MDOT Use Only
Checked _____
Loaded _____
Keyed _____

SM No. CSTP0014030652

PROPOSAL AND CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

(STATE DELEGATED)

2
Adaptive Signal System on US 98 and US 49, known as Federal Aid Project Nos. STP-0014-03(065) / 106424301 & 302 in Forrest & Lamar Counties.
Project Completion: April 11, 2014

NOTICE

BIDDERS MUST PURCHASE A BOUND PROPOSAL
FROM MDOT CONTRACT ADMINISTRATION DIVISION
TO BID THIS PROJECT.

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

SECTION 900

OF THE CURRENT
2004 STANDARD SPECIFICATIONS
FOR ROAD AND BRIDGE CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION
JACKSON, MISSISSIPPI

BIDDER CHECK LIST
(FOR INFORMATION ONLY)

_____ All unit prices have been entered into Expedite Bid in accordance with Subsection 102.06 of the Mississippi Standard Specifications for Road and Bridge Construction.

_____ Expedite bid sheets have been stapled and inserted into the proposal package.

_____ First sheet of SECTION 905--PROPOSAL has been completed.

_____ Second sheet of SECTION 905--PROPOSAL has been completed and signed.

_____ Addenda, if any, have been acknowledged. Second sheet of Section 905 listing the addendum number has been substituted for the original second sheet of Section 905. Substituted second sheet of Section 905 has been properly completed, signed, and added to the proposal.

_____ DBE/WBE percentage, when required by contract, has been entered on last sheet of the bid sheets of SECTION 905 - PROPOSAL.

_____ Form OCR-485, when required by contract, has been completed and signed.

_____ The last sheet of the Expedite bid sheets of SECTION 905--PROPOSAL has been signed.

_____ Combination Bid Proposal of SECTION 905--PROPOSAL has been completed for each project which is to be considered in combination (See Subsection 102.11).

_____ Equal Opportunity Clause Certification, when included in contract, has been completed and signed.

_____ The Certification regarding Non-Collusion, Debarment and Suspension, etc. has been executed in duplicate.

_____ A certified check, cashier's check or bid bond payable to the State of Mississippi in the principal amount of 5% of the bid has been included with project number identified on same. A bid bond has been signed by the bidder and has also been signed or countersigned by a Mississippi Agent or Qualified Nonresident Agent for the Surety with Power of Attorney attached.

_____ ON FEDERAL FUNDED PROJECTS, the Notice To Bidders regarding DUNS Requirements has been completed and included in the contract documents.

_____ Non-resident Bidders: ON STATE FUNDED PROJECTS ONLY, a copy of the current laws regarding any preference for local Contractors from State wherein domiciled has been included. See Subsection 103.01, Mississippi Standard Specifications for Road and Bridge Construction, and Section 31-7-47, MCA, 1972 regarding this matter.

Return the MDOT flash drive with completed EBS file, proposal and contract documents in its entirety in a sealed envelope. DO NOT remove any part of the contract documents; exception - an addendum requires substitution of second sheet of Section 905. A stripped proposal is considered as an irregular bid and will be rejected.

Failure to complete any or all of the applicable requirements will be cause for the proposal to be considered irregular.

(10/2012)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 4557 **CODE: (SP)**

DATE: 6/12/2013

SUBJECT: Readvertisement

PROJECT: STP-0014-03(065) / 106424301 & 302 – Forrest & Lamar Counties

The contents of this proposal are the same as when advertised for a September 2013 Letting, except as follows:

Added this Notice To Bidders No. 4557;

Revised the Advertisement;

Notice To Bidders No. 4488, replaces Notice To Bidder No. 2596;

Revised Notice To Bidders No. 4458;

SP 907-102-10, replaces SP 907-102-2, w/Supplement;

SP 907-104-5, replaces SP 907-104-4;

SP 907-105-7, replaces SP 907-105-6, w/Supplement;

SP 907-107-13, replaces SP 907-107-9, w/Supplement;

SP 907-108-30, replaces SP 907-108-24, w/Supplement;

SP 907-109-6, replaces SP 907-109-5, w/Supplement;

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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PROJECT: STP-0014-03(065) / 106424301 & 302 – Forrest & Lamar Counties

RE-ADVERTISEMENT NOTICE TO BIDDERS NO. 4557

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907-659-3: Traffic Management Center (TMC) Modifications
907-662-3: Video Communication Equipment
907-663-1: Traffic Signal Software
907-668-1: Traffic Signal Conduit

SECTION 905 - PROPOSAL, PROPOSAL BID ITEMS
COMBINATION BID PROPOSAL
CERTIFICATION OF PERFORMANCE - PRIOR FEDERAL-AID CONTRACTS
CERTIFICATION REGARDING NON-COLLUSION, DEBARMENT AND SUSPENSION
SECTION 902- CONTRACT FORM, AND SECTION 903 - CONTRACT BOND FORMS
FORM -- OCR-485

(REVISIONS TO THE ABOVE WILL BE INDICATED ON THE SECOND SHEET OF SECTION 905 AS ADDENDA)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 901 - ADVERTISEMENT

Sealed bids will be received by the Mississippi Transportation Commission in the Office of the Contract Administration Engineer, Room 1013, Mississippi Department of Transportation Administration Building, 401 North West Street, Jackson, Mississippi, until 10:00 o'clock A.M., Tuesday, July 23, 2013, and shortly thereafter publicly opened on the Sixth Floor for:

Adaptive Signal System on US 98 and US 49, known as Federal Aid Project No. STP-0014-03(065) / 106424301 & 302 in Forrest & Lamar Counties.

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.

Bid proposals must be purchased online at https://shopmdot.ms.gov. Specimen proposals may be viewed and downloaded online at no cost at http://mdot.ms.gov or purchased online. Proposals are available 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: 05/03/2004

SUBJECT: Governing Specifications

The current (2004) 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 herein. Copies of the specification book may be purchased from the MDOT Construction Division.

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 1990 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 2004 Edition of the Standard Specifications.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 883 **CODE: (IS)**

DATE: 04/28/2006

SUBJECT: Payroll Requirements

Bidders are hereby advised that the Contractor and Subcontractor(s) are required to submit payroll information to the Project Engineers on a weekly basis.

On Federal-Aid Projects, CAD-880, CAD-881 and certified payroll submissions are required each week the Contractor or a Subcontractor performs work on the project. This is addressed in Section V, page 6 of Form FHWA-1273.

On State-Funded Projects, CAD-880 is required each week the Contractor or a Subcontractor performs work on the project.

When no work is performed on either Federal-Aid and State-Funded Projects, the Contractor should only submit CAD-880 showing no work activities.

The Contractor shall make all efforts necessary to submit this information to the Project Engineer in a timely manner. The Engineer will have the authority to suspend the work wholly or in part and to withhold payments because of the Contractor's failure to submit the required information. Submission of forms and payrolls shall be current through the first full week of the month for the estimate period in order for the Project Engineer to process an estimate.

Bidders are advised to review the requirements regarding payroll submissions in Section 110 of the Standard Specifications.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1405 **CODE: (IS)**

DATE: 03/15/2007

SUBJECT: ERRATA AND MODIFICATIONS TO THE 2004 STANDARD SPECIFICATIONS

Page	Subsection	Change
101	201.01	In the second sentence of the first paragraph, change “salvable” to “salvageable”.
107	202.04	In the fourth sentence of the fourth paragraph, change “yard” to “feet”.
107	202.05	In the list of units measurements for 202-B, add “square foot”.
132	211.03.4	In the second sentence of the second paragraph, change “planted” to “plated”.
192	306.02.4	In the first line of the first paragraph, delete the word “be”.
200	307.03.7	In the fourth sentence of the second paragraph, change “lime-fly ash” to “treated”.
236	401.01	Change the header from “Section 403” to “Section 401”.
242	401.02.3.2	In the first sentence of the third full paragraph, add “1/8” in the blank before the inch mark.
250	401.02.6.3	In the second sentence of the first paragraph on page 250, change “rutting over ” ” to “rutting over 1/8" ”.
253	401.02.6.4.2	In the paragraph preceding the table, change “91.0” to “89.0”.
259	401.03.1.4	In the first paragraph, change “92.0 percent” to “the specified percentage (92.0 or 93.0)”.
269	403.03.2	In the table at the top of page 269, change the PI requirement from “ = ” to “ ≤ ”.

278	404.04	In the second sentence, change the subsection from "401.04" to "403.04".
283	409.02.2	Change "PG 64-22" to "PG 67-22".
294	413.02	In the first sentence of the second paragraph, change "707.02.1.3" to "Subsection 707.02.1.3".
340	511.04	In the second sentence of the second paragraph, change "412" to "512".
349	601.03.3	In the first sentence, change "804.03.2" to "804.03.5".
355	603.02	Change the subsection reference for Joint mortar from "707.03" to "714.11".
369	604.04	In the first sentence, change "601.04" to "Subsection 601.04".
427	619.04	Delete the second paragraph.
442	625.04	In the third paragraph, change "626.04" to "Subsection 626.04".
444	626.03.1.2	Delete the third sentence of the first paragraph.
464	631.02	Change the subsection reference for Water from "714.01.0" to "714.01.1".
570	682.03	Change the subsection number from "682-03" to "682.03".
575	683.10.4	Change the subsection number from "683.10.4" to "683.04".
575	683.10.5	Change the subsection number from "683.10.5" to "683.05".
596	701.02	In the table under the column titled "Cementations material required", change Class F, FA" to "Class F FA,".
603	702.11	In the first sentence, change "702.12" to "Subsection 702.12".
612	703.04.2	In the fifth paragraph, delete "Subsection 703.11 and".
616	703.07.2	In the Percentage By Weight Passing Square Mesh Sieves table, change the No. 10 requirement for Class 7 material from "30 - 10" to "30 - 100".

618	703.13.1	In the first sentence of the first paragraph, change "703.09" to "703.06".
618	703.13.2	In the first sentence, change "703.09" to "703.06".
671	712.06.2.2	In the first sentence, change "712.05.1" to "Subsection 712.05.1".
689	714.11.2	In the first sentence, change "412" to "512".
709	715.09.5	In the first sentence of the first paragraph, change "guage" to "gauge".
717	717.02.3.4	In the top line of the tension table, change "1 1/2" to "1 1/8" and change "1 1/8" to "1 1/2".
741	720.05.2.2	In the last sentence of this subsection, change "720.05.2.1" to "Subsection 720.05.2.1".
827	803.03.2.3.7.5.2	In the first sentence of the second paragraph, change "803.03.5.4" to "803.03.2.3.4".
833	803.03.2.6	In the first sentence, change "803.03.7" to "803.03.2.5".
854	804.02.11	In the last sentence of the first paragraph, change "automatically" to "automatic".
859	804.02.13.1.3	In the last sentence, change Subsection "804.02.12.1" to "804.02.12".
879	804.03.19.3.2	In the first sentence of the third paragraph, change "listed on of Approved" to "listed on the Approved".
879	804.03.19.3.2	In the last sentence of the last paragraph, change "804.03.19.3.1" to "Subsection 804.03.19.3.1".
962	814.02.3	In the first sentence, change "710.03" to "Subsection 710.03".
976	820.03.2.1	In the first sentence, change "803.02.6" to "803.03.1.7".
976	820.03.2.2	In the first sentence, change "803.03.9.6" to "803.03.1.9.2".
985	Index	Change the subsection reference for Petroleum Asphalt Cement from "702.5" to "702.05".

985	Index	Change the subsection reference for the Definition of Asphaltic Cement or Petroleum Asphalt from "700.2" to "700.02".
985	Index	Change the subsection reference for Automatic Batchers from "501.03.2.4" to "804.02.10.4".
986	Index	Delete "501.03.2" as a subsection reference for Batching Plant & Equipment.
988	Index	Change the subsection reference for the Central Mixed Concrete from "501.03.3.2" to "804.02.11".
988	Index	Change the subsection reference for the Concrete Batching Plant & Equipment from "501.03.2" to "804.02.11".
999	Index	Delete "501.03.3.3" as a subsection reference for Truck Mixers.
1001	Index	Change the subsection reference for Edge Drain Pipes from "605.3.5" to "605.03.5".
1002	Index	Change the subsection reference for Metal Posts from "713.05.2" to "712.05.2".
1007	Index	Change the subsection reference for Coarse Aggregate of Cement Concrete Table from "703.3" to "703.03".
1007	Index	Change the subsection reference for Composite Gradation for Mechanically Stabilized Courses Table from "703.8" to "703.08".
1009	Index	Delete "501.03.3.3" as a subsection reference for Truck Mixers and Truck Agitators.
1010	Index	Delete reference to "Working Day, Definition of".

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1928 **CODE: (IS)**

DATE: 04/14/2008

SUBJECT: Federal Bridge Formula

Bidders are hereby advised that Federal Highway Administration Publication No. FHWA-MC-94-007, **BRIDGE FORMULA WEIGHTS**, dated January 1994, 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://ops.fhwa.dot.gov/freight/sw/brdgcalc/calc_page.htm

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2382 **CODE: (IS)**

DATE: 02/12/2009

SUBJECT: Status of Right-of-Way

Although it is desirable to have acquired all rights-of-way and completed all 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, relocatees and utilities which have not been completed.

The status of right-of-way acquisition, utility adjustments, encroachments, potentially contaminated sites and asbestos containation 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.

STATUS OF RIGHT-OF-WAY
STP-0014-03(065)
106424/301000
106424/302000
Signal Control on US 98 & US 49
Forrest & Lamar County
January 16, 2013

All rights of way and legal rights of entry have been acquired **except:**

NONE.

STATUS OF POTENTIALLY CONTAMINATED SITES
STP-0014-03(065)
106424-301000
Forrest County
January 16, 2013

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.

ASBESTOS CONTAMINATION STATUS OF BUILDINGS
TO BE REMOVED BY THE CONTRACTOR
STP-0014-03(065)
106424-301000
Forrest County
January 16, 2013

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
STP-0014- 03(065)
106424-302000
Lamar County
January 16, 2013

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.

ASBESTOS CONTAMINATION STATUS OF BUILDINGS
TO BE REMOVED BY THE CONTRACTOR
STP-0014-03(065)
106424-302000
Lamar County
January 16, 2013

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.

UTILITY STATUS REPORT

STP-0014-03(065)

106424301 & 302

FORREST & LAMAR COUNTY(IES)

January 16, 2013

This is to certify that the above captioned project has been inspected and there are no known utilities in conflict with the project.

ENCROACHMENT CERTIFICATION

STP-0014-03(065)

106424301 & 302

FORREST & LAMAR COUNTY(IES)

January 16, 2013

This is to certify that the above captioned project has been inspected and no encroachments were found.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2937 **CODE: (SP)**

DATE: 01/11/2010

SUBJECT: Reduced Speed Limit Signs

Bidders are advised that all black and white speed limits signs that are used to reduce the speed limit through construction zones shall be covered or removed during times when the Contractor is not performing work. If the Contractor has a routine daytime operation and is not working at night, the signs shall be covered or removed during the nighttime when there is no work activity.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 3414 **CODE: (SP)**

DATE: 02/16/2011

SUBJECT: DUNS Requirement for Federal Funded Projects

Bidders are advised that the Prime Contractor must maintain current registrations in the Central Contractor Registration (http://www.ccr.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 Central Contractor Registration.

