noted, work under this special provision conform to the requirements of the following special provisions:

- Electrical Work
- Electrical Service
- Auxiliary Electrical Equipment

- Control Console
- Motor Control Center
- PLC Cabinet and Programming
- Span Drives
- Limits and Sensors
- Submarine Cable
- Lightning and Surge Protection
- Training, Manual and Spare Parts

907-853.01.3--Coordination of Electrical Work. The contract documents are diagrammatic in showing certain physical relationships which must be arranged within the electrical work, and which must interface with other work including utilities and mechanical work. Coordinate electrical work with the work of other trades to eliminate conflicts. Advise other trades of openings required in their work for the subsequent move-in of large units of electrical equipment.

Schedule and arrange electrical work in a neat, well organized manner.

Locate operating and control equipment to provide easy access, and arrange entire electrical work with adequate access for operation and maintenance, as per the latest NEC requirements.

907-853.01.4--Electrical Journeymen.

907-853.01.4.1--Designation of Electrical Journeymen. Provide a listing of pre-qualified electrical journeymen to perform the electrical work in accordance with this special provision. Perform all work either by, or under the immediate supervision of an electrical journeyman. For this project, "under the immediate supervision" is defined to mean that the journeyman is in the immediate vicinity and physically involved in performing the electrical work. It is the intention of this special provision that the journeyman's knowledge, talents, and skills in performing certain critical work will be judged and approved by the engineer and that the journeyman will do the actual work utilizing those talents and skills. Helpers are expected to aid the journeyman in the performance of the work and not to act as non-credentialed surrogates of a remote journeyman. Non-approved helpers may only perform tasks of a support nature that do not directly involve responsibility for the installation, connection, or adjustment of electrical materials.

907-853.01.4.2--Qualification of Electrical Journeymen. Each electrical journeyman must hold, at a minimum, an active journeyman electrician's license and have at least five (5) years of experience in industrial electrical work. The journeyman must also have knowledge and experience on emergency power systems and other electrical devices required to operate the movable bridges. Each journeyman must be pre-approved by the engineer based on submitted documentation of licensing, training and experience history. The engineer might also require a demonstration of knowledge of the tool and technique requirements of specialty electrical work to be performed including, but not limited to: conductor pulling, termination, testing, conduit and device mounting before the journeyman will be permitted to perform such specialty work.

907-853.02--Materials. Provide all new materials that conform to the standards of the Underwriters Laboratories, Inc., in every case where such a standard has been established for the particular type of materials in question. Submit to the engineer for approval, prior to purchase of any materials or equipment required to be furnished and installed, a complete list of all such materials and equipment including manufacturer's catalog (part and/or model) numbers, catalog data sheets, illustrations, and shop drawings.

907-853.02.1--General. In addition to the standard specifications, provide and install all equipment in accordance with the applicable requirements of the following:

- AASHTO Standard Specifications for Movable Highway Bridges
- NFPA 70, National Electrical Code
- NFPA 79, Electrical Standard for Industrial Machinery

Ensure that equipment and its installation present a neat and attractive appearance. Use new heavy-duty industrial design, equivalent to the best grade of the particular type of equipment made by the leading manufacturers of such equipment.

Furnish new equipment that is compatible with all other associated equipment in the system. Ensure that all items furnished perform the function indicated on the approved drawings and as required by the design.

Equipment sizes and space shown on design drawings are approximate. Ensure that all required electrical equipment components can be adequately located in the operator's house and elsewhere on the project as required.

Provide the department a written warranty for operation of the bridge and for all of the components furnished under this work, to cover a period of one year after Substantial Completion as described in article "Control of the Work". Have normal manufacturer warranties extended to cover parts and labor for this period.

907-853.02.2--Disconnect Switches. Furnish and install heavy-duty disconnect switches having electrical characteristics, ratings, and modifications shown on the drawings. Furnish and install fuses for fused disconnect switches. Provide fuses and switches conforming to the following:

- UL 248-1-Low Voltage Fuses- Part 1: General Requirements
- UL 248-12- Low Voltage Fuses- Part 12: Class R Fuses.
- FS W-F-870 - Fuse Holders and Fuse Clips (For Plug and Enclosed Cartridge Fuses).
- FS W-S-865 - Switch, Box, (Enclosed), Surface-Mounted.
- NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600V).

Provide the following:

- NEMA Type 4X (stainless steel) enclosures in the machinery room.
- NEMA 12 units in the operator room, entry level and utility rooms.

- Metal front cover mounted factory nameplates that contain a permanent record of switch type, catalog number, and HP rating.
- Pad-lockable handles with easily recognizable positions are required.
- Switches that include visible blades, reinforced fuse clips, and non-teasible positive quick make-quick break mechanisms.
- Switch assemblies and operating handles that are an integral part of the enclosure base.
- Switches that are HP rated and meet Federal and NEMA Specifications.
- Switches that have defeatable door interlocks that prevent the door from opening when the operating handle is in the ON position.
- Heavy duty switches with line terminal shields.
- Fusible switch assemblies of NEMA KS 1 construction with quick-make, quick-break load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position and Handle lockable in OFF position. Furnish fuse clips designed to accommodate Class R fuses.
- Non-fusible switch assemblies of NEMA KS 1 construction Type HD with quick-make, quick-break load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position and Handle lockable in OFF position. One N.C. (normally closed) and one N.O. (normally open) set of auxiliary contacts is required.
- Fuses that are time delay, current-limiting type with 200KA interrupting rating at 600 VAC. Rejection type are required that are, UL listed to minimize short circuit damage. Use UL Class RK1 for service entrance, transformer feeder and panelboard feeder. Use UL Class RK5 for motor branch circuit.

907-853.02.3--Wiring Devices.

907-853.02.3.1--General Requirements. Conform to UL 943- Ground-Fault Interrupters.

907-853.02.3.2--Toggle Switches. Toggle switches are to be heavy-duty use, totally enclosed type with bodies and, handles of thermosetting plastic, supported on a metal mounting strap. Provide wiring terminals of the screw type, side-wired. Back-wired, clamp-type terminals are not allowable. Use switches with snap type with toggle handle, rated quiet type, AC only, 20 A, 120/277 VAC, single pole. Use three-way switches as shown in plans. Install with OFF position down.

907-853.02.3.3--Receptacles. Receptacles are to be heavy-duty use, specification grade, duplex 3-wire, NEMA 5-20R grounding type rated 20 A and 125 VAC. Provide bodies with thermosetting plastic composition, supported on a metal mounting strap. Use receptacles with side-wired with binding-type terminals. Back-wired, clamp-type terminals are not allowable. Use grounded pole type that is connected to the mounting strap.

907-853.02.3.4--Ground Fault Circuit Interrupter (GFCI) Receptacles. Provide GFCI duplex receptacles that are heavy-duty jufeed-through type, convenience receptacle with integral ground fault current interrupter. Provide GFCIs that are rated at 125 VAC and 20 A and capable of detecting a current leak of five (5) mA. Receptacles shall be connected to protect the local load without disruption of the rest of the circuits.

907-853.02.4--Lighting.

907-853.02.4.1--General Requirements. Construct, wire, and install all luminaries in compliance with all applicable national, state and local codes. Unless otherwise specified, each luminaire shall be listed by the Underwriters' Laboratories as suitable for application and location shown and conform to any additional regulations necessary to obtain approval for use in locations shown. If Underwriters' Laboratories listing of luminaire is waived, all electrical components shall be UL recognized. Include provision for thru-branch circuit wiring for all recessed incandescent and high intensity discharge luminaires shall include provision for thru-branch circuit wiring. Provide internal wiring of luminaires with a minimum number of splices and make all splices with approved connectors. Ensure wiring and connectors are suitable for the current, voltage and temperature to which they will be subjected.

Construct luminaires with the minimum possible number of joints. Make joints only by means of approved welded, brazed, screwed, or bolted construction methods. Soldered joints are not acceptable. No self-tapping screws, bled metal tapping methods, or rivets shall be employed for fastening any parts which must be removed to gain access to electrical components requiring service or replacement, or for fastening any electrical component or support for same. Manufacture ferrous metal parts and supports of luminaires other than parts manufactured of stainless steel completely rustproofed after fabrication and before finishing coatings are applied, by treatment with an approved rust-preventing process. Pre-treated sheet steel shall not be accepted unless treated as above. Provide mounting frames and all screws, bolts, nuts, and other fastening and latching hardware of stainless steel, unless otherwise specified.

Final finish shall be uniform, even in appearance, free from runs and surface imperfections. Luminaires for use at wet or damp locations must be suitably gasketed to prevent access of moisture into electrical components or enclosing diffusers, lenses, or globes.

Unpainted aluminum parts of luminaires must be anodized with coating of sufficient weight to protect against corrosion. Anodize visible surfaces and trim with minimum coating of 35 mg. per square inch.

Where stainless steel or non-ferrous metal surfaces (other than reflectors) are to remain unpainted, or where steel surfaces are to be electroplated, unless otherwise specified, coat with a baked-on clear lacquer. Reflectors must be free of ripples, tool marks and other surface imperfections.

Provide sockets for all luminaires suitable for the specified lamps and set so that lamps are positioned in an optically correct relationship to lenses, reflectors, baffles, etc. Ensure lenses, diffusers or louvers contained in frames are removable, but positively held within the frame so that hinging or other motion of the frame will not cause the diffusing element to drop out. Face trims fabricated in pieces for rectangular or square luminaires must have mitered corners, continuously welded and smoothed before finishing. Lapping of trim metal is not acceptable.

Provide glass used for lenses, refractors, or diffusers of water-white crystal quality and provide minimum 88 percent light transmittance. Unless otherwise specified, equip glass for incandescent and H.I.D. luminaire of borosilicate or aluminosilicate, tempered for high impact and high heat resistance.

Unless otherwise specified, fabricate plastic lenses or diffusers of virgin, clear material, cast, molded or extruded. The material shall provide minimum 88 percent light transmittance and maximum five (5) percent haze factor. If not specified, the thickness shall be sufficient to prevent sagging, warping or other deflection under luminaire operating conditions.

Provide fluorescent fixtures with hinged frames with stainless steel latches, and 1/8-inch thick virgin acrylic lenses. Provide each industrial type open-tube fluorescent fixture with spring loaded telescoping sockets or lamp retainers (two per lamp). Construct fluorescent fixture housings so that all electrical components are easily accessible and replaceable without removing the fixture body from its mountings. Provide fluorescent Lamps of warm white, all by same manufacturer. Ensure fluorescent ballasts meet the requirements of ANSI C82.1 and are high power factor type. Ballasts must be labeled Certified Ballast Manufacturers (CBM) certified by Electrical Testing Laboratories (ETI). Provide ballasts of Class P with a sound rating "A."

Provide exterior fixtures, accessories, and enclosures complete with gaskets to form weatherproof assembly.

Provide hermetically sealed cadmium sulfide photocell rated for the system voltage with single throw contacts rated 1,000 watts. The unit shall turn ON below three (3) footcandles and OFF at 3 to 10 footcandles. Provide a time delay to prevent accidental switching from transient light sources. Mount a directional lens in front of the cell to prevent fixed light sources from creating a turn-off condition. Aim the unit according to manufacturer's instructions.

Provide self-contained incandescent emergency lighting units with rechargeable storage batteries, charger, and lamps. Equip each unit with an automatic power failure device, test switch, pilot light, and fully automatic high/low trickle charger. Provide sealed wet-cell type batteries, with 1.5 hour capacity to supply the connected lamp load, operate unattended, and be maintenance-free for a period of not less than 10 years. Emergency lighting units shall be rated for 12 V, except units having no more than two (2) unit-mounted lamps may be rated 6 V. Provide dual-rate charger, capable of maintaining the battery in a full-charge state during normal conditions, and capable of recharging discharged battery to full charge within 12 hours. Lamps shall be 12 watts minimum, sealed beam type in plastic housing. Unit shall have plastic enclosure. Provide lamps to indicate AC ON and RECHARGING. Provide TEST switch.

907-853.02.5--Boxes.

907-853.02.5.1--Control Panels & Cabinets. Furnish and install NEMA 12 enclosures for all enclosures located in each Operator's house or as noted in plans. Wall mounted enclosures must be a minimum of 14 gauge sheet steel. Free standing enclosures must be a minimum of 12 gauge sheet steel. Provide enclosures with data pockets, 3 point latches and a continuous hinge. Provide back panels on all enclosures and side panels if required.

Furnish and install NEMA 4X stainless steel enclosures for all locations other than the operator's room, entry level or utility room. Wall mounted enclosures must be a minimum of 14 gauge 304 stainless steel. Free standing enclosures must be a minimum of 12 gauge stainless steel. Provide enclosures with heavy duty three-point latching mechanism. Provide enclosures with data pockets, three-point latches and a continuous hinge. Provide back panels on all enclosures and side panels if required.

Install all electrical equipment in each cabinet on sheet steel back or side panels. The components will be front connected, front wired and removable from the front. Arrange the equipment in a systematic and neat arrangement that allows for ease of maintenance.

Provide all control cabinets with a door operated fluorescent light and a convenience receptacle. The power for these devices will be separate from control power. Provide an individual 5 A circuit breaker in each cabinet to isolate and protect the circuit.

907-853.02.5.2--Device Boxes. Provide wall-mounted boxes for wiring devices (toggle switches, duplex receptacle, GFCI) that are cast metal. Provide drain holes in the boxes. Provide all boxes with mounting lugs and securely fasten them to the structure with not less than four bronze or monel metal through-bolts.

Boss, drill, and tap for threaded conduit ends, which enter squarely, all cast iron boxes Fabricate from hot-dip galvanized structural steel Type A36 not less than 3/8-inch thick framework for supporting boxes, switches, and other externally mounted electrical devices.

Use brass, monel metal, or stainless steel for all mounting bolts, nuts, washers, and other hardware used for fastening boxes, disconnect switches, devices, lighting outlet boxes, conduit clamps, and similar devices. Use hexagonal bolt heads and nuts, and do not use bolts smaller than 3/8 inch in diameter except as may be necessary to fit the mounting holes in small devices, outlet boxes, and similar standard equipment.

907-853.02.5.3--Boxes and Enclosures. All pull boxes, junction boxes, and all enclosures, panels and cabinets, and all other miscellaneous housings used for pulling wires, terminating wires, or otherwise used to install electrical equipment must conform to the following requirements unless specifically stated elsewhere. For all locations, provide 4X (stainless steel) enclosures that are UL-listed for the application. If unavailable, then NEMA 4 rating may be substituted. Specify all mounting hardware material for Supporting Devices. Specify construction requirements device boxes. Provide sheet metal enclosures with "O-ring" sealing hub connectors. Equip the conduit ends projecting into all boxes and enclosures with insulated bushings. Drill no box or enclosure for more conduits than actually enter it. Use of wireways (metallic or non-metallic) and/or sheet metal troughs with hinged or removable covers are acceptable provided their use is limited and locations are approved by the engineer. Comply with the 40 percent fill allowance per NEC.

907-853.02.5.4--Boxes and Enclosures. Use hand-holes that conform to the standard specifications.

907-853.02.6--Terminal Blocks. Provide terminal blocks for any conductor that enters or leaves a cabinet or junction box. Provide spring clamp style terminal blocks for conductors 10 AWG and smaller. Use terminal blocks rated at a minimum 600 Volts, 30 A. Provide terminal blocks with a minimum of three (3) conductors with field side of terminal blocks utilizing two (2) conductors. Use terminal blocks fabricated from Allen Bradley, Wago, Phoenix or approved equal.

Use manufacturer accessories for jumpers, end barriers, clamps and wire markers. All terminal block markers will be printed. Hand marked terminals will not be accepted.

907-853.02.7--Electrical Identification.

907-853.02.7.1--Cabinets. Provide legend nameplates for all major pieces of equipment named on the plans, and for all control devices. Provide a plastic laminated engraved nameplate mounted with stainless steel screws for each device. Mark devices as indicated on electrical schematics, for fuses and breakers, include the amperage or fuse part number. Use white nameplates with black lettering. Taped labels can be used on the inside of the console top to identify the selector switches, pushbuttons lights and etc.

Provide nameplates for equipment identification with minimum letter height of 3/16 inch. Use a minimum ¼-inch high nameplates for the console top. Use 1/16-inch minimum thickness plastic nameplates.

Degrease and clean surfaces to receive nameplates. Install nameplates parallel to equipment lines. Secure nameplates to equipment fronts using stainless steel screws or approved manufacturer's recommended adhesive. Secure nameplates to inside of recessed panelboard doors in finished locations.

907-853.02.7.2--Conduit Markers. Provide adequate marking of primary conduits, which are exposed or concealed, in accessible spaces, to distinguish each run as either a power or signal/communication conduit. Use orange banding with black lettering except as otherwise indicated. Provide snap-on type plastic markers. Indicate voltage ratings of conductors where above 240 VAC. Locate markers at both ends of conduit runs, near switches and other control devices, near items of equipment served by the conductors, at points where conduits pass through walls, floors or into non-accessible construction, and at spacing of not more than 50 feet along each run of exposed conduit. Switch-leg conduit and short branches for power connections need not be marked, except where conduit is larger than one (1) inch. Both ends of each marked conduit run shall be provided with a brass tag having a number stamped thereon in accordance with the conduit diagrams. These tags shall be securely and permanently fastened to the conduit ends with bare copper wire.

907-853.02.7.3--Console. Provide plastic laminated engraved nameplates for the top of the console. For new consoles, provide black lettering on white background plastic laminated engraved nameplates for the top of the console.

Secure nameplates not secured by a pushbutton or indicator light with stainless steel screws. Adhesive backed nameplates as the only means of securing nameplates will not be allowed.

Provide nameplates for equipment identification with minimum letter height of 3/16 inch. Use a minimum ¼-inch high nameplates for the console top. Use 1/16-inch minimum thickness plastic nameplates.

907-853.02.7.4--Wire and Cable Markers. Provide wire and cable markers that are vinyl cloth, split sleeve, or tubing type. Wire numbers printed on wire insulation are not acceptable.

907-853.02.8--Supporting Devices.

907-853.02.8.1--General. Conduit and equipment supports and anchors and fasteners.

- NECA - National Electrical Contractors Association.
- ANSI/NFPA 70 - National Electrical Code.
- UL - Underwriter Laboratories, Inc.

907-853.02.8.2--Manufacturer's Instructions. Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

907-853.02.8.3--Regulatory Requirements. Conform to requirements of ANSI/NFPA 70. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

907-853.02.8.4--Material Requirements. Provide adequate corrosion resistance. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products. Minimum safety factor is 2.0. Framework for supporting boxes, switches, and other externally mounted electrical devices shall be hot-dip galvanized steel. For U-Channel strut systems utilizing bolted construction, all components shall be of the same manufacturer, and shall be 12 gauge and 1-5/8-inch width minimum.

907-853.02.9--Conduit and Wiring.

907-853.02.9.1--General. Furnish and install conduit and raceways in the quantities and sizes required to complete the work as shown on the plans and as required by NEC. Conduit and circuits indicated on plans diagrams and schedule may be recombined in the field where appropriate, with the approval of the engineer. Section Includes: metal conduit, non-metallic conduit, liquidtight flexible metal conduit, and fittings and conduit bodies.

Use rigid galvanized steel conduit for conduit in the utility, entry and operator level rooms. Use of thinwall EMT is allowed for lighting and receptacle circuits that are installed behind finished drywall. Use PVC coated rigid galvanized steel conduit for all exterior conduit that is located

outside the three rooms listed above. Use PVC schedule 40 for concrete embedded and installed in a trench, unless the conduit is under a roadway, then use Schedule 80.

907-853.02.9.2--Conduit drawings. Before the initial start of construction, submit a full size drawing showing all conduit runs between all pieces of equipment for review and approval. Provide "as-built" drawing for riser diagrams and schedules.

907-853.02.9.3--Definitions:

- Conduit: Pipe that has been treated, threaded, and classified to be suitable for use as an electrical raceway.
- Conduit Body: Fitting with removable cover to allow pulling conductors and which may also provide means for making a tight turn or "tee" connection in conduit.
- Fitting: Accessory component for joining conduit (coupling), connecting conduit to box or enclosure (connector or hub), or providing other functions (such as expansion fitting).

907-853.02.9.4--Conform to the following:

- NEMA/ANSI C80.1 - Rigid Steel Conduit - Zinc Coated (GCR).
- NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- NEMA TC 2 - Electrical Polyvinyl-Chloride (PVC) Tubing and Conduit.
- NEMA TC 3 - PVC Fittings for use with Rigid PVC Conduit and Tubing.
- NEMA TC 14 - Filament-Wound Reinforced Thermosetting Resin Conduit.
- UL 651 - Schedule 40 and 80 Rigid PVC Conduit.
- NCEA 101 - Standard Practice for Good Workmanship in Electrical Construction.
- NEMA VE 2 - Metal Cable Tray Installation Guidelines.
- UL 1684 - Reinforced Thermosetting Resin Conduit (RTRC) and Fittings.
- UL 514B - Fittings for Cable and Conduit.
- UL 360 - Liquid-Tight Flexible Steel Conduit.
- UL 6 - Rigid Metal Conduit.

907-853.02.9.5--Conduit Requirements:

- Minimum Size: ¾ inch minimum trade size for rigid and PVC, unless otherwise specified. ½ inch for EMT.
- PVC Coated Metal Conduit Description: NEMA RN 1; rigid steel conduit (ANSI C80.1) with external PVC coating, 40 mil thick. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.
- Liquidtight Flexible Metal Conduit Description: UL 360; Interlocked steel construction with PVC jacket. Fittings: NEMA FB 1.
- Non-metallic conduit description: NEMA TC 2, schedule 80 (UL 651). PVC fittings NEMA TC 3 to match conduit. Embedded in concrete use only.

907-853.02.10--Conductors.

907-853.02.10.1--General. For building wire and cable, wiring connectors and connections, and flexible cable,
Conform to the following:

- ANSI/NFPA 70 - National Electrical Code.
- ASTM B3/ANSI C7.1 - Standard Specifications for Soft or Annealed Copper Wire.
- UL 83 - Thermoplastic-Insulated Wires and Cable.
- UL 44 - Thermoset-Insulated Wires and Cable.
- UL 854 - Service Entrance Cables.
- UL 1063 - Machine-Tool Wire and Cables.
- UL 1685 - Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical Cables.
- Conform to requirements of ANSI/NFPA 70. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

907-853.02.10.2--Project Conditions. Verify that field measurements are as shown on plans. Wire and cable routing shown on plans is approximate unless dimensioned. Route wire and cable as required to meet project conditions. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required. Determine required separation between cable and other work. Determine cable routing to avoid interference with other work.

907-853.02.10.3--Building Wire and Cable. No aluminum or solid copper conductors allowed. For single conductor insulated wire use no wire smaller than No. 12 AWG for power and lighting circuits and no smaller than No. 14 AWG for control wiring, except that control wiring within a cabinet may be No. 16 AWG. Minimum field wire size is No. 12 AWG for control and No. 10 AWG for motor loads. Use minimum No. 10 AWG for 20 A, 120 VAC, branch circuit home runs longer than 75 feet, and for 20 A, 208/240/277 VAC, branch circuit home runs longer than 200 feet.

Furnish insulated conductors of seven or nineteen strand copper, minimum 98 percent conductivity and connector accessories for copper in sufficient quantities for a complete installation. Use twisted shielded pairs in cases of low level audio or digital signal when required. Provide XHNW, THHW/THWN-MTW insulation rated 600 VAC unless otherwise noted. Provide type SE, USE-2, RHW-2 or RHW insulation for incoming conductors, unless otherwise noted. All field wiring shall be rated 90 ºC.

907-853.02.11--Lighting Transformer. Provide transformers with proven 220 °C, UL tested insulation system. Wind coils with copper. Insulate material with proven, high temperature resistant 220 °C material. Insure all materials in the transformer are flame retardant and do not support combustion as defined in ASTM Standard Test Method D635. Provide final insulation treatment by total immersion in a 220 °C insulating varnish that maintains superior bond strength, high dielectric strength, and outstanding power factors at temperatures normally

associated with 220 °C system. After immersion, cure the varnish thoroughly at normal operating temperatures to assure the scourging of all volatiles in the varnish solvent.

Construct transformers with core materials of high quality and low loss characteristics to minimize exciting currents, no-load loss, and interlaminar vibrations. Incorporate built-in vibration dampening systems to minimize and isolate sound transmission. Mechanically brace the core-coil assembly to withstand short circuit tests as defined in NEMA TR-27. Coil construction and mechanical bracing members must prevent mechanical degradation of the insulation structure during short circuit.

Provide self-bracing transformer enclosure and provide drip-proof and rodent-proof protection. Include convenient knockouts for conduit entrance. Locate terminal compartment in bottom of transformer, below the core-coil assembly, for side or bottom conduit entrance. Temperature rise in terminal compartment must not exceed 5 °C above ambient. Run line and load conductors in separate conduits.