Bidders are also advised that the following information needs to be completed and included in the bid documents:

DUNS: _____

Company Name: _____

Company e-mail address: _____

By: _____

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 3512 **CODE: (SP)**

DATE: 04/26/2011

SUBJECT: Wage Rates

Bidders are advised that when a contract consists of work in two or more counties, workers shall be paid the higher wage rate listed in the contract regardless of the county in which work is being performed.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 3655 **CODE: (SP)**

DATE: 10/04/2011

SUBJECT: Type III Barricade Rails

Bidders are advised that the use of 2-inch nominal thickness timber for rails on Type III barricades has not been approved by NCHRP as a crashworthy device. Therefore, the use of 2-inch nominal thickness timbers will not be allowed for rails on Type III Barricades. Timber rails for Type III Barricades shall be as follows.

- For barricades up to four feet (4') wide, the maximum thickness of timber rails shall be one inch (1") and the material shall be pine timber or ¾-inch ACX plywood.

- For barricades more than four feet (4') wide, timber rails shall be constructed of ¾-inch ACX plywood.

A list of crashworthy Type III Barricades can be found at the below FHWA website.

http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/wzd/

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 3893 **CODE: (SP)**

DATE: 04/10/2012

SUBJECT: Petroleum Products Base Prices

Bidders are advised that monthly petroleum products base prices will be available at the web site listed below. Current monthly prices will be posted to this web site on or before the 15th of each month. Bidders are advised to use the petroleum base prices on this web site when preparing their bids. The current monthly petroleum products base prices will be acknowledged by the Bidder and become part of the contract during the execution process.

Monthly Petroleum Products Base Prices can be viewed at:

http://sp.gomdot.com/Contract%20Administration/BidSystems/Pages/letting%20calendar.aspx

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 3980 **CODE: (SP)**

DATE: 07/25/2012

SUBJECT: Questions Regarding Bidding

Bidders are advised that all questions that arise regarding the contract documents (proposal) or plans on this project shall be directed to the www.gomdot.com current letting webpage. Click on the call number for this project to open an email form to submit your question. Questions must be submitted by 8:00 a.m. on Monday prior to the letting on Tuesday. Answers to questions will be posted by 6:00 p.m. on Monday prior to the letting on Tuesday. Answers can be viewed by clicking on Q&A link under the Proposal Addenda column.

It shall be the Bidders responsibility to familiarize themselves with the questions and answers that have been submitted on this project.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO NOTICE TO BIDDERS NO. 4103

DATE: 04/09/2013

The goal is 1 percent for the Disadvantaged Business Enterprise. The low bidder is 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:

http://sp.gomdot.com/Contract%20Administration/BidSystems/Pages/letting%20calendar.aspx

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

Delete subparagraph (3) under AWARD on page 7, and substitute the following.

(3) Bidder must submit an OCR-485 listing all firms that submitted quotes for material supplies or items to be subcontracted. Please make and add copies of this form when needed or attach additional sheets containing the information required by the form and add these sheets to the bid proposal. Form OCR-485 must be signed and submitted with the bid proposal. If at least one copy of this form is not signed and included as part of bid proposal, your bid will be deemed irregular.

Delete subparagraph (5) under DBE REPORTS on page 8, and substitute the following.

(5) OCR-485: Bidder must submit **signed form with bid proposal** of all firms that submitted quotes for material supplies or items to be subcontracted. Please make and add copies of this form when needed or attach additional sheets containing the information required by the form and add these sheets to the bid proposal. If at least one copy of this form is not signed and included as part of bid proposal, your bid will be deemed irregular.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 4103 **CODE: (IS)**

DATE: 9/12/2012

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 "Part 26, Title 49, Code of Federal Regulations". 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, age, religion, national origin, or any handicap.

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, subrecipient 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 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 CFR 49 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, national origin, religion or sex. 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 requires 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.

The percentage of the contract that is proposed for DBEs shall be so stated on the last bid sheet of the proposal.

The apparent lowest responsive bidder shall submit to the Office of Civil Rights Form OCR-481, signed by the Prime Contractor and the DBE Subcontractors, no later than the 10th day after opening of the bids.

Form OCR-481 is available on the MDOT website at GoMDOT.com, then Divisions, Civil Rights, Forms, DBE, MDOT Projects, or by calling 601-359-7466.

FORMS ARE AVAILABLE FROM THE OFFICE OF CIVIL RIGHTS

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 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, with the proposal, 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 with the bid proposal, shall be just cause for rejection of the proposal. Award may then be made to the next lowest responsive bidder or the work may be readvertised.

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.

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 "Part 26, Title 49, Code of Federal Regulations" 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.gomdot.com. 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 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.

GOOD FAITH EFFORTS

To demonstrate good faith efforts to replace any DBE that is unable to perform successfully, the Contractor must document steps taken to subcontract with another certified DBE Contractor. Such documentation shall include no less than the following:

(1) 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.

(2) 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.

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

(4) 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.

(5) 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.

(6) 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.

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

(8) Only the dollars actually paid to the DBE firm may be counted towards the DBE goal.

Failure of the Contractor to demonstrate good faith efforts to replace a DBE Subcontractor that cannot perform as intended with another DBE Subcontractor, when required, shall be a breach of contract and may be just cause to be disqualified from further bidding for a period of up to 12 months after notification by certified mail.

PRE-BID MEETING

A pre-bid meeting will be held in Amphitheater 1 & 2 of the Hilton Jackson located at I-55 and County Line Road, Jackson, Mississippi 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.

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) Bidder must submit to the Office of Civil Rights for approval, Form OCR-481 (DBE Commitment) no later than the 10th day after opening of the bids, or submit information with the bid proposal 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 submit a list of all firms that submitted quotes for material supplies or items to be subcontracted. This information must be submitted on form OCR-485 in the back of the contract proposal. Form OCR-485 must be signed and submitted **with the bid proposal.**

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

The contract goal established by MDOT in this proposal 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 the 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 each Contractor / Supplier. 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-03-09-01-483. 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 Contractor will submit to the Project Engineer OCR-484 certifying payments to all Subcontractors.

(5) OCR-485: The bidder must submit **with the bid proposal** a list of all firms that submitted quotes for material supplies or items to be subcontracted.

(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. It should be returned to MDOT with the OCR-481 form, or can also be returned with the Permission to Subcontract Forms (CAD-720 or CAD-725).

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 an amount equal to the unmet portion of the DBE goal

(4) Recover an amount equal to the unmet contract goal

(5) Debar the Contractor involved from bidding on Mississippi Department of Transportation projects.

(6) Deduct from the Contractor's final estimate all or any combination of the following.

Offense	Percentage of the monetary amount disallowed from (1) above	Lump Sum
# 1	10%	$ 5,000 or both
# 2	20%	$ 10,000 or both
# 3	40%	$ 20,000 & debarment

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 4214 **CODE: (IS)**

DATE: 11/29/2012

SUBJECT: Safety Apparel

Bidders are advised that the Code of Federal Regulations CFR 23 Part 634 final rule was adopted November 24, 2006 with an effective date of November 24, 2008. This rule requires that "All workers within the right-of-way of a Federal-Aid Highway who are exposed either to traffic (vehicles using the highway for the purposes of travel) or to construction equipment within the work area shall wear high-visibility safety apparel". High-visibility safety apparel is defined in the CFR as "personnel protective safety clothing that is intended to provide conspicuity during both daytime and nighttime usage, and that meets the Performance Class 2 or 3 requirements of the ANSI/ISEA 107-2004 publication entitled American National Standard for High-Visibility Safety Apparel and Headwear". All workers on Mississippi State Highway right-of-way shall comply with this Federal Regulation. Workers are defined by the CFR as "people on foot whose duties place them within the right-of way of a Federal-Aid Highway, such as highway construction and maintenance forces, survey crews, utility crews, responders to incidents within the highway right-of-way, and law enforcement personnel when directing traffic, investigating crashes, and handling lane closures, obstructed roadways, and disasters within the right-of-way of a Federal-Aid Highway".

More information regarding high visibility safety apparel can be found at the following sites.

http://www.gpo.gov/fdsys/pkg/CFR-2008-title23-vol1/pdf/CFR-2008-title23-vol1-sec634-1.pdf

http://ops.fhwa.dot.gov/wz/resources/policy.htm#hv

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 4458 **CODE: (SP)**

DATE: 6/12/2013

SUBJECT: Contract Time

PROJECT: STP-0014-03(065) / 106424301 & 302 – Forrest & Lamar Counties

The calendar date for completion of work to be performed by the Contractor for this project shall be **April 11, 2014** which date or extended date as provided in Subsection 907-108.06 shall be the end of contract time. It is anticipated that the Notice of Award will be issued no later than **August 13, 2013** and the effective date of the Notice to Proceed / Beginning of Contract Time will be **September 12, 2013**.

Should the Contractor request a Notice to Proceed earlier than **September 12, 2013** and it is agreeable with the Department for an early Notice to Proceed, the requested date will become the new Notice to Proceed / Beginning of Contract Time date.

The available productive days for this project are **75**.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 4488 **CODE: (IS)**

DATE: 05/01/2013

SUBJECT: DBE Forms, Participation and Payment

Bidders are hereby advised that the participation of a DBE Firm can not be counted towards the Prime Contractor's DBE goal until the amount being counted towards the goal has been paid to the DBE.

Form OCR-482 has been developed to comply with this requirement. Bidders are hereby advised that at the end of the job, the Prime Contractor will submit this form to the Project Engineer before the final estimate is paid and the project is closed out. This form certifies payments to all DBE Subcontractors over the life of the contract.

Form OCR-484 has also been developed to comply with this requirement. Bidders are hereby advised that each month, the Prime Contractors will submit this form to the Project Engineer no later than the last day of each month. This form 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 this form to the monthly estimate before forwarding the estimate to the Contract Administration Division for processing.

Bidders are also advised that Form OCR-485 will be completed by **ALL BIDDERS** submitting a bid proposal and **must be signed and included in the bid proposal package**. If at least one copy of this form is not signed and included as part of bid proposal, your bid will be deemed irregular.

DBE Forms, including Forms OCR-482, OCR-484 and OCR-485, can be obtained from the Office of Civil Rights Division, MDOT Administration Building, 401 North West Street, Jackson, MS, or at www.gomdot.com under *Business, Disadvantaged Enterprise, Applications and Forms for the DBE Program, MDOT Forms.*

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 4527 **CODE: (SP)**

DATE: 01/07/2013

SUBJECT: Traffic Management Center (TMC) Modifications

PROJECT: STP-0014-03(065) / 106424301 & 302 - Forrest and Lamar Counties

Bidders are hereby advised that the following Traffic Management Center (TMC) Modifications will be required for this project.

MDOT TMC Modifications SITE #1

The Hattiesburg Regional TMC is located at 6356 Highway 49N, Hattiesburg, Mississippi (MDOT District 6).

Software:
The Contractor shall initially use vendor supplied software to test the CCTV to demonstrate full compliance with the contract requirements. A minimum of two (2) licenses of each system of the vendor supplied software must be provided to MDOT upon completion of the testing for each component.

In addition to the vendor supplied software, MDOT currently has a Delcan ATMS Software Suite installed at the Hattiesburg Regional TMC. The contractor shall be required to configure the software to utilize and operate the ITS field devices once this project is complete.

The Contractor is required to fully configure the existing ATMS software for operation of the CCTV that is installed on this project. At a minimum, this shall include:

- Update and configure the existing map to show the locations of the CCTV with dynamic icons.
- Install and configure all CCTV into the software's database.
- Update all ATMS client software within the TMC to be able to fully utilize the changes noted above.

The Contractor is required to arrange for the ATMS vendor to be on-site to complete this configuration and provide the required testing to show that the software is fully functioning for each CCTV.

Testing:
The Contractor shall submit a proposed test plan for review and approval by MDOT. The test plan shall demonstrate full compliance with all requirements in the plans and specifications.

MDOT TMC Modifications SITE #2

The Jackson State-wide TMC is located in the MDOT Shop Complex at 2567 North West St., Jackson, Mississippi (MDOT District 5).

Software:
The Contractor shall initially use vendor supplied software to test the CCTV to demonstrate full compliance with the contract requirements. A minimum of two (2) licenses of each system of the vendor supplied software must be provided to MDOT upon completion of the testing for each component.

In addition to the vendor supplied software, MDOT currently has a Delcan ATMS Software Suite installed at the State-wide TMC. The contractor shall be required to configure the software to utilize and operate the ITS field devices once this project is complete.

The Contractor is required to fully configure the existing ATMS software for operation of the CCTV that is installed on this project. At a minimum, this shall include:

- Update and configure the existing map to show the locations of the CCTV with dynamic icons.
- Install and configure all CCTV into the software's database.
- Update all ATMS client software within the TMC to be able to fully utilize the changes noted above.

The Contractor is required to arrange for the ATMS vendor to be on-site to complete this configuration and provide the required testing to show that the software is fully functioning for each CCTV.

Testing:
The Contractor shall submit a proposed test plan for review and approval by MDOT. The test plan shall demonstrate full compliance with all requirements in the plans and specifications.

Payment:
All work, software, equipment, and testing covered in this NTB will be paid under TMC Modifications pay items 907-659-A.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 4528 **CODE: (SP)**

DATE: 01/08/2013

SUBJECT: Cabinet Modifications

PROJECT: STP-0014-03(065) / 106424301 & 302 - Forrest and Lamar Counties

Bidders are hereby advised that the following additional requirements for Cabinet Modifications shall be required on this project and shall be included in the price bid for Pay Item Number 907-642-B.

Cabinet Modifications. All work done under this NTB as cabinet modifications will include but not be limited to work, installation, equipment and cabling necessary in the existing traffic signal cabinets identified and as stated in this NTB to add, modify, interconnect and integrate the equipment as specified to be able to communicate on the fiber backbone to the Hattiesburg Regional Traffic Management Center and on to the Statewide TMC located in Jackson. Traffic controllers, network switches, video encoders, or cameras that are installed at cabinet modification locations will be paid under their respective pay item numbers as outlined in their corresponding special provisions. Cabinet modifications shall be made at the following locations as indicated:

Configuration.
Traffic Signal Controller Cabinet Modifications are to add Fiber Interconnect at four (4) Locations.

EXISTING TRAFFIC SIGNAL CABINET (US 98 @ SR 589) (WKG. NO. ITS-1).
The Contractor shall remove and replace the existing traffic signal controller at this location as indicated in the plans, which will be paid under the pay item 907-642-A Solid State Traffic Actuated Controllers, Type 8M. The existing traffic signal controller shall be turned over to MDOT. Modify cabinet to install and connect a fiber drop cable as shown on the plans from the new trunk fiber along US Hwy 98 into the traffic signal cabinet. The Contractor shall splice and terminate the drop fiber cable as indicated in the plans and in the fiber specifications for fiber drops. A Type A network switch, video encoder, two fixed CCTV, and one pan-tilt-zoom CCTV shall be provided and installed at this location. Cabinet modifications shall include all labor, equipment and materials necessary to provide the physical entrance for the fiber drop cable into the cabinet, whether via existing spare conduit or with a new separate conduit entrance. If new separate conduit entrance is required, all above ground conduit and fittings shall be rigid type. Materials and construction methods for all cabinet entrances shall conform to details shown in the Plans and all other requirements set forth in the Plans and specifications. Cabinet modifications shall also include all the work necessary to install and configure the switch, connect fiber drop, video encoder, fixed CCTV, PTZ CCTV, surge and power systems, and all work, incidental equipment and cables necessary to integrate all devices on the Ethernet network over the fiber trunk back to the TMC and existing ATMS software.

EXISTING TRAFFIC SIGNAL CABINET (US 98 @ CANEBRAKE) (WKG. NO. ITS-2).

The Contractor shall modify cabinet to install and connect a fiber drop cable as shown on the plans from the new trunk fiber along US Hwy 98 into the traffic signal cabinet. The Contractor shall splice and terminate the drop fiber cable as indicated in the plans and in the fiber specifications for fiber drops. A Type A network switch shall be provided and installed at this location. Cabinet modifications shall include all labor, equipment and materials necessary to provide the physical entrance for the fiber drop cable into the cabinet, whether via existing spare conduit or with a new separate conduit entrance. If new separate conduit entrance is required, all above ground conduit and fittings shall be rigid type. Materials and construction methods for all cabinet entrances shall conform to details shown in the Plans and all other requirements set forth in the Plans and specifications. Cabinet modifications shall also include all the work necessary to install and configure the switch, connect fiber drop, surge and power systems, and all work, incidental equipment and cables necessary to integrate all devices on the Ethernet network over the fiber trunk back to the TMC and existing ATMS software.

EXISTING TRAFFIC SIGNAL CABINET (US 98 @ COLE RD.) (WKG. NO. ITS-4).

The Contractor shall modify cabinet to install and connect a fiber drop cable as shown on the plans from the new trunk fiber along US Hwy 98 into the traffic signal cabinet. The Contractor shall splice and terminate the drop fiber cable as indicated in the plans and in the fiber specifications for fiber drops. A Type A network switch, video encoder, two fixed CCTV, and one pan-tilt-zoom CCTV shall be provided and installed at this location. Cabinet modifications shall include all labor, equipment and materials necessary to provide the physical entrance for the fiber drop cable into the cabinet, whether via existing spare conduit or with a new separate conduit entrance. If new separate conduit entrance is required, all above ground conduit and fittings shall be rigid type. Materials and construction methods for all cabinet entrances shall conform to details shown in the Plans and all other requirements set forth in the Plans and specifications. Cabinet modifications shall also include all the work necessary to install and configure the switch, connect fiber drop, video encoder, fixed CCTV, PTZ CCTV, surge and power systems, and all work, incidental equipment and cables necessary to integrate all devices on the Ethernet network over the fiber trunk back to the TMC and existing ATMS software.

EXISTING TRAFFIC SIGNAL CABINET (US 98 @ KING RD.) (WKG. NO. ITS-7).

The Contractor shall disconnect and remove existing fiber drop cable, and install/connect a new fiber drop cable as shown on the plans from the new trunk fiber along US Hwy 98 into the traffic signal cabinet utilizing the existing fiber drop conduit entrance. The new fiber drop shall be connected to the existing Type A network switch at this location. Cabinet modifications shall include all labor, equipment and materials necessary to reconnect the fiber drop, switch, video encoder, PTZ CCTV, and all work, incidental equipment and cables necessary to integrate all devices on the Ethernet network over the fiber trunk back to the TMC and existing ATMS software. Contractor shall coordinate the cutover of the communications with the Project Engineer and Traffic Management Center(s). No cutover shall occur until the communications with the installed Type A network switch has been tested and verified. Cutover shall occur with less than one (1) hour of downtime.

Installation. The Contractor shall install the drop cable, provide and connect the fiber patch cables, connect the fiber patch cables as necessary to the traffic signal controller, and configure the traffic signal controller to communicate with the existing Actra/Tactics Server in the Regional/State-wide TMC. All work, equipment, configuration, and incidental cabling to modify the cabinet signals to communicate and be integrated with the Signal Control Software in the TMC equipment room will be considered incidental.

Any equipment, cords, cables or configuration required at the existing traffic control cabinets to connect the new fiber to equipment at existing locations shall be considered incidental and shall be included in the cost of Pay Item Number 907-642-B.

General Decision Number: MS130169 03/29/2013 MS169

Superseded General Decision Number: MS20120169

State: Mississippi

Construction Type: Highway

County: Forrest County in Mississippi.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Modification Number	Publication Date
0	01/04/2013
1	03/29/2013

* ELEC0903-003 06/01/2012

	Rates	Fringes
ELECTRICIAN	$ 23.60	12%+4.40

* SUMS2008-130 09/04/2008

	Rates	Fringes
CARPENTER	$ 13.00	0.00
CEMENT MASON/CONCRETE FINISHER	$ 11.54	1.63
LABORER: Common or General	$ 8.34	0.00
LABORER: Pipelayer	$ 10.17	0.00
OPERATOR: Backhoe	$ 12.57	0.00
OPERATOR: Broom/Sweeper	$ 8.00	0.00
OPERATOR: Bulldozer	$ 11.63	0.00
OPERATOR: Grader/Blade	$ 11.10	0.00
OPERATOR: Mechanic	$ 13.00	0.00
OPERATOR: Piledriver	$ 12.50	1.23
OPERATOR: Roller	$ 9.31	0.00
OPERATOR: Scraper	$ 10.00	0.00
TRUCK DRIVER	$ 10.34	0.00

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

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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 union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows 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. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

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

General Decision Number: MS130174 03/29/2013 MS174

Superseded General Decision Number: MS20120174

State: Mississippi

Construction Type: Highway

County: Lamar County in Mississippi.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Modification Number	Publication Date
0	01/04/2013
1	03/29/2013

* ELEC0903-003 06/01/2012

	Rates	Fringes
ELECTRICIAN	$ 23.60	12%+4.40

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* SUMS2008-135 09/04/2008

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 11.54	1.63
LABORER: Common or General	$ 8.34	0.00
LABORER: Pipelayer	$ 10.17	0.00
OPERATOR: Backhoe	$ 12.57	0.00
OPERATOR: Broom/Sweeper	$ 8.00	0.00
OPERATOR: Bulldozer	$ 11.63	0.00
OPERATOR: Grader/Blade	$ 11.10	0.00
OPERATOR: Mechanic	$ 13.00	0.00
OPERATOR: Piledriver	$ 12.50	1.23
OPERATOR: Roller	$ 9.31	0.00
OPERATOR: Scraper	$ 10.00	0.00
TRUCK DRIVER	$ 10.34	0.00

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

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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 union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows 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. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

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

SUPPLEMENT TO FORM FHWA-1273

DATE: 6/15/94

SUBJECT: Final Certificate and 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 subcontract for review by the Mississippi Department of Transportation. The federal contract provisions may be omitted from the subcontract copy submitted for review provided the Contractor certifies that the provisions will be physically incorporated into the agreement furnished to the Subcontractor.

In lieu of submitting a copy of the subcontract for review, the Contractor may certify that the subcontract agreement is in writing and that it contains all the requirements and pertinent provisions of the prime contract.

Each Subcontractor will be required to provide a copy of the subcontract agreement for contract compliance reviews, along with physical evidence (copy of FHWA-1273) that requirements and pertinent provisions have been provided for review and adherence.

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 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

(06/28/2012)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-101-4 **CODE: (IS)**

DATE: 11/05/2008

SUBJECT: **Definitions**

Section 101, Definitions and Terms, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-101.02--Definitions. Replace the following definitions in Subsection 101.02 on pages 3 through 13.

Contract - The written agreement between the Mississippi Transportation Commission and the Contractor setting forth the obligations of the parties thereunder, including but not limited to, the performance of the work, the furnishing of labor and materials, and the basis of payment.

The contract includes the invitation for bids, proposal, contract form and contract bonds, specifications, supplemental specifications, interim specifications, general and detailed plans, special provisions, notices to bidders, notice to proceed, and also any agreements that are required to complete the construction of the work in an acceptable manner, including authorized extensions thereof, all of which constitute one instrument.

Contract Bonds - The approved form of security, executed by the Contractor and the Contractor's Surety(ies), guaranteeing complete execution of the contract and all supplemental agreements pertaining thereto and the payment of all legal debts pertaining to the construction of the project. This term includes Performance and Payment Bond(s).

Surety - A corporate body, qualified under the laws of Mississippi, which is bound with and for the successful bidder by "contract bond(s)" to guarantee acceptable performance of the contract and payment of all legal taxes and debts pertaining to the construction of the project, including payment of State Sales Tax as prescribed by law, and any overpayment made to the Contractor.

Add the following to the list of definitions in Subsection 101.02 on pages 3 through 13.

Performance Bond - The approved form of security, executed by the Contractor and issued by the Contractor's Surety(ies), guaranteeing satisfactory completion of the contract and all supplemental agreements pertaining thereto.

Payment Bond - The approved form of security, executed by the Contractor and issued by the Contractor's Surety(ies), guaranteeing the payment of all legal debts pertaining to the construction of the project including, but not limited to, the labor and materials of subcontractors and suppliers to the prime contractor.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-102-10 **CODE: (IS)**

DATE: 05/01/2013

SUBJECT: Bidding Requirements and Conditions

Section 102, Bidding Requirements and Conditions, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-102.06--Preparation of Proposal. Delete the first paragraph of Subsection 102.06 on page 17, and substitute the following.

The bidder's complete original proposal shall be submitted upon the forms (Certification of Performance, Certification Regarding Non-Collusion, etc.) furnished by the Department and shall include Expedite Bid printed bid sheets along with the bid data on the MDOT-supplied USB Flash Drive. Expedite Bid System (EBS) files shall be downloaded from the Department's website http://mdot.ms.gov. In case of discrepancy between a unit price and the extension, the unit price will govern and the extension along with the total amount of the proposal will be corrected.

Delete the fifth, sixth, and seventh paragraphs of Subsection 102.06 on page 18, and substitute the following.

Bid sheets generated by the Department's Electronic Bid System (Trns•port Expedite Bid) along with a completed proposal package (with all forms completed and signed) will constitute the official bid and shall be signed on the last sheet of the Expedite Bid generated bid sheets and delivered to the Department in accordance with the provisions of Subsection 102.09. Bids submitted using any other form, format or means will result in an irregular bid. The bidder's bid data shall be saved on the MDOT-supplied USB Flash Drive and submitted with the bid. Failure to return the USB Flash Drive with bid data will result in an irregular bid. If a Bidder is submitting bids on multiple proposals, the bid data for all proposals can be included on one flash drive and submitted with any of the bid envelopes.

Bidders are cautioned that using other versions of the Expedite Bid may result in improperly printed bid sheets. The correct version of Expedite Bid can be obtained at no cost from the MDOT Contract Administration Division or at the MDOT website, http://mdot.ms.gov. The current version of Expedite Bid is also included on the MDOT-supplied USB Flash Drive.

The Expedite Bid generated bid sheets should be stapled together in order beginning with page 1, signed and included in the bid proposal package in the sealed envelope. Only the Expedite Bid generated sheets will be recognized as the official bid. The MDOT-provided USB Flash Drive containing the information printed on the Expedite Bid generated bid sheets should be placed in the padded envelope included with the bid proposal package and enclosed in the sealed envelope. Bid sheets printed from Expedite Bid should be a representation of the data returned on the flash

drive. To have a true representation of the bid sheets, the Bidder must copy the EBS and EBS amendment files used to prepare the bid sheets to the flash drive. Otherwise, the unit prices bid will not be recorded to the flash drive. Bidders are cautioned that failure to follow proper flash drive handling procedures could result in the Department being unable to process the flash drive. Any modification or manipulation of the data contained on the flash drive, other than entering unit bid prices and completing all required Expedite Bid sections, will not be allowed and will cause the Contractor's bid to be considered irregular.

907-102.08--Proposal Guaranty. Delete the first and second paragraphs in Subsection 102.08 on page 20 and substitute the following.

No proposal will be considered unless accompanied by certified check, cashier's check or bid bond, made payable to the State of Mississippi, in an amount of not less than five percent (5%) of the total amount of the proposal offered. The guaranty shall be evidence of good faith that, if awarded the contract, the bidder will execute the contract and give performance and payment contract bond(s) as stipulated in Subsection 907-103.05.1, 907-103.05.2, and as required by law.

If a bid bond is offered as guaranty, the bond must be on a form approved by the Executive Director, made by a Surety acceptable to the Executive Director and signed or countersigned by a Mississippi Agent or Qualified Nonresident Agent and the Bidder. Such bid bond shall also conform to the requirements and conditions stipulated in Subsection 907-103.05.2 as applicable.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-103-8 **CODE: (SP)**

DATE: 12/15/2009

SUBJECT: Award and Execution of Contract

Section 103, Award and Execution of Contract, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-103.04--Return of Proposal Guaranty. Delete the second paragraph of Subsection 103.04 on page 23 and substitute the following:

Certified checks or cashier's checks submitted as proposal guaranties, except those of the two lowest bidders, will be returned within 10 days of contract award. The retained proposal guaranty of the unsuccessful of the two lowest bidders will be returned within ten days following the execution of a contract with the successful low bidder. The retained proposal guaranty of the successful bidder will be returned after satisfactory performance and payment bonds have been furnished and the contract has been executed.

In the event all bids are rejected by the Commission, certified checks or cashier's checks submitted as proposal guaranty by all bidders will be returned within 10 days of rejection.

Delete Subsection 103.05 on page 23 and substitute the following:

907-103.05--Contract Bonds.

907-103.05.1--Requirement of Contract Bonds. Prior to the execution of the contract, the successful bidder shall execute and deliver to the Executive Director a performance and payment bond(s), in a sum equal to the full amount of the contract as a guaranty for complete and full performance of the contract and the protection of the claimants and the Department for materials and equipment and full payment of wages in accordance with Section 65-1-85 Miss. Code Ann. (1972 as amended). In the event of award of a joint bid, each individual, partnership, firm or corporation shall assume jointly the full obligations under the contract and the contract bond(s).

907-103.05.2--Form of Bonds. The form of bond(s) shall be that provided by or acceptable to the Department. These bonds shall be executed by a Mississippi agent or qualified nonresident agent and shall be accompanied by a certification as to authorization of the attorney-in-fact to commit the Surety company. A power of attorney exhibiting the Surety's original seal supporting the Mississippi agent or the qualified nonresident agent's signature shall be furnished with each bond. The Surety company shall be currently authorized and licensed in good standing to conduct business in the State of Mississippi with a minimum rating by A.M. Best of (A-) in the latest printing "Best's Key Rating Guide" to write individual bonds up to ten percent of the policy holders' surplus or listed on the current list of “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as

published by the United States Department of the Treasury, Financial Management Service, Circular 570 (latest revision as published and supplemented on the Financial Management Service Web site and in the Federal Register) within the underwriting limits listed for that Surety. All required signatures on the bond(s) and certifications shall be original signatures, in ink, and not mechanical reproductions or facsimiles. The Mississippi agent or qualified nonresident agent shall be in good standing and currently licensed by the Insurance Commissioner of the State of Mississippi to represent the Surety company(ies) executing the bonds.