Provide transformers with two 22 percent full capacity taps above rated voltage and two 22 percent full capacity taps below rated voltage. Minimum basic impulse level (BIL) allowed is 10 kV. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap. Provide transformers 75 kVA and less, suitable for wall, floor, or trapeze mounting; transformers larger than 75 kVA shall be suitable for floor or trapeze mounting. Provide continuous winding coils with terminations brazed or welded. Include transformer connection data and overload capacity based on rated allowable temperature rise on the factory nameplate.

Conduct the following tests at the factory:

- Applied voltage test (one minute) 4 kV.
- Induced voltage test - two times normal for 7,200 cycles.
- Ratio and phase relation.

Test reports on electrically duplicated units must certify that the following tests have been completed on the first rating of any design:

- No load losses.
- Induced voltage.
- Total losses.
- Sound level.
- Applied voltage.
- Impulse test.
- Temperature rise.

Submit three (3) copies of test results to the engineer for approval.

907-853.02.12--Panelboards. Furnish and install, where indicated, a dead-front panelboard incorporating switching and protective devices of the number, rating, and type noted herein or shown on the Plans. Panelboards shall be circuit breaker equipped. Panelboards shall have

general purpose enclosures and shall be surface mounted except where noted. All panelboards shall be rated for the intended voltage and shall be in accordance with the Underwriters' Laboratories, Inc. "Standard for Panelboards" and "Standard for Cabinets and Boxes" and shall be so labeled where procedures exist. Where panelboards are to be used as service entrance equipment, they shall be so labeled. Panelboards shall also comply with NEMA Standard for Panelboards, National Electric Code, and Federal Specification 115a (Power Distribution Panels) where applicable. Manufacturer shall be a company specializing in manufacturing the product specified with a minimum of five (5) years documented experience.

Factory-assemble interiors with switching and protective devices, wire connectors, etc. All terminals shall be suitable for copper wire of the sizes indicated. Interiors shall be so designed that switching and protective devices can be replaced without disturbing adjacent units and without removing the main bus connectors and shall be so designed that circuits may be changed without machining, drilling, or tapping. Arrange branch circuits using double row construction. Provide a factory nameplate listing panel type and ratings. Bus bars for the mains shall be copper and sized in accordance with UL standards. Unless otherwise noted, full size neutral bars shall be included. Bus bar taps for panels with single pole branches shall be arranged for sequence phasing of the branch circuit devices. The short circuit rating of the assembled panelboard shall be in accordance with UL standards and their test verification. Phase bussing shall be full height without reduction. Cross and center connectors shall be copper. Neutral bussing shall have a suitable lug for each outgoing feeder requiring a neutral connection. Spaces for future switching and protective devices shall be bussed for the maximum device that can be fitted into them.

Provide boxes made from galvanized code gauge steel of sufficient size to provide a minimum gutter space of six inches on all sides. Where feeder cables supplying the mains of a panel are carried through its box to supply other electrical equipment, size the box to include this wiring space. This wiring space shall be in addition to the minimum gutter space specified above and the limiting width may be increased accordingly. Provide a minimum of four (4) interior mounting studs.

Include hinged doors covering all switching device handles in all panel trims, except that panelboards having individual metal clad externally operable deadfront units may be supplied without such doors. In making switching device handles accessible, doors shall not uncover any live parts. Provide doors with a cylinder lock and catch. Key all locks alike. Furnish a directory frame and card having a transparent cover on each door. Fabricate the trim from code gauge sheet steel. Clean and finish all exterior and interior steel surfaces of the panelboard trim with gray ANSI-61 paint over a rust-inhibiting phosphatized coating. For flush panels overlap trim for the box by at least ¾ inch all around.

Protect electrical circuits with molded case circuit breakers with inverse time delay and instantaneous circuit protection. Operate the breakers with a toggle type handle with a quick-make, quick-break, over-center switching mechanism that is mechanically trip free from the handle. Include provisions so that the contacts cannot be held closed against short circuits and abnormal currents. Tripping because of overload or short circuit shall be shown by the handle automatically assuming a position midway between the manual ON and OFF positions. Ground and polish all latch surfaces. Plug-in type circuit breakers are not acceptable. Breakers must be

completely enclosed in a molded case, bolt-on type construction. For non-interchangeable trip breakers seal their covers; for interchangeable trip breakers seal the trip unit sealed to prevent tampering. Provide non-welding silver alloy contacts with Arc chutes, consisting of metal grids mounted in an insulating support.

Circuit breakers shall conform to the applicable requirements of NEMA Standards, and meet the appropriate classifications of Federal Specifications W-C-375b. Provide molded case breakers of the following types: Thermal magnetic standard type that provides inverse time delay overload and instantaneous short circuit protection by a thermal-magnetic element; or magnetic only standard (Motor Circuit Protector) that provides instantaneous short circuit protection by a front adjustable magnetic element with supplemental thermal overload protection. The adjustment button(s) shall have main setting points and mid-setting points following a linear scale so that each point has a significant value within calibration tolerance.

Provide multi-pole breakers with a single operating handle that is independently removable without disturbing adjacent units or other bus connections and is fastened to the main bus bars with a bolted connection. Plate all copper parts to prevent corrosion. Provide 100 A frame breakers with an interrupting rating of 10,000 A (minimum). Provide larger frame size breakers with an interrupting rating of 22,000 A (minimum).

907-853.03--Construction Requirements.

907-853.03.1--General.

907-853.03.1.1--Codes. Comply with all local codes, all laws applying to electrical installations in effect and with the regulations of the latest edition of the National Electrical Code, where such regulations do not conflict with the laws in effect and with the requirements of the utility company.

907-853.03.1.2--Protection of Electrical Equipment . Protect electrical equipment from water damage, especially from rain, snow, condensation, and water dripping or splashing on equipment and wiring, at all times during shipment, storage and construction (prior to final acceptance). Provide temporary electrical connections to equipment heaters, or provide temporary heaters, as required to prevent damage from moisture.

Thoroughly dry out and put through a special dielectric tests as directed by the engineer at no cost to the department, or replace if not tested to the satisfaction of the engineer, any apparatus that has been subjected to possible injury by water or dampness (including the interiors of motor control equipment, submarine cable ends, or any other electrical devices).

907-853.03.1.3--Coordination of Electrical Work. The plans are diagrammatic in showing certain physical relationships which must be arranged within the electrical work, and which must interface with other work including utilities and mechanical work. Coordinate as necessary between trades to allow for proper installation of all electrical work and to eliminate conflicts. Locate operating and control equipment to provide easy access, and arrange entire electrical work with adequate access for operation and maintenance, as per the latest NEC requirements.

907-853.03.1.4--Field Measurements and Surveys. Prior to development of submittals, conduct field surveys to verify construction dimensions. Identify field dimensions on submittals that have been field verified. Conduct field measurements and surveys as required to supplement information provided to provide a complete and satisfactory fitting and fully operational installation.

907-853.03.2--Submittals. Submit electrical equipment, hardware, drawings, testing plans, and documentation for all electrical items described in the contract documents, except for the submarine cables installation. Submarine cables installation is submitted as a separate bid item.

Submit working plans and shop drawings as prescribed in the contract documents and in this special provision. Clearly mark manufacturer's standard drawings that indicate dimensions and/or options for more than one piece of equipment to clearly indicate what data applies.

Provide a separate submittal package for this and all other electrical bid items unless otherwise indicated. Label each submittal package to indicate the project name and bid item number. Label data sheets for individual components such as motors, limit switches, etc. with the identification numbers shown in the plans and the special provisions.

Submit all components of a bid item by task (Traffic Gates, Traffic Signals, Navigational Lights & Aids, Sump Pump, etc.). Include shop drawings drawn to scale and certified by the manufacturer for all submittals for major electrical equipment. Where wiring diagrams, schematic diagrams, engraving schedules, conduit drawings, interconnection diagrams, one-line, three-line diagrams, etc. are called for or provided, they are to be site specific.

For motors, submit manufacturer's product data, installation instructions, operation and maintenance data. Include assembly drawings, bearing data with replacement sizes, and lubrication instructions. Clearly identify the locations of each motor terminal connection box relative to the bridge drive machinery. Ensure proper clearances of all components.

Submittal approval shall be on an "all or none" basis. Provide complete resubmittals even if some items on the original submittals may not have been marked deficient. Provide sufficient time in project schedule to allow for the possibility of repetitious submittals without creating delays to the project. The department will not bear any responsibilities for delays caused by repetitious submittals.

907-853.03.3--As-Built Drawings. At the completion of the project, provide complete as-built drawings. As-built drawings will be essentially the same as the working plans and shop drawings submitted for approval but showing all of the changes made during construction.

907-853.03.3.1--Working Drawings. Prepare and submit to the engineer for approval the following working drawings and documents executed in accordance with the provisions of the contract:

- A drawing to scale showing the location, depth, and length of cables, together with the proposed method of installing the cables and all equipment. Submit drawings for approval prior to placing cable and equipment orders with any manufacturer.
- Typical published test data showing physical and electrical characteristics of the proposed submarine cable insulating compound.
- Manufacturer's construction drawings of all submarine cables showing the sizes of conductors, thickness of insulation, makeup of the cable layers, type and size of jackets, armor, jute serving and other components, and the outer diameters of the finished cables.
- Detail drawings showing the construction of the submarine and terminal boxes and cabinets and all equipment and components mounted therein. Terminal and wire tagging must be shown prior to cable installation.
- Submit calculations and locations of heaters within each termination cabinet. Provide thermostats that are internal to each self-contained heater unit. Size each heater unit per the internal space of each terminal cabinet, and per heater manufacturer's recommendations.
- Provide Manufacturer's data sheets (including type, length, and minimum bending radius), certified test data, and cross section drawings for each cable. Provide manufacturer's data sheets for each type of cabinet, heater, terminal block, ground bar(s), and other devices within each cabinet. Provide detailed dimensioned drawings for termination cabinets including terminal/wire number designations, cable routing, cabinet and cable support devices and mounting details. Submit drawings showing configuration of conduits and devices entering submarine cable termination cabinets, and detailed layouts of terminal blocks within submarine cable termination cabinets. Submit details of termination cabinets, showing dimensions, segregation shields, and mounting arrangement of all equipment. Provide electrical schematics and system diagrams showing all system wiring. Provide dimensioned drawings that detail all surrounding mounting walls and structures. Where existing cables and conduit penetrations are to be re-used, provide details of how the new cables, conduits and fittings are to be installed. Where new submarine cables route through new or existing penetrations sleeves, provide details on sealing the openings.

907-853.03.4--Wiring Devices. Provide devices installed outside of control house with corrosion-resistant metal weatherproof covers. Furnish cover plates with a1 mm thick satin finished Type 302 stainless steel that fit Type FS or FD boxes without overlapping edges or corners.

907-853.03.5--Terminal Block Requirements. Provide terminal blocks with white marking strips. Group them for easy accessibility unrestricted by interference from structural members and instruments. Provide two (2) inches, minimum on each side of each terminal block to allow an orderly arrangement of all leads to be terminated on the block. Do not terminate more than two wires on any one terminal position. Permanently label each terminal block, device, fuse block, and both ends of each conductor to coincide with the identification indicated on the manufacturer's wiring diagrams.

907-853.03.6--Electrical Identification (Nameplates). Degrease and clean surfaces to receive nameplates and tape labels. Install nameplates and tape labels parallel to equipment lines. Secure nameplates to equipment fronts using a minimum of two (2) stainless steel screws or

approved manufacturer's recommended adhesive. Secure nameplates to inside of recessed panelboard doors in finished locations.
Provide wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connection. Identify with branch circuit or feeder number for power and lighting circuits, and with control wire number as indicated on schematic and interconnection diagrams or equipment manufacturer's shop drawings for control wiring.

907-853.03.7--Supporting Devices. Do not fasten supports to piping, ductwork, mechanical equipment, or conduit. Do not drill any holes in any structural steel or concrete members without approval of engineer. All mounting bolts, nuts, washers, and other hardware used for fastening boxes, disconnect switches, devices, lighting outlet boxes, conduit clamps, and similar devices shall be monel metal, bronze, or stainless steel. Use hexagonal bolt heads and nuts with spring lock washers under all nuts. Use minimum 3/8-inch diameter bolts except as may be necessary to fit the mounting holes in small devices, outlet boxes, and similar standard equipment.

Fasten hanger rods, conduit clamps, and outlet and junction boxes to structure using proper fasteners. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchor on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction. Attachment to steel or concrete shall be by stainless steel straps or hangers held at not less than two points by galvanized bolts or lag screws. Concrete inserts shall be fabricated from stainless steel. Install surface-mounted cabinets and panelboards with a minimum of four anchors. Do not use powder-actuated anchors. Do not drill or weld structural steel members.

907-853.03.8--Motors.

Megger all motors before final connection. Record these readings and submit with "as-built" drawings at time of functional testing. Coordinate motor shaft diameters and lengths with requirements for machine and service brakes. Before ordering motors, verify that the sizes and lengths of all shafts, location of conduit boxes match the requirements for the brake and mechanical equipment furnished.

907-853.03.9--Conduit and Wiring.
Unless otherwise specified in the plans, install conduit in accordance with NECA Standard Practice. Install nonmetallic conduit in accordance with manufacturer's instructions. Arrange supports to prevent misalignment during wiring installation. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers. Do not use plastic straps or plastic hangers. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits. Fasten conduit supports to building structure and surfaces under provisions of supporting devices. Attachment to steel or concrete shall be by galvanized or stainless steel straps, hangers held at not less than two points by galvanized, stainless steel bolts, or lag screws. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary support.

Provide pull boxes or junction boxes wherever necessary to facilitate the installation of the conductors. Pull boxes are used for pulling conductors through. No splicing or terminations are permitted. Junction boxes are used for field connections of conductors. Conductors are to be connected using approved terminal blocks. Do not use condulets for pulling more than 10 conductors or for making such turns in conduit runs or for branching conductors, except for indoor wiring to lighting fixtures and receptacles. At any point where a conduit crosses an expansion joint, or where movement between adjacent sections of conduit can be expected, install a bronze or alloy expansion fitting.

Use of flexible conduit is allowed only for the connection of motors, limit switches, and other devices that must be periodically adjusted in position. Make connections between the rigid conduit system and all motors, and limit switches with flexible conduit with couplings and threaded terminal fittings. Do not exceed two (2) feet in length for flexible conduit extensions. Install flexible conduit with bonding jumpers and arrange to drain away from the device it serves.

Provide at both ends of each conduit run a brass tag having a number stamped thereon in accordance with the conduit diagrams. Secure and permanently fasten these tags to the conduit ends with bare copper wire. Run concealed in walls, ceiling, or floor conduits in the control room. Run exposed conduits in the bascule piers. Where conduits pass through the floors or walls of the control room, provide galvanized rigid conduit sleeves for free passage of the conduits. After the conduits are installed, caulk openings with an elastic compound and provide escutcheon plates on the interior walls, ceilings, and floors for airtight fits.

Arrange conduit to maintain headroom and present neat appearance. Route exposed conduit parallel and perpendicular to walls. Route conduit in and under slab from point-to-point. Maintain adequate clearance between conduit and piping. Maintain 12-inch clearance between conduit and surfaces with temperatures exceeding 104 ºF.

Connect conduit sections to each other with threaded couplings. Install conduits to be continuous and watertight between boxes or equipment. Protect conduits at all times from the entrance of water and other foreign matter by capping or well plugging overnight when the work is temporarily suspended.

Conduits mounted exteriorly on parts of the steel work must be set not less than 1½ inch clear from the supporting structure to prevent accumulation of dirt. Space parallel horizontal conduit one inch apart and securely clamp to the steel work to prevent rattling and wear. The clamps, in general, shall consist of U-bolts attached to angle or channel iron supports bolted to the members. The spacing of the clamps shall not exceed 6 feet of spacing per NEC 346 and 347 whichever is less.

Cut conduit square using saw or pipe cutter; de-burr cut ends. Bring conduit to shoulder of fittings; fasten securely. Long running threads will not be permitted. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for

20 minutes, minimum. Embedded conduit stub-outs shall be provided with threaded 316 stainless steel.

Use conduit hubs to fasten conduit to sheet metal boxes. Install no more than equivalent of three 90 degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use factory elbows for bends in metal conduit larger than 2 inches. All field bends shall be long sweep, free from kinks, and of such easy curvature as to facilitate the drawing in of conductors without injury to the conductors. Make conduit runs with as few couplings as standard lengths will permit.

Avoid moisture traps; provide junction box with drain fitting at low points in conduit system. Install all conduits so that they will drain properly and provide drainage tees at low points where required. Provide suitable pull string in each empty conduit except sleeves and nipples. Use suitable caps to protect installed conduit against entrance of dirt and moisture. Carefully clean all conduits before and after installation. Upon completion of the conduit installation, clear each conduit with a tube cleaner equipped with a mandrel of a diameter not less than eighty percent of the nominal inside diameter of the conduit, and draw in the conductors. Identify conduit under provisions of the Electrical Identification section of this special provision.

907-853.03.10--Conductors. Do not splice conductors (except for "pigtail" leads and lighting circuits). Use solderless pressure connectors with insulating covers for wire splices and taps, No. 8 AWG and smaller, for lighting circuits. Make lug connections with high-pressure indent connector tools as recommended by the lug manufacturer. Use split bolt connectors for wire splices and taps, No. 6 AWG and larger, and all motor connections or other approved method.

Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of conductor. Make splices and taps to carry full ampacity of conductors without perceptible temperature rise. All splices shall be waterproof. Terminate spare conductors with electrical tape.

Neatly train and lace wiring inside boxes, equipment, and panelboards. Place an equal number of conductors for each phase (three-phase system) of a circuit in same raceway or cable. Make conductor lengths for parallel circuits equal. Pull all conductors into a raceway at the same time. Use soap base wire pulling lubricant for pulling No. 4 AWG and larger wire. Tighten all connections to manufacturer's recommendations. Take precautions to avoid "sawing" through PVC conduit. Pull ropes shall be braided. Bare conductors shall not be pulled through PVC conduits. Conduit shall be swabbed with lubricant prior to pulling the conductors.

Identify wire and cable under provisions of Electrical Identification. Identify each conductor with its circuit number or other designation indicated on plans.

907-853.03.10.1--Conductor Tests. Test each circuit for continuity and short-circuits for its complete length before being connected to its load. Verify identification numbers for the entire length of the circuit. Inspect wire and cable for physical damage and proper connection. Perform insulation testing on all power conductors.

907-853.03.10.2--Insulation Resistance Test. Perform insulation resistance test (wire-to-wire and wire-to-ground) at 1,000 VDC for one minute. Minimum insulation resistance for new cable shall be 100 mega-ohms or greater. When insulation resistance must be determined with all MCCs, panelboards, switches, and over current devices in place, the insulation resistance when tested at 500 VDC shall be no less than 50 megaohms. Test results shall be recorded and witnessed by the engineer. Submit test results to the engineer for review prior to energizing the circuit. Include a table of the test results with the "as-built" drawings with additional columns left blank for future readings to be recorded.

907-853.03.11--Panel Boards. Obey the following directives for the installation of panelboards:

- Install panelboards in accordance with NEMA PB 1.1.
- Install panelboards plumb. Install recessed panelboards flush with wall finishes.
- Height: 6 feet (1.8 m) to top of panelboard; install panelboards taller than 6 feet (1.8 m) with bottom no less than 4 inches (102 mm) above floor.
- Provide filler plates for unused spaces in panelboards.
- Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.
- Provide engraved plastic nameplates under the provisions of Article 508-4.11 Electrical Identification.
- Minimum space for five spare conduits (future).
- No 2 size breakers shall be used.
- Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the running phase loads to within 10 percent of each other. Maintain proper phasing for multi wire branch circuits.
- Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers, fusible switches, and fuses. Take care to maintain proper phasing for multi-wire branch circuits. The engineer will witness this test.

Prior to energization of the panelboard:

- Megger check phase-to-phase and phase-to-ground insulation for proper resistance levels.
- Check panelboard electrical circuits for continuity and for short-circuits.

907-853.03.12--Incoming Bridge Power. Provide a concrete pad with retaining wall as shown in plans. Furnish a UL listed 13 terminal meter socket with room beneath for test switches that is approved by Two Rivers Water & Light. Install a 1½-inch PVC coated rigid galvanized steel conduit from the meter socket to the secondary side of the transformer. Install two PVC coated rigid galvanized steel conduits for new electrical service. Stub and cap one of the two conduits for future use.

907-853.04--Method of Measurement. Electrical Work will be measured as a lump sum quantity.

907-853.05--Basis of Payment. Electrical Work, measured as prescribed above, will be paid for at the contract lump sum price which shall be full compensation for all materials, labor, tools, equipment, testing and all incidentals necessary to complete the work.

Payment will be made under:

907-853-A: Electrical Work - lump sum

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-854-1 **CODE: (SP)**

DATE: 06/10/2020

SUBJECT: Electrical Service

Section 907-854, Electrical Service, is added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-854 – ELECTRICAL SERVICE

907-854.01--Description. This special provision describes furnishing labor, tools, equipment and materials necessary for the manufacture, installation, finishing, testing, and making fully operational the permanent and backup electrical service components for the bascule span bridge.

Comply with all local codes, all laws applying to electrical service installations in effect and with the regulations of the latest National Electrical Code, where such regulations do not conflict with the laws in effect and with the requirements of the utility company.

It is the intention of the contract plans to call for completely finished work, fully tested and ready for reliable and consistent operation. Furnish, deliver, and install any apparatus, appliance, materials, or work not shown on the plans but mentioned in the special provisions or vice versa, or any incidental accessories necessary to make the work complete in all respects and ready for operation, to be furnished, delivered, and installed without additional expense to the department.

907-854.01.1--Scope. The work under this item includes the following:

- Replace existing cables and messenger wire for the electric service incoming feed from the electric utility transformer pole to the service entrance equipment inside the bridge operator house. This task includes furnishing and installing 5KV rated cables, steel messenger wire, and all hardware and supports required to attach the new cables in the same manner and location as existing cables.
- Replace existing 3-phase electric service transformers inside the operator house with new dry type transformers. Transformer shall be rated at 300kva, 4.16kv-480/277V, 3-phase.
- Run, test, and perform comprehensive maintenance on the existing 250 KW, diesel, standby generator set. Provide and Install new remote control panel as described in section 854.02.4.
- Furnish and Install a new fusible service entrance disconnect switch, 400A, 600V, 3P, heavy duty.
- Test the operation of the existing Automatic Transfer Switch (ATS). Make any necessary repairs and maintenance, as needed, to ensure full operation. Furnish and replace any damaged or inoperable parts.
- Furnish and install any other parts, materials, and equipment related to electric service not mentioned above.

- Furnish and install all new cables and conduits between the transformers and the MCC as part of the Electrical Work special provision and payment.

907-854.01.2--Related Provisions. Unless otherwise noted, work under this special provision conforms to the requirements of the following special provisions:

- Electrical Work
- Auxiliary Electrical Equipment
- Control Console
- Motor Control Center
- PLC Cabinet and Programming
- Span Drives and Motors
- Limits and Sensors
- Submarine Cable
- Lightning and Surge Protection
- Training, Manual and Spare Parts

907-854.01.3--Coordination of Electrical Service. The contract documents are diagrammatic in showing certain physical relationships which must be arranged within the electrical service, and which must interface with other work including utilities and mechanical work. Coordinate electrical service with the work of other trades to eliminate conflicts. Advise other trades of openings required in their work for the subsequent move-in of large units of electrical equipment.

The Contractor shall contact and coordinate both the work required and the timing of the installation with the electric utility. Schedule any electric service outages with Mississippi Power Company at least 72 hours in advance.

All work and materials must conform to Power Company requirements and per the latest NEC Code.

907-854.02--Materials. Provide all new materials that conform to the standards of the Underwriters Laboratories, Inc., in every case where such a standard has been established for the particular type of materials in question. Submit to the engineer for approval, prior to purchase of any materials or equipment required to be furnished and installed, a complete list of all such materials and equipment including manufacturer's catalog (part and/or model) numbers, catalog data sheets, illustrations, and shop drawings.

907-854.02.1--General. In addition to the standard specifications, provide and install all equipment in accordance with the applicable requirements of the following:

- AASHTO Standard Specifications for Movable Highway Bridges
- NFPA 70, National Electrical Code
- NFPA 79, Electrical Standard for Industrial Machinery

Ensure that equipment and its installation present a neat and attractive appearance. Use new heavy-duty industrial design, equivalent to the best grade of the particular type of equipment made by the leading manufacturers of such equipment.

Furnish new equipment that is compatible with all other associated equipment in the system. Ensure that all items furnished perform the function indicated on the approved drawings and as required by the design.

Equipment sizes and space shown on design drawings are approximate. Ensure that all required electrical equipment components can be adequately located in the operator's house and elsewhere on the project as required.