Surety bonds shall continue to be acceptable to the Commission throughout the life of the Contract and shall not be canceled by the Surety without the consent of the Department. In the event the Surety fails or becomes financially insolvent, the Contractor shall file a new Bond in the amount designated by the Executive Director within thirty (30) days of such failure, insolvency, or bankruptcy. Subsequent to award of Contract, the Commission or the Department may require additional security for any supplemental agreements executed under the contract or replacement security in the event of the surety(ies) loss of the ratings required above. Suits concerning bonds shall be filed in the State of Mississippi and adjudicated under its laws without reference to conflict of laws principles.

907-103.08--Failure to Execute Contract.. In the first sentence of Subsection 103.08 on page 24, change "bond" to "performance and payment bonds".

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-104-1 **CODE: (IS)**

DATE: 05/03/2004

SUBJECT: Partnering Process

Section 104, Scope of Work, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-104.01--Intent of Contract. At the end of Subsection 104.01 on Page 24, add the following:

907-104.01.1--Partnering Process.

COVENANT OF GOOD FAITH AND FAIR DEALING:

This contract imposes an obligation of good faith and fair dealing in its performance and enforcement.

The contractor and the Department, with a positive commitment to honesty and integrity, agree to the following mutual duties:

A. Each will function within the laws and statutes applicable to their duties and responsibilities.

B. Each will assist in the other's performance.

C. Each will avoid hindering the other's performance.

D. Each will proceed to fulfill its obligations diligently.

E. Each will cooperate in the common endeavor of the contract.

VOLUNTARY PARTNERING:

The Mississippi Department of Transportation intends to encourage the foundation of a cohesive partnership with the contractor and its principal subcontractors and supplier. This partnership will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objectives are effective and efficient contract performance and completion within budget, on schedule, and in accordance with plans and specifications.

This partnership will be bilateral in make-up, and participation will be totally voluntary. Any cost associated with effectuating this partnering will be agreed to by both parties and will be shared equally.

To implement this partnering initiative prior to starting of work in accordance with the requirements of Subsection 108.02 Notice to Proceed and prior to the preconstruction conference, the contractor's management personnel and MDOT's District Engineer, will initiate a partnering development seminar/team building workshop. The Contractor working with the assistance of the District and the State Construction Engineer will make arrangements to determine attendees for the workshop, agenda of the workshop, duration, and location. Persons required to be in attendance will be the MDOT key project personnel, the contractor's on-site project manager and key project supervision personnel of both the prime and principal subcontractors and suppliers. The project design engineers, FHWA and key local government personnel will be also be invited to attend as necessary. The contractors and MDOT will also be required to have Regional/District and Corporate/State level managers on the project team.

Follow-up workshops may be held periodically throughout the duration of the contract as agreed by the contractor and Mississippi Department of Transportation.

The establishment of a partnership charter on a project will not change the legal relationship of the parties to the contract nor relieve either party from any of the terms of the contract.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-104-5 **CODE: (IS)**

DATE: 05/01/2013

SUBJECT: Scope of Work

Section 104, Scope of Work, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-104.05--Removal and Disposal of All Materials From the Project. Delete the second sentence of the first full paragraph of Subsection 104.05 on page 30 and substitute the following:

The Contractor shall also furnish the Engineer a certified letter stating that the area of disposal is not in a wetland or in Waters of the U.S.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-105-7 **CODE: (IS)**

DATE: **05/01/2013**

SUBJECT: **Control of Work**

Section 105, Control of Work, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is modified as follows.

907-105.05--Cooperation by Contractor. In the third sentence of the second paragraph of Subsection 105.05 on page 35, change "Notice to Proceed" to "Notice of Award".

Delete the fourth paragraph of Subsection 105.05 on page 35, and substitute the following.

On projects that include erosion control pay items, the Contractor shall also designate a responsible person whose primary duty shall be to monitor and maintain the effectiveness of the erosion control plan, including NPDES permit requirements. This responsible person must be a Certified Erosion Control Person certified by an organization approved by the Department. Prior to or at the pre-construction conference, the Contractor shall designate in writing the Certified Erosion Control Person to the Project Engineer. The designated Certified Erosion Control Person shall be assigned to only one (1) project. When special conditions exist, such as two (2) adjoining projects or two (2) projects in close proximity, the Contractor may request in writing that the State Construction Engineer approve the use of one (1) Certified Erosion Control Person for both projects. The Contractor may request in writing that the Engineer authorize a substitute Certified Erosion Control Person to act in the absence of the Certified Erosion Control Person. The substitute Certified Erosion Control Person must also be certified by an organization approved by the Department. A copy of the Certified Erosion Control Person's certification must be included in the Contractor's Protection Plan as outlined in Subsection 907-107.22.1. This in no way modifies the requirements regarding the assignment and availability of the superintendent.

907-105.14--Maintenance During Construction. Before the first sentence Subsection 105.14 on page 39, add the following.

The Contractor will be responsible for the maintenance of existing roadways within the limits of this project starting on the date of the Notice To Proceed / Beginning of Contract Time. Anytime work is performed in a travel lane, the Contractor shall install portable lane closure signs meeting the requirement of the MDOT Standard Drawing or MUTCD.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-107-13 **CODE: (IS)**

DATE: 05/01/2013

SUBJECT: **Legal Relations and Responsibility to Public**

Section 107, Legal Relations and Responsibility to Public, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-107.02--Permits, Licenses and Taxes. Delete in toto Subsection 107.02 on page 49 and substitute the following.

The Contractor or any Subcontractor shall have the duty to determine any and all permits and licenses required and to procure all permits and licenses, pay all charges, fees and taxes and issue all notices necessary and incidental to the due and lawful prosecution of the work. At any time during the life of this contract, the Department may audit the Contractor's or Subcontractor's compliance with the requirements of this section.

The Contractor or any Subcontractor is advised that the "Mississippi Special Fuel Tax Law", Section 27-55-501, et seq. and the Mississippi Use Tax Law, Section 27-67-1, et seq., and their requirements and penalties, apply to any contract or subcontract for construction, reconstruction, maintenance or repairs, for contracts or subcontracts entered into with the State of Mississippi, any political subdivision of the State of Mississippi, or any Department, Agency, Institute of the State of Mississippi or any political subdivision thereof.

The Contractor or any Subcontractor will be subject to one or more audits by the Department during the life of this contract to make certain that all applicable fuel taxes, as outlined in Section 27-55-501, et seq., and any sales and/or use taxes, as outlined in Section 27-67-1, et seq. are being paid in compliance with the law. The Department will notify the Mississippi State Tax Commission of the names and addresses of any Contractors or Subcontractors.

907-107.14--Damage Claims and Insurance.

907-107.14.2--Liability Insurance. Delete Subsection 107.14.2 beginning on page 60 and substitute the following.

907-107.14.2.1--General. The Contractor shall carry Contractor's liability, including subcontractors and contractual, with limits not less than: $500,000 each occurrence; $1,000,000 aggregate; automobile liability - $500,000 combined single limit - each accident; Workers' Compensation and Employers' Liability - Statutory & $100,000 each accident; $100,000 each employee; $500,000 policy limit. Each policy shall be signed or countersigned by a Mississippi Agent or Qualified Nonresident Agent of the Insurance Company.

The Contractor shall have certificates furnished to the Department from the insurance companies providing the required coverage. The certificates shall be on the form furnished by the Department and will show the types and limits of coverage.

907-107.14.2.2--Railroad Protective. The following provisions are applicable to all work performed under a contract on, over or under the rights-of-way of each railroad shown on the plans.

The Contractor shall assume all liability for any and all damages to work, employees, servants, equipment and materials caused by railroad traffic.

Prior to starting any work on railroad property, the Contractor shall furnish satisfactory evidence to the Department that insurance of the forms and amounts set out herein in paragraphs (a) and (b) has been obtained. Also, the Contractor shall furnish similar evidence to the Railroad Company that insurance has been obtained in accordance with the Standard Provisions for General Liability Policies and the Railroad Protective Liability Form as published in the Code of Federal Regulations, 23 CFR 646, Subpart A. Evidence to the Railroad Company shall be in the form of a Certificate of Insurance for coverages required in paragraph (b), and the original policy of the Railroad Protective Liability Insurance for coverage required in paragraph (a).

All insurance herein specified shall be carried until the contract is satisfactorily complete as evidenced by a release of maintenance from the Department.

The Railroad Company shall be given at least 30 days notice prior to cancellation of the Railroad Protective Liability Insurance policy.

For work within the limits set out in Subsection 107.18 and this subsection, the Contractor shall provide insurance for bodily injury liability, property damage liability and physical damage to property with coverages and limits no less than shown in paragraphs (a) and (b). Bodily injury shall mean bodily injury, sickness, or disease, including death at anytime resulting therefrom. Property damage shall mean damages because of physical injury to or destruction of property, including loss of use of any property due to such injury or destruction. Physical damage shall mean direct and accidental loss of or damage to rolling stock and their contents, mechanical construction equipment or motive power equipment.

(a) **Railroad Protective Liability Insurance** shall be purchased on behalf of the Railroad Company with limits of $2,000,000 each occurrence; $6,000,000 aggregate applying separately to each annual period for lines without passenger trains. If the line carries passenger train(s), railroad protective liability insurance shall be purchased on behalf of the Railroad Company with limits of $5,000,000 each occurrence; $10,000,000 aggregate applying separately to each annual period.

Coverage shall be limited to damage suffered by the railroad on account of occurrences arising out of the work of the Contractor on or about the railroad right-of-way, independent of the railroad's general supervision or control, except as noted in paragraph 4 below.

Coverage shall include:

(1) death of or bodily injury to passengers of the railroad and employees of the railroad not covered by State workmen's compensation laws,

(2) personal property owned by or in the care, custody or control of the railroads,

(3) the Contractor, or any of the Contractor's agents or employees who suffer bodily injury or death as a result of acts of the railroad or its agents, regardless of the negligence of the railroads, and

(4) negligence of only the following classes of railroad employees:

(i) any supervisory employee of the railroad at the job site

(ii) any employee of the railroad while operating, attached to, or engaged on, work trains or other railroad equipment at the job site which are assigned exclusively to the Contractor, or

(iii) any employee of the railroad not within (i) or (ii) above who is specifically loaned or assigned to the work of the Contractor for prevention of accidents or protection or property, the cost of whose services is borne specifically by the Contractor or Governmental authority.

(b) **Contractor's Liability - Railroad**, including subcontractors, XCU and railroad contractual with limits of $1,000,000 each occurrence; $2,000,000 aggregate. **Automobile** with limits of $1,000,000 combined single limit any one accident; **Workers' Compensation and Employer's Liability** - statutory and $100,000 each accident; $100,000 each employee; $500,000 policy limit. **Excess/Umbrella Liability** $5,000,000 each occurrence; $5,000,000 aggregate. All coverage to be issued in the name of the Contractor shall be so written as to furnish protection to the Contractor respecting the Contractor's operations in performing work covered by the contract. Coverage shall include protection from damages arising out of bodily injury or death and damage or destruction of property which may be suffered by persons other than the Contractor's own employees.

In addition, the Contractor shall provide for and on behalf of each subcontractor by means of a separate and individual liability and property damage policy to cover like liability imposed upon the subcontractor as a result of the subcontractor's operations in the same amounts as contained above; or, in the alternative each subcontractor shall provide same.

907-107.15--Third Party Beneficiary Clause. In the first sentence of the first paragraph of Subsection 107.15 on page 61, change "create the public" to "create in the public".

907-107.17--Contractor's Responsibility for Work. Delete the fifth sentence of the fifth paragraph of Subsection 107.17 on page 63 and substitute the following.

The eligible permanent items shall be limited to traffic signal systems, changeable message signs, roadway signs and sign supports, lighting items, guard rail items, delineators, impact

attenuators, median barriers, bridge railing or pavement markings. The eligible temporary items shall be limited to changeable message signs, guard rail items, or median barriers.

907-107.18--Contractor's Responsibility for Utility Property and Services. After the first sentence of Subsection 107.18 on page 63, add the following:

Prior to any excavation on the project, the Contractor shall contact MS 811 and advise them to mark all known utilities in the area of the excavation.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-108-30 **CODE: (IS)**

DATE: 05/22/2013

SUBJECT: Prosecution and Progress

Section 108, Prosecution and Progress, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-108.01--Subletting of Contract.

907-108.01.1--General. At the end of the last paragraph of Subsection 108.01.1 on page 73, add the following.

The Engineer will have the authority to suspend the work wholly or in part and to withhold payments because of the Contractor's failure to make prompt payment within 15 calendar days as required above, or failure to submit the required OCR-484 Form, Certification of Payments to Subcontractors, which is also designed to comply with prompt payment requirements.

907-108.02--Notice To Proceed. Delete the second paragraph of Subsection 108.02 on page 75 and substitute the following.

The anticipated date of the Notice to Proceed (NTP) / Beginning of Contract Time (BCT) will be specified in the proposal.

Delete the fourth paragraph of Subsection 108.02 on page 75 and substitute the following.

Upon written request from the Contractor and if circumstances permit, the Notice to Proceed may be issued at an earlier date subject to the conditions stated therein. The Contractor shall not be entitled to any monetary damages or extension of contract time for any delay claim or claim of inefficiency occurring between the early issuance Notice To Proceed date and the Notice to Proceed date stated in the contract.

907-108.03--Prosecution and Progress. Delete Subsection 108.03.1 on pages 75 & 76, and substitute the following.

907-108.03.1--Progress Schedule. Prior to or at the Pre-Construction Conference, the Contractor shall furnish a progress schedule and be prepared to discuss both its proposed methodologies for fulfilling the scheduling requirements and its sequence of operations. The Engineer will review the schedule and approve the schedule as it relates to compliance with the specifications and logic. The progress schedule must be approved by the Engineer prior to commencing work. The schedule shall be a bar-chart type schedule submitted on 11”x17” paper meeting the below minimum requirements. These activities shall be significantly detailed enough to communicate the Contractor's understanding of the construction sequencing and phasing of the project.

When preparing the progress schedule, the Contractor shall include the following:

- Show a time scale to graphically show the completion of the work within contract time.
- Define and relate activities to the contract pay items.
- Show all activities in the order the work is to be performed including submittals, submittal reviews, fabrication and delivery.
- Show all activities that are controlling factors in the completion of the work.
- Show the time needed to perform each activity and its relationship in time to other activities.

Should the schedule not include the above requirements or becomes unrealistic during construction, the Contractor should immediately submit a revised, more realistic schedule for approval.

907-108.03.2--Preconstruction Conference. Delete the first paragraph of Subsection 108.03.2 on page 76 and substitute the following.

Prior to commencement of the work, a preconstruction conference shall be held for the purpose of discussing with the Contractor essential matters pertaining to the prosecution and satisfactory completion of the work. The Contractor will be responsible for scheduling the preconstruction conference. The Contractor will advise the Project Engineer in writing 14 days prior to the requested date that a conference is requested. When the contract requires the Contractor to have a certified erosion control person, the Contractor's certified erosion control person shall be at the preconstruction conference. The Department will arrange for utility representatives and other affected parties to be present.

Delete the third paragraph of Subsection 108.03.2 on page 76.

907-108.06--Determination and Extension of Contract Time. Delete Subsections 108.06.1 and 108.06.2 on pages 79 thru 85 and substitute the following.

907-108.06.1--Blank.

907-108.06.2--Based on Calendar Date Completion.

907-108.06.2.1--General. Contract Time will be established on the basis of a Completion Date, as indicated in the contract. The span of time allowed for the completion of the work included in the contract will be indicated in the contract documents and will be known as "Contract Time".

The span of time allowed in the contract as awarded is based on the quantities used for comparison of bids. If satisfactory fulfillment of the contract requires performance of work in greater quantities than those set forth in the proposal, the time allowed for completion shall be increased in Calendar Days in the same ratio that the cost of such added work, exclusive of the cost of work altered by Supplemental Agreement for which a time adjustment is made for such altered work in the Supplemental Agreement, bears to the total value of the original contract unless it can be established that the extra work was of such character that it required more time

than is indicated by the money value.

The Contractor shall provide sufficient materials, equipment and labor to guarantee the completion of the work in the contract in accordance with the plans and specifications within the Contract Time.

907-108.06.2.2--Contract Time. The following TABLE OF ANTICIPATED PRODUCTIVE DAYS indicates an average/anticipated number of productive days per month.

TABLE OF ANTICIPATED PRODUCTIVE DAYS

Month	Available Productive Days
January	6
February	7
March	11
April	15
May	19
June	20
July	21
August	21
September	20
October	16
November	11
December	5
Calendar Year	172

Allocation of anticipated productive days for a fractional part of the month will be computed as a proportion of the listed anticipated productive days for the applicable month.

Available productive days will start being assessed at the original Notice to Proceed/Beginning of Contract Time date shown in the contract documents, regardless of whether or not the Contractor has been issued an early Notice to Proceed.

Available productive days will be based on soil and weather conditions and other specific conditions cited in the contract. The Engineer will determine on each applicable day the extent to which work in progress could have been productive, regardless of whether the Contractor actually worked.

An available productive day will be assessed as follows:

(a) any day of the week, Monday through Friday, exclusive of legal holidays recognized by the Department in Subsection 108.04.1, in which the Contractor works or could have worked for more than six (6) consecutive hours on the controlling item(s) of work, as determined by the

Engineer from the Contractor's approved progress schedule. When the Contractor works or could work more than four but less than six consecutive hours, one-half (0.5) of an available work day will be charged for that day. When the Contractor works or could work six or more consecutive hours during the day, one (1.0) available work day will be charged for that day, or

(b) any Saturday, exclusive of legal holidays recognized by the Department in Subsection 108.04.1, in which the Contractor works for more than six (6) consecutive hours on the controlling item(s) of work, as determined by the Engineer from the Contractor's approved progress schedule. When the Contractor works less than four consecutive hours during the day, no time will be charged for that day. When the Contractor works more than four but less than six consecutive hours, one-half (0.5) of an available work day will be charged for that day. When the Contractor works six or more consecutive hours during the day, one (1.0) available work day will be charged for that day.

Should the weather or other conditions be such that four (4) consecutive satisfactory hours are not available prior to noon (for daytime operations) or midnight (for nighttime operations), no time will be assessed for that day regardless of the above conditions. However, if the Contractor elects to work, time will be assessed in accordance with the previous paragraph.

Weather delays will not be considered for Saturdays, Sundays or legal holidays recognized by the Department in Subsection 108.04.1.

Each month the Engineer will complete, and furnish to the Contractor, an "Assessment Report for Available Productive Days" (CSD-765). This report shows the number of available productive days during the estimate period and the cumulative available productive days to date. The Contractor should review the Engineer's report as to the accuracy of the assessment and confer with the Resident or Project Engineer to rectify any differences. Each should make a record of the differences, if any, and conclusions reached. In the event mutual agreement cannot be reached, the Contractor will be allowed a maximum of 15 calendar days following the ending date of the monthly report in question to file a protest Notice of Claim in accordance with the provisions of Subsection 105.17. Otherwise, the Engineer's assessment shall be final unless mathematical errors of assessment are subsequently found to exist, and any claim of the Contractor as to such matter shall be waived.

The Contractor's progress will be determined monthly at the time of each progress estimate and will be based on the percentage of money earned by the Contractor compared to the percentage of elapsed time.

The percentage of money earned will be determined by comparing the total money earned to-date by the Contractor, minus any payment for advancement of materials, to the total dollar amount of the contract. The percentage of time elapsed will be determined by comparing the available productive days assessed to-date on Form CSD-765 to the total available productive days for the contract.

When the "percent complete" lags more than 20 percent behind the "percentage of elapsed time", the Contractor shall immediately submit a written statement and revised progress schedule

indicating any additional equipment, labor, materials, etc. to be assigned to the work to ensure completion within the specified contract time. When the "percent complete" lags more than 40 percent behind the "percentage of elapsed time", the contract may be terminated.

907-108.06.2.3--Extension of Time. The Contractor may, prior to the expiration of the Contract Time, make a written request to the Engineer for an extension of time with a valid justification for the request. The Contractor's plea that insufficient time was specified is not a valid reason for extension of time.

No extension of the specified completion date will be granted except as provided herein. An extension of contract time may be granted for unusually severe weather, abnormal delays caused solely by the State or other governmental authorities, or unforeseeable disastrous phenomena of nature of the magnitude of earthquakes, hurricanes, tornadoes, or flooded essential work areas which are deemed to unavoidably prevent prosecuting the work.

Unusually severe weather is defined as when the actual available productive days for the contract time are less than the number of available productive days shown in the Table of Anticipated Productive Days. Any extension of contract time will be based on a calendar days basis, excluding Saturdays, Sundays or legal holidays recognized by the Department in Subsection 108.04.1. Any extension of contract time will be made on or after the specified completion date. No extension of contract time will be made on a monthly basis.

If the specified completion date of the project is extended into a season of the year in which completion of certain items of work would be prohibited or delayed because of seasonal or temperature limitations, the Engineer may waive the limitations provided the completion of the work will not result in a reduction in quality. When determined that the completion of the out-of-season items will cause a reduction in the quality of the work, the completion of the project will be further extended so the items may be completed under favorable weather conditions. In either case, the Engineer will notify the Contractor in writing.

Liquidated damages as set forth in Subsection 108.07 under the heading "Daily Charge Per Calendar Day" in the Table titled "Schedule of Deductions for Each Day of Overrun in Contract Time", shall be applicable to each calendar day after the specified completion date, or authorized extension thereof, and until all work under the contract is completed.

907-108.06.2.4--Cessation of Contract Time. When the Engineer by written notice schedules a final inspection, time will be suspended until the final inspection is conducted and for an additional 14 calendar days thereafter. If after the end of the 14-day suspension all necessary items of work have not been completed, time charges will resume. If the specified completion date had not been reached at the time the Contractor called for a final inspection, the calendar day difference between the specified completion date and the date the Contractor called for a final inspection will be added after the 14-day period before starting liquidation damages. If a project is on liquidated damages at the time a final inspection is scheduled, liquidated damages will be suspended until the final inspection is conducted and for seven (7) calendar days thereafter. If after the end of the 7-day suspension all necessary items of work have not been completed, liquidated damages will resume. When final inspection has been made by the

Engineer as prescribed in Subsection 105.16 and all items of work have been completed, the daily time charge will cease.

907-108.07--Failure to Complete the Work on Time. Delete the Schedule of Deductions table in Subsection 108.07 on page 85, and substitute the following.

Schedule of Deductions for Each Day of Overrun in Contract Time

Original Contract Amount		Daily Charge
From More Than	To and Including	Per Calendar Day
$ 0	100,000	$ 150
100,000	500,000	360
500,000	1,000,000	540
1,000,000	5,000,000	830
5,000,000	10,000,000	1,200
10,000,000	20,000,000	1,800
20,000,000	----------	3,500

907-108.10--Termination of Contractor's Responsibility. In the last sentence of Subsection 108.10 on page 88, change "bond" to "performance and payment bond(s)".

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-109-6 **CODE: (IS)**

DATE: 05/01/2013

SUBJECT: Measurement and Payment

Section 109, Measurement and Payment, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-109.01--Measurement of Quantities. Delete the third full paragraph of Subsection 109.01 on page 90 and substitute the following.

When requested by the Contractor, material specified to be measured by the cubic yard or ton may be converted to the other measure as appropriate. 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.

After the second sentence of the fourth full paragraph of Subsection 109.01 on page 90, add the following.

Where loose vehicle measurement (LVM) is used, the capacity will be computed to the nearest one-tenth cubic yard and paid to the whole cubic yard. Measurements greater than or equal to nine-tenths of a cubic yard will be rounded to the next highest number. Measurements less than nine-tenths of a cubic yard will not be rounded to the next highest number. Example: A vehicle measurement of 9.9 cubic yards will be classified as a 10-cubic yard vehicle. A vehicle measurement of 9.8 cubic yards will be classified as a 9-cubic yard vehicle.

907-109.04--Extra and Force Account Work. In the last sentence of subparagraph (b) in Subsection 109.04 on page 91, change “bond” to “bond(s)”.

Delete the first sentence of the second paragraph of subparagraph (d) in Subsection 109.04 on page 92 and substitute the following.

In the event an agreement cannot be reached for a particular piece of equipment, the book entitled "Rental Rate Blue Book For Construction Equipment" as published by EquipmentWatch® and is current at the time the force account work is authorized will be used to determine equipment ownership and operating expense rates.

907-109.06--Partial Payment.

907-109.06.1--General. Delete the fourth and fifth sentences of the third paragraph of Subsection 109.06.1 on page 94, and substitute the following.

In the event mutual agreement cannot be reached, the Contractor will be allowed a maximum of

25 calendar days following the Contractor's receipt of the monthly estimate in question to file in writing, a protest Notice of Claim in accordance with the provisions Subsection 105.17. Otherwise, the Engineer's estimated quantities shall be considered acceptable pending any changes made during the checking of final quantities.

907-109.07--Changes in Material Costs. Delete the third full paragraph of Subsection 109.07 on page 96 and substitute the following.

A link to the established base prices for bituminous products and fuels will be included in the contract documents under a Notice to Bidders entitled "Petroleum Products Base Prices."

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-110-2 **CODE: (SP)**

DATE: 04/02/2010

SUBJECT: Wage Rates

Section 110, Required Contract Provisions, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-110.02--Application. Delete Subsection 110.02.2 on page 100 and substitute the following.

907-110.02.2--Wage Rates. All persons employed or working upon the site of the work will be paid at wage rates not less than those contained in the wage determination decision of the Secretary of Labor in effect 10 days prior to taking bids.

Bidders are advised that regardless of the wage rates listed in the Supplement to FHWA 1273 in the contract, minimum federal wage rates must be paid.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-237-4 **CODE: (SP)**

DATE: 03/13/2012

SUBJECT: Wattles

Section 907-237, Wattles, is hereby added to and made a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-237 - WATTLES

907-237.01--Description. This work consists of furnishing, constructing and maintaining wattles for the retention of soil around inlets, swale areas, small ditches, sediment basins and other areas as necessary. Also, the work includes removing and disposing of the wattles and silt accumulations.

Measurement and payment for wattles will be made only when a pay item is included in the bid schedule of the proposal. The quantity is estimated for bidding purposes only and will be dependent upon actual conditions which occur during construction of the project.

907-237.02--Materials. Wattles used around inlets shall have a diameter of twelve inches (12") and a length adequate to meet field conditions. Wattles used at other locations shall have a diameter of twenty inches (20") and a length adequate to meet field conditions. The minimum diameter for the above wattle sizes shall be one inch (1") less than the specified diameter.

The stakes used in securing the wattles in place shall be placed approximately three feet (3') apart throughout the length of the wattle. Stakes shall be wooden and of adequate size to stabilize the wattles to the satisfaction of the Engineer.

In addition to the requirements of this specifications, wattles shall be listed on the Department's "Approved Sources of Materials".

907-237.03--Construction Requirements.

907-237.03.1--General. The wattles shall be constructed at the locations and according to the requirements shown on the erosion control plan.

907-237.03.2--Maintenance and Removal. The Contractor shall maintain the wattles and remove and dispose of silt accumulations.

When the wattles are no longer needed, they shall be removed and the Contractor shall dispose of silt accumulations and treat the disturbed areas in accordance with the contract requirements.

907-237.04--Method of Measurement. Wattles of the size specified will be measured per linear foot.

907-237.05--Basis of Payment. Wattles, measured as prescribed above, will be paid for at the contract unit price per linear foot, which price shall be full compensation for installation, maintaining and removal of the wattles, the removal and disposal of silt accumulations and any required restoration of the disturbed areas.

Payment will be made under:

907-237-A: Wattles, Size - per linear foot

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

DATE: 03/09/2009

SUBJECT: Changeable Message Signs

Section 619, Traffic Control for Construction Zones, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-619.02--Material Requirements. After Subsection 619.02.13 on page 424, add the following.

907-619.02.14--Changeable Message Sign. This work shall consist of furnishing, testing, and maintaining a trailer-mounted electronic Portable Changeable Message Sign (PCMS) assembly. The sign display shall be a LED, full matrix sign. If more than one portable changeable message sign is required for this project, they shall all be of the same model and from the same manufacturer. All parts and materials used to construct the portable changeable message signs shall be interchangeable.

The PCMS shall be a trailer-mounted, solar powered, portable changeable message sign.

Each PCMS shall include the following main components:

a) Sign Housing
b) LED Modules
c) LED Drivers
d) Battery Bank
e) Sign Controller
f) Trailer
g) AC Charger
h) Solar Panel
i) Solar Panel Charger

The LED display shall be full matrix sign with a minimum of 28-pixel rows x 50-pixel columns. The pixel spacing shall be such that three (3) lines of text (5 columns x 7 rows, 8 characters) shall each have a nominal height of 18 inches.

The PCMS shall include a remote communications interface as specified herein. The PCMS shall be provided with a local serial and USB connection within the sign control cabinet so that a laptop computer using the remote software can communicate directly with the sign CPU.

This Special Provision incorporates normative references to other standards as outlined in Section 1 of the NEMA TS-4 standard and as listed below.

NEMA TS4-2004, Hardware Standards for Dynamic Message Signs (DMS) with NTCIP Requirements. All NEMA TS-4 requirements that are applicable to portable signs shall be used.

NTCIP Standards.

If a conflict between the standards referenced and this Special Provision, this Special Provision shall govern.

The definitions of the terms used within this Special Provision are as defined in Section 1 of the NEMA TS-4 standard.

If required in the contract, the PCMS shall include a speed radar unit as specified herein.

907-619.02.14.1--Mechanical Construction. Each PCMS shall meet the following minimum requirements.