Provide the department a written warranty for operation of the bridge and for all of the components furnished under this work, to cover a period of one year after Substantial Completion as described in article "Control of the Work". Have normal manufacturer warranties extended to cover parts and labor for this period.

907-854.02.2--Electric Service Cables. Furnish and install Medium Voltage rated power cable and steel messenger wire to replace incoming service cables. Conductor material shall be Copper. Cable shall be thermosetting crosslinked polyethylene insulated (XLP), shielded power cables for use in circuits not exceeding 5000 volts 100% and 133% insulation levels at conductor temperatures of 90°C for continuous normal operation, 130°C for emergency overload conditions and 250°C for short-circuit conditions. Cables are intended for power cable applications, in wet or dry locations, including conduit, duct, direct burial and aerial installation. The cable shall be rated 90 ºC wet and dry and shall be resistant to oils, chemicals, sunlight, and shall have a Type USE-2 rating. The UL listing mark, cable voltage, insulation type and ratings, as well as the cable size shall all be clearly printed on the cable in a color contrasting with the insulation color. All electric cables installed shall be color coded. Neutral wires shall be color coded white; three phase three wire runs of cable shall be color coded one black, one red, and one blue. The insulated ground wires and the equipment grounding conductor shall be green. Tape on the conductor or color striping of cables will not be acceptable in lieu of the specified color coding means.

A polyvinyl chloride jacket shall be applied overall. This jacket shall meet the requirements of Part 7 of ICEA S-97-682 and the Sunlight Resistant requirements of UL Standard 1072. The thickness of the jacket shall be as specified in Part 7 of ICEA S-97-682 and UL 1072. The minimum thickness at any point shall be not less than 80% of the specified UL thickness.

Copper Conductors shall be according to ICEA S-93-639, NEMA WC-74, and UL Listed as MV-90 per standard 1072.

Conductors shall have sufficient ampacity to carry the current for the load as calculated in accordance with NEC Article 220 and shall have adequate mechanical strength. The conductors shall not be smaller than 6 AWG.

907-854.02.3--Transformers. Furnish and install an energy efficient Medium Voltage Transformer, 300kva, 4160V-480/277V, 3-Phase, 60Hz, Copper Wound, dry type transformer in a NEMA 3R rated enclosure. Transformer shall have a 220ºC insulation system, 150ºC rise. Transformer shall meet all applicable NEMA, ANSI and IEEE Standards and shall be UL Listed and labeled. Install transformer in the same location as existing transformers to be removed.

Transformer shall be Eaton Catalog No. V46D47T33CUE3R, or approved equal.

907-854.02.4--Disconnect Switches. Furnish and install heavy-duty disconnect switches having electrical characteristics, ratings, and modifications shown on the drawings. Furnish and install fuses for fused disconnect switches. Provide fuses and switches conforming to the following:

- UL 248-1-Low Voltage Fuses- Part 1: General Requirements
- UL 248-12- Low Voltage Fuses- Part 12: Class R Fuses.
- FS W-F-870 - Fuse Holders and Fuse Clips (For Plug and Enclosed Cartridge Fuses).
- FS W-S-865 - Switch, Box, (Enclosed), Surface-Mounted.
- NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600V).

Provide the following:

- NEMA Type 4X (stainless steel) enclosures in the machinery room.
- NEMA 12 units in the operator room, entry level and utility rooms.
- Metal front cover mounted factory nameplates that contain a permanent record of switch type, catalog number, and HP rating.
- Pad-lockable handles with easily recognizable positions are required.
- Switches that include visible blades, reinforced fuse clips, and non-teasible positive quick make-quick break mechanisms.
- Switch assemblies and operating handles that are an integral part of the enclosure base.
- Switches that are HP rated and meet Federal and NEMA Specifications.
- Switches that have defeatable door interlocks that prevent the door from opening when the operating handle is in the ON position.
- Heavy duty switches with line terminal shields.
- Fusible switch assemblies of NEMA KS 1 construction with quick-make, quick-break load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position and Handle lockable in OFF position. Furnish fuse clips designed to accommodate Class R fuses.
- Non-fusible switch assemblies of NEMA KS 1 construction Type HD with quick-make, quick-break load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position and Handle lockable in OFF position. One N.C. (normally closed) and one N.O. (normally open) set of auxiliary contacts is required.
- Fuses that are time delay, current-limiting type with 200KA interrupting rating at 600 VAC. Rejection type are required that are, UL listed to minimize short circuit damage. Use UL Class RK1 for service entrance, transformer feeder and panelboard feeder. Use UL Class RK5 for motor branch circuit.

907-854.02.5--Existing Standby Generator Set. Perform comprehensive maintenance operations on the existing diesel powered standby generator set (Gen Set Model No. SD250). The following are the minimum steps required to complete this task:

- Furnish and Install a new remote annunciator panel in the operator room. Wall mount panel near the operator console in full view of operator. This panel shall be an approved panel for use with the existing generator set (Generac Panel Model 984-0). The remote panel shall have all of the available alarms and indicators and provide remote monitoring & annunciation of the standby generator.
- Inspect generator set and make note of all visible damage, leaks, and grime. Thoroughly clean all parts with a manufacturer approved industrial cleaner and/or degreaser, as necessary.
- Drain all fuel in generator tank and lines completely, and refill tank with fresh fuel.
- Drain engine oil in generator and refill with fresh oil. New oil type and quantity shall be as recommended by generator manufacturer.
- Drain, or flush, engine coolant completely and refill with approved coolant type and mix.
- Replace generator set charger batteries with new batteries. New batteries shall be as recommended by generator set manufacturer.
- Replace all existing filters with new ones as recommended by generator set manufacturer.
- Test battery charger and alternator to verify that it is operating as intended. Make any necessary repairs.
- Check all lines and pans for oil and other fluids, and Drain old fluids before adding new fluids. Clean all pans as necessary.
- Lubricate and grease parts as specified by the manufacturer.
- Perform a complete tune up as recommended by the manufacturer.
- Verify the operation of the control panel.
- Repair or replace any parts that are not operating according to generator manufacturer standards, malfunctioning, damaged, or worn out.
- Fully test the operation of the standby generator set with the incoming utility power turned off.
- Make any necessary adjustments as a result of the testing process.
- Document all findings and provide three (3) certified copies to the engineer.
- Obtain maintenance and operating instructions manuals from the generator manufacturer or an authorized dealer if not available on site. Provide three (3) copies to the engineer.
- Provide adequate training on operation and maintenance of generator, ATS and remote panel to bridge operator and Mississippi DOT interested personnel.

Full inspection and testing shall extend to any other equipment or parts not specifically mentioned here, including any detached parts installed near the generator.

907-854.02.6--Existing Automatic Transfer Switch (ATS). Perform the following steps on the Automatic Transfer Switch (ATS):

- Inspect the outside and inside of the Automatic Transfer Switch Cabinet.

- Perform required maintenance as recommended by the manufacturer.
- Test the operation of the Automatic Transfer Switch after all maintenance steps have been completed on the generator set.
- Repair or replace any damaged or inoperable parts.

907-854.03--Method of Measurement. Electrical Service will be measured as a lump sum quantity.

907-854.04--Basis of Payment. Electrical, measured as prescribed above, will be paid for at the contract lump sum price which shall be full compensation for all materials, labor, tools, equipment, testing and all incidentals necessary to complete the work.

Payment will be made under:

907-854-A: Electrical Service - lump sum

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-855-1 **CODE: (SP)**

DATE: 06/10/2020

SUBJECT: Auxiliary Electrical Equipment

Section 907-855, Auxiliary Electrical Equipment, is added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-855 -- AUXILIARY ELECTRICAL EQUIPMENT

907-855.01--Description. This special provision describes furnishing labor, tools, equipment and materials necessary for the manufacture, installation, testing, and making fully operational miscellaneous electrical auxiliary equipment. The following equipment is included in this provision:

- P.A. System
- CCTV Cameras, Pole and Control
- Commercial Fire and Security System
- Air Horn
- Navigational Lights
- Marine Radio
- Pedestrian Gate
- Traffic Signals and Poles

907-855.01.1--References. In addition to those listed in article "Definitions and Acronyms", numerous acronyms are used in this special provision. Interpret acronyms used throughout as follows:

AGC	Automatic Gain Control
BNC	Bayonet Neill Concelman (Connector)
CCD	Charged Coupled Device
Cd	Candela
CD	Compact disc
dB	Decibel
DVR	Digital Video Recorder
DSL	Digital Subscriber Line
IP	Internet Protocol
PA/IC	Public Address/Intercom
RH	Relative Humidity
TV	Television
THD	Total Harmonic Distortion
UV	Ultra-violet
XGA	eXtended Graphics Array

SXGA Super eXtended Graphics Array

907-855.01.2--Related Provisions. Unless otherwise noted, work under this special provision shall conform to the requirements of the following special provisions:

- Electrical Work
- PLC Cabinet
- Control Console
- MCC
- Programming
- Limits and Sensors
- Submarine Cable
- Lightning and Surge Protection
- Training, Manual and Spare Parts

907-855.02--Materials.

907-855.02.1--P.A. System. Equipment will be a NEMA Class 1 or NEMA Class 4 (as required) wall mounted unit incorporating an intercom and public address systems served by a common handset, as specified below. Supply equipment by a single manufacturer with at least five (5) years' experience of manufacturing this type of equipment. Manufacturer of the equipment is to be ISO 9002 (or equivalent) certified. Employ a communications system with the capability of providing several different communications functions.

Depressing a pushbutton switch will allow the operator to select the desired communication system function. Functions include one-way page (PA system) and Intercom communications. Provide a common interface for switching the handset (and speaker) between communications zones, matching impedance to selected zone.

Mount the selector switch assembly with push buttons in a row. The handset, with a press bar page switch in the handle will be used on the master control station and intercom stations. The speakers connected to the intercom stations must monitor the intercom zone. Mute a speaker connected to an intercom station when the intercom station handset press bar is depressed. Provide adjustable speaker volume control at the intercom or speaker amplifier that connects to the speaker.

Furnish one distributed PA amplifier per speaker and mount in close proximity to the speaker. The amplifier must deliver 10 watts RMS minimum to each speaker. Two (2) speakers for roadway and two (2) speakers for marine channel (separately controlled) are required. Maximum distortion is five (5) percent for first and third harmonics. Use industrial type equipment. Provide speakers immune to salt spray and be capable of 120 degree dispersion at 12 watts. Frequency response at 3 dB is 450 to 8000 Hz, ±0.5 dB.

The intercom system consists of page/party stations located at all levels of the operator house, pier and the machinery room areas. Provide 25-foot coiled cords with the interior or exterior type units as required. Equip units with page speakers. Page and private voice communication

(party line communication) between intercom station locations are indicated in the plans. Provide transmit/receive page line communication with duplex party line communication between two or more intercom stations.

Master control station operator selects intercom zone by depressing selection pushbutton associated with intercom zone. A page is initiated by lifting handset, depressing press bar, and speaking into the handset microphone. A responding individual approaches the nearest intercom station and lifts the handset. Duplex telephone type communication can occur on the intercom system party line without broadcast to all intercom system stations. Pages can be initiated from all intercom system handset locations.

Install the desk or wall mount the intercom master control unit as directed by Engineer with standard molded plastic telephone handset with 25 foot long permanently coiled cord. Provide the master unit with a speaker amplifier rated 12 watts output with less than 5 percent total harmonic distortion and frequency response of 250 to 4,000 Hz. Provide the handset amplifier circuit with a minimum rated 1.5 VRMS nominal output level into 33 ohm load, 55 dB nominal gain (below limiter level of 1.5 VRMS nominal). Provide adequate input sensitivity to deliver rated amplifier output when no more than 10 dynes per square centimeter impinge on speaker.

907-855.02.2--CCTV.

907-855.02.2.1--Pan/Tilt/Zoom Cameras. Furnish and install high resolution digital IP Pan/Tilt/Zoom dome-type cameras. Set camera up to control and monitor over an IP network. Provide cameras that meet the following minimum standards:

- Horizontal resolution - NTSC & PAL > 540 TV lines
- Zoom – 35X Optical, 12X digital
- Interlace/Progressive scan selectable
- Lens- f/1.4(focal length 3.4 -119 mm)
- Sensitivity at 35 IRE – 0.55 lux at 1/60sec (color), 0.018 lux at ½ sec (color)
- Resolution – 704 x 480 NTS format
- H2.64 , MPEG-4 and MJPEG compression

907-855.02.2.2--Camera Assemblies. Camera assemblies must conform to the following minimum specifications:

- Provide enclosures rated outdoor, harsh environment, dust-tight, waterproof. Enclosure must be lightweight, aluminum construction and meet NEMA 4 and IP66 standards. Include a sun shroud enclosure, heater/controller/defroster to eliminate fogging, obstructions, and visual artifacts. Size enclosure to make compatible with camera, lens, mounts, and accessories required. Make all external connections through watertight fittings. Provide easily serviceable enclosure and provide stainless steel fasteners.
- Provide transient suppressors at each BNC video output. Suppressors shall be CX-12-BNC, VG-BNC or equal.
- Mount cameras, pan-tilt-zoom lenses, and accessories securely in the enclosures.

- Provide camera assemblies from the same manufacturer as the digital video recorder, supports, and controls that has been regularly engaged in providing similar type and quality of equipment for at least the last five years.

907-855.02.2.3--Camera Power Supplies. Provide individual 24 VAC, 60 Hz camera power supplies for each camera assembly. Fuse power supply and size to provide 125 percent of full load amperes for camera and accessory loads. Account for voltage drops to provide 24 VAC @ +/- 15 percent (with heaters on) at each camera power input connector. Install, mount, and label into the 19-inch rack cabinet and provide service access to fuses. One (1) power supply for multiple cameras shall not be permitted unless each output is fused.

Power supplies must be in a NEMA 4 minimum rated enclosure, 120 VAC input, 24 VAC, with five (5) A minimum output per camera assembly.

907-855.02.2.4--Digital Video Recorder. Digital video server system includes an industrial IBM compatible computer with access door to disk drives and controls. Contain all disk drives, including CD backup system, in the rack cabinet system. Permit no loose or un-mounted equipment, except for the monitor. Mount keyboard and mouse (if required) as shown in the plans.

Conform the digital video server system to the following minimum requirements:

- Include a DSL/Modem data port and software capable of connecting to multiple video servers via external IBM compatible computers and the internet. The minimum transfer data rate of 384k transmit and receive.
- Include digital video recorder hardware and software capable of recording high quality digital images and data at a minimum of three frames/second, for fifteen cameras, 24 hours/day, for up to 30 days. After 30 days of recording, the system has an option to write over the video file(s). Size the computer hard disk(s) accordingly to provide 25 percent minimum free disk space with 30 days of image data, plus all other software. Analog VCR type video recorders are not be permitted.
- Include a CD backup system to easily backup timed sections of the video recorded hard disk.
- Operate digital video server and all peripheral equipment on 120 VAC, 60 Hz, with an operating temperature of 41 °F to 104 °F, 80 percent RH non-condensing.
- Provide a minimum of five (5) video outputs and eight (8) configurable alarm inputs.
- Include an x86 32-bit processor, 1.2 GHz minimum, with 1 Gb RAM, 10/1000 NIC, USB, 480GB HD, 24x CD-RW (minimum), mouse & keyboard, four (4) USB ports (minimum).
- Applications software: Event logging, live viewing, search video, motion detection, alarm-based recording, image alteration recognition, multiple camera display, time/date/camera stamping, hardware watchdog, playback by date/time/camera.
- Minimum Connections: 16 BNC inputs to NTSC A-V processor with M-JPEG compression, 1 – ISDN, 1 – RS-422, 8 – alarm inputs, 8 – control/fault form "C" output terminals, 1 – RJ-45, 1 – USB, 1 – mouse, 1 – keyboard, 2 – serial DIN, 1 – SVGA, 1 – printer, 1 – RS-422, 1 – 10/100bt

- Certifications: CE class B, UL, FCC class B
- Provide Electronic Keyboards, 83-pkb-sams-ckps2r NEMA 4 industrial membrane keyboard with integrated touchpad (or approved equal).

907-855.02.2.5--Cabinet. Provide an industrial 19-inch rack chassis on a swing out frame with slide out rails and rack ears. Front door of the server cabinet is to be a glass front. Furnish cabinet with lockable access door. Install fans and filters as necessary to dissipate heat generated by the equipment. The fans are to be temperature switch controlled. Install a fluorescent cabinet light with a built-in ON/OFF switch and a separately mounted door switch. All connections are to be made from the rear of the enclosure. Conform the enclosure to the following minimum standards:

- NEMA 1 minimum rated steel, vented back and side panels
- Slide out rails for all equipment
- Rack slide supports
- 19-inch LCD monitor
- Slide out Keyboard and mouse.
- Blank panels installed over unused space

907-855.02.2.6--Monitors. Provide two (2) high-bright SXGA/video LCD color monitors that will be functional components of the digital video server system located inside of the bridge operator house. Attach monitors to a height and tilt adjustable ceiling bracket located above the control console in the operator's room as shown in the plans. Monitors that conform to the following performance requirements shall be provided:

- IBM compatible with a minimum of 18.1- to 20.1-inch, SXGA thin film transistor (TFT) mm pitch LCD flat-panel screen with frame work for desk mounting.
- Have a minimum brightness of 900 Cd/m^2, a minimum contrast ratio of 500:1, a minimum horizontal viewing angle of 170 degrees, and a maximum response time of 11 ms.
- Produce a minimum resolution of 1280 x 1024 dpi at 75 Hz.
- Be compatible with digital video server and cameras specified.
- Be powered by 95 – 130 VAC, 60 Hz. and include a grounded power cable plug.
- Have dual inputs: BNC NTSC video and DVI VGA. Provide NTSC to DVI converters as required.
- All wiring, cables, and adjustments shall be provided as required.
- Connections to monitor with sufficient service loops for easy removal shall be provided.
- High-resolution and high contrast in night time fluorescent overhead room lighting conditions and day time high ambient external room lighting and not "wash out" or become dark during operation shall be provided.
- Operate in a minimum 32 °F to +104 °F environment.
- Pictures shall be free of video artifacts including noise, hum bars, and flicker.

907-855.02.2.7--Quality Control. All items specified in this article must be compatible and tightly integrated with the rest of the CCTV system to produce a high quality, high-resolution, high contrast, and artifact free picture.

907-855.02.2.8--Camera Pole. Provide and install camera poles, including bridge anchorages, poles, mounting adapter, all hardware and all fittings necessary to completely install the pole as shown in the plans.

Paint all exposed surfaces, including but not limited to, poles, bases (if applicable), bolts, pole caps, and mounting hardware black.

907-855.02.3--Air Horn. Furnish and install a weatherproof, self-contained, air driven, dual projector, 120 dB air horn equipped with a rapid response, direct drive, oil-less piston type compressor, powered by a 60 Hz, 120 VAC one (1) HP motor with sealed, self-lubricated ball bearings. Ensure the horn mechanism is air pressure actuated with free floating, vibrating type, tempered phosphor bronze diaphragm and coupled to a resonant chrome plated zinc die-cast trumpet style projector capable of producing 120 dB (as measured at a distance 10 feet) at 320 cycles per second.

907-855.02.4--Navigational Lights. Provide a complete navigation hazard lighting system operating at 120 VAC and complying with USCG CFR 118.80(b). Furnish all Fender and Clearance lights with shock proof LED lamps and surge suppressors. Lamps shall consist of 48 individual LED beams arranged in four tiers in an optically clear elastomer medium. The viewing angle of the individual LED beams shall not be less than 22 degrees for red, 20 degrees for green. The MTBF rating of the LED's shall be 100,000 hours. Lamp base shall be Rynite FR350 or approved equal. Provide lamp lens of UV Polycarbonate. Wattage consumption should not exceed 1.8 watts for red, 1.44 watts for green. Candela output should be not less than 78 candela for red, 270 candela for green. Provide lamps with integral surge suppression with a clamping voltage of not less than 380 VAC at two (2) A. Provide clear silicon filled lamps that have been field tested and documented for not less than six (6) months continuous service in extremely high vibration movable bridge applications.

907-855.02.4.1--Fender/Pier Lights. Furnish and install unpainted housings of cast aluminum construction with a one inch threaded conduit opening at the bottom, equipped with a red 180°, standard marine Fresnel type, rigid, heat resistant glass lens, 7- to 8-inch diameter. Furnish manufacturer's recommended wall mounting bracket and 90° post. Furnish all stainless steel closure bolts, lens tie rods, and attachment hardware. Use only marine type junction boxes. All joints, including lid shall be sealed with weatherproof gaskets. All fastenings shall be tamper resistant. Access cover shall require a special wrench.

907-855.02.4.2--Channel Lights. Furnish and install unpainted housings of cast aluminum with cushioned lenses, weatherproof gasketed joints and large service access door equipped with 180°, standard marine molded single-piece Fresnel type, rigid, heat resistant glass, 7 to 8-inch diameter with the Lower Section; Red, Upper Section; Green. Furnish all stainless steel closure bolts, lens tie rods, and attachment hardware. Ensure swivel assembly is cast bronze housing and bracket with stainless steel pivot, watertight "O" ring seal, bronze bearings, cable entrance

fitting, and #35 stainless steel service chain rated for 225 pounds. Use a hanger stem 1½- or 2-inch galvanized pipe as recommended by manufacturer with anti-swing brake and automatic lock. No solid wire conductors shall be permitted.

907-855.02.5--VHF Marine Radio. Provide a separate, battery powered, marine radio VHF transceiver (157 - 160 MHz) with an output of 1.0 watts capable of scanning channels 9 and 16, transmitting on at least three additional channels as required by the Engineer. Couple the system to a stainless steel or fiberglass whip antenna of 39 inches in length mounted as directed by the Engineer. Ensure the Maximum audio distortion is less than five (5) percent. Radio must comply with FCC Rules and Regulations, Part 80. Provide a battery charger capable of maintaining the radio battery fully charged.

907-855.02.6--Fire and Security Alarm System. Provide a commercial combination fire and security alarm system to monitor, alarm and callout to a programmed phone number. Furnish the system control center in a wall mounted cabinet.

The system shall include the following features:

- Minimum of eight (8) programmable zones for two (2) wire detectors.
- UL listed
- Auxiliary contacts for alarms
- Arm/disarm keypad at entry door.
- Smoke detectors in each room and machinery room. Smoke detectors shall be multiplex photoelectric smoke detector with 57 °C heat detector.
- Door open sensors for each entrance to the pier and operator house.
- Built in automatic telephone dialer with digital coder
- Built in power supply with backup battery and charger
- Programmable auxiliary relay
- External voice siren driver to provide audible selectable tones and two voice synthesized channel
- Strobe Light
- Agency Listings - UL609 Grade A, UL1610A, UL864, NFPA72A & NFPA71

907-855.02.7--Pedestrian Gate. Furnish and install a new pedestrian gate. Gate shall be similar to the existing traffic gates, with a short arm to block sidewalk. Traffic gates shall be vertical to horizontal type; electrically operated with manual cranking ability at locations shown in the plans equipped with warning gongs on the on-coming gate assembly enclosures, in accordance with manufacturer's instructions. Equip gate arms with steel hot-dip galvanized, sectional bolt-on counterweights with at least 10 percent adjustment and lights. Size anchorages for new gate installations on gate pilasters per manufacturer's recommendations with drilled anchor bolts, set with epoxy adequately sized to support all attachments. During the opening and closing cycles, begin the gate arm movement with zero velocity and accelerate smoothly, reaching maximum velocity at mid stroke (45 degrees) then decelerate smoothly to zero velocity at full stroke (90 degrees) without whip or bounce. Standard operating time is 13 seconds for full opening or closing cycle. Size gate assemblies and anchorages to handle the weight of the arm used and to operate against a wind speed of 50 mph.

The gate shall be equipped with a manual disconnect switch and with an automatic disconnect switch to break control circuit when any door is opened. Furnish two spare gate arms (complete with lights and striping) in proper length, and one spare gate operator motor for each type of gate installed. One gate arm shall be used for temporary traffic control. Traffic gates shall include cam limit switch, warning gong and LED warning lights.

907-855.02.7--Traffic Signals. Furnish and install new traffic signals and cantilevered poles. Signals shall conform to sections 634, 639 and 640 of the Standard Specifications. Traffic signal heads shall be 12 inch 3 unit red/yellow/green LED type. Lighting control for signals shall utilize the existing bridge electrical control system, with any modifications as necessary.

The new poles shall utilize the same anchor bolts as the existing pole. The contractor shall gather existing anchor bolt information and pole height to select the proper pole. The contractor shall submit anchorage calculation for approval.

907-855.03--Construction Requirements.

907-855.03.1--P.A. System. Interface all PA and common audio party signal lines to the submarine cable system. Provide a submittal to the Engineer detailing the interfacing and testing of the PA/IC system. Provide manufacturer recommended cables and wiring and consult with the PA/IC manufacturer to provide seamless integration that is void of feedback, hum, distortion, and noise. Adjust the PA/IC system for maximum performance as determined by the Engineer. Install new communications system and balance system. Adjust roadway and waterway speakers as required to provide the optimum audio signals to the roadway and waterways.