Weather-Tight Enclosure. The entire sign and trailer assembly, including each component / equipment exposed to weather, shall be fully protected. It shall withstand the effects of sand, dirt, dust, moisture, hose-directed water, ice, snow and UV radiation (UVA and UVB). It shall withstand the effects of high wind loading and blowing rain as specified herein with all outriggers and/or leveling jacks in place. The sign and all components shall be watertight. Space shall be provided for manuals to be stored in a weatherproof environment.

Wind Loading. Wind loading requirements for the portable sign housing and trailer assembly shall be as specified in Section 3.3.2.1.2 of the NEMA TS-4 standard.

Welding. All welding on all major structural components (aluminum or steel) shall be performed by certified welders and in accordance to SAE/AWS D8.8 American Welding Society.

Protective Coatings. Protective coatings or processes, such as anodizing, e-coating, powder coat painting, plating, etc., shall be incorporated to protect all sign, cabinet, and trailer metal surfaces from corrosion. Any non-protected metallic fasteners shall be made of stainless steel or aluminum. All components shall be similar material, or be isolated to reduce galvanic reactions.

Temperature and Humidity. Each PCMS shall be designed to operate continuously in extreme ambient temperature ranges and at high humidity levels.

Operating ambient temperature range of the portable sign and trailer assembly shall be -29^{o}F to $+165^{o}$F. Storage temperature range shall be from -40^{o}F to $+185^{o}$F. The portable sign shall be capable of continued operation within the operating temperature ranges specified without the need for active systems (i.e., fans). Operating relative humidity level of the portable sign shall be up to 95% non-condensing.

Sign Face. Sign face material shall be protected by a non-glaring polycarbonate material of at least ¼-inch thickness. It shall be replaceable and manufactured of material rated for outside use and resistant to UV degradation (exposure to the sun).

All electronics and pixels shall be protected from damage due to moisture.

Sign Housing Construction. The portable sign housing, including its front face panels, shall be designed to conform to the requirements of minimum NEMA Type 3R, as described in the latest edition of NEMA 250.

It shall be comply with latest structural AASHTO requirements.

It shall be constructed of aluminum sheeting which shall not be less than 1/8-inch thick with all seams continuously welded by the inert gas process.

The front of the sign housing shall have a flat black matte finish.

Weep holes shall be provided in the housing to allow moisture from condensation to escape.

The sign housing and cabinets shall be designed to keep insects out.

The sign housing shall be constructed in such a manner as to prohibit stray light from reducing legibility.

All sides of the sign housing shall have a maintenance-free finish.

Alignment of the sign housing shall be capable of being horizontally adjusted to position the sign a full 360 degrees. It shall be capable of rotating and locking at any selected horizontal angle up to 360 degrees. A sight alignment tube/device shall be mounted to horizontally position the sign display. A positive brake assembly with lockable control arm shall be provided to position the sign display in the desired position.

It shall allow easy access to all components contained within the display housing without the removal of any external parts. Door locks shall be rigidly mounted. Gasketing shall be provided on all door openings and shall be dust-tight, permanently bonded to the door metal, and shall not stick to the mating metal surface. A gasket channel shall be provided to support the gasket on the door.

Trailer. Each PCMS trailer shall meet all requirements for trailers as outlined in Section 3.3.3 of the latest NEMA TS-4 standard as well as the following minimum requirements.

All trailers shall meet the requirements of FMVSS, Part 571 and SAE J684 for transport safety including, but not limited to the use of brakes, safety chains, coupling device, and lights. PCMS manufacturer shall provide instructions stating procedures necessary to insure safe transport.

The structural frame shall be capable of supporting the gross vehicle weight (GVW) load of the trailer corresponding to the axle and tire ratings that shall be in accordance with FMVSS, Part 571.

The tires shall be radial ST "Special Trailer" rated. The wheels shall be 15-inch steel wheels with five lug bolts per wheel. Each trailer wheel shall be equipped with one locking lug nut. A minimum of four keys for the locking lug nuts shall be supplied for each trailer.

The trailer shall be provided with a minimum of four outriggers or leveling jacks. One outrigger or leveling jack shall be mounted near each corner of the trailer. The length of the leveling jacks shall be such that when the trailer is level, all four jacks and the tongue jack can be lowered into the vertical position. The jacks shall be screw type jacks with a minimum 25-inch lift. Each jack shall include a swivel mechanism that allows the jacks to be swing up to a horizontal position for towing. The swivel mechanism shall secure the jack in both vertical and horizontal positions through a lock pin.

The trailer shall also be provided with a trailer stand mounted on the tongue of the trailer. The stand shall be corrosion resistant. It shall include a 6-inch wheel that allows horizontal positioning of the trailer. The stand shall be welded, not bolted, to the tongue of the trailer.

The trailer shall be provided with legal tail/brake lights, signals, and license plate mounting bracket. The trailer shall be supplied with an electrical harness assembly for connection to the tow vehicle and shall be terminated in a connector type to be specified by the Engineer.

The trailer shall be provided with a 2-inch "hammer blow coupler" style hitch in accordance with SAE J684 and interchangeable with a 2½-inch Pintle coupler / ring meeting SAE J847.

The trailer spring leafs shall be rated at a minimum of 3500 pounds.

The trailer shall be equipped with a sign display lift and control console. The lift shall be electric, hydraulic lift, or combination of both with manual backup lift. The lift shall be capable of lifting the display a minimum of seven feet (7') above the roadway surface. A mast safety pin shall be provided to prevent the sign display from falling in the event of an electric or hydraulic system failure.

The trailer shall have a minimum of 6,000-pound capacity hydraulic surge brake system along with a breakaway latch.

Illumination shall be provided as an integral part of the sign or trailer assembly to change the sign controller data in darkness.

The trailer shall contain batteries and photovoltaic (solar) panels as specified herein.

Photovoltaic (Solar) Panel System. Each PCMS shall include solar panels. A solar bank shall be assembled using multiple solar panels. All photovoltaic panels shall be listed in accordance with UL 1703, or equivalent. The solar cell bank shall have a minimum capacity of 240 watts. The

solar cell bank shall be mounted on a frame capable of being tilted at a minimum of one direction up to 61 degrees with zero degrees being horizontal. Solar cells shall be laminated between ethylene vinyl acetate and tempered glass. The solar panel shall incorporate an extruded aluminum frame. The solar battery charge controller shall include the following three state charger modes.

- Bulk
- Absorption
- Float

Battery Requirements. Each PCMS shall include batteries for primary energy storage on trailers. The battery bank capacity shall be a minimum of 900 amp/hours at 12VDC at 20-hour rate of discharge. The batteries shall be heavy duty deep cycle type rated for 80% discharge. A battery power disconnect shall be provided.

Battery enclosures shall be vented to prevent the accumulation of explosive gases. The battery cabinets must be lockable with a standard padlock.

AC Charging System. Each PCMS shall have an AC battery charging sub-system. The system shall be UL listed and operate from a standard 120VAC generator meeting all NEC requirements for portable equipment.

The solar battery charger shall include the following three state charger modes.

- Bulk
- Absorption
- Float

The AC battery charger shall have sufficient capacity to charge the battery bank from 80% discharged to fully charge in 24-hours, and operate the sign simultaneously. The AC battery charger shall be equipped with a male plug-in and a 50-foot long extension cord constructed of a minimum 12-guage wire for this purpose.

907-619.02.14.2--Controller to Sign Interface. Each PCMS shall meet all applicable controller to sign interface requirements as outline in Section 4 of the NEMA TS-4 standard.

907-619.02.14.3--Display Properties. Each PCMS shall have a cone of vision (viewing angle) from the center (reference axis) shall be a minimum 15 degrees with the half-power viewing angle defined such that at a given distance from the LED, luminous intensity measured at any point at an angle of 7.5 degrees from the LED's center axis is no less than half the luminous intensity measured directly on the LED's center axis.

The minimum word legibility requirements shall be 1232 feet or greater under daytime light conditions and within the cone of visions as specified. Legibility is defined as the ability to discern the content of a display using a "word message". The minimum word legibility

requirement shall be documented either by a MDOT approved independent testing laboratory or by participation in the NTPEP test program.

The minimum visibility requirements shall be 3000 feet or greater under daytime light conditions and within the cone of vision as specified. Visibility is defined as the ability to recognize that a display exists. The minimum visibility requirement shall be documented either by a MDOT approved independent testing laboratory or by participation in the NTPEP test program.

The PCMS shall be capable of displaying standard fonts and font alphabets as specified in Sections 5.6.1 and 5.6.2.3 of the NEMA TS-4 standard and adhere to NTCIP 1203. The PCMS shall also support moving arrows.

Any NTPEP test results shall be for the PCMS model being used and shall be within the last three completed test cycles.

907-619.02.14.4--Optical Components. The pixels for the PCMS shall be manufactured using Light Emitting Diodes (LED). Changes to displays shall be performed by turning the LEDs in a pixel either on or off. The discrete, LED shall be an untinted, non-diffused, solid-state lamp that uses Aluminum Indium Gallium Phosphide (AlInGap) technology manufactured by Avago Technologies (formerly Agilent Technologies), Toshiba Corporation, Nichia Corporation, or functional equivalent. Horizontal and vertical spacing between modules shall be such that the horizontal and vertical pitch between all pixels is equal. A failure of one pixel shall not effect the operation of any other pixel.

All LEDs used to create a display in a single portable sign shall have a nominally rated LED life of 100,000 hours of operation under field conditions. This shall include a operating temperatures between -29^{o}F to +165^{o}F. LED life shall be defined as the time it takes for the LED light output to degrade to half of the LED's initial light output. Current through an LED shall be limited to the manufacturer's recommendation under any conditions. Each LED character module shall be rated for use over the environmental range specified herein, including heat absorption due to sunlight. The LEDs shall be protected from the outside environmental conditions, including moisture, snow, ice, wind, dust, dirt, and UV rays (UVA and UVB). All LEDs shall be mounted so that they present a uniform and legible display.

Pixels shall be replaceable in modular groupings (modules). All modules within a sign shall be the same size and interchangeable. The replacement of any module shall be possible with no more that simple non-vendor-specific hand tools, such as screw drivers or wrenches, without any physical modification to the module.

907-619.02.14.5--PCMS Controller and Storage Cabinets. All PCMS controller and storage cabinets shall be minimum NEMA 3R rated and be completely encased and lockable with a standard padlock as specified herein. A separate lockable storage cabinet shall be provided to house various accessories. The controller cabinet shall be manufactured to withstand all types of adverse weather conditions and shall be designed and installed to keep insects out. All components inside the controller cabinet shall be accessible without disconnecting any

unassociated wires or components. The controller cabinet shall be illumination. The keyboard terminal and control panel shall be housed. Lighted keys and terminal displays are acceptable.

All controls in the controller cabinet shall be labeled. The cabinet shall have a voltmeter gauge to indicate the current battery charge status. It shall have an amp gauge to indicate the current/charging status. It will be acceptable to have a display via digital readout on a control console or panel.

907-619.02.14.6--Electronics and Electrical. Each PCMS shall meet all applicable electronics and electrical requirements as outline in Section 8 of the NEMA TS-4 standard.

Sign Controller. The PCMS shall include a local sign controller with firmware. The local control interface shall have a keyboard capable of allowing full programming and control of the PCMS locally. It shall have a separate serial RS-232 or USB connection to allow a laptop computer using the remote control software to communicate directly with the sign controller.

Local and remote interfaces shall be password protected to safeguard against unauthorized use.

It shall perform and report the following minimum sign diagnostics both through the local interface and Remote Control Subsystem.

- LED brightness controls
- Sign status
- Communications status
- Battery voltage
- Photocell ambient light level.

It shall automatically report a low battery alarm to a remote user through the Remote Control Subsystem. It shall have an alarm for the controller door open and over temperature.

It shall store and display both textual and graphical symbols. It shall store a minimum of 20 pre-programmed messages and graphics. It shall display preprogrammed (by manufacturer) Manual on Uniform Traffic Control Devices (MUTCD) symbolic messages and standard arrows. It shall schedule predetermined sequences of messages based on a programmed time and date. Each sequence shall display up to four (4) programmed messages (text and/or graphics). It shall display conventional one, two, or three-line messages for display with a choice of a minimum of three font sizes. Character width shall be proportional to the letter type. The one line message font size shall be capable of displaying messages in full size to utilize the maximum area of display.

It shall allow for automatic and manual controls to adjust the brightness of the LEDs. Automatic control shall be capable of varying the LED brightness by sensing the ambient light level using photocells. Manual brightness control shall be password protected to safeguard against unauthorized use.

It shall display a preprogrammed default message or no message at all, after a power recovery from a power failure. The sign shall shut down its LED display if internal cabinet temperatures reach a level that is determined unsafe by the manufacturer.

All communications and power cabling shall be either shielded or routed within conduit to minimize potential EMI/RFI effects.

Remote Control Subsystem. The PCMS shall be supplied with all the hardware and software necessary to control the PCMS from a remote central station.

It shall have a cellular phone and/or modem capable of communication using a MDOT provided cellular service provider. The Contractor shall coordinate with MDOT for cellular service provider. The Contractor shall be responsible for establishing cellular service and providing activated phone number(s) as directed and approved by the MDOT. The Contractor shall pay for cellular service for this project until the Final Maintenance Release as documented by the State Construction Engineer at which time it will be turned over to MDOT.

The cellular service type shall be CDMA/1xRTT or GSM/GPRS, as directed by MDOT.

It shall be capable of supporting connection and remote control, programming and diagnostics via the Internet.

The subsystem shall have all necessary hardware such as external antenna, communications cables, and controller interface and NTCIP Sign controller software. The central station software meeting the following minimum requirements:

- Windows XP compatible
- Capable of running on any desktop or laptop.
- Capable of controlling all PCMS functions through windows and GUIs (Graphical User Interface)
- NTCIP compatible as specified herein.

Communications. In addition to any protocols that may be available from the PCMS Manufacturer, each sign controller shall support NTCIP as follows.

- NTCIP Protocol and Command Sets**.** This specification references several standards through their NTCIP designated names and numbers. Each NTCIP Component covered by these project specifications shall implement the most recent version of the standard that is available as of project advertisement date, including any and all prepared Amendments to these standards as of the same date.

  Profile Implementation Conformance Specifications (PICS) for each NTCIP standard required shall be submitted for review and approval to the Department.

- RS-232 Interface. Communication interfaces using RS-232 shall conform, with the following minimum requirements.

1101 – NTCIP Simple Transportation Management Framework (STMF)
1203 - NTCIP Object Definition for Portable Dynamic Message Signs
2301 - NTCIP AP-STMF
2201 - NTCIP TP-Transportation Transport Profile
2103 – NTCIP SPPPP/RS232
2104 - NTCIP SP-PMPP/RS232

- Subnet Level**.** For each communication interface, the NTCIP Components may support additional Subnet Profiles at the manufacturer's option. At any time, only one Subnet Profile shall be active on a given communication interface. The NTCIP Component shall be configurable to allow the field technician to activate the desired Subnet Profile.