907-855.03.1.1--Wiring. All wiring is to be run in separate conduits. All interconnecting conductors between various units will be manufacturer approved twisted shielded pairs of conductors. Inter-wiring between units will not be smaller than No. 18 AWG. Wiring for units on the far side of the channel is to be incorporated in the bridge submarine cables.

907-855.03.1.2--Testing. The Contractor will arrange for and provide all necessary field tests required by the Engineer to demonstrate that the entire public address/intercom system is in proper working order and in accordance with the plans and these special provisions.

Adjust intercom speaker volume to so as to be heard over operating noise and to a level that can be easily understood anywhere in the room.

Operational tests of the complete installation is to be conducted by the Contractor in the presence of the Engineer to demonstrate to his satisfaction that all components and systems are installed, connected and operate in accordance with the plans, specifications and approved shop drawings. If the tests show that any piece of equipment, in the judgment of the Engineer, is defective or functions improperly, make such adjustments and/or replacements so that the installation is satisfactory to the Engineer, and at no extra cost to the department.

907-855.03.2--CCTV. Perform the following tasks for the installation of the camera assemblies:

- Verify system voltage matches camera requirements.
- Install in accordance with manufacturer's instructions.
- Attached the proper test instruments and adjust AGC, video levels and field of vision to ensure proper operation for day, night and inclement conditions. Do not rely on video monitors only to properly adjust the levels.
- All connections shall be tested for tightness and for intermittent connections.
- Furnish and install new camera assemblies into the enclosures at the locations shown in the plans.
- Make all electrical connections and adjustments to provide proper operation of the cameras as specified herein.

Install interior wiring neatly and carefully with proper connectors of video and power connections per manufacturer's instructions. Use conductors approved by the camera manufacturer.

907-855.04--Method of Measurement. Auxiliary Electrical Equipment will be measured as a lump sum quantity.

907-855.05--Basis of Payment. Auxiliary Electrical Equipment, measured as prescribed above, will be paid for at the contract lump sum price which price shall be full compensation for all materials, labor, tools, equipment, testing and all incidentals necessary to complete the work.

Payment will be made under:

907-855-A: Auxiliary Electrical Equipment - lump sum

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-856-1 **CODE: (SP)**

DATE: 06/10/2020

SUBJECT: Control Console

Section 907-856, Control Console, is added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-856 – CONTROL CONSOLE

907-856.01--Description. This special provision describes furnishing labor, tools, equipment and material necessary for the manufacture, installation, testing, and making fully operational a control console and a gate station.

907-856.01.1--Related Provisions. Unless otherwise noted, conform work under this special provision to the requirements of the following special provisions:

- Electrical Work
- Electrical Service
- Auxiliary Electrical Equipment
- Span Drives and Motors
- PLC Cabinet and Programming
- Motor Control Center
- Limits and Sensors
- Submarine Cable
- Lightning and Surge Protection
- Training, Manual and Spare Parts

907-856.02--Materials.

907-856.02.1--Cabinet. Control enclosure will be NEMA 12 with hinged access doors and hinged control top plates. Provide access doors with flush lockable handles. Design the console with shipping splits for installation in the bridge house. Include gasketing and stainless steel hardware to connect each shipping split.

Manufacture console cabinet with 12 gauge steel painted an ANSI gray finish. Use minimum 10 gauge stainless steel with a smooth brushed finish for each console top.

Console top will have a stainless steel piano hinge for opening. Install two (2) gas filled shocks to assist in opening the console tops. Include an arm on each side to support the console top when it is open. Size shocks to support the weight of the top and the weight of the components and wire.

Clean and phosphatize internal and external surfaces prior to application of high-quality rust inhibiting primer. Apply a light gray ANSI No. 61 baked enamel or polyester powder for the finish coat. Use a gloss white lacquer finish over suitable primers for the backplates.

907-856.02.2--Pushbuttons, Selector Switches and Indicator Lights

907-856.02.2.1--Indicating Lights. Use 30.5 mm push-to-test industrial heavy-duty, oil tight NEMA 13, 120 V transformer type, with LED bulbs. Lens colors are as indicated on plans.

907-856.02.2.2--Pushbuttons. Furnish single button operator with one normally open (1 N.O.) and one normally closed (1 N.C.) momentary contact, 30.5 mm corrosion resistant, heavy duty, oil tight pushbuttons.

907-856.02.2.3--Selector Switch. Supply selector switches with a lever operator knob, one N.O. and one N.C. contact in each position. Provide switches that are 30.5 mm corrosion resistant, heavy duty, and oil tight. Provide key switch operator where required.

907-856.02.3--Contact Blocks. Provide contact blocks rated at 10 A, NEMA Class A300. Blocks are to be clear to allow visual inspection and are oil-tight.

907-856.02.4--Span Control Switch. Pistol grip rotary switches will be multi-position with spring return-to-center mill duty type switches. Rotary contacts are to be double sided and knife type. There will be terminal screws for easy installation. Furnish controller with a handle interlock for movement and a detent for each position. Configure controller per the design plans. All connections will be finger safe. Contacts are to be rated at 10 A.

907-856.02.5--Pistol Grips. Pistol grip rotary switches will be 3-position with spring return-to-center capability. Rotary contacts are to be double sided and knife type. There will be terminal screws for easy installation. All connections are finger safe. Contacts are to be rated at 10 A.

907-856.02.6--Meters. Furnish red LCD programmable digital displays with 4½-digit resolution. Furnish meter with a minimum of 0.48-inch high digits, programmable decimal points and a NEMA 4x sealed front bezel.

They will have vertical orientation with colored bars for easy viewing. There is to be peak and valley hold capability and trend indication for signal direction. There will be an accuracy of at least 0.1 percent of full scale.

907-856.02.7--Legend Plates. Legend plates are to be rectangular and manufactured out of laminated plastic or any similar non-metal corrosion resistant material. Provide ½-inch black lettering on a white background.

907-856.02.8--HMI. Provide an Operator Interface Terminal with a color touch screen for the operator to view alarms and status of bridge devices. This Operator Terminal or HMI will also provide the capabilities for maintenance personnel modify key setpoints and parameters in the PLC and drives. These parameters will have the capabilities of being password protected, so

only authorized personnel will have access to changing the values. Supply an HMI that meets the following minimum requirements:

- 15-inch color display with touchscreen control.
- Same Manufacturer of PLC.
- Two USB Ports
- 18 bit Color Graphics with minimum 640 x 480 resolution
- NEMA 4X rated
- Ethernet communications
- 85 to 264 VAC or 18 to 32 VDC Power input
- The HMI will operate at 0 °C to 55 °C with a relative humidity of 5 percent to 95 percent non-condensing

Install HMI in an NEMA 12 enclosure with three (3) axis adjustable arm as shown in as shown in plans. Attach and adjust arm to of console to provide the optimum operator view.

907-856.03--Construction.

907-856.03.1--Cabinets and Enclosures. Clean and phosphatize internal and external surfaces prior to application of high-quality rust inhibiting primer. Apply finish coat of light gray ANSI No. 61 baked enamel or polyester powder. Finish back panel with gloss white lacquer over suitable primers.

907-856.03.2--Wiring. Provide interconnection wiring between all electrical devices mounted in the panels and enclosures. If the devices are to be connected to external equipment, connect them to terminal blocks. Provide conductors that are UL listed type THWN-MTW. The minimum field installed control wire within the control console is No. 16 AWG. Everywhere else, use No. 14 AWG minimum wire size.

Install all interior wiring neatly and carefully, and terminate on UL approved terminal blocks as per manufacturer's instructions. Individually bundle wiring to each control switch and install with a "drop loop" of sufficient length to allow for its removal for maintenance without disconnecting the wiring. Use plastic wireways (open slot type) for routing all internal wiring in the control panels. Internal wiring in the factory prewired electronic system cabinets may be installed according to the manufacturer's standard as to wire size, insulation, and method of termination on internal equipment.

Permanently identify individual conductors. The marking will be done on a sleeve not less than ½ inch long. Mark each sleeve with permanent and waterproof identification. Do not use adhesive-type labels.

907-856.03.3--Terminal Blocks. Group for easy accessibility unrestricted from structural members and instruments. Provide sufficient space (2 inches minimum) on each side of each terminal block to allow an orderly arrangement of all leads to be terminated on the block. Do not terminate more than two (2) wires on any one (1) terminal position.

907-856.03.4--Marking and Labeling. Each terminal block, device, fuse block, terminal, and both ends of each conductor will be permanently labeled to coincide with the identification indicated on the manufacturer's wiring diagrams. Terminal blocks and devices already numbered in the plans are to be so numbered on the equipment supplied. Mounted electronic components are to be identified by marking with contrasting colored ink beside the component.

907-856.04--Measurement. Control Console will be measured as a lump sum quantity.

907-856.05--Payment. Control Console, measured as prescribed above, will be paid for at the contract lump sum price which price shall be full compensation for all materials, labor, tools, equipment, testing and all incidentals necessary to complete the work.

Payment will be made under:

907-856-A: Control Console - lump sum

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-857-1 **CODE: (SP)**

DATE: 06/10/2020

SUBJECT: Motor Control Center

Section 907-857, Motor Control Center, is added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-857 -- MOTOR CONTROL CENTER

907-857.01--Description. This special provision describes furnishing labor, tools, equipment and materials necessary for the manufacture, installation, testing, and making fully operational a Motor Control Center (MCC).

907-857.01.1--Related Provisions. Unless otherwise noted, conform work under this special provision to the requirements of the following special provisions:

- Electrical Work
- Electrical Service
- Auxiliary Electrical Equipment
- Control Console
- PLC Cabinet and Programming
- Span Drives and Motors
- Limits and Sensors
- Submarine Cable
- Lightning and Surge Protection
- Training, Manual and Spare Parts

907-857.02--Materials.

907-857.02.1--MCC.

907-857.02.1.1--Assembly. Structures are to be totally enclosed dead-front, free-standing assemblies. They will be 90 inches high and approximately 20 inches deep for front-mounted units. Structures will contain a horizontal wire way at the top, isolated from the horizontal bus and will be readily accessible through a hinged cover. Adequate space for conduit and wiring to enter the top or bottom will be provided without structural interference.

A vertical wire way with minimum of 35 square inches of cross-sectional area is to be adjacent to each vertical unit and covered by a hinged door. Wire ways are to contain steel rod cable supports.

All full voltage starter units through NEMA Size 5 will be of the draw out type. Draw out provisions will include a positive guide rail system and stab shrouds to absolutely ensure alignment of stabs with the vertical bus. Draw out units will have a tin-plated stab assembly for connection to the vertical bus. No wiring to these stabs will extend into the bus compartment. Interior of all units is to be painted white for increased visibility. Units will be equipped with side-mounted, positive latch pull-apart type control terminal blocks rated 600 volts. Provide knockouts for the addition of future terminal blocks. All control wire to be 14 gauge minimum.

All draw out units to be secured by a spring-loaded quarter turn indicating type fastening device located at the top front of the unit. Each unit compartment will be provided with an individual front door.

An operating mechanism will be mounted on the primary disconnect of each starter unit. It will be mechanically interlocked with the unit door to prevent access unless the disconnect is in the OFF position. A defeater will be provided to bypass this interlock. With the door open, an interlock will be provided to prevent inadvertent closing of the disconnect. A second interlock will be provided to prevent removal or reinsertion of the unit while in the ON position. Padlocking facilities will be provided to positively lock the disconnect in the OFF position with one (1) to three (3) padlocks with the door open or closed. In addition, means will be provided to padlock the unit in a partially withdrawn position with the stabs free of the vertical bus.

Provide each structure with a main horizontal copper tin-plated bus, with minimum ampacity of 600 A. Vertical bus feeding unit compartments will be copper and will be securely bolted to the horizontal main bus. All joints will be front-accessible for east of maintenance. The vertical bus will have a minimum rating of 300 A for front mounted units and 600 A for back-to-back mounted units or fully rated amperes.

Provide each MCC with a vertical bus that is completely isolated and insulated by means of a labyrinth design barrier. It will effectively isolate the vertical buses to prevent any fault-generated gases to pass from one phase to another. The vertical bus will include a shutter mechanism to provide complete isolation of the vertical bus when a unit is removed.

Buses are to be braced for a minimum of 42,000 A rms symmetrical minimum.

A copper ground bus is secured to each vertical section structure and will extend the entire length of the MCC.

Each structure will contain tin plated vertical ground bus rated 300 A minimum. The vertical ground bus will be directly connected to the horizontal ground bus via a tin-plated copper connector. Units are to connect to the vertical bus via a tin-plated copper stab.

Wiring will be NEMA Class 1B. Pull apart terminal blocks will not be used on motor leads.

Provide MCC with a NEMA 1 gasketed enclosure.

Provide a MCC such as the Allen Bradley 2100 series, Cutler Hammer Freedom series, Square D Model 6 or approved equal.

Shop paint will be UL recognized enamel finish, light gray (like NEMA 61) over a rust inhibitor and paint adhesion pretreatment.

Provide laminated nameplates on each door. Identification nameplates will have black characters on a white background. Attach nameplates with stainless steel screws. Each nameplate will identify each starter unit, circuit breaker or other control unit and include the horsepower or current rating of the device.

Provide high voltage safety warning name plates with white characters on red background. Also provide power disconnect locations for MCC compartments not equipped with a power disconnect.

Provide the MCC with shipping splits as required to be installed in the control house. These shipping splits will need to be coordinated with the contractor to allow for clearances in doorways or stairwells.

Incoming feeders, load and control line entrances to MCC are to be as indicated in the Plans. A ground will be provided in each vertical section as well as a connecting horizontal bus. Vertical sections will be provided with a vertical wireway and wireways on top and bottom. An insulated barrier with removable access covers will conceal vertical bus work.

907-857.02.1.2--Starter Buckets. Provide all starters with a minimum NEMA size 1 starter. Each starter will have its own control power transformer. Each starter will have a minimum of 1 N.O. and 1 N.C. contacts. Provide each starter with door mounted 120 volt LED "ON" indicator lights. Provide overload relays with Class 20 trip. Overload relays are to be re-settable from outside the enclosure by means of an insulated bar or button. Starters are to be protected by motor circuit protectors.

Provide 3-pole 480 VAC, full voltage, NEMA type starters of the magnetic combination type. Motor starters will be a combination circuit breaker, NEMA controller with overload relay protection. Connection to the bus will be by stab-type contacts, including ground, and a screw-type locking mechanism to hold the chassis firmly in place. Quantities are to be as shown in the plans. Provide through-the-door overload RESET button. For FVNR units a HAND-OFF-AUTO switch and pilot lights for OFF, RUN, and OL TRIPPED status will be provided. For FVR units provide a HAND-OFF-AUTO switch, a FORWARD-OFF-REVERSE spring return to center switch and pilot lights for FORWARD, OFF, REVERSE, and OL TRIPPED status.

Furnish, where indicated or required, motor controls having the electrical characteristics, ratings, and modifications shown in the plans. All magnetic starter coils shall be 120 VAC.

- NEMA ICS 1 - Industrial Control and Systems- General Standards
- NEMA ICS 2 - Industrial Control and Systems- Controllers, Contractors and Overload Relays Rated not More than 200 VAC or 750 VDC

- NEMA ICS 4 - Industrial Control and Systems- Terminal Blocks
- NEMA ICS 5 - Industrial Control and Systems- Control Circuit and Pilot Devices
- NEMA ICS 6 - Industrial Control and Systems- Enclosures
- NEMA ST 1- Standard for Specialty Transformers (Except General Purpose Type)

907-857.02.1.2.1--Non-Reversing Starters (Across-the-line magnetic starters for motors up to 100 HP, 600 VAC). Provide starters that are built and tested in accordance with the latest NEMA standards. Non-reversing starters shall be equipped with three NEMA Class 20 overload relays. Provide for field installation of up to 3 N.O. and 4 N.C. NEMA ICS 2, Class A300, auxiliary contacts in addition to the hold-in interlock.

907-857.02.1.2.2--Reversing Starters (Reversing magnetic starters for motors up to 100 HP, 600 VAC). Provide starters that are built and tested in accordance with the latest NEMA standards. Reversing starters shall be equipped with three NEMA Class 20 overload relays. Provide for field installation of up to 4 N.O. and 4 N.C. NEMA ICS 2, Class A300, auxiliary contacts in addition to the normal interlocks.

907-857.02.1.2.3--Overload Relays. Overload relays shall be block-type with a push-to-test feature. An isolated, field-mountable alarm contact shall be available.

907-857.02.1.3--Feeder Buckets. Provide thermal magnetic molded case heavy duty breakers of the correct size for all feeder type breakers. Operating handle will always remain connected to the MCP or circuit breaker. The operating handle is not to be mounted in the door of the enclosure, but to the side of the door for safe "stand-aside" operation. Position of the operating handle will indicate ON, OFF, or TRIPPED condition. Interlock provision will prevent unauthorized opening or closing of the cubicle door with the disconnect in the ON position as well as turning the switch ON with the door open.

907-857.02.1.4--Main Breakers. Furnish a molded case circuit breaker with an adjustable electronic trip unit and rated for service entrance and minimum interrupting rating of 10,000 KA. Operating handle will always remain connected to circuit breaker. The operating handle is not to be mounted in the door of the enclosure, but to the side of the door for safe "stand-aside" operation.

907-857.03--Construction.

907-857.03.1--Motor Control Center. Deliver MCC individually wrapped in factory fabricated fiberboard type containers and with lifting angles on each MCC supporting structure. Handle MCC carefully to prevent internal component damage, and denting or scoring of enclosure finish. Do not install damaged MCC. Store MCC in a clean, dry space. Protect units from dirt, fumes, water, construction debris and traffic.

907-857.04--Measurement. Motor Control Center will be measured as a lump sum quantity.

907-857.05--Payment. Motor Control Center, measured as prescribed above, will be paid for at the contract lump sum price which price shall be full compensation for all labor, materials, tools, testing and incidentals necessary to complete the work.

Payment will be made under:

907-857-A: Motor Control Center -lump sum

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-858-1 **CODE: (SP)**

DATE: 06/10/2020

SUBJECT: PLC Cabinet and Programming

Section 907-858, PLC Cabinet and Programming is added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-858 -- PLC CABINET AND PROGRAMMING.

907-858.01--Description. This special provision describes furnishing labor, tools, equipment and materials necessary for the manufacture, installation, testing, and making fully operational a PLC cabinet, a laptop computer and all associated programming for the PLC and the HMI interface.

During construction, temporary programs will be required to maintain operation of the bridge at all times as the different pieces of equipment are installed. The program includes an automatic sequence that opens and closes the leaf using the motor drives. Control camera triggers with logic programmed in PLC.

907-858.01.1--Related Provisions. Unless otherwise noted, conform work under this special provision to the requirements of the following special provisions:

- Electrical Work
- Electrical Service
- Auxiliary Electrical Equipment
- Control Console
- Motor Control Center
- Span Drives and Motors
- Limits and Sensors
- Submarine Cable
- Lightning and Surge Protection
- Training, Manual and Spare Parts

907-858.02--Materials.

907-858.02.1--Cabinet. Provide heavy NEMA type 12 enclosures manufactured with 10-guage steel. Apply a baked powder coat gray finish on the outside and white finish on the inside to the enclosure.

907-858.02.2--Programmable Logic Controller (PLC). Provide a PLC system manufactured by a single source and that will be the product of a company with a minimum of five (5) years of experience in the manufacture and service of this type of equipment. The PLC systems must have the communication capability to communicate and program drive parameters and settings.

Provide the PLC processor with a minimum of two (2) Mb user memory, compactflash nonvolatile user memory a built in communication port, extensive instruction set and ladder logic programming capability.

Provide the PLC system with Ethernet communications, hubs and switches.

Provide a modem or a means of monitoring and troubleshooting the PLC from a remote location.

Provide 16 point digital input cards rated for 120 VAC. Provide output cards rated at 120 VAC. Provide 16-point output cards having a minimum 0.5 A per point rating. Individually isolate relay output cards with a rating of 2 A continuous. Supply digital input and outputs with 20 percent spares

Provide analog inputs and outputs with a 4-20 milliampere range.

907-858.02.3--Relays, Timers and Contactors. Furnish relays, timers and contactors that are listed and classified by UL as suitable for the purpose specified and indicated.

907-858.02.3.1--Relays. Provide ice cube type control relays for non-load carrying control circuits. Relays will be rated for 120 VAC with a minimum contact rating of 10 A. Provide all relays with LED indicating lamp across coil. Relays will be Allen Bradley 700-FS, Square D 8501 type K, Cutler Hammer D5 series or approved equal.

For load carrying circuits and latching circuits less than 10 A, provide industrial control/machine tool relays with contacts rated at a minimum of 20 A. Relays will be Allen Bradley 700-P, Square D 8501 type X, Cutler Hammer D26 series or approved equal.

907-858.02.3.2--Timers. Provide solid state multifunction timers. Timers will be rated for 120 VAC. Timers will be Allen Bradley 700-H, Square D RE7, Cutler Hammer TR series or approved equal.

907-858.02.3.3--Contactors. For all lighting loads, provide contactors with a minimum of 20 A tungsten contacts. Contactors are to be Allen Bradley, Square D, Cutler Hammer or approved equal.

907-858.02.4--Circuit Protection.

907-858.02.4.1--Supplemental Protectors. Provide single pole UL listed or recognized miniature thermal magnetic circuit breakers. Provide breakers that are track mountable with a positive trip-free holding mechanism and a 10 kA interrupting rating.

907-858.02.4.2--Control Fuses. Provide ferrule end type, ceramic or fiberglass body, midget type, rated 250 VAC, 10 kA interrupting, UL listed for control circuit application. Automotive type, glass body fuses are not acceptable. Provide fuse blocks to house the control fuses. Provide terminal block style with isolating feature, and rail mounted, rated 600 VAC, 30 A maximum for midget type fuses. Provide a hinge type cover for isolating and automatic fuse extraction from circuit when cover is lifted.

907-858.02.5--Uninterruptible Power Supplies (UPS). Provide backup power to the PLC power supply, Ethernet switch and HMI by a computer type on-line UPS.

Provide self-contained UPSs with battery chargers, internal battery banks, local controls, and on-line inverters that provides continuous power output when incoming power is lost. Loss of output power is unacceptable during loss of input power. Size UPSs to provide power for full load connected plus 25 percent (minimum) for a total of 20 minutes continuous output power at 120 VAC. Provide built in surge protection.

907-858.02.6--PLC Program Development Software. The programming software is to be an industry standard package supplied by an industrial controls manufacturer. Supply all security keys for development software.

Software is to be manufactured by the PLC manufacturer. Furnish the latest version of software. Make the software compatible with the laptop's operating system. One (1) package will be installed on the new laptop with all licenses.

Provide software package that allows PLC off line and on line programming as well as on line monitoring, utilizing the approved PC, displaying the labels ("nicknames"), coil and rung comments, search for registers and rungs, coils, contacts by address and by label. It must allow printing of selected rungs or the entire logic to either a file or a printer. The software must allow access to the PLC local network through all ports, including the PLC Ethernet module.

The software must be capable of creating logic to modify key setup parameters of each drive, such as speed setpoints and ramps.

907-858.02.6.1--PLC Program Development Software. Provide one development package for programming the HMI and downloading revisions in the future. The software is to be an industry standard package supplied by an industrial controls manufacturer. Supply all security keys for development software.

Software is to be manufactured by the HMI manufacturer. Furnish the latest version of software. Install one (1) package on the laptop with license.

907-858.02.6.2--Laptop Computer. Provide one new laptop computer to be used for programming and troubleshooting the PLC. Include the following minimum requirements for the laptop computer; a CD/DVD burner, 80 GB hard drive, 1 GB ram memory, 512 MB USB memory storage device, three (3) year warranty, Microsoft Office Professional, modem, Ethernet

port, USB ports and necessary communication ports or adapters and cables to communicate with the PLC. Laptop computer is to be Dell, Compaq, IBM or approved equal.

907-858.03--Construction.

907-858.03.1--Cabinets and Enclosures. Make all PLC equipment accessible through the front doors of the enclosure.

Clean and phosphatize internal and external surfaces prior to application of high-quality rust inhibiting primer. Apply finish coat of light gray ANSI No. 61 baked enamel or polyester powder. Finish back panel with gloss white lacquer over suitable primers.

907-858.03.2--Wiring. Provide interconnection wiring between all electrical devices mounted in the panels and enclosures. If the devices are to be connected to external equipment, connect them to terminal blocks. Conductors are to be UL listed type THWN-MTW. The minimum field installed control wire within the control console is No. 14 AWG.

Install all interior wiring neatly and carefully, and terminate on UL approved terminal blocks as per manufacturer's instructions. Use plastic duct (open slot type) for routing all internal wiring in the control panels. Internal wiring in the factory prewired electronic system cabinets may be installed according to the manufacturer's standard as to wire size, insulation, and method of termination on internal equipment.

Permanently identify individual conductors. The marking will be done on a sleeve not less than ½ inch long. Mark each sleeve with permanent and waterproof identification.

907-858.03.3--Terminal Blocks. Group for easy accessibility unrestricted from structural members and instruments. Provide sufficient space (2" minimum) on each side of each terminal block to allow an orderly arrangement of all leads to be terminated on the block. Do not terminate more than two (2) wires on any one terminal position.

907-858.03.4--Marking and Labeling. Permanently label each terminal block, device, fuse block, terminal, and both ends of each conductor to coincide with the identification indicated on the manufacturer's wiring diagrams. Terminal blocks and devices already numbered in the plans will be so numbered on the equipment supplied. Identify mounted electronic components by marking with contrasting colored ink beside the component.

907-858.03.5--PLC Program. Develop the PLC application program for bridge control and alarm logic based on the function block chart in the plans. Submit hard copies and electronic files for review and approval. Provide user's manual(s) and instruction manual(s) and hardware, including cables and connectors.

All programming will be performed using ladder logic style programming method. Each address and rung of program will be well documented. The program will be organized to group the core bridge movement operations separate from any alarm or overhead type functions. Subroutines, and/or files, are to be utilized to separate and organize the program.

Avoid the use of latching/unlatching relays. Every step is to be interlocked to prevent movement, unless all conditions have been satisfied. Some of the circuits in the sequence are combined and interlocked with relay controls for added safeguards. All sequences can be stopped at any time and the sequence can be continued in either direction from the point the sequence was stopped, provided that all interlocks are satisfied.

907-858.03.6--Alarms. Program alarms with a debounce circuit or delay to prevent nuisance trips. Group alarms in a separate file or subroutine that can be enabled at a later date. The following is a minimum list of alarms. Protect the HMI alarm screen via password, so only authorized personnel will have access to changing the values.

- Gate and Lock travel time exceeded
- Gate and Lock limit switch trouble (both limits tripped)
- Span limit/inclinometer out of range
- Drive Faults
- Motor overloads

907-858.03.7--Camera Controls. Program outputs for relays that are connected to the camera control equipment. Trigger the outputs by the sequence of the bridge operation as described in the camera communication plans. Submit proposed camera sequence to engineer for approval.

907-858.03.8--HMI Program. Program a minimum of five (5) screens. Add additional setup parameters to setup screen as needed to allow field adjustments. Password-protect the setup screen. Provide color animation to devices on screen to indicate status of signals, gates, barrier, rear locks and span. Submit color copies of each screen for approval prior to testing.

907-858.04--Measurement. PLC Cabinet and Programming will be measured for payment as a lump sum quantity.

907-858.05--Payment. PLC Cabinet and Programming, measured as prescribed above, will be paid for at the contract lump sum price which price shall be full compensation for all labor, materials, tools, testing and all incidentals necessary to complete the work.

Payment will be made under:

907-858-A: PLC Cabinet and Programming -lump sum

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-859-1 **CODE: (SP)**

DATE: 06/10/2020

SUBJECT: Span Drives and Motors

Section 907-859, Span Drives and Motors, is added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-859 – SPAN DRIVES AND MOTORS

907-859.01--Description. This special provision describes furnishing labor, tools, equipment and materials necessary for the manufacture, transporting, installation, testing, and making fully operational new span main motors and drives.

The existing auxiliary motor and mechanical gearing on each leaf shall be removed and replaced with a new AC induction motor and flux vector AC drive. Once the auxiliary motors have been replaced and new motor/drives have been commissioned, the existing main motor will be replaced with an identical system that will provide a redundant operating system.

907-859.01.1--References.

- IEEE 112 – Test Procedures for Polyphase Induction Motors and Generators
- NEMA MG 1 – Motors and Generators
- NEMA MG 2 – Safety Standards for Construction and Guide for Selection, Installation, and Use of Electric Motors and Generators

907-859.01.2--Related Provisions. Unless otherwise noted, conform work under this special provision to the requirements of the following special provisions:

- Electrical Work
- Electrical Service
- Auxiliary Electrical Equipment
- Control Console
- Motor Control Center
- PLC Cabinet and Programming
- Limits and Sensors
- Submarine Cable
- Lightning and Surge Protection
- Training, Manual and Spare Parts

907-859.02--Materials.

907-859.02.1--General. Each span drive cabinet shall contain two AC flux vector drives that will be "synched" together to form an electronic line shaft function between adjacent leafs. Each cabinet shall be complete with AC drives, dynamic braking resistors, brake choppers (as required), disconnect, fusing, contactors, cabinet, communications, metering and miscellaneous equipment necessary to meet the performance requirements of this specification.

Power ratings given in the plans and specifications are for general reference only. The supplier is responsible for ensuring that the Variable Speed Drive (VSD) and motor package is properly sized to accommodate the speed and torque requirements of the project

907-859.02.2--Three Phase Power - Squirrel Cage Motors. Refer to Plans for required electrical characteristics. Provide stamped, stainless steel visible nameplate indicating motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model and serial number, design class and service factor. Provide a full test report for each motor. Provide conduit connection boxes, threaded for conduit.

Provide three phase power squirrel cage motors with the following minimum specifications:

- 8 pole motor, 900 RPM at 60 Hertz
- Continuous Duty in 40 °C environment.
- Start-Ups: 6 per hour. two (2) per 10 minute period.
- Power Output, Locked Rotor Torque, Breakdown or Pullout Torque: NEMA Design B Characteristics for pumps,
- Conform to NEMA MG one (1) for Design B & D Motors.
- Insulation System: NEMA Class F or better.
- Testing Procedure: In accordance with IEEE 112, Test Method B. Load test motors to determine freedom from electrical or mechanical defects and compliance with performance data. Perform additional testing to determine speed/torque curve relationship.
- Motor Frames: TENV or TEFC steel or cast iron frames (no aluminum frames allowed). Motor bases have been designed based on a L3213 frame. Coordinate actual motor frame with machinery fabricator. No external blower allowed.
- Three PTC thermistors imbedded in motor windings and epoxy encapsulated solid state control relay for wiring into motor starter.
- Bearings: Grease lubricated anti-friction ball bearings with housings equipped with plugged provision for relubrication, rated for minimum AFBMA 9, L-10 life of 20,000 hours. Calculate bearing load with NEMA minimum V-belt pulley with belt center line at end of NEMA standard shaft extension. Stamp bearing sizes on nameplate.
- Sound Power Levels: To NEMA MG 1.
- Nominal Efficiency: Meet or exceed values in Schedules at full load and rated voltage when tested in accordance with IEEE 112.
- Nominal Power Factor: Meet or exceed values in Schedules at full load and rated voltage when tested in accordance with IEEE 112.
- Service Factor: 1.15. Horsepower ratios shall be referenced from a 1.0 service factor.

Motors are integral to assemblies being provided for rear locks and are paid for as part of those assemblies.

907-859.02.3--Span Drives. Each span drive shall be a complete system that includes two variable speed drives, a cabinet, disconnects, resistors, contactors, fuses and various components necessary to operate two motors in an electronic line shaft configuration.

The Variable speed drives shall be a high performance flux vector drives with advanced programming features and built in diagnostics. Each individual drives shall be capable of side-by-side mounting. Each individual drive shall have closed loop speed control with an encoder mounted on the new drive motors. Each drive pair shall be connected with a high speed communication link capable of precisely synchronizing each motor's speed and position.

Design, fabrication, and performance requirements for VSD:

- Rated for operation in 460 V, 3-phase, 60 Hz systems.
- Installed in NEMA 12 enclosure with a fused flange mounted disconnect.
- Dynamic braking Resistors with chopper modules as required.
- Dynamic braking function capable of 100 percent braking of full load motor torque for three (3) minutes
- Include suitable warning labels inside and outside the enclosure in those cases where it is possible for the maintenance electrician to wire circuits into the enclosure that are not disconnected by the disconnect device.
- Operate in an ambient temperature of 0 °C. to 40 °C., an altitude of up to 3,300 feet above sea level, and humidity of 0 to 95 percent non-condensing.
- Have complete front accessibility with easily removable assemblies.
- Human interface module with alphanumeric display, local/remote and start/stop buttons.
- The control shall be capable of providing selectable current/torque limit settings.
- Drives shall be capable of controlling both Ethernet and relay interface.
- Have complete front accessibility with easily removable assemblies.
- AC drive with the following requirements and features:
  - Contact outputs: two (2) form "c" min. (functionally programmable).
  - Programmable analog outputs
  - Reduced Torque Capability
  - Acceleration time: 0-3600 second with two (2) independently programmable timers.
  - Deceleration time: 0-3600 second with two (2) independently programmable timers.
  - Minimum of four (4) digital Speed inputs.
  - Sensorless Flux Vector Control to within 0.1 percent of base speed across 100:1 speed range.
  - Ethernet port
  - Control and Setup Parameters programmable from PLC program and programming software.
  - Electronic Class 10 overload protection.
  - Programmable current Limit
  - Able to withstand output terminal line-to-line short circuits without component failure.

- Power ride-thru of 15 MS at full load.
- Insensitive to input line rotation.
- Over temperature protection.
- Acceleration and deceleration control.
- Electrical isolation between the power and logic circuits, as well as between the 120 VAC control power.
- Line transient voltage protection.
- Slip compensation speed regulation to 0.5 percent.

907-859.02.4--Cabinet. Provide heavy duty free standing NEMA type 12 enclosures manufactured with 10-guage steel. Furnish enclosure with a flange mount disconnect. Apply a baked powder coat gray finish on the outside and white finish on the inside of the enclosure.

Furnish two ground lugs, one for incoming line power and one for outgoing motor ground connections. Furnish and install vents or fans to dissipate heat generated by the drives.

907-859.03--Construction.

907-859.03.1--General. Coordinate motor frame size with brake and mechanical manufacturers. Install motors per manufacturers' instructions. Install motor mounting bases as required to accommodate motors. Properly align motor shaft with driven shaft before connecting motor coupling. Align if required. Megger motors before final connection. Record these readings and submit with "as-built" drawings. Connections shall be accomplished with bolted compression lugs.

907-859.03.2--Factory Load Testing. Before shipping, conduct a factory design proof test on each drive and motor system with a calibrated dynamometer to verify that the performance requirements have been met. The test will be witnessed by the engineer. Provide 30-day advanced notice and submit description of the test stand to document the accuracy of the torque readings.

Supply test results to confirm that the VSD has been tested to substantiate designs according to applicable ANSI and NEMA Standards. The tests shall verify not only the performance of each unit and integrated assembly, but also the suitability of the enclosure venting and rigidity. All units shall be factory tested in accordance with ANSI standards in addition to the design proof tests conducted on all units.

Testing procedures shall include:

- Apply loads equal to the torques specified for AASHTO Condition A to motor shafts. Run motor at 100 percent speed for three (3) minutes (driving). Motor-drive combinations should be capable of driving the load.
- Apply overhauling loads equal to the AASHTO Condition A torque to motor shafts. Run motors at 100 percent speed for three (3) minutes (dynamic braking). Motor-drive combinations should be capable of dynamically braking the load.

- Demonstrate that motors/drive cannot produce or exceed the never-exceed torque value at zero or any other speed. NOTE: Zero speed is defined at 0-20 RPM max.
- Make final adjustments to installed drive to assure proper operation of fan system. Obtain performance requirements from installer of driven loads. Touch up scratched or marred surfaces to match original finish. Demonstrate operation of controllers in automatic and manual modes.

907-859.03.3--Shop Control Testing. Interconnect both drives and motors with the entire control system. Demonstrate the operation of both drives using the control system. Demonstrate the following in an unloaded condition during the shop test:

- Speed changes for both raising and lowering for each motor/drive in one motor operation
- Speed changes for both raising and lowering for in two (2) motor operation.
- Speed setpoint and ramp programming changes from HMI setup screen.
- Normal Stop sequence
- Emergency Stop sequence
- Apply overhauling

907-859.04--Method of Measurement. Span Drives and Motors will be measured for payment as a lump sum quantity.

907-859.05--Basis of Payment. Span Drives and Motors, measured as prescribed above, will be paid for at the contract lump sum price which price shall be full compensation for all labor, materials, tools, testing and all incidentals necessary to complete the work.

Payment will be made under:

907-859-A: Span Drives and Motors - lump sum

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-860-1 **CODE: (SP)**

DATE: 06/10/2020

SUBJECT: Limits and Sensors

Section 907-860, Limits and Sensors is added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-860 – LIMITS AND SENSORS

907-860.01--Description. This special provision describes furnishing labor, tools, equipment and materials necessary for the manufacture, installation, adjusting, calibrating, testing, and making fully operational new span position cam limits, brake limits, rear lock limits, and span position inclinometers as indicated in the plans.

907-860.01.1--Related Provisions. Unless otherwise noted, conform work under this special provision to the requirements of the following special provisions:

- Electrical Work
- Electrical Service
- Auxiliary Electrical Equipment
- Control Console
- Motor Control Center
- PLC Cabinet and Programming
- Span Drives and Motors
- Submarine Cable
- Lightning and Surge Protection
- Training, Manual and Spare Parts

907-860.02--Materials.

907-860.02.1--Rear Lock Limits. Provide non-contact, inductive proximity style switches. Switch contacts shall be rated for 250 VAC. Supply switches that are heavy duty 30 mm diameter, NEMA Type 4 construction with a stainless steel housing and temperature rating between -25 ºC and 70 ºC. Sensing distance shall be a minimum of 15 mm. Sensor shall be supplied with quick disconnect cables.

907-860.02.2--Inclinometer – Span Position Transmitter. Install a leaf angle position transmitter/inclinometer to the bascule girder at a suitable location to the centerline of bridge rotation as practical. Power unit with 120 VAC and provide a voltage or current output signal relative to leaf angle. This output signal is 4 to 20 mA as required to properly interface with the PLC. House position transmitters in a NEMA 4X rated enclosures with terminal blocks, and power supply as required for connecting to power source and angle position meters. The position

transmitter itself is adjustable and calibratable without having to physically move the NEMA enclosure.

Do not exceed 0.01 percent per °C for the position transmitter temperature drift. Have suitable vibration resistance and dampening for a bridge leaf application. Non-Linearity is <1*10 –3 full scale. Transverse sensitivity is < 1 percent at 45 degree tilt.

907-860.02.3--Span Position Cam Limits. Cam limits shall be 6 circuit rotating cams in a NEMA 12 enclosure with a straight drive with SPDT snap action type switches with a minimum 10 amp rating at 120 VAC. The limit shall be furnished with all necessary couplings and or adapters. The contractor shall verify the shaft locations of the existing cam limits. All sprockets and gears shall be cleaned, reused and lubricated.

907-860.02.4--Span Seated Plunger Limits. Switch shall be a weather-sealed design, with neoprene gaskets between exterior bolted connections. Cover shall be designed to positively retain a gasket. Drain plugs and a breather shall allow condensation to evaporate or drain from housing. Construction shall be stainless steel, heavy duty, durable and suitable for marine environment. Plunger extension shall permit at least .75" field adjustment and shall have a ball end. Design shall also allow for simple field swapping of service cover hand. Plunger shaft shall be stainless steel. Pre-travel shall be approximately 1.50" with a minimum over-travel of 2.00". Trip plate shall be spring loaded with an over-center mechanism to provide simultaneous, positive, accurate, and repeatable snap-action activation of all switches. Trip point shall be field adjustable by simple adjustment of plunger extension. Each circuit shall provide independent normally open and normally closed sets of contacts (1 NO and 1 NC). Heavy-duty snap-action microswitches shall be double-break type to increase contact life. Individual switches shall be rated for 15A make / 40A break at 120V

907-860.03--Construction. Install limit switches in accordance with manufacturer's instructions. Provide all mounting hardware and supports as required. The method of mounting and hardware allows for field adjustment at construction and for future maintenance. Terminate all limit switches on terminal blocks. Install drainage "T" below takeoff for limit switches on all applicable conduit runs. Submit to the engineer, for review, prior to installation the limit switch target materials, shapes, and mounting methods.

907-860.03.1--Testing. After installation, test switches, in the presence of the engineer, to determine if operation is as intended. Switches will relay signal to the control console and/or control panel at intended "point of operation." Switches will provide positive indications with no intermittent signals or flickering of lights on control console. Adjust position of switches as required.

907-860.03.2--Installation. Fabricate brackets out of stainless steel material with 3-axis adjustability. Use stainless steel material for all mounting hardware. Use painted steel for sensing plates.

907-860.04--Measurement. Limits and Sensors will be measured for payment as a lump sum quantity.

907-860.05--Payment. Limits and Sensors, measured as prescribed above, will be paid for at the contract lump sum price which price shall be full compensation for all labor, materials, tools, testing and all incidentals necessary to complete the work.

Payment will be made under:

907-860-A: Limits and Sensors - lump sum

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-861-1 **CODE: (SP)**

DATE: 06/10/2020

SUBJECT: Submarine Cable

Section 907-861, Submarine Cable, is added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-861 -- SUBMARINE CABLE

907-861.01--Description. This special provision describes furnishing, installing and testing new submarine cables and termination cabinets.

The submarine cable system includes the physical cables that cross the channel, the submarine cable termination cabinets, all mounting hardware and cable supports, timber pier protection and all electrical and mechanical connections to and from the submarine cable termination cabinets.

907-861.01.1--Related Provisions. Unless otherwise noted, conform work under this special provision to the requirements of the following special provisions:

- Electrical Work
- Electrical Service
- Auxiliary Electrical Equipment
- Control Console
- Motor Control Center
- PLC Cabinet and Programming
- Span Drives
- Limits and Sensors
- Lightning and Surge Protection
- Training, Manual and Spare Parts

907-861.02--Materials.

907-861.02.1--Submarine Cable. Verify the conductor count of the cable with the vendor of the bridge control system to ensure the specified number of spare conductors is provided. Ascertain the correct continuous length of submarine cables, including sufficient excess length to accommodate pulling eyes, adequate slack for submarine cable settling, cable clamping, connections, testing, and for samples. Ascertain the correct conductor counts (to include spares) based on approved working drawings. In no case can the conductor counts be less than those herein before specified.

907-861.02.1.1--Cable Materials. Furnish cables with a weather and UV resistant high density polyethylene (HPDE) outer jacket with galvanized steel armor conforming to the requirements of

ICEA S-95-658 and NEMA WC70. Provide soft annealed copper wire conductors conforming to the requirements of ICEA Publication. Provide Class B concentric stranding conductors. Provide a moisture-resisting, cross-linked, polyethylene compound insulation for each conductor conforming to the requirements of ICEA #S-95-658/NEMA WC70, Part 3.7. Conform the thickness of insulation as given under Column A of Table 3-1 for 2,000 volts rated circuit voltage. Provide mineral filler (not carbon) insulation to inhibit treeing.

Before cable orders are placed with any manufacturer, determine the true length of each cable between the submarine cable terminal cabinets. Splicing or joining of conductors between these points will not be permitted. Ascertain and order the correct continuous length of submarine cables, including sufficient excess length to accommodate pulling eyes, adequate slack for submarine cable settling, cable clamping, connections, testing, and for samples.

907-861.02.1.2--Cable. Furnish 600 volt rated power, control and communication cables as shown in plans. Include copper conductors, twisted shielded pairs, coax cables and an inner ducts of the sizes and quantities shown in the plans.

907-861.02.1.3--Conformance. Conform all materials and construction of the submarine cables to the requirements of ICEA Publication #S-95-658/NEMA No. WC70.

Conform all electrical equipment and installations to the requirements of the Standard Specifications for Movable Highway Bridges of the American Association of State Highway and Transportation Officials, except as may be otherwise provided herein. Conform all materials and construction items to the requirements of the Electrical Code of Mississippi and to any applicable local rules and ordinances.

907-861.02.2--Terminal Cabinets. Furnish and install terminal cabinets to provide termination for the submarine cables. All cabinets shall be adequately sized to mount all terminal blocks and to provide ample space between blocks for routing of the wires. Size will be determined by the number of conductors and available wall space.

Provide Stainless Steel type NEMA 4X terminal cabinet enclosures fabricated from No.10 gauge, Type 316 stainless steel reinforced by steel angles. Install framed overlapping door(s) hung on continuous stainless steel piano hinges to provide access to the equipment inside. Construct the door(s) from No. 10 gauge stainless steel, suitably reinforced with a three-point, vault-type latch and padlock. Provide door(s) with rubber gaskets to prevent water from entering the cabinets. Weld reinforcing plates to the walls where conduits and cables enter the cabinets. Provide each cabinet with drain fittings of the same type as specified for conduit drains under this bid item.

Provide spring clamp type disconnect type terminal blocks in each terminal cabinet for control conductors in the submarine cables. Provide feed through coaxial connectors for each coax cable and RJ-45 patch panel for Cat 5E cable. Provide space in cabinet for installation of fiber optic patch panel for future use by the city. Provide sufficient terminals for termination of all spare conductors and other conductors to be terminated inside the cabinet. Mount all terminal blocks and boards on structural steel brackets in such a manner as to permit routing the cables behind

the blocks. Provide one-piece terminal blocks suitable for use in highly corrosive atmospheres conforming to the requirements specified under this bid item.

Provide for grounding and bonding of all termination cabinets. Provide grounded vertical stainless steel segregation shield between the power terminal blocks and the control and signal terminal blocks. Extend the segregation shield at a height from the backplate of the terminal cabinet to the inside of the cabinet door. Bolt the shield to the bare metal backplate with stainless steel fasteners and test for proper grounding.

Provide cabinet heaters that are sized for the interior dimensions of the cabinet. Include internal thermostat for controlling the temperature inside.

907-861.02.3--Hardware. Use a threaded cable support clamp screwed onto the end of the threaded conduit for supporting each submarine cable at the top end of its pier encased conduit run. Provide clamp assemblies that are fabricated of hot dipped galvanized steel and made specifically for this use. Provide stainless steel hardware conforming to the requirements of ASTM Designation A276, Type 316. Provide bolt heads and nuts that are hexagonal and with medium series lock washers.

Secure each jacketed core of each submarine cable entering terminal cabinets at the entrance wall by a watertight, bronze cable entrance sealing bushing. Do not drill a box for more conduits or cables than actually enter it.

Furnish and install a stainless steel cover to protect the cables from the floor brackets to the bottom of the cabinet. Use grommet and or cord grips to seal the cable's entrance into the cabinet.

907-861.03--Construction.

907-861.03.1--Submarine Cable. In each cable, provide insulated conductors cabled to a full circular section using non-hygroscopic fillers, where necessary, to fill out the section. Cover each layer of the conductors with a single serving of binder tape. Identify conductors in each layer by coloring or marking the outer surface of the insulation. Apply one (1) layer of binder tape over the cabled conductors followed by a homogeneous synthetic sheath conforming to the requirements of NEMA WC7, Part 4.4.2, Polyethylene, Black. Conform the thickness of the sheath in accordance with the requirements of Table 4-7. Apply cable armor over the sheath consisting of a single layer of galvanized plow steel wire, each wire covered with a layer of polyethylene. Apply a high-density polyethylene jacket over the armor. Conform the polyethylene jacket, jacket thickness, and armor jacket to NEMA WC70 and be sunlight and weather resistant. Submit any variations in cable construction or materials to the engineer for review and approval.

Provide approved non-hygroscopic filler material suitable for submarine cable application, such as jute, in the interstices between and over the insulated conductors to give the complete cable a circular cross-section. Apply binder tape of approved suitable, flame-resistant, and moisture-

resistant fabric material with a thickness not less than 10 mils over the multi conductor/filler assembly and overlapped not less than 10 percent of its width between turns.

907-861.03.2--Submission of Proposed Method of Installation. Submit, in detail, the proposed method for installing the submarine cables, submarine cable termination cabinets, and all other equipment, and obtain the approval of the engineer before any work is started.

907-861.03.3--Factory Tests of Submarine Cables. Test all cables at the factory in accordance with the test methods of ICEA/NEMA Standards for the types of cable and insulating materials specified and meet or exceed the minimum requirements and criteria for acceptance as set forth therein. Test to demonstrate the quality of the production run prior to assembly and fabrication of the submarine cables, the individual insulated conductors to be incorporated in the cables.

Conform the conductors and insulating compounds to meet the minimum physical and electrical requirements set forth in NEMA Publication No. WC-70. After each multi conductor cable is completely assembled and armored, subject the entire cable to tests for insulation resistance and high voltage. Perform high-voltage tests at the same voltage used on the individual wires and the insulation resistance cannot be less than 80 percent of the original values for the individual wires. Submit the test reports for approval prior to shipping any cable.