- Transport Level. For each communication interface, the communication interface may support additional Transport Profiles at the manufacturer's option. Response data-grams shall use the same Transport Profile used in the request. Each communication interface shall support the receipt of data-grams conforming to any of the identified Transport Profiles at any time.

- Application Level. For each communication interface, all interfaces shall comply with NTCIP 1101 and shall meet the requirements for Conformance Level 1 (NOTE -See Amendment to standard). Optionally, the NTCIP Component may support SNMP traps. A communication interface may support additional Application Profiles at the manufacturer's option. Responses shall use the same Application Profile used by the request. Each communication interface shall support the receipt of Application data packets at any time allowed by the subject standards.

  Information Level. For all communication interfaces, the information level protocol shall provide Full, Standardized Object Range Support of all objects required by these procurement specifications unless otherwise indicated below. The maximum Response Time for any object or group of objects shall be 200 milliseconds. All communication interfaces shall implement all mandatory objects of all mandatory Conformance Groups as defined in NTCIP 1203 and their respective Amendments. Table 1 indicates the modified object requirements for these mandatory objects. Table 2 shows the required minimum support of messages that are to be stored in permanent memory. The sign shall blank if a command to display a message contains an invalid Message CRC value for the desired message. Table 3 specifies the support of the required MULTI tags and their ranges.

  It shall also implement all mandatory objects of the following optional conformance groups of NTCIP 1201.

  - Time Management Conformal Group
  - Report Conformal Group. Table 4 indicates the modified object requirements.
  - Implement all objects of the Font Configuration Conformance Group, as defined in NTCIP 1203. Table 5 indicates the modified object requirements for this conformance group.

- Implement all objects of the PCMS Configuration Conformance Group, as defined in NTCIP 1203.
- Implement all objects of the Multi Configuration Conformance Group, as defined in NTCIP 1203. Table 6 indicates the modified object requirements for this conformance group.
- Implement all objects of the Multi Error Configuration, as defined in NTCIP 1203.
- Implement all objects of the Illumination/Brightness.
- Sign Status, as defined in NTCIP 1203.
- Status Error, as defined in NTCIP 1203.
- Pixel Error Status, as defined in NTCIP 1203.
- The sign display shall be capable of displaying preprogrammed Manual on Uniform Traffic Control Devices (MUTCD) symbolic messages and standard arrows Since the display of graphics is currently not defined within the NTCIP Standards or their amendments, the vendor shall propose, and provide detailed documentation (i.e., interface protocol description level), how the specified graphical shapes can be displayed.
- Implement the optional objects listed in Table 7.

Table 1
Modified Object Ranges for Mandatory Objects

Object	Reference	Project Requirement
ModuleTableEntry	NTCIP 1201 Clause 2.2.3	Shall contain at least one row with moduleType equal to 3 (software). The moduleMake shall specify the name of the manufacturer, the moduleModel shall specify the manufacturer's name of the component and the modelVersion shall indicate the model version number of the component.
MaxGroupAddresses	NTCIP 1201 Clause 2.7.1	Shall be at least 1
CommunityNamesMax	NTCIP 1201 Clause 2.8.2	Shall be at least 3
PCMSNumPermanentMsg	NTCIP 1203 Clause 2.6.1.1.1.1	Shall be at least 20*
PCMSMaxChangeableMsg	NTCIP 1203 Clause 2.6.1.1.1.3	Shall be at least 50. Each message shall support at least 4 pages per message.
PCMSFreeChangeableMemory	NTCIP 1203 Clause 2.6.1.1.1.4	Shall be at least 70 when no messages are stored.
PCMSMessageMultiString	NTCIP 1203 Clause 2.6.1.1.1.8.3	The PCMS shall support any valid MULTI string containing any subset of those MULTI tags listed in Table 4.
PCMSControlMode	NTCIP 1203 Clause 2.7.1.1.1.1	Shall support at least the following modes: ▪ local ▪ external ▪ central ▪ centralOverride

Table 2
Content of Permanent Messages

Perm. Msg. Num.	Section 12 Description
1	Permanent Message #1 shall blank the display (i.e., command the sign to use PCMSMessageType 7). It shall have a run-time priority of 50.

Table 3
Required MULTI Tags

Code	Feature
f1	Field 1 - time (12hr)
f2	Field 2 - time (24hr)
f8	Field 8 - day of month
f9	Field 9 – month
f10	Field 10 - 2 digit year
f11	Field 11 - 4 digit year
Fl (and /fl)	flashing text on a line by line basis with flash rates controllable in 0.5 second increments.
Fo	Font
J12	justification - line – left
J13	justification - line – center
J14	justification - line – right
J15	justification - line – full
Jp2	justification - page – top
Jp3	justification - page - middle
Jp4	justification - page - bottom
Nl	New line
Np	New page, up to 2 instances in a message (i.e., up to 4 pages/frames in a message counting first page)
Pt	page times controllable in 0.5 second increments.

Table 4
Modified Object Ranges for the Report Conformance Group

Object	Reference	Project Requirement
maxEventLogConfigs	NTCIP 1201 Clause 2.5.1	Shall be at least 50
eventConfigurationMode	NTCIP 1201 Clause 2.4.3.1	The NTCIP Component shall support the following Event Configuration Modes: ▪ onChange ▪ greaterThanValue ▪ smallerThanValue
maxEventLogSize	NTCIP 1201 Clause 2.5.3	Shall be at least 200
maxEventClasses	NTCIP 1201 Clause 2.5.5	Shall be at least 16

Table 5
Modified Object Ranges for the Font Configuration Conformance Group

Object	Reference	Project Requirement
numfont	NTCIP 1203 Clause 2.4.1.1.1.1	Shall be at least 3*
maxFontCharacters	NTCIP 1203 Clause 2.4.1.1.1.3	Shall be at least 127**

* Upon delivery, the first font shall be a standard 18-inch font. The second font shall be a double-stroke 18-inch font. The third font shall be a 28-inch font.

** Upon delivery, the first three font sets shall be configured in accordance with the ASCII character set for the following characters:

"A" thru "Z" - All upper case letters.
"a" thru "z" - All lower case letters.
"0" thru "9" - All decimal digits.
Space (i.e., ASCII code 0x20).
Punctuation marks shown in brackets [. , ! ? - ‘ ’ “ ” / ( )]
Special characters shown in brackets [# & * + < >]

Table 6
Modified Object Ranges for the MULTI Configuration Conformance Group

Object	Reference	Project Requirement
defaultBackgroundColor	NTCIP 1203 Clause 2.5.1.1.1.1	The PCMS shall support the following background colors: ▪ black
defaultForegroundColor	NTCIP 1203 Clause 2.5.1.1.1.2	The PCMS shall support the following foreground colors: ▪ amber ▪ orange
defaultJustificationLine	NTCIP 1203 Clause 2.5.1.1.1.6	The PCMS shall support the following line justification: ▪ Left ▪ Center ▪ Right ▪ Full
defaultJustificationPage	NTCIP 1203 Clause 2.5.1.1.1.7	The PCMS shall support the following forms of page justification: ▪ Top ▪ Middle ▪ Bottom
defaultPageOnTime	NTCIP 1203 Clause 2.5.1.1.1.8	The PCMS shall support the full range of these objects with step sizes no larger than 0.5 seconds
defaultPageOffTime	NTCIP 1203 Clause 2.5.1.1.1.9	The PCMS shall support the full range of these objects with step sizes no larger than 0.5 seconds
defaultCharacterSet	NTCIP 1203 Clause 2.5.1.1.1.10	The PCMS shall support the following character sets: ▪ eightBit

Table 7
Optional Object Requirements

Object	Reference	Project Requirement
globalSetIDParameter	NTCIP 1201 Clause 2.2.1	
eventConfigLogOID	NTCIP 1201 Clause 2.5.2.7	
eventConfigAction	NTCIP 1201 Clause 2.5.2.8	
eventClassDescription	NTCIP 1201 Clause 2.5.6.4	
defaultFlashOn	NTCIP 1203 Clause 2.5.1.1.1.3	The PCMS shall support the full range of these objects with step sizes no larger than 0.5 seconds
defaultFlashOff	NTCIP 1203 Clause 2.5.1.1.1.4	The PCMS shall support the full range of these objects with step sizes no larger than 0.5 seconds
PCMSSWReset	NTCIP 1203 Clause 2.7.1.1.1.2	
PCMSMessageTimeRemaining	NTCIP 1203 Clause 2.7.1.1.1.4	
PCMSShortPowerRecoveryMessage	NTCIP 1203 Clause 2.7.1.1.1.8	
PCMSLongPowerRecoveryMessage	NTCIP 1203 Clause 2.7.1.1.1.9	
PCMSShortPowerLossTime	NTCIP 1203 Clause 2.7.1.1.1.10	
PCMSResetMessage	NTCIP 1203 Clause 2.7.1.1.1.11	
PCMSCommunicationsLossMessage	NTCIP 1203 Clause 2.7.1.1.1.12	
PCMSTimeCommLoss	NTCIP 1203 Clause 2.7.1.1.1.13	
PCMSEndDurationMessage	NTCIP 1203 Clause 2.7.1.1.1.15	
PCMSMemoryMgmt	NTCIP 1203 Clause 2.7.1.1.1.16	The PCMS shall support the following Memory

		management Modes: ▪ normal ▪ clearChangeableMessage ▪ clearVolatileMessages
PCMSMultiOtherErrorDescription	NTCIP 1203 Clause 2.7.1.1.1.20	If the vendor implements any vendor-specific MULTI tags, the PCMS shall be provided with documentation that includes meaningful error messages within this object whenever one of these tags generates an error.
PCMSIllumLightOutputStatus	NTCIP 1203 Clause 2.8.1.1.1.9	
watchdogFailureCount	NTCIP 1203 Clause 2.11.1.1.1.5	
PCMSStatDoorOpen	NTCIP 1203 Clause 2.11.1.1.1.6	
fanFailure	NTCIP 1203 Clause 2.11.2.1.1.8	
fanTestActivation	NTCIP 1203 Clause 2.11.2.1.1.9	
tempMinCtrlCabinet	NTCIP 1203 Clause 2.11.4.1.1.1	
tempMaxCtrlCabinet	NTCIP 1203 Clause 2.11.4.1.1.2	
tempMinSignHousing	NTCIP 1203 Clause 2.11.4.1.1.5	
tempMaxSignHousing	NTCIP 1203 Clause 2.11.4.1.1.6	

NTCIP Compliance Documentation. Software shall be supplied with full documentation, including a CD-ROM containing ASCII versions of the following Management Information Base (MIB) files in Abstract Syntax Notation 1 (ASN.1) format.

The relevant version of each official standard MIB Module referenced by the device functionality shall be included. If the device does not support the full range of any given object within a Standard MIB Module, a manufacturer specific version of the official Standard MIB Module with the supported range indicated in ASN.1 format in the SYNTAX and/or DESCRIPTION fields of the associated OBJECT TYPE macro shall be provided. The filename of this file shall be identical to the standard MIB Module, except that it will have the extension ".man".

A MIB Module in ASN.l format containing any and all manufacturer-specific objects supported by the device with accurate and meaningful DESCRIPTION fields and supported ranges indicated in the SYNTAX field of the OBJECT-TYPE macros shall be provided. This includes a MIB containing any other objects supported by the device.

Additionally, the manufacturer shall provide a test procedure that demonstrates how the NTCIP compliance of both, the data dictionaries (NTCIP 1201, 1203, and their amendments) and the communications protocols have been tested. The manufacturer shall allow the use of any and all of this documentation by any party authorized by the Procuring Agency for systems integration purposes at any time initially or in the future, regardless of what parties are involved in the systems integration effort.

907-619.02.14.7–Additional Equipment Requirements. When the contract requires the PCMS to include a speed radar unit, the radar shall operate in the "K" band, in an "approach only" mode. In conjunction with the radar, the sign shall be capable of displaying the vehicle speeds. The unit shall be programmable to allow the interruption of user-defined messages by the vehicle speed display and/or alternate messages whenever a settable speed threshold is exceeded. The radar unit shall be encased in an aluminum enclosure with a polycarbonate lens, and the metal portion shall receive the same protective coating, priming, and painting as the rest of the sign

907-619.02.14.8–System Documentation. For each PCMS, the Contractor shall provide two (2) user manuals. The user manual shall include description and samples for all operational functions, software required to operate the sign on site and remotely, all wiring diagrams, a parts lists, the sign specifications, warranty information, maintenance information and schedule, and a trouble shooting table

Each copy shall be bound and shall contain laminated sheets.

907-619.03--Construction Requirements. After Subsection 619.03.9 on page 427, add the following.

907-619.03.10--Changeable Message Sign. Each changeable message sign shall be installed and continuously operated at the location selected by the Engineer on State right-of-way. The Contractor is advised that selected locations may be outside the planned indicated limits of the project. The Contractor shall perform all work necessary for preparation of the site selected and approved by the Engineer, to insure maximum safety for and sign visibility of the traveling public; and may be required to remove any temporary work at a later date as directed by the Engineer. The Contractor will also place a minimum of two plastic drums in advance of the sign and one beside the sign as long as it is in use. The Contractor shall be required to move the sign to a new location if directed by the Engineer.

The Contractor may be permitted to bring electric power from outside the normal right-of-way for operation of the equipment if the Department determines that the installation operation will not be hazardous to the traveling public. The Contractor will be required to secure a permit from the Department prior to any work by the power company on the right-of-way. The entire cost of

providing electrical service, power to operate the equipment, and removal of the power source from the right-of-way shall be borne by the Contractor.

The changeable message sign(s) will remain the property of the Contractor after the Engineer determines that there is no further need for the sign(s) on the project.

907-619.04--Method of Measurement. After the last paragraph of Subsection 619.04 on page 428, add the following.

Changeable message signs, as described above, will be measured by the unit. When directed, separate measurements will be made for items included in the contract and required for temporary site preparation for the sign as referenced in Subsection 907-619.03.10. Materials for which no pay items are included in the contract will not be measured for separate payment. Separate measurements will not be made for moving the changeable message sign to a new location, but materials used for which pay items are included in the contract and are necessary for repositioning the sign as directed by the Engineer will be measured for separate payment. Removal of materials used for site preparation for changeable message signs will not be measured for separate payment.

907-619.05--Basis of Payment. After the second paragraph of Subsection 619.05 on page 428, add the following.

Payment for items required by the Engineer for temporary location of the changeable message sign, and for which pay items are included in the contract, will be made by the individual pay item. No additional payment will be made for having to work outside the planned indicated project limits.

Payment for removal of materials used for site preparation at changeable message sign locations shall be included in the contract bid price for Maintenance of Traffic.

Between pay item nos. 619-E2 and 619-F1 on page 429, insert the following:

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

* Indicate when options are required

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-637-4 **CODE: (SP)**

DATE: 11//21/2012

SUBJECT: ITS Equipment Cabinets

Section 637, Equipment Cabinets, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

Delete in total Section 637 beginning on page 479, and substitute the following:

SECTION 907-637--ITS EQUIPMENT CABINETS

907.637.01--Description. This Section specifies the minimum requirements for equipment cabinets furnished and installed for Mississippi Intelligent Transportation Projects. The cabinet will provide a protective outdoor housing enclosure in which to install field hardware required for ITS devices. Major elements of the equipment cabinet include the cabinet housing and equipment mounting hardware, interior wiring and termination facilities, power supplies, electrical accessories and field installation. Work also includes making modifications to existing ITS cabinets in accordance with the plans, specials provisions, Notice to Bidders and contract documents.

907-637.02--Materials.

907-637.02.1--Blank.

907-637.02.2--Equipment And Materials. The Contractor shall furnish Only new equipment and materials as follows.

1) Furnish equipment cabinets and integral materials recommended by the manufacturers for outside plant use and the intended application. This requirement includes wiring and electrical materials and configurations (including connector pin-outs) that are wholly or partially related to the field device applications (CCTV, RDS, VDS, etc.).
2) Furnish and configure equipment cabinets to be installed at locations as shown in the Plans. Furnish and configure all equipment and materials for each specific location as shown in the Plans.
3) Provide electrical system and components with UL-listings.
4) Unless otherwise specified, provide wire and cable with stranded copper conductors, 75°/90° Celsius wet/dry rated insulation, and sized for the maximum voltage and current in the circuit.

907-637.02.3--Components Specified As Rail-Mounted. Components specified as rail-mounted shall be compliant as follows.

1) DIN EN 50022 (NS35) component rails.
2) Component rails shall be the perforated type and of sufficient length as to protrude beyond the mounted components for fastening to cabinet panels as specified herein.
3) UL 1059.
4) UL 486E.
5) NEMA ISC-4.
6) Alternate Rail configurations may be submitted to the Engineer for consideration and approval.

907-637.02.4--Terminal Blocks and Component Terminals. Terminal Blocks and Component Terminals shall meet the following.

1) Shall be nickel-plated copper, copper alloy or brass.
2) Terminal blocks shall have voltage and current ratings greater than the ratings of the wires that are terminated, be able to terminate wires from #8 AWG to #1/0 AWG wiring and shall be assembled into housing enclosures such that all exposed surfaces are touch-safe. Conductor fastening screws shall be captive. Terminal block housings shall be colored as follows:
   a. 120 VAC line/hot: black
   b. 120 VAC neutral: white
   c. 24 VDC positive: red
   d. 24 VDC negative: gray
   e. RS485 communications: orange
   f. Ground: green or green/yellow

907-637.02.5--Door Locks. Door Locks shall meet the following.

1) Provide door locks for all cabinet doors, keyed to MDOT standard Corbin No. 15481RS lock keyed to be operated with a traffic industry conventional No. 2 Key, Corbin No. 1R6380 made from heavy-duty blanks.
2) Provide two keys with each cabinet.

907-637.02.6--Labels. Lables shall be provided with agency name, device name and ID labels on all cabinets. Labels shall meet the following minimum requirements:

1) Labels shall be flat black lettering on a reflective white background. Lettering shall be a minimum of 1 inch in height.
2) Labels shall be manufactured from pre-coated adhesive backed reflective sheeting material meeting the minimum requirements of AASHTO M268 Type 1.
3) The agency name labels shall be "MDOT ITS" in one continuous adhesive sheet.
4) The device ID labels shall include the device name as an acronym and a hyphen, and shall be one continuous adhesive sheet. Device name acronyms are "CCTV-", "RDS-", "VDS-"or "DMS-".
5) The device ID shall be numerals corresponding to the location and shall be installed adjacent to the acronym sheet. Multiple device IDs of the same type shall be on the same line separated with a space. Examples: "CCTV-73", "RDS-219 220", "VDS-303 304".

6) Labels shall be installed along the top of the cabinet door (front cabinet door on Type B cabinets), with MDOT ITS label at the top and the device ID labels immediately underneath.

Provide a voltage label on all cabinets or enclosures in accordance with the NEC labeling requirements. Voltage labels shall meet the following minimum requirements:

1) Labels shall be flat black lettering on a reflective yellow background. Lettering shall be a minimum of 1 inch in height.
2) Labels shall be manufactured from pre-coated adhesive backed reflective sheeting material meeting the minimum requirements of AASHTO M268 Type 1.
3) Labels shall include the voltages entering the cabinet and shall be one continuous adhesive sheet. Examples are "120VAC" or "24VDC".
4) Labels shall be installed on all cabinet doors.

907-637.02.7--Type A Cabinet. Type A cabinets shall meet the following.

1) All Type A cabinets shall be identical in manufacture and assembly, capable of supporting Radar Detection System units.
2) Provide a Type A cabinet intended for outdoor use with a minimum NEMA 3R rating.
3) The cabinet enclosure shall be manufactured from 0.125-inch aluminum.
4) The cabinet shall provide a minimum of one ventilation louver on at least two sides. Any louver opening greater than 3/16 inch in any dimension shall be screened to prevent insect entry.
5) The cabinet shall be intended for strapped pole-mounting; provide all mounting hardware necessary including ½-inch stainless steel mounting straps.
6) Provide a Type A cabinet enclosure with dimensions of 18 inches (H) by 14 inches (W) by 8 inches (D) with a tolerance of +/- 0.25 inches.
7) Cabinet door shall reveal the entire front opening of the cabinet for accessibility. The hinge shall be designed to prevent the door from sagging.
8) Include a single-piece 0.125-inch aluminum back panel covering no less than 90% of the cabinet back wall. Back panel shall be affixed to the enclosure with threaded fasteners and shall be removable from the enclosure with hand tools only and without requirement to remove the cabinet door, mounting straps, or any other components other than communications or device wiring.
9) The cabinet shall be furnished with doorstops, which retain the doors open in a 90 degree and 120 degree positions.
10) Provide on the back panel a grounding lug directly bonded to the back panel capable of terminating #6 AWG wire.

907-637.02.7.1--RDS Communications Wiring. RDS communication wiring shall meet the following.

1) Component rail physically and electrically fastened to the cabinet back panel.
2) Strain relief brackets for the RDS comm. cable(s) and the RDS unit harness cables.

3) Parallel-connection single-stage surge suppressors for the four wire RS-485 data signal for the RDS units with integral or separate terminals for a minimum of three RDS comm. Cables.
4) Parallel-connection zero-power dissipation surge suppressor for the 12-24VDC power supply for the RDS units with integral or separate terminals for a minimum of three RDS comm. cables and two RDS unit harness cables.
5) Connection/jumper wiring between the surge suppressors and the local/remote communications disconnect module(s) shall be of the same conductor size, type, and insulation color as in the RDS comm. cable.

907-637.02.8--Type B Cabinet. Type B cabinets shall meet the following.

1) All Type B cabinets (except those at solar power locations) shall be uniform in manufacture and assembly, capable of supporting the field equipment as shown on the plans. As a minimum support is required for two RDS units, one Type A or B network switch, one video encoder, one Type A radio/antenna, RDS comm. cable and fiber drop panel terminations, regardless of the devices shown in the Plans at a specific location.
2) A complete Type B cabinet shall be an assembly consisting of a cabinet housing and electrical subsystems.
3) Provide a Type B cabinet housing that conforms to the standards for a Type 170 336S (approximate exterior dimensions 46 inches (H) x 24 inches (W) x 23 inches (D)), including standard EIA 19-inch rack cabinet cage, as defined in the latest version of the Caltrans Transportation Electrical Equipment Specifications (TEES). The minimum clear vertical inside dimension of the 19-inch rack for equipment mounting shall be 39.5 inches. Standard cabinet accessories for traffic signal operations, such as controller, power distribution assembly, input/output file and termination panels, and the police panel, are not required as part of this cabinet assembly.

907-637.02.8.1--Hardware. Hardware shall meet the following.

1) Provide all mounting hardware necessary for base or pole mounting as shown on the plans. As a minimum provide three (3) 3/4-inch stainless steel mounting straps for pole mounted cabinets.
2) Include hooks, welded to the inside of each cabinet door, for hanging a side-opening, opaque, resealable, heavy-duty plastic documentation pouch with metal or hard-plastic reinforced holes for the door hooks. Provide one pouch with each cabinet.
3) Include a rack-mounted cabinet sliding storage drawer in accordance with the following:
   a. Approximate exterior dimensions 1.75 inches (H) x 16 inches (W) x 14 inches (D).
   b. Telescoping drawer guides to allow full extension from the rack cage.
   c. Opening storage compartment lid to access storage space for cabinet documentation and other items.
   d. Supports a weight of 25 lb when extended.
   e. Non-slip plastic laminate surface attached to the compartment lid which covers a minimum of 90% of the surface area of the lid.
   f. Mounted in the rack cage with the bottom surface approximately 9 inches above the bottom of the rack cage.

4) Includes side panels within the two sides of the rack cabinet cage, inserted and fastened from the inside of the cage. Use side panels fabricated from 0.125 inch 5052 sheet aluminum alloy and sized to the full inside dimensions of the rack cabinet cage. Side panel surfaces for equipment mounting are denoted by cabinet side, with the "right" side being the support pole side, and by upper or lower as related to the sliding storage drawer. Upper right side panel (support pole side of cabinet, above the drawer) and lower left side panel (opposite side from the support pole, below the drawer) are example side panel surface names.
   a. Includes a 12-inch long DIN rail (for future components) mounted in the horizontal and vertical center of the lower left side panel.

907-637.02.8.2--Electrical Subsystems. Provide Type B cabinet electrical subsystems meeting the following requirements (Note: Type B Cabinets at Solar Power Locations are not required to meet Section 637.05.02 requirements):

1) Includes an electrical distribution module comprised of the following DIN rail-mounted components:
   a. Service entrance terminal block with positions for 120VAC line, neutral, and ground and capable of terminating minimally #6 through #8 AWG wire, located at one end of the mounting rail with an approximately 0.75 inch blank spacer module adjacent to the main cabinet breaker.
2) Main cabinet automatic overcurrent 15A circuit breaker that is UL-listed and of the mechanical-magnetic type rated for use from -18° C to 50° C minimum.
3) Main cabinet surge suppressor for single-phase 120VAC service entrance, parallel wired with a clamp voltage of approximately 280V and capable of a surge current of at least 20,000 amps.
4) Main cabinet filter for power line noise and switching transient suppression, integral to, or separate from and wired to, the main cabinet surge suppressor.
5) Electrical distribution terminal block for line and neutral conductors parallel wired to the main cabinet surge suppressor but non-filtered, with a minimum terminating capability of six conductors of #10 to #18 AWG. Label the terminal block as "ACCY POWER".
6) Electrical distribution terminal block for line and neutral conductors for circuits on the load/equipment side of the power line filter, with a minimum terminating capability of six conductors of #10 to #18 AWG. Label the block as "EQUIP POWER".
7) Electrical distribution terminal block for grounding and bonding conductors located on the same rail but separate from the service entrance terminal block and connected to the entrance ground with a #6 AWG green insulated wire. The grounding block shall have a minimum terminating capability of two #6 AWG conductors and ten #10 to #18 AWG conductors.
8) Ground fault interrupt duplex receptacle (NEMA 5-15R) with 2.5A circuit breaker connected to the ACCY POWER distribution block. Permanently affixed to the receptacle, provide two red, orange or green/yellow labels with minimum 0.25 inch lettering with the legend "300 WATTS MAX". This receptacle is for technician use only and shall not be used to power equipment.
9) Include two duplex non-GFCI equipment power receptacles (NEMA 5-15R) connected to the EQUIP POWER distribution block mounted on the upper rear corner of the cabinet upper right side panel. Permanently affixed to the receptacle, Provide two red, orange or

green/yellow labels with minimum 0.25 inch lettering with the legend "75 WATTS MAX" permanently affixed to the receptacle.

10) Interconnection wiring between all electrical distribution module components and the other systems included in or housed in the Type B cabinet.

907-637.02.8.3--Lighting Subsystem. Include a cabinet lighting subsystem comprised of the following components:

1) One fluorescent lighting fixture, minimum 15 watt, mounted on the inside top front portion of the cabinet, with a cool white lamp with shatter-proof cover and operated by a normal power factor UL listed ballast.
2) A resistor-capacitor network noise suppressor installed across the light fixture power terminals.
3) Two door-actuated switches installed to turn on the cabinet light when either door is opened.
4) Powered from the ACCY POWER distribution block.

907-637.02.8.4--RDS Communications Subsystem. Where RDS are shown in the plans include DIN rail-mounted components that include the following:

1) Nominal 24VDC output power supply, capable of user setting between 23 and 28VDC minimum, with minimum 1A output rating and minimum operating temperature range of -25° C to +70° C. Power supply shall provide terminal facilities for a minimum of three sets of #14 AWG conductors (in the RDS comm cable). Maximum size of the power supply shall be 1 inch (W) X 7 inches (H) X 7 inches (D). Connect the power supply to the EQUIP POWER distribution block for 120VAC input.
2) Include interconnection wiring between the RDS communications subsystem and the Terminal Server.
3) Surge suppressor for the RS485 data signal, wired between the terminal server and the RDS units shall be provided. The surge suppressor shall protect the 4-wire RS485 data signal with hybrid multi-stage suppression components including gas tube and silicon avalanche diode. The surge suppressor shall have a response time no greater than 1 nanosecond. The surge suppressor shall provide terminal facilities for a minimum of four two-pair cables of #22 AWG conductors.

907-637.02.8.5--CCTV Subsystem. The requirements listed in Subsection 650.2.12 shall be met by installing the required CCTV support equipment in the Type B Cabinet.

907-637.03--Construction Requirements.

907-637.03.1--General. This work shall meet the following general requirements.

1) Install and configure cabinets as shown in the Plans and according to manufacturers recommendations, including installations and dimensions given for pole-mounting in relationship to the surrounding grade.
2) Bond all cabinets to the pole grounding lug with minimum #6 AWG stranded copper bare or green-insulated cabinet grounding wire. Alternately on existing poles only, bond the

cabinet grounding wire to an existing pole grounding wire with a cast brass or copper alloy threaded compression connector within 4 inches of the existing pole grounding lug.

3) Do not install electrical service or electronic devices in the cabinet or connect to the cabinet until ground testing for the pole or structure has been successfully completed and accepted, and the cabinet ground connection has been installed.
4) Provide a cabinet wiring and interface diagram to be included in the required hanging, side-opening, able to be resealed opaque, heavy-duty plastic documentation pouch.

907-637.03.2--Type B. Type B cabinets shall meet the following.

1) Install and configure equipment in the Type B cabinet in accordance with the requirements for that equipment, including RDS units, CCTV, Type A and B network switches, video encoders, Type A radio/antennas, RDS comm. cables and/or fiber distribution or drop panels.
2) Do not install electronic devices in the cabinet until electrical service has been installed and activated, and the cabinet ventilation fan is operational.
3) Install network switches and video encoders in the top most area of the cabinet rack. Use the equipment receptacles for power.
4) Install supporting equipment/electronics for CCTV on the lower area of the cabinet upper left side panel. Ensure there is no physical or access conflict with the network switch and video encoder. Use the EQUIP POWER distribution block for the power source.
5) Install fiber drop panels in a vertical configuration on the lower rear edge of the cabinet upper right side panel.

907-637.03.3--Testing. The Contractor shall conduct a Project