Submit to the engineer certified copies of all the factory test data for approval before accepting shipment of cable from the manufacturer. Include, in a tabulated form, the test data, a description of the material undergoing tests, a description of each test performed, the measured or observed results, and the value and limits required by the ICEA/NEMA Standard for acceptance. In addition submit to the engineer copies of a statement certifying that the cable delivered for use under this contract has passed the required factory inspections and tests and complies with all the requirements, including electrical, materials and construction, of the standards and specifications in the contract.

907-861.03.4--Submarine Cable Field Testing. Test the submarine cable system as described in the plans and special provisions. Replace and retest at no additional cost to the department any cable or component of the submarine cable system that does not pass the required testing. Obtain the submarine cables from one manufacturer that is experienced in producing submarine cable of similar types to those described.

907-861.03.5--Installation. Install new submarine cable across the channel at the location shown on the contract plans. Care shall be taken to prevent damage to existing submarine cables. Provide all labor, permits, and equipment sufficient to perform all work necessary to install and place in satisfactory operating condition submarine cables and terminating equipment for carrying the power, control, and ground across the navigable channel.

Provide certified diver(s) and equipment necessary to install and inspect (electrically and physically) the cables as required by the engineer.

Under this item, coordinate installation with the engineer, the cable manufacturer, and pertinent Federal, state and local agencies, including, but not limited to, the U.S. Coast Guard, and the

Department of Natural Resources (DNR). Coordinate any channel obstructions with waterway agencies in accordance with all applicable laws, regulations and permits. Install submarine cables in accordance with USACE and DNR permits.

Install cables that cross the channel side by side without twists or loops. No cable will be permitted to cross the other. Route the cables to avoid unforeseen obstructions. Do not exceed the minimum bending radius of each cable at any time before, during, or after installation. Perform the cable installation without damaging the bridge structure or any existing substructure and as directed by the engineer. Exercise proper care so as not to overstress, score, nick, or cut the conductors, insulation, outer jacket or armor, or otherwise damage the cable. During the installation of the cables, arrange to have a representative of the cable manufacturer, experienced in submarine cable handling and installation procedures, on site to provide advice to the contractor and the engineer in these matters.

Take special care to prevent the new cable ends from being damaged or wet during the installation. Provide sealed cable ends from the cable manufacturer. Install all cables per all manufacturer's recommendations. Install cables as shown in the contract plans.

Allow cables to settle for a period of a minimum of 48 hours, after the last cable has been placed, before any rigid connections or attachments are made. Provide submarine cables of sufficient length to allow for slack in settlement and to allow for making permanent connections. Provide proper equipment for lifting or lowering the submarine cables at the abutments. Determine the proper type of lifting or lowering device for the cables, subject to approval by the engineer. Include considerations for the quantity and size of conductors in the submarine cable and distances involved.

907-861.04--Measurement. Submarine Cable will be measured for payment as a lump sum quantity.

907-861.05--Payment. Submarine Cable, measured as prescribed above, will be paid for at the contract lump sum price which price shall be full compensation for all excavation and backfilling required for installing the submarine cable; for all labor, materials, and equipment needed to perform the underwater installation in accordance with all requirements of DNR and USACE; furnishing, installing and testing the submarine cable and its termination cabinets; providing divers and underwater inspection; and for furnishing all labor, tools, equipment, software, materials, and incidentals necessary to complete the work.

Payment will be made under:

907-861-A: Submarine Cable - lump sum

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-862-1 **CODE: (SP)**

DATE: 06/10/2020

SUBJECT: Lightning and Surge Protection

Section 907-862, Lightning and Surge Protection, is added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-862 – LIGHTNING AND SURGE PROTECTION

907-862.01--Description. This special provision describes furnishing labor, tools, equipment and materials necessary for the installation and operation of a fully functional lighting protection and transient voltage surge-suppression (TVSS) system.

Comply with all local codes, all laws applying to electrical installations in effect and with the regulations of the latest NEC, where such regulations do not conflict with the laws in effect and with the requirements of the utility company.

It is the intention of the contract plans to call for completely finished work, fully tested and ready for operation. Furnish, deliver, and install any apparatus, appliance, materials, or work not shown on the plans but mentioned in the special provisions or vice versa, or any incidental accessories necessary to make the work complete in all respects and ready for operation, shall be furnished, delivered, and installed without additional expense to the department.

907-862.01.1--Related Provisions. Unless otherwise noted, work under this special provision shall conform to the requirements of the following special provisions:

- Electrical Work
- Electrical Service
- Auxiliary Electrical Equipment
- Control Console
- Motor Control Center
- PLC Cabinet and Programming
- Span Drives
- Limits and Sensors
- Submarine Cable
- Training, Manual and Spare Parts

907-862.01.2--Submittals. Submit the following for each component of the Lightning Protection and TVSS bid item:

- Submit Manufacturers shop drawings.
- Submit Product Data.

- Submit Manufacturer's installation instructions.
- Submit operation and maintenance data.

907-862.01.3--Regulatory Requirements. National Fire Protection Association, NFPA-780, Standard for the Installation of Lightning Protection Systems, 2008.

- ANSI/IEEE Standard 81 Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System.
- UL 96A Installation Requirements for Lighting Protection Systems.
- NFPA 70 - National Electric Code, NEC, Article 250, 2011.
- UL 467 - Grounding and Bonding Equipment.

907-862.02--Materials.

907-862.02.1--Lightning Protection. In general, use 316 stainless steel materials. In locations where system components are to be connected to aluminum surfaces, use tin plated or CU-AL marked fittings. Use Class I stainless steel air terminals with a threaded base. Height shall be no less than 18 inches for control house. Provide threaded stud base for air terminal and bolted clamp conductors. Provide main and down conductors of stranded stainless steel, 14 AWG minimum size strands, 133 CM overall. Provide bonding conductor of stranded stainless steel, 17 AWG minimum size strands, 28,000 CM overall. Bond connections between movable span and fixed pier and traffic gate arms to the operator base bonded with No. 4 type W or extra flexible welding cable.

Use a grounding electrode of minimum of 1-inch by 10-inch feed copper clad steel for all ground points including submarine earth grounding electrodes. In general, connect bonds and taps by exothermic weld. Mechanical, bolted connections are allowed at the air terminals, the flexible cable ends, sheet piles and on aluminum surfaces. Provide bonding plates for aluminum surfaces of tin plated or copper-aluminum alloy.

Design the static discharge assembly to safely interface with other bridge components without degrading, in any way, its structural integrity and while blending with the appearance of the structure. Design the system to withstand a wind force of at least 80 MPH.

Install a minimum of two (2) air terminals on the peak of the control house roof. Bond the terminals to a main conductor installed around the perimeter of the roof. Install two (2) down conductors, each from opposite corners and extending down to submarine ground rods. Encircle a bonding conductor around the control house windows, with the window frame bonded at the corners. Route main conductors between ground rods as shown on the plans. Bond the ground system to the lightning protection system with conductors sized per NFPA 780. Bond all metal structures, including traffic light structures, traffic and barrier gate assemblies, and camera poles and any external lighting fixture, metal traffic barrier and all handrails to the lightning protection main conductors. Bond the handrail and guardrail to the main conductors at regular intervals. Bond the electrical system ground to the lightning protection system at the MCC ground bus. Exothermically weld all joints in the system. Use bolted connections where connections are accessible for inspection and maintenance.

907-862.02.2--Surge Suppression.

907-862.02.2.1--General. Furnish and install surge suppression equipment as described in this article and shown on the plans. Provide Transient Voltage Surge Suppressors (TVSS) as described herein for all motors, incoming power and any circuit that enter or leave the tender house's protected perimeter. The protected perimeter includes the operator level, entry-level room and machinery level room. Install motor and branch circuit protectors in a TVSS cabinet in the machinery level room.

907-862.02.2.2--Conformance. All materials and workmanship shall conform to the latest editions of the following standards and publications referenced in various parts of this article:

- ANSI/IEEE C62.1 Standard for Surge Arrestors for AC Power Circuits
- Underwriters Laboratories, UL 1449 Standard for Safety, Transient Voltage Surge Suppressors, Revised edition.
- UL 96A Installation Requirements For Lightning Protection Systems.

907-862.02.2.3--Suppressors for Motor Branch Circuits. Install transient voltage surge suppressors on each motor branch circuit entering or leaving the operator house's protected perimeter. Provide motor circuit suppressors rated for category A in a parallel shunt design, clamping each conductor to ground.

Motor circuit suppressors shall meet or exceed the following minimum criteria:

- Single impulse withstand rating: 25,000 A (8 x 20 µs waveform) plus power-follow per wire.
- Pulse lifetime rating (3,000 A – 8 x 20 µs plus power-follow): 1,000 occurrences.
- Minimum energy handling capability – 1,500 joules
- Worst case response time: 5 µs
- Maximum clamping voltage (voltage with input current of 3,000 A – 8 x 20 µs plus power-follow):

Normal Applied Circuit Voltage	Maximum Clamp
120V	300V
240V	550V
277V	1,000V
480V	2,000V

(Energy rating @10 x 1000 µs waveform plus power-follow.)

- UL listed and approved for the location in which they are installed.

- Provide visible indication of suppressor failure. Arrange shunt TVSS elements to fail open.

907-862.02.2.4--Suppressors for Control and Signal Circuit Protection. Provide control circuit suppressors that are multi-stage hybrid shunt-series-shunt design. Suppressors for balanced (two-conductor) circuits shall also clamp conductor to conductor when required by the nature of the circuit. Provide suppression devices for control circuit protection in single or multi-channel packages suitable for the circuitry to be protected with connectors or terminal blocks or strips suitable for the type of wiring being used.

Provide suppression for each conductor consisting of a high energy dissipater parallel (shunt to ground) first stage, a series surge current-limiting impedance second stage, and a voltage clamping parallel connected third stage. Resistive limiting elements may be used where the voltage drop across the series resistance has no effect on circuit operation. Inductive series elements may be used on other circuits to effectively pass DC or low frequency AC currents while limiting passage of fast risetime surge waveforms.

Minimum performance criteria (each circuit) shall be as follows:

- Maximum single impulse conductor-to-ground current withstand: 10,000 A (8 x 20 µs waveform) plus power-follow.
- Pulse lifetime rating category B worst-case current waveform (8 x 20 µs at 3,000 A plus power-follow): 1,000 occurrences
- Minimum energy handling capability – 500 joules per conductor
- Worst case response time: 5 µs
- Worst case (3,000 A at 8 x 20 µs) clamping voltage: 200 percent of normal operating voltage amplitude and polarized or bipolar as appropriate for each circuit type.
- Initial clamping voltage: 150 percent of normal operating voltage peak amplitude ± 5 percent.
- Capacitance for DC or low frequency AC circuits: Do not exceed 2,000 picofarads, measured line to ground at the rated diode breakdown voltage.
- Capacitance for audio, video, high frequency, or high baud rate circuits: Install suppressors designed for use on such lines. Capacitance of such units shall be equated to equivalent cable length based on the type of cabling used for the particular circuit. The sum of equivalent cable length of suppressors and actual cable length shall not exceed manufacturer's recommended maximum values for the system on which those devices are installed.

907-862.02.3--Incoming Main for Control and Signal Circuit Protection. Provide an incoming main surge protective device that meets the following minimum criteria:

- Installed in a NEMA 12 enclosure
- L-L, L-N, L-G and N-G protection modes
- 10 year warranty
- U.L. 1449 listed
- Peak surge current rating per phase of 480 kA.

- Indicator LEDs for normal and fault conditions for each phase.
- Audible alarm with enable disable switch.
- Surge Counter

907-862.03--Construction.

907-862.03.1--General. Protect the tender house by a lightning protection system installed in accordance with U.L. 96A except as expressly otherwise specified herein. Furnish and install system by a U.L. listed installer of lightning protection systems and provide a Master Label or UL Letter of Finding for the system.

Protect the operator house fully in accordance with UL 96A as though it were a separate structure. Pay special attention to routing the down leads from the lightning system as to maintain a minimum 6-foot spacing from the control desk and interior equipment bonding down leads.

Protect the moving bascule leaves and their supporting piers in accordance with UL 96A Class II. Treat the bascule leaves as structural steel framing under UL 96A Section 13 assuming that the perimeter grounding requirements apply when the bascule leaf is in the upright position. The down conductors from the bascule leaf to the balance of the structure will be No. 2/0 AWG type W extra flexible cable such as welding cable or locomotive/diesel cable, all other main and secondary cables shall be standard Class II conductors. Provide the connection between the flexing cable from the bascule leaf and the main down conductor on the pier to route surges through the flexing cable. Bond all machinery, fixed equipment, and metal parts within the bounds established by the back faces of the bascule leaf piers, and excluding the fender system, in accordance with UL 96A. Treat metal handrails above road level air terminals and bond with main conductors except the "two-way" path requirement of UL 96A Paragraph 7.1 will not apply. There shall be no requirement to bond to any embedded reinforcement bar. Where structural steel members of the bridge are to be connected, piercing of the steel member is not allowed.

Protect isolated electrical equipment (e.g., traffic gates) or support poles or structures for electrical apparatus (e.g., signal lights) in accordance with standard UL 96A practice utilizing individual ground terminals. Bond traffic and barrier gates with No. 2/0 AWG copper. Bond the gate arm to the gate operator housing with (No. 1 AWG) extra flexible tinned copper bonding strap 25 mm wide by 10 mm thick.

The unique nature of the bridge must be taken into account in the selection of materials and techniques. The highly corrosive environment requires that externally mounted conductors, air connectors, and ground connectors shall be corrosion resistant either inherently (e.g., series 300 stainless steel or bronze construction) or by protection using plating or coating acceptable to the UL and the engineer. All conductors and ground terminal components within five feet above mean high water shall be inherently corrosion resistant sufficient to provide a minimum thirty year service life.

Access to the system will be restricted after the installation is completed and routine maintenance will be minimal. Install the system in a manner to assure long term reliability. Weld connections to the bascule leaf structure and other fixed metal parts, cable splices, and connections to ground terminal components. Restrict bolted connections to removable items (e.g., motors) and to the flexing cables from the bascule leafs to permit cable replacement. Crimp type connectors will not be acceptable in any part of the lightning protection system. Conductor guards shall be non-metallic.

Conductor or ground terminal exposure to the water only (e.g., "reservoir grounding") will not be an acceptable ground connection. Accomplish grounding in the submarine earth in accordance with UL 96A Paragraph 8.6 or 8.8 as applicable except that ground rod is used. Ground terminal components must be buried and anchored in a manner to provide the required service life. Furnish a diver and the necessary diving equipment for use of the UL Inspector, the engineer, or his representative in making inspections of the grounding installation. Upon completion of the installation, furnish the Master Label issued by Underwriters Laboratory for this system, thus certifying that this system complies with all UL requirements.

The desired primary bond to the TVSS system is to be at the TVSS equipment cabinets on the equipment (lower) floor.

907-862.03.2--Surge Suppressors.

907-862.03.2.1--Bonding and Grounding Conductors and Materials. Use conductors for individual surge suppressor bonding specified in UL 96A for the lightning protection circuit unless otherwise specified. Make connections as specified in UL 96A unless otherwise specified. Aluminum conductors are not acceptable.

907-862.03.2.2--Segregation of Wiring. Classify all system wiring into protected and non-protected categories. Wiring on the exposed side of suppression devices is considered unprotected. Surge suppressor grounding and bonding conductors also fall into this category. All wiring between surge suppressors and protected equipment is considered protected. Wiring that is wholly within a protected cluster and thereby exempted from surge suppression requirements is also considered protected.

Provide a minimum of three (3) inches of separation between parallel runs of protected and unprotected wiring in control panels, terminal cabinets, terminal boards, and other locations. Do not bundle protected and unprotected wiring together or route through the same wireway. Where bundles of protected and unprotected wiring cross, cross them at right angles with a minimum of one (1) inch of separation or a ferrous shield between the conductors. No unprotected wiring is permitted with the protected perimeter of the tender house or any other system that is protected as a cluster.

907-862.03.2.3--Installation of Suppressors. Mount, install, and ground all suppressors per the manufacturer's requirements. Give special attention to grounding requirements and minimum conductor sizes. Install individual suppressors as close as possible to the equipment to be protected consistent with available space. Where space permits and no code restrictions apply,

install suppressors within the same cabinet as the protected equipment. Install bonding jumpers not exceeding two (2) inches in length between the chassis and suppressor ground terminals. Use bolted connections with star washers to insure electrical and mechanical integrity of connections to the equipment chassis. Install suppressors in a neat, logical manner. Lead dress shall be consistent with recommended industry practices for the system on which these devices are installed.

Keep bonding between ground terminals for power and control or signal line suppressors serving a particular item or cluster of equipment as short as possible. Where practical, install suppressors in a common location for the cluster with the ground terminals bonded closely together. For installations requiring separation between the various suppressor grounds and equipment chassis within an equipment cluster, use the following table to determine bonding conductor requirements (distances are measured between most distant suppressor or chassis grounds within the cluster):

Bonding Distance	**Material**
0-10 feet	No. 6 AWG bare copper (solid) or 1½-inch copper strip 0.051 inch thick (min.)
10-50 feet	57,400 CM main conductor or 3-inch copper strip 0.051 inch thick (min.)
Over 50 feet	115,000 CM main conductor or 6-inch copper strip 0.051 inch thick (min.)

For the tender house cluster, mount all suppressors except power service protectors in a cabinet assembly at the protection window in the protection perimeter. Where cabinets are used to house surge suppressors, use painted steel backboards to serve as a low impedance ground plane for bonding surge suppressor leads together. Bond suppressors with ground terminals not inherently bonded to the ground plane through their mounting to this plane using a conductor from the table above. Drill and tap ground planes and backboards to accept brass or series 300 stainless steel machine screws or bolts. Remove any paint in the area of the bond and use star washers to attach.

Where multi-channel surge suppressor devices are used, provide a minimum of 20 percent of the channels as spares. For example, if four channel modules are installed, one channel will be the spare. If eight (8) channel modules are installed, two (2) channels will be spares.

907-862.03.2.4--Transient Voltage Surge Suppression System Performance Criteria. Transient voltage surge suppression including grounding and bonding as required by this specification shall effectively protect the electrical systems to which it is applied against lightning and other surge transients throughout the useful life of the system. Design surge suppression devices and install in such a manner that normal operation of the system is not impaired due to the installation of such devices.

Calculations for suppressor pulse lifetime rating must assume the devices are installed in areas of medium exposure when such devices are installed in ANSI/IEEE 62.41 category A or B locations. Devices in category C locations shall be considered to be in an area of high exposure. Frequency of surge occurrence and surge amplitudes shall be as outlined in this standard with a

required minimum suppressor lifetime of fifteen (15) years. Surge current amplitudes and energy dissipation values used for life test and calculation purposes must include the power-follow currents appropriate to the circuit in which they are installed.

Protect the electrical system by dealing with each group of related devices as a "cluster" of equipment and protecting all metallic circuits that enter and leave the cluster. The cluster may be as large as the tender house or as small as an individual equipment cabinet. For purposes of establishing maximum size, all equipment within a protected cluster falls within a circular area of not greater than 25 feet in radius around a common point. Group all metallic circuits entering and leaving the equipment cluster together at a common point or "window" not larger than four (4) by eight (8) feet in dimension and protected with one exception: treat the tender house as a single continuous cluster with a window not larger than eight (8) by eight (8) feet and equipment which is located more than 25 feet from the window and circuits which extend beyond the 25 feet radius to serve devices within the building shall not require protection provided the following conditions are met:

- Circuitry is enclosed within metal raceways. Newly installed raceway must be metallic with the following exceptions:
- Lightning and surge suppression bonding conductors shall be bare or in non-metallic tubing only.
- The circuit between the main service protector and the control panel shall be in non-metallic conduit to provide a minimum impedance path for any transients that may reach the power bus from field circuits.
- No wiring within the raceways containing such circuits extends beyond the confines of the building or cluster.
- No connection is made between this wiring and conduit ground outside of the house's protected perimeter.
- All devices connecting to such circuits shall have no connections to conduit or other grounds or other power sources outside the house's protected perimeter.
- All equipment chassis within the house's protected perimeter shall be effectively isolated from stray grounds and bonded to a ground bar at the protection window for the house.

Connect the ground terminals of the suppressors at the window and any remotely located suppressors within the house (e.g. marine radio antenna, main service entrance protector) to this bar using a short, direct route. The bonding conductor between the control desk, motor control center (MCC), all suppressors, and the ground bar must be minimum UL 96A Class II main conductors installed in accordance with the requirements stated above for the lightning protection system. Coordinate the routing of these conductors with the installation of the lightning protection system so as to attempt to maintain minimum 6 feet spacing from the lightning down leads and prevent the necessity of cross-bonding before the ground bar. Route the bonding conductor from the control desk to the MCC and thence to the ground bar. Route all other bonding conductors direct to the ground bar without interconnection except at the ground bar. Nothing herein shall necessitate isolating raceway grounding. Around all raceways at each cabinet entered; field conduit entering the protection window from outside the house perimeter must be bonded to the ground bar in accordance with the lightning protection requirements. The tender house ground bar shall be two-way bonded as specified in UL 96A Paragraph 7.1 (for air

terminals) to the two main down conductors of the lightning protection system. The bonding conductors must be at least equal in size to the down conductors. Bonding connections between the ground bar and down conductors shall be thermo-welded; bolted connections are not acceptable in this circuit.

External to the tender house, isolate equipment chassis within a protected cluster from stray grounds and bond them to a ground bar at the suppressor location for the cluster. Connect the ground terminals of the TVSS protecting the equipment cluster to this bar using a short, direct route. The ground bar for each equipment cluster must interconnect with the electrical "green wire" grounds serving equipment within the cluster.

907-862.04--Measurement. Lightning and Surge Protection will be measured as a per lump sum quantity.

907-862.05--Payment. Lightning and Surge Protection, measured as prescribed above, will be paid for at the contract lump sum price which price shall be full compensation for furnishing and installing the lightning and surge protection equipment for the bascule span; and for furnishing all labor, tools, testing equipment, software, materials, and incidentals necessary to complete the work.

Payment will be made under:

907-862-A: Lightning and Surge Protection - lump sum

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-863-1 **CODE: (SP)**

DATE: 06/10/2020

SUBJECT: Training, Manuals and Spare Parts

Section 907-863, Training, Manuals and Spare Parts is added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-863 – TRAINING, MANUALS AND SPARE PARTS

907-863.01--Description. This special provision shall consist of testing, training and manuals for the movable bridge electrical and mechanical systems installed on the bridge. Testing shall include factory, preliminary and final acceptances. Manuals shall be supplied for both operations and maintenance. Training shall include separate sessions for both the operator and maintenance personnel.

907-863.01.1--Related Provisions. Unless otherwise noted, all work under this special provision shall conform to the requirements of the following special provisions:

- Electrical Work
- Electrical Service
- Auxiliary Electrical Equipment
- Control Console
- Motor Control Center
- PLC Cabinet and Programming
- Span Drives and Motors
- Limits and Sensors
- Submarine Cable
- Lightning and Surge Protection

907-863.02--Materials.

907-863.02.1--Manuals.

907-863.02.1.1--Operator Manuals. Furnish six (6) hard copy operations manuals and four (4) .pdf copies on CD or DVD to the department to be used for operator reference and the training of future operators. Include the following sections, and/or chapters in the operator's manual at a minimum.

1. TABLE OF CONTENTS
   Identify the title of each chapter.
2. CONDENSED OPERATOR INSTRUCTION
   Provide a condensed set of instructions the operator with simple, one (1) to four (4) word, descriptions of each step (for example lower near on-coming gate). Write separate

instructions for manual and automatic operations. With each set of instructions, provide a console layout with the switches and pushbuttons sequence labeled with a number that is associated with the instructions. Provide separate sheets for manual open, manual close, automatic open and automatic close.

3. DETAILED OPERATOR INSTRUCTION
   Write a detailed set of operator instructions that describes every step in the sequence for both manual and automatic operations. Describe, in detail, each step of the operation. Steps in this sequence should include any visual and audio checks of roadway or waterway prior to making a movement.
4. BYPASS INSTRUCTIONS
   Describe how and when to use each bypass switch. Emphasize the dangers of using a bypass and the importance fixing the problem.
5. ALARM LIST
   Include all alarms with their definition.
6. EMERGENCY CALL LIST
   Include a list of local municipality emergency contacts, phone numbers and addresses, department contacts and numbers and the contractor's emergency call number. Consult the department for the key contacts.

907-863.02.1.2--Maintenance Manuals. Furnish six (6) hard copy maintenance manuals and four (4) .pdf copies on CD or DVD to the Department for reference and the training of future maintenance technicians. Include the following sections, and/or chapters in the operator's manual at a minimum.

1. TABLE OF CONTENTS
   Identify the title of each chapter.
2. CONDENSED OPERATOR INSTRUCTION
   Provide a condensed set of instructions the operator with simple, one (1) to four (4) word, descriptions of each step (for example lower near on-coming gate). Write separate instructions for manual and automatic operations. With each set of instructions, provide a console layout with the switches and pushbuttons sequence labeled with a number that is associated with the instructions. Provide separate sheets for manual open, manual close, automatic open and automatic close.
3. DETAILED OPERATOR INSTRUCTION
   Write a detailed set of operator instructions that describes every step in the sequence for both manual and automatic operations. Describe in detail each step of the operation. Steps in this sequence should include any visual and audio checks of roadway or waterway prior to making a movement.
4. BYPASS INSTRUCTIONS
   Describe how and when to use each bypass switch. Emphasize the dangers of using a bypass and the importance fixing the problem.
5. ALARM LIST
   Include all alarms with their definition.
6. EMERGENCY CALL LIST
   Include a list of local municipality emergency contacts, phone numbers and addresses, department contacts and numbers and the contractor's emergency call number. Consult the department for the key contacts to be put on the list.
7. VIDEO AND CAMERA INSTRUCTIONS

Include instructions for setting up presets on cameras, recording video and burning it to DVD.

8. ALARM AND DATA PRINTING AND COPYING INSTRUCTIONS
   Include instructions for printing and copying alarms to DVD.
9. SETPOINT ADJUSTMENTS
   Describe how to adjust setpoints on the operator interface. Include a description of each setpoint, the as-built setting and the range.
10. ELECTRICAL SCHEMATICS
    Fold 11-inch by 17-inch final as-built schematics.
11. HYDRAULIC/MECHANICAL DRAWINGS
    Fold 11-inch by 17-inch final as-built schematics.
12. MOTOR MEGGER READINGS
    Include all motor readings in a table with a column for as-built and a column to be used yearly for the next 20 years.
13. SPARE PARTS LIST
    Furnish a complete list of each spare part, including, their manufacturer and part number and the quantity supplied.
14. COMPLETE PARTS LIST
    Furnish a complete parts list that describes every electrical, mechanical or hydraulic component furnished. Include cutsheets and instruction manuals for all components. Divide the parts into chapters with similar components. Include a cover sheet for each chapter with all part descriptions, their numbers and manufacturer included. A separate binder is recommended for the complete parts list.

907-863.02.2--Spare Parts.

907-863.02.2.1--General. Furnish the following spare parts:

- A minimum two (2) limit and proximity switches of each type installed, including limit lever arms.
- A minimum of one (1) operating coil for every ten (10) of each size contactor installed.
- A minimum of one (1) relay for every ten (10) of each kind and size of control, timing, or overload relay installed.
- A minimum of three (3) heaters for every ten (10) thermal overload relays of each size.
- A minimum of three (3) spare fuses of each size and type used throughout the bridge
- A minimum of ten (10) spare indicator lamps of every type used. Include lamp extractor(s).
- A minimum of one (1) PLC card for every five (5) of each type installed, including power supplies, I/O cards and communication modules.
- A minimum of one (1) power supply, electronic module and/or converter for every five (5) of each type installed.
- One (1) spare Inclinometer
- One (1) complete camera assembly with cables, lens, lens filters, transient suppressors, power supplies, manuals and accessories.
- Other spare parts as called out in individual sections.
- One (1) spare traffic gate arm (complete with lights, and striping) in proper length
- One (1) spare traffic gate arm fiberglass end extension. (if part of standard gate arm)

- One (1) spare gate operator motor and gearbox for each type of gate installed.
- For interior and walkway lights, ten (10) spare lamps of each size and type used.
- For flood lights – one (1) spare lamp of each size and type used.
- For Navigational lights – two (2) spare bulbs of each size, type and color used.
- One (1) spare ballast of each size and type used.

Provide spare parts in sealed, uniform-sized cartons, with typed and clearly varnished labels to indicate their contents, and store them in a lockable box. Also, provide a directory of permanent type describing the parts. The directory must state the name of each part, the manufacturer's number, and the rating of the device for which the part is a spare. Mark spare parts to correspond with their respective item numbers as indicated on the elementary wiring diagram. Plastic laminate and store in the same cabinet the schematic diagrams for the control console.

907-863.02.2.2--Mechanical Spare Parts.

907-863.02.2.2.1--Spare Lubricant. Furnish the bridge with an appropriate amount of proper lubricant. Store the lubricant in steel containers at room temperature. Store, at the site, the following amounts of additional lubricant:

Gear Reducer Oil:	55 gallons
Open Gear Grease:	20 pounds
Bearing Grease:	20 pounds
Gear Coupling Lubricant:	5 pounds

Keep the lubricant for each type of machinery component separately in clearly marked containers. Take all measure necessary to prevent lubricant contamination.

907-863.02.2.2.2--Spare Parts and Tools. Provide the following spare parts and tools to the department, along with all spare parts required in other articles. Spare parts and tools are considered incidental to the component to which they apply and will be paid for as such.

- Two (2) wrenches, drop forged steel, of a standard tool manufacturer, for all fasteners larger than 1½ inches.
- One (1) set of seals for all speed reducer shafts.
- One (1) tool box of suitable size for the wrenches provided.
- One (1) breather for each reducer provided.

907-863.02.2.3--Spare Parts for Rear Locks. Supply spare parts for the rear lock hydraulic system as required in the plans or herein.

Provide one (1) spare of the following items:

- Hydraulic cylinder with quick disconnect fittings.
- Hydraulic filter element
- Pressure gauge
- Hydraulic hoses, one of each length

907-863.03--Construction.

907-863.03.1--Manuals. Bind all manuals in white three-ring binders. Use plastic dividers with tabs to divide each chapter. Use reinforced edge sheets for all copies for binder holes. Number all pages with the chapter and page (for example II-4).

Label the edge of each binder with a type written label with the title of manual and the bridge name. Label the front cover with a type written sheet indicating the title, the bridge name, structure number, project and date.

907-863.03.2--Training.

907-863.03.2.1--Operator Training. Provide Operator training in two (2) 8-hour sessions held at the bridge. Design each session for up to six (6) people. Provide a syllabus, a copy of the operator instructions, a pad of paper and pen to each trainee.

1. INTRODUCTION
   Start each session shall start with a brief description of the work performed and the features of the bridge. Following the description, open the bridge as a demonstration. Provide a tour of near side piers and machinery rooms.
2. OPERATOR INSTRUCTIONS
   Explain the operation of the bridge using the instructions as an aide. Discuss and demonstrate each mode of operation. Demonstrate how to use the HMI operator station including how to interpret and acknowledge the alarms.
3. TRAINEE OPENINGS
   Each trainee will be required to open the bridge at least four (4) times: two (2) of the four (4) openings under normal automatic mode; one (1) opening using manual mode; and the last operation using a bypass. During the bypass operation, create a simple scenario that would require the use of a bypass. The scenarios shall be simple and should not risk damage to equipment. Before using the bypass, investigate the problem to determine if it is safe to operate. Record each opening with time, date, operator, and a witness for a record of the training.
4. SUMMARY
   At the end of the day, summarize the training and emphasize the use of indications and the operator interface to diagnose a problem.

907-863.03.2.2--Maintenance Training. Provide Maintenance training in two (2) 8-hour sessions. Design one (1) session for the classroom and one (1) session at the bridge for up to eight (8) people. Provide a syllabus, a copy of the operator instructions, a pad of paper and pen to each trainee.

CLASSROOM

1. INTRODUCTION
   Start each session shall start with a brief description of the work performed and the features of the bridge.
2. OPERATOR INSTRUCTIONS
   Explain the operation of the bridge using the instructions as an aide.

3. MECHANICAL
   Include an overview of the mechanical gearing, brakes and hydraulic rear lock systems. Provide a lubrication schedule and instructions on how to properly lubricate each item.
4. ELECTRICAL
   Explain how to read and use the electrical schematics to locate problems.
5. PLC
   Provide a brief description of a PLC and how to interpret a rung of logic. Include a demonstration on how to access the online programming.
6. VIDEO STORAGE
   Provide an overview of the video camera control and storage system.

BRIDGE

1. BRIDGE TOUR
   Prior to the tour, open the bridge to demonstrate the operation. Tour the near side pier, roadway and machinery rooms.
2. TRAINEE OPENINGS
   Each trainee will be required to open the bridge at least one time in automatic mode.
3. MECHANICAL/HYDRAULIC
   Demonstrate how to lubricate the bridge, isolate hydraulic valves and how to maintain and repair the mechanical and hydraulic equipment on the bridge.
4. ELECTRICAL
   Demonstrate where and how to isolate power, adjust limits, adjust cameras, connect to the PLC and print reports.
5. TROUBLESHOOTING AIDES
   Explain and demonstrate control system aides such as indicator lights, alarms and data logs. Create at least four scenarios that prevent bridge operation and have the trainees use the aides to identify and repair the problem.

907-863.03.2.3--Submittals. Submit PDF sample copies of each manual and a training syllabus for approval prior to any training.

907-863.04--Measurement. Training, Manuals and Spare Parts will be measured as a lump sum quantity.

907-863.05--Payment. Training, Manuals and Spare Parts, measured as prescribed above, will be paid for at the contract lump sum price which price shall be full compensation for furnishing manuals and spare parts and providing training to operators and maintenance personnel.

Payment will be made under:

907-863-A: Training, Manuals and Spare Parts - lump sum

SPECIAL PROVISION NO. 906-8

Training Special Provision

This Training Special Provision supersedes subparagraph 7b of the Special Provision entitled "Specific Equal Employment Opportunity Responsibilities," (Attachment 1), and is in implementation of 23 U.S.C. 140(a). Additional information regarding On the Job Training (OJT), Forms, and *Exhibits* are available at the following website.

http://www.gomdot.com/Divisions/CivilRights/Resources.aspx

As part of the Contractor's equal employment opportunity affirmative action program training shall be provided as follows:

The Contractor shall provide on-the-job training aimed at developing full journeymen in the type of trade or job classification involved.

The number of trainee hours to be trained under this special provision will be as indicated in the bid schedule of the contract.

In the event that a Contractor subcontracts a portion of the contract work, the Contractor shall determine how many, if any, of the trainee hours are to be trained by the Subcontractor, provided, however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also insure that this training special provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing construction, the Contractor shall submit to the State transportation agency for approval an OJT Trainee Schedule Form indicating the number of trainees to be trained in each selected classification, training program to be used and start date of training for each classification. Furthermore, the Contractor shall provide a Trainee Enrollment Form for each trainee enrolled. The Contractor will be credited for each trainee employed on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeymen status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that they take in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he/she has successfully completed a training course leading to journeyman status or in which he/she has been employed as a journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by the State highway agency and the

Federal Highway Administration. The State transportation agency and the Federal Highway Administration shall approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office.

Except as otherwise noted below, the Contractor will be reimbursed $5.00 per hour of training given an employee on this contract in accordance with an approved training program. As approved by the engineer, reimbursement will be made for training persons in excess of the number specified herein.

No payment shall be made to the Contractor if failure to provide the required training is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee will begin training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in the work classification or until the trainee has completed the training program. It is not required that all trainees be on board for the entire length of the contract. A Contractor's responsibility will have been fulfilled under this Training Special Provision if the Contractor has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The Contractor shall furnish the trainee a copy of the program being followed in providing the training. The Contractor shall provide each trainee with a certification showing the type and length of training satisfactorily completed.

The Contractor will provide for the maintenance of records and furnish periodic reports to include an OJT Trainee Monthly Report form and an OJT Trainee Termination Report form when appropriately documenting performance under this Training Special Provision.

Contractor's Responsibility

1. Provide On-the-Job Training aimed at developing full journeymen in the type of trade or job classification involved. Accordingly, the Contractor shall make every effort to enroll minority trainees and women (e.g., conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment.

2. Contractors are expected to fulfill their obligations under the Training Special Provisions. Those obligations will be considered fulfilled if Contractors have provided acceptable training to the number of trainees specified in the OJT Plan.

3. Upon deciding to sub-contract out a portion of the contract work, determine how many, if any, of the trainees are to be trained by the sub-Contractor. The Contractor however, shall retain the primary responsibility for meeting the training requirements imposed by the special provision. Additionally, the Contractor will ensure that the Training Special Provision is made applicable to such sub-contract. Training and upgrading of minorities and women toward journeymen status is a primary objective of the Training Special Provision.

4. Prior to commencing construction (no more than 60 days from the date of the Notice to Proceed), the Contractor shall submit to the State Transportation Agency (STA) (MDOT) for approval the Trainee Schedule Form indicating the number of trainees to be trained in each selected classification and any appropriate attachments representing their training program or OJT Plan *(See Exhibit 1)* to be used. The Contractor shall also submit Trainee Enrollment Forms for each trainee to be trained *(See Exhibit 2).* Contractors should submit the above-mentioned forms as their OJT Plan to the Project Engineer who will in turn forward on to the Office of Civil Rights for Approval.

5. Designate and make known at the preconstruction conference to the Office of Civil Rights and the Project Engineer the name of the company **Equal Employment Officer (EEO Officer)/Designated Representative** who will have the responsibility for and must be capable of effectively administering and promoting an active Contractor program of equal employment opportunity and who must be assigned adequate authority and responsibility to do so. These individuals should have the authority to sign monthly trainee enrollment/time reports.

6. **Implement the EEO policy** and contractual responsibilities to provide equal employment opportunity in each grade and classification of employment. To assure that the preceding policy is adhered to, the following actions will be taken as a minimum:

   a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six (6) months.

   b. Ensure that supervisors brief all employees which include trainees on company EEO Policies.

7. Utilize the following procedures to request additional training classifications not presently approved by the STA for assignment to the OJT for training.

   a. Initially, for a "trainee" to be trained, there must be a "journeyman" on the project site to train the employee. The "trainer" can be a supervisor, foreman or another employee in the "trainee classification" who already is a "journeyman".

b. If a classification is not on the "Wage Determination" included in the contract, a written request for an additional classification should be submitted by the Contractor to the Project Engineer.

c. Preferably, the request (written) should originate in the Project Office so that they will know that the Contractor has applied for the needed classification and that payrolls will not be delayed. The Project Office will ensure that they have been given the project number, Contractor, subcontractor, craft and rate and will submit to the Office of Civil Rights.

For documentation purposes it is recommended to the Contractor that the request for additional classifications should be written and addressed to the Office of Civil Rights that states in concise manner the need for the new classification in lieu of using an existing classification within the OJT Manual. In addition, the training program with required hours and job description similar to the OJT Manual.

d. After receipt of the Request for Additional Classification, the OJT Coordinator will:

1. Review for preliminary approval and submit a new Trainee Schedule Form to the Contractor for signature.

2. Upon receipt of the signed form from the Project Office/Contractor, a cover letter is attached to the appropriate documentation. The cover letter and documentation are transmitted to Department of Labor (DOL) in Washington D.C. requesting concurrence of the new classification.

e. If an individual is hired for the requested classification during the time frame when the STA (OJT Coordinator) is awaiting approval, the individual will be paid at the proposed wage rate.

f. If the DOL does not agree with the proposed classification and wage rate, the DOL will make a determination on the appropriate wage rate for the classification. The Labor Compliance Officer will make a copy of the letter and attach a cover letter which cites the recommendation and rationale for the disapproval.

g. If the DOL approves the request, a letter will be sent to the STA (OJT Coordinator) citing approval and the accompanying wage rate. The OJT Coordinator will make a copy of the approval letter and attach a cover letter which cites the approval of the classification and wage rate. This letter is sent to the Contractor and all "paper copies" listed at the end of the cover letter.

8. Begin training as soon as possible after the start date indicated on the Trainee Schedule Form for work utilizing the skill involved. In addition, if training does not begin at the preceding time, a written explanation will be given to the Project Engineer citing the rationale and time frame when training will commence on the project. The trainee should be briefed (furnished a copy) at this juncture on the training program for which he/she has started to ensure understanding of the phases of work and wage rates within each section of the program.

9. After commencement of work at the project site, the Contractor shall implement the following **Trainee Wage Rates** according to the Davis Bacon rules.

Normally, trainees are paid a percentage of journeyman's wages (Davis Bacon rates). The following payment plan is required in the FHWA Training Special Provision;

a. Sixty percent (60%) of the journeyman's wages for the first half of the training period;

b. Seventy-five percent (75%) of the journeyman's wages for the third quarter of the training period; and

c. Ninety percent (90%) of the journeyman's wages for the last quarter of the training period.

10. Indicate on the payroll records the trainer i.e. roller operator trainer for a given classification.

11. Recruit a replacement for the trainee when training obligations have not been met on a project provided that there are enough work hours remaining on the project as well as time within the work phase to complete training. Contractors will document in writing all Good Faith Efforts (GFE) in accordance with FHWA Form 1273 Section II 4a- 4e Recruitment and 6a-6d Training and Promotions) *(See Exhibit 9)*. The Contractor must submit documentation of GFE i.e. efforts made to hire replacements for trainees who terminated their training program to the Office of Civil Rights. The GFE will be complied into a letter which is attached to the MDOT Monthly Training Report and submitted to the along a MDOT Termination Report *(See Exhibit 4)* that includes the names/reasons of individuals who separated from the company during the respective reporting period. The GFE will be evaluated to determine if it is sufficient or insufficient. The Project Engineer will forward documentation to the Office of Civil Rights within five (5) days of receipt.

12. Transferring trainees from one federal-aid project to another.

a. Contractors are to make written requests for transferring trainees from one federal-aid project to another federal aid project and submit to the Project Engineer to be forwarded to the Office of Civil Rights for review and approval.

b. In addition, if trainees are approved for transfer, the gaining project must have the same training classification approved for that project. The Contractor must provide documentation i.e. written letter that the gaining project will have sufficient work time to complete training requirements.

c. All hours trained by employees on a project other than their originally assigned project without the proper transfer approval will not be counted towards the OJT obligation for that project. If the OJT obligation is not met, the prime Contractor will have to show good faith efforts in fulfilling this portion of the contract requirement.

13. Utilize and submit monthly trainee reports *(See Exhibit 3)* to document training activities to the respective Project Engineer. Monthly training reports should be accurate, concise and include the following items:

a. Report Period (month) – the date at the top of the training report reflects the month and year the trainee received the training (not the date the report was completed by the Contractor)

b. Project Number – project number on the certified payroll and training report should match

c. Contractor Name

d. County

e. Trainee Name

f. Job Classification/Hours Required – obtained from OJT Manual - certified payrolls and training reports should match

g. Hours required – obtained from OJT Manual should match the Job Classification

h. Date Training Started/Terminated – inserted by the Contractor

i. Hours trained for the month – training performed this month on federal aid projects and inserted by a respective week ending date i.e. Sunday

j. Hours to date – all training annotated on report for previous and current month

k. Hours training remaining – subtraction of total training hours to date from training hours required

l. Trainee wage rate – Contractor cite the appropriate wage rate for phase of training

m. Original signatures and dates for respective training period citing trainee, trainer, and Company EEO Officer/Designated Representative

n. Every applicable field on the training report is completed

14. Monthly training reports intended for submission to the MDOT Central Office should cite activities illustrated in the individual training forms received from project personnel. Failure of the Contractor to submit monthly trainee reports may result in the estimate not being processed and paid. Monthly Training Reports should be submitted to the Project Engineer within fifteen (15) days of the current month with data covering the previous month's activities. However, if monthly training reports are not submitted within this time frame, the Contractor will provide written explanation to the Project Engineer citing the reason for the delay. In addition, a copy of this documentation will be provided to the MDOT Office of Civil Rights within ten (10) days of receipt by the Project Engineer.

15. Provide the trainee with a certification *(See Exhibit 7)* showing the type and length of training satisfactorily completed.

16. Retain all EEO records, i.e. employment breakdown by race and craft on a project, recruitment and hiring of minority and females for a period of three (3) years following the completion of contract work and shall be available at reasonable times and places for inspection by authorized representatives of the STA and the FHWA.

17. Submit an annual report to the STA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form PR 1391 *(See Exhibit 8)*. Contractors are provided an annual notice for this reporting requirement.

18. Periodically evaluate the effectiveness of their OJT Programs and trainees' progress within the training program. Based on these evaluations, forward comments / recommendations through the Project Engineer to the Office of Civil Rights for improving or correcting deficiencies in the training program.

S E C T I O N 9 0 5 - P R O P O S A L

Date _____

Mississippi Transportation Commission
Jackson, Mississippi

Sirs: The following proposal is made on behalf of _____
_____ of _____
_____
for constructing the following designated project(s) within the time(s) hereinafter specified.

The plans are composed of drawings and blue prints on file in the offices of the Mississippi Department of Transportation, Jackson, Mississippi.

The Specifications are the current Standard Specifications of the Mississippi Department of Transportation approved by the Federal Highway Administration, except where superseded or amended by the plans, Special Provisions and Notice(s) to Bidders attached hereto and made a part thereof.

I (We) certify that I (we) possess a copy of said Standard and any Supplemental Specifications.

Evidence of my (our) authority to submit the Proposal is hereby furnished. The proposal is made without collusion on the part of any person, firm or corporation. I (We) certify that I (we) have carefully examined the Plans, the Specifications, including the Special Provisions and Notice(s) to Bidders, herein, and have personally examined the site of the work. On the basis of the Specifications, Special Provisions, Notice(s) to Bidders, and Plans, I (we) propose to furnish all necessary machinery, tools, apparatus and other means of construction and do all the work and furnish all the materials in the manner specified. I (We) understand that the quantities mentioned herein are approximate only and are subject to either increase or decrease, and hereby propose to perform any increased or decreased quantities of work at the unit prices bid, in accordance with the above.

I (We) acknowledge that this proposal will be found irregular and/or non-responsive unless a certified check, cashier's check, or Proposal Guaranty Bond in the amount as required in the Advertisement (or, by law) is submitted electronically with the proposal or is delivered to the Contract Administration Engineer prior to the bid opening time specified in the advertisement.

INSTRUCTION TO BIDDERS: Alternate and Optional Items on Bid Schedule.

1. Two or more items entered opposite a single unit quantity WITHOUT DEFINITE DESIGNATION AS "ALTERNATE ITEMS" are considered as "OPTIONAL ITEMS". Bidders may or may not indicate on bids the Optional Item proposed to be furnished or performed WITHOUT PREJUDICE IN REGARD TO IRREGULARITY OF BIDS.
2. Items classified on the bid schedule as "ALTERNATE ITEMS" and/or "ALTERNATE TYPES OF CONSTRUCTION" must be preselected and indicated on bids. However, "Alternate Types of Construction" may include Optional Items to be treated as set out in Paragraph 1, above.
3. Optional items not preselected and indicated on the bid schedule MUST be designated in accordance with Subsection 102.06 prior to or at the time of execution of the contract.
4. Optional and Alternate items designated must be used throughout the project.

I (We) further propose to perform all "force account or extra work" that may be required of me (us) on the basis provided in the Specifications and to give such work my (our) personal attention in order to see that it is economically performed.

I (We) further propose to execute the attached contract agreement (Section 902) as soon as the work is awarded to me (us), and to begin and complete the work within the time limit(s) provided for in the Specifications and Advertisement. I (We) also propose to execute the attached contract bond (Section 903) in an amount not less than one hundred (100) percent of the total of my (our) part, but also to guarantee the excellence of both workmanship and materials until the work is finally accepted.

I (We) shall submit electronically with our proposal or deliver prior to the bid opening time a certified check, cashier's check or bid bond for **five percent (5%) of total bid** and hereby agree that in case of my (our) failure to execute the contract and furnish bond within Ten (10) days after notice of award, the amount of this check (bid bond) will be forfeited to the State of Mississippi as liquidated damages arising out of my (our) failure to execute the contract as proposed. It is understood that in case I am (we are) not awarded the work, the check will be returned as provided in the Specifications.

SECTION 905 -- PROPOSAL (CONTINUED)

I (We) hereby certify by digital signature and electronic submission via Bid Express of the Section 905 proposal below, that all certifications, disclosures and affidavits incorporated herein are deemed to be duly executed in the aggregate, fully enforceable and binding upon delivery of the bid proposal. I (We) further acknowledge that this certification shall not extend to the bid bond or alternate security which must be separately executed for the benefit of the Commission. This signature does not cure deficiencies in any required certifications, disclosures and/or affidavits. I (We) also acknowledge the right of the Commission to require full and final execution on any certification, disclosure or affidavit contained in the proposal at the Commission's election upon award. Failure to so execute at the Commission's request within the time allowed in the Standard Specifications for execution of all contract documents will result in forfeiture of the bid bond or alternate security.

Respectfully Submitted,

DATE _____

_____
Contractor

BY _____
Signature

TITLE _____

ADDRESS _____

CITY, STATE, ZIP _____

PHONE _____

FAX _____

E-MAIL _____

(To be filled in if a corporation)

Our corporation is chartered under the Laws of the State of _____ and the names, titles and business addresses of the executives are as follows:

_____
President Address

_____
Secretary Address

_____
Treasurer Address

The following is my (our) itemized proposal.

Bascule Bridge Rehabilitation on SR 605 over Industrial Waterway (Bridge No. 3.5), known as Federal Aid Project No. BR-9371-01(001) / 107505301 in Harrison County.

Line no.	Item Code	Adj Code	Quantity	Units	Description[Fixed Unit Price]
				Roadway Items	
0010	202-B007		288	Square Yard	Removal of Asphalt Pavement, All Depths
0020	202-B013		288	Square Yard	Removal of Base
0030	202-B050		324	Linear Feet	Removal of Concrete Combination Curb & Gutter
0040	202-B241		2	Mile	Removal of Traffic Stripe
0050	203-EX017	(E)	96	Cubic Yard	Borrow Excavation, AH, FME, Class B7
0060	213-C001		1	Ton	Superphosphate
0070	216-A001		216	Square Yard	Solid Sodding
0080	219-A001		4	Thousand Gallon	Watering ($20.00)
0090	230-B022		4	Each	Tree Planting, Crape Myrtle
0100	403-A005	(BA1)	95	Ton	19-mm, MT, Asphalt Pavement
0110	407-A001	(A2)	17	Gallon	Asphalt for Tack Coat
0120	503-C010		10	Linear Feet	Saw Cut, Full Depth
0130	609-D008	(S)	324	Linear Feet	Combination Concrete Curb and Gutter Type 3A
0140	618-A001		1	Lump Sum	Maintenance of Traffic
0150	618-B001		1	Square Feet	Additional Construction Signs ($10.00)
0160	619-A1007		10,194	Linear Feet	Temporary Traffic Stripe, Continuous White, Type 1 or 2 Tape
0170	619-A2008		10,112	Linear Feet	Temporary Traffic Stripe, Continuous Yellow, Type 1 or 2 Tape
0180	619-C6001		40	Each	Red-Clear Reflective High Performance Raised Marker
0190	619-C7001		220	Each	Two-Way Yellow Reflective High Performance Raised Marker
0200	619-E1001		2	Each	Flashing Arrow Panel, Type C
0210	619-F1001		2,182	Linear Feet	Concrete Median Barrier, Precast
0220	619-F1002		160	Linear Feet	Portable Median Barrier
0230	619-F2001		1,881	Linear Feet	Remove and Reset Concrete Median Barrier, Precast
0240	619-F2002		160	Linear Feet	Remove and Reset Portable Median Barrier
0250	619-G4005		228	Linear Feet	Barricades, Type III, Single Faced
0260	619-G5001		87	Each	Free Standing Plastic Drums
0270	619-G7001		20	Each	Warning Lights, Type "B"
0280	619-H1001		1	Lump Sum	Traffic Signals
0290	619-J1001		2	Each	Impact Attenuator, 40 MPH
0300	619-J2001		1	Each	Impact Attenuator, 40 MPH, Replacement Package
0310	619-J3001		2	Each	Remove and Reset Impact Attenuator
0320	620-A001		1	Lump Sum	Mobilization
0330	626-A002		3,109	Linear Feet	6" Thermoplastic Double Drop Traffic Stripe, Skip White
0340	626-B001		3,078	Linear Feet	6" Thermoplastic Double Drop Traffic Stripe, Continuous White
0350	626-C001		3,018	Linear Feet	6" Thermoplastic Double Drop Edge Stripe, Continuous White

Line no.	Item Code	Adj Code	Quantity	Units	Description[Fixed Unit Price]
0360	626-D002		923	Linear Feet	6" Thermoplastic Double Drop Traffic Stripe, Skip Yellow
0370	626-E002		1,562	Linear Feet	6" Thermoplastic Double Drop Traffic Stripe, Continuous Yellow
0380	626-F002		1,306	Linear Feet	6" Thermoplastic Double Drop Edge Stripe, Continuous Yellow
0390	626-G004		814	Linear Feet	Thermoplastic Double Drop Detail Stripe, White
0400	626-G005		300	Linear Feet	Thermoplastic Double Drop Detail Stripe, Yellow
0410	626-H001		280	Square Feet	Thermoplastic Double Drop Legend, White
0420	627-K001		165	Each	Red-Clear Reflective High Performance Raised Markers
0430	627-L001		116	Each	Two-Way Yellow Reflective High Performance Raised Markers
0440	628-L002		108	Square Feet	High Performance Cold Plastic Legend, White
0450	907-619-E3001		20	Each	Changeable Message Sign
0460	907-906001		720	Hours	Trainees ($5.00)
				ALTERNATE GROUP AA NUMBER 1	
0470	304-F001	(GT)	130	Ton	3/4" and Down Crushed Stone Base
				ALTERNATE GROUP AA NUMBER 2	
0480	304-F002	(GT)	130	Ton	Size 610 Crushed Stone Base
				ALTERNATE GROUP AA NUMBER 3	
0490	304-F003	(GT)	130	Ton	Size 825B Crushed Stone Base
				ALTERNATE GROUP BB NUMBER 1	
0500	907-624-A002		2,867	Linear Feet	6" Inverted Profile Thermoplastic Traffic Stripe, Skip White
0510	907-624-B002		5,733	Linear Feet	6" Inverted Profile Thermoplastic Traffic Stripe, Continuous White
0520	907-624-D002		2,867	Linear Feet	6" Inverted Profile Thermoplastic Traffic Stripe, Continuous Yellow
				ALTERNATE GROUP BB NUMBER 2	
0530	628-G001		2,867	Linear Feet	6" High Performance Cold Plastic Traffic Stripe, Skip White
0540	628-H001		5,733	Linear Feet	6" High Performance Cold Plastic Traffic Stripe, Continuous White
0550	628-J001		2,867	Linear Feet	6" High Performance Cold Plastic Traffic Stripe, Continuous Yellow
				Bridge Items	
0560	413-C001		500	Linear Feet	Cleaning and Sealing Cracks
0570	602-A001	(S)	2,543	Pounds	Reinforcing Steel
0580	607-B035		78	Linear Feet	96" Type I Chain Link Fence, Class I
0590	803-C003	(S)	342	Linear Feet	16" x 16" Prestressed Concrete Piling
0600	810-A006	(S)	5,618	Pounds	Structural Steel, A 709, Grade 50
0610	812-A001	(S)	16	Square Feet	Steel Grid Floor, Open Type
0620	814-A001	(S)	1	Lump Sum	Painting of Metal Structures
0630	907-258-PP006		1	Lump Sum	Building Amenities,
0640	907-804-A002	(S)	16	Cubic Yard	Bridge Concrete, Class AA
0650	907-824-PP004		1	Lump Sum	Bridge Repair, Add Generator Access
0660	907-824-PP004		1	Lump Sum	Bridge Repair, Bird Deterrent
0670	907-824-PP004		1	Lump Sum	Bridge Repair, Concrete Repair
0680	907-824-PP004		1	Lump Sum	Bridge Repair, Fender System

Line no.	Item Code	Adj Code	Quantity	Units	Description[Fixed Unit Price]
0690	907-824-PP004		1	Lump Sum	Bridge Repair, Remove & Replace Live Load Uplift Bearings
0700	907-824-PP004		1	Lump Sum	Bridge Repair, Remove & Replace Warning Gates
0710	907-824-PP004		1	Lump Sum	Bridge Repair, Steel Crack Repair
0720	907-850-A001		1	Lump Sum	Mechanical Work
0730	907-851-A001		1	Lump Sum	Span Balancing
0740	907-853-A001		1	Lump Sum	Electrical Work
0750	907-854-A001		1	Lump Sum	Electrical Service
0760	907-855-A001		1	Lump Sum	Auxiliary Electrical Equipment
0770	907-856-A001		1	Lump Sum	Control Console
0780	907-857-A001		1	Lump Sum	Motor Control Center
0790	907-858-A001		1	Lump Sum	PLC Cabinet and Programming
0800	907-859-A001		1	Lump Sum	Span Drives and Motors
0810	907-860-A001		1	Lump Sum	Limits and Sensors
0820	907-861-A001		1	Lump Sum	Submarine Cables
0830	907-862-A001		1	Lump Sum	Lightning and Surge Protection
0840	907-863-A001		1	Lump Sum	Training, Manuals, and Spare Parts

CONDITIONS FOR COMBINATION BID

If a bidder elects to submit a combined bid for two or more of the contracts listed for this month's letting, the bidder must complete and execute these sheets of the proposal in each of the individual proposals to constitute a combination bid. In addition to this requirement, each individual contract shall be completed, executed and submitted in the usual specified manner.

Failure to execute this Combination Bid Proposal in each of the contracts combined will be just cause for each proposal to be received and evaluated as a separate bid.

It is understood that the Mississippi Transportation Commission not only reserves the right to reject any and all proposals, but also the right to award contracts upon the basis of lowest separate bids or combination bids most advantageous to the State.

It is further understood and agreed that the Combination Bid Proposal is for comparison of bids only and that each contract shall operate in every respect as a separate contract in accordance with its proposal and contract documents.

I (We) agree to complete each contract on or before its specified completion date.

* *

COMBINATION BID PROPOSAL

This proposal is tendered as one part of a Combination Bid Proposal utilizing option ___* of Subsection 102.11 on the following contracts:

* Option to be shown as either (a), (b), or (c).

	Project No.	County		Project No.	County
1.	______________	______________	6.	______________	______________
2.	______________	______________	7.	______________	______________
3.	______________	______________	8.	______________	______________
4.	______________	______________	9.	______________	______________
5.	______________	______________	10.	______________	______________

(a) If Combination A has been selected, your Combination Bid is complete.

(b) If Combination B has been selected, then complete the following page.

SECTION 905 - COMBINATION BID PROPOSAL (Continued)

Project Number	Pay Item Number	Unit	Unit Price Reduction	Total Item Reduction	Total Contract Reduction
1. _____	_____	_____	_____	_____	
2. _____	_____	_____	_____	_____	
3. _____	_____	_____	_____	_____	
4. _____	_____	_____	_____	_____	
5. _____	_____	_____	_____	_____	
6. _____	_____	_____	_____	_____	
7. _____	_____	_____	_____	_____	
8. _____	_____	_____	_____	_____	

Project Number	Pay Item Number	Unit	Unit Price Reduction	Total Item Reduction	Total Contract Reduction
9. _____	_____ _____	_____ _____	_____ _____	_____ _____	
10. _____	_____ _____	_____ _____	_____ _____	_____ _____	

(c) If Combination C has been selected, then initial and complete ONE of the following.

_____ I (We) desire to be awarded work not to exceed a total monetary value of $ _____.

_____ I (We) desire to be awarded work not to exceed _____ number of contracts.

Certification with regard to the Performance of Previous Contracts or Subcontracts subject to the Equal Opportunity Clause and the filing of Required Reports

The Bidder hereby certifies that he has ____, has not ____, participated in a previous contract or subcontract subject to the Equal Opportunity Clause, as required by Executive Orders 10925, 11114, or 11246, and that he has ____, has not ____, filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

_____
(COMPANY)

DATE: _____

NOTE: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7 (b) (1)), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the Equal Opportunity Clause. Contracts and Subcontracts which are exempt from the Equal Opportunity Clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of $10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime Contractors and Subcontractors who have participated in a previous contract or subcontract subject to the Executive orders and have not filed the required reports should note that 41 CFR 60-1.7 (b) (1) prevents the award of contracts and subcontracts unless such Contractors submit a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U. S. Department of Labor.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

CERTIFICATION

I,_____,
(Name of person signing bid)

individually, and in my capacity as_____ of
(Title of person signing bid)

_____do hereby certify under
(Name of Firm, partnership, or Corporation)

penalty of perjury under the laws of the United States and the State of Mississippi that_____

_____, Bidder
(Name of Firm, Partnership, or Corporation)

on Project No. **BR-9371-01(001)/ 107505301000**

in **Harrison** County(ies), Mississippi, has not either

directly or indirectly entered into any agreement, participated in any collusion; or otherwise taken any action in restraint of free competitive bidding in connection with this contract; nor have any of its corporate officers or principal owners.

Except as noted hereafter, it is further certified that said legal entity and its corporate officers, principal owners, managers, auditors and others in a position of administering federal funds:

a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in (b) above; and

d) Have not within a three-year period preceding this application/ proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

Do exceptions exist and are made a part thereof? Yes / No

Any exceptions shall address to whom it applies, initiating agency and dates of such action.

Note: Exceptions will not necessarily result in denial of award but will be considered in determining bidder responsibility. Providing false information may result in criminal prosecution or administrative sanctions.

The bidder further certifies that the certification requirements contained in Section XI of Form FHWA 1273, will be or have been included in all subcontracts, material supply agreements, purchase orders, etc. except those procurement contracts for goods or services that are expected to be less than the Federal procurement small purchase threshold fixed at 10 U.S.C. 2304(g) and 41 U.S.C. 253(g) (currently $25,000) which are excluded from the certification requirements.

The bidder further certifies, to the best of his or her knowledge and belief, that:

1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this contract, Standard Form-LLL, Disclosure Form to Report Lobbying, in accordance with its instructions will be completed and submitted.

The certification contained in (1) and (2) above is a material representation of fact upon which reliance is placed and a prerequisite imposed by Section 1352, Title 31, U.S. Code prior to entering into this contract. Failure to comply shall be subject to a civil penalty of not less than $10,000 and not more than $100,000. The bidder shall include the language of the certification in all subcontracts exceeding $100,000 and all subcontractors shall certify and disclose accordingly.

All of the foregoing is true and correct.

Executed on _____ _____

Signature

(01/2016 F)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SAM.GOV Registration and DUNS Number

Bidders are advised that the Prime Contractor must maintain current registration in the **System for Award Management** (http://www.sam.gov) at all times during the project. A Dun and Bradstreet Data Universal Numbering System (DUNS) Number (http://www.dnb.com) is one of the requirements for registration in the System for Award Management.

Bidders are advised that prior to the award of this contract, they MUST be registered in the System for Award Management.

I (We) acknowledge that this contract cannot be awarded if I (We) are not registered in the System for Award Management prior to the award of this contract. _____ (Yes / No)

I (We) have a DUNS Number . _____ (Yes / No)

DUNS Number: _____

Company Name: _____

Company e-mail address: _____

(6/2015F)

SECTION 902

CONTRACT FOR **BR-9371-01(001)/ 107505301000**

LOCATED IN THE COUNTY(IES) OF **Harrison**

STATE OF MISSISSIPPI,
COUNTY OF HINDS

This contract entered into by and between the Mississippi Transportation Commission on one hand, and the undersigned contractor, on the other witnesseth;

That, in consideration of the payment by the Mississippi Transportation Commission of the prices set out in the proposal hereto attached, to the undersigned contractor, such payment to be made in the manner and at the time of times specified in the specifications and the special provisions, if any, the undersigned contractor hereby agrees to accept the prices stated in the proposal in full compensation for the furnishing of all materials and equipment and the executing of all the work contemplated in this contract.

It is understood and agreed that the advertising according to law, the Advertisement, the instructions to bidders, the proposal for the contract, the specifications, the revisions of the specifications, the special provisions, and also the plans for the work herein contemplated, said plans showing more particularly the details of the work to be done, shall be held to be, and are hereby made a part of this contract by specific reference thereto and with like effect as if each and all of said instruments had been set out fully herein in words and figures.

It is further agreed that for the same consideration the undersigned contractor shall be responsible for all loss or damage arising out of the nature of the work aforesaid; or from the action of the elements and unforeseen obstructions or difficulties which may be encountered in the prosecution of the same and for all risks of every description connected with the work, exceptions being those specifically set out in the contract; and for faithfully completing the whole work in good and workmanlike manner according to the approved Plans, Specifications, Special Provisions, Notice(s) to Bidders and requirements of the Mississippi Department of Transportation.

It is further agreed that the work shall be done under the direct supervision and to the complete satisfaction of the Executive Director of the Mississippi Department of Transportation, or his authorized representatives, and when Federal Funds are involved subject to inspection at all times and approval by the Federal Highway Administration, or its agents as the case may be, or the agents of any other Agency whose funds are involved in accordance with those Acts of the Legislature of the State of Mississippi approved by the Governor and such rules and regulations issued pursuant thereto by the Mississippi Transportation Commission and the authorized Federal Agencies.

The Contractor agrees that all labor as outlined in the Special Provisions may be secured from list furnished by

It is agreed and understood that each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and this contract shall be read and enforced as though it were included herein, and, if through mere mistake or otherwise any such provision is not inserted, then upon the application of either party hereto, the contract shall forthwith be physically amended to make such insertion.

The Contractor agrees that he has read each and every clause of this Contract, and fully understands the meaning of same and that he will comply with all the terms, covenants and agreements therein set forth.

Witness our signatures this the____ day of _____,_____.

_____
Contractor(s)

By_____

Title_____

Signed and sealed in the presence of:
(names and addresses of witnesses)

_____

MISSISSIPPI TRANSPORTATION COMMISSION

By_____
Executive Director

_____
Secretary to the Commission

Award authorized by the Mississippi Transportation Commission in session on the ____ day of _____,_____, Minute Book No. _____, Page No. _____.

Revised 8/06/2003

SECTION 903
PERFORMANCE AND PAYMENT BOND

CONTRACT BOND FOR: **BR-9371-01(001)/ 107505301000**

LOCATED IN THE COUNTY(IES) OF: **Harrison**

STATE OF MISSISSIPPI,
COUNTY OF HINDS

Know all men by these presents: that we, _____
(Contractor)
_____ Principal, a _____

residing at_____ in the State of _____

and _____
(Surety)
residing at _____ in the State of _____,

authorized to do business in the State of Mississippi, under the laws thereof, as surety, effective as of the contract date shown below, are held and firmly bound unto the State of Mississippi in the sum of _____

_____

($_____) Dollars, lawful money of the United States of America, to be paid to it for which payment well and truly to be made, we bind ourselves, our heirs, administrators, successors, or assigns jointly and severally by these presents.

The conditions of this bond are such, that whereas the said _____

_____

principal, has (have) entered into a contract with the Mississippi Transportation Commission, bearing the date of _____ day of _____ A.D. _____ hereto annexed, for the construction of certain projects(s) in the State of Mississippi as mentioned in said contract in accordance with the Contract Documents therefor, on file in the offices of the Mississippi Department of Transportation, Jackson, Mississippi.

Now therefore, if the above bounden _____
_____in all things shall stand to and abide by and well and truly observe, do keep and perform all and singular the terms, covenants, conditions, guarantees and agreements in said contract, contained on his (their) part to be observed, done, kept and performed and each of them, at the time and in the manner and form and furnish all of the material and equipment specified in said contract in strict accordance with the terms of said contract which said plans, specifications and special provisions are included in and form a part of said contract and shall maintain the said work contemplated until its final completion and acceptance as specified in Subsection 109.11 of the approved specifications, and save harmless said Mississippi Transportation Commission from any loss or damage arising out of or occasioned by the negligence, wrongful or criminal act, overcharge, fraud, or any other loss or damage whatsoever, on the part of said principal (s), his (their) agents, servants, or employees in the performance of said work or in any manner connected therewith, and shall be liable and responsible in a civil action instituted by the State at the instance of the Mississippi Transportation Commission or any officer of the State authorized in such cases, for double any amount in money or property, the State may lose or be overcharged or otherwise defrauded of, by reason of wrongful or criminal act, if any, of the Contractor(s), his (their) agents or employees, and shall promptly pay the said agents, servants and employees and all persons furnishing labor, material, equipment or supplies therefor, including premiums incurred, for Surety Bonds, Liability Insurance, and Workmen's Compensation Insurance; with the additional obligation that such Contractor shall promptly make payment of all taxes, licenses, assessments, contributions, damages,

any liquidated damages which may arise prior to any termination of said principal's contract, any liquidated damages which may arise after termination of the said principal's contract due to default on the part of said principal, penalties and interest thereon, when and as the same may be due this state, or any county, municipality, board, department, commission or political subdivision: in the course of the performance of said work and in accordance with Sections 31-5-51 et seq. Mississippi Code of 1972, and other State statutes applicable thereto, and shall carry out to the letter and to the satisfaction of the Executive Director of the Mississippi Department of Transportation, all, each and every one of the stipulations, obligations, conditions, covenants and agreements and terms of said contract in accordance with the terms thereof and all of the expense and cost and attorney's fee that may be incurred in the enforcement of the performance of said contract, or in the enforcement of the conditions and obligations of this bond, then this obligation shall be null and void, otherwise to be and remain in full force and virtue.

_____	_____
(Contractors) Principal	Surety
By _____	By _____
	(Signature) Attorney in Fact
	Address _____
	_____
Title _____	_____
(Contractor's Seal)	(Printed) MS Agent
	_____
	(Signature) MS Agent
	Address _____
	_____
	_____
	(Surety Seal)
	_____
	Mississippi Insurance ID Number

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we_____
Contractor

_____
Address

_____
City, State ZIP

As principal, hereinafter called the Principal, and _____
Surety

a corporation duly organized under the laws of the state of _____

as Surety, hereinafter called the Surety, are held and firmly bound unto **State of Mississippi, Jackson, Mississippi**

As Obligee, hereinafter called Obligee, in the sum of **Five Per Cent (5%) of Amount Bid**

Dollars($_____)

for the payment of which sum will and truly to be made, the said Principal and said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for **Bascule Bridge Rehabilitation on SR 605 over Industrial Waterway (Bridge No. 3.5), known as Federal Aid Project No. BR-9371-01(001) / 107505301 in Harrison County.**

NOW THEREFORE, the condition of this obligation is such that if the aforesaid Principal shall be awarded the contract, the said Principal will, within the time required, enter into a formal contract and give a good and sufficient bond to secure the performance of the terms and conditions of the contract, then this obligation to be void; otherwise the Principal and Surety will pay unto the Obligee the difference in money between the amount of the bid of the said Principal and the amount for which the Obligee legally contracts with another party to perform the work if the latter amount be in excess of the former, but in no event shall liability hereunder exceed the penal sum hereof.

Signed and sealed this _____day of _____, 20___

_____
(Principal) (Seal)

_____ By:_____
(Witness) (Name) (Title)

_____
(Surety) (Seal)

_____ By:_____
(Witness) (Attorney-in-Fact)

_____
(MS Agent)

_____
Mississippi Insurance ID Number

OCR-485

REV. 1/2016

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
OFFICE OF CIVIL RIGHTS
JACKSON, MISSISSIPPI

LIST OF FIRMS SUBMITTING QUOTES

I/we received quotes from the following firms on: Letting Date: **August 25, 2020**

Project No: **BR-9371-01(001)/ 107505301000**

County: **Harrison**

Disadvantaged Business Enterprise (DBE) Regulations as stated in 49 CFR 26.11 require the Mississippi Department of Transportation (MDOT) to create and maintain a comprehensive list of all firms quoting/bidding subcontracts on prime contracts and quoting/bidding subcontracts on federally-funded transportation projects. For every firm, we require the following information:

Firm Name: ______________________________
Contact Name/Title: ______________________________
Firm Mailing Address: ______________________________
Phone Number: ______________________________
_______ DBE Firm _______ Non-DBE Firm

Firm Name: ______________________________
Contact Name/Title: ______________________________
Firm Mailing Address: ______________________________
Phone Number: ______________________________
_______ DBE Firm _______ Non-DBE Firm

Firm Name: ______________________________
Contact Name/Title: ______________________________
Firm Mailing Address: ______________________________
Phone Number: ______________________________
_______ DBE Firm _______ Non-DBE Firm

Firm Name: ______________________________
Contact Name/Title: ______________________________
Firm Mailing Address: ______________________________
Phone Number: ______________________________
_______ DBE Firm _______ Non-DBE Firm

Firm Name: ______________________________
Contact Name/Title: ______________________________
Firm Mailing Address: ______________________________
Phone Number: ______________________________
_______ DBE Firm _______ Non-DBE Firm

____
S

____

FORM CSD-612
Rev. 1 / 2015

YEAR 2020 PROGRESS SCHEDULE YEAR 2021

PROJECT NUMBER BR-9371-01(001) / 107505301
COUNTY Harrison

WORK PHASE NO.	WORK PHASE DESCRIPTION	LINE NUMBERS	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOV	DEC	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOV	DEC	
1	Miscellaneous	10-540										0															218
2	Bridge Repair	550-830										5		41		59											213
						2022																					
1	Miscellaneous		231									344															
2	Bridge Repair		231									344															
	LET:	August 25, 2020																									
	NOA:	September 08, 2020																									
	NTP/BCT:	October 08, 2020																									
	W.D.:	344																									
MONTH			JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOV	DEC	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOV	DEC	172 WORKING DAYS PER YEAR
ANTICIPATED WORKING DAYS PER MONTH			6	7	11	15	19	20	21	21	20	16	11	5	6	7	11	15	19	20	21	21	20	16	11	5	

NOTE: THE ANTICIPATED WORKING DAYS SHOWN ON THIS SCHEDULE ARE FOR INFORMATIONAL PURPOSES ONLY.
THE ACTUAL WORKING DAY TOTAL AS ASSESSED BY THE PROJECT ENGINEER ON FORM CSD-765 SHALL GOVERN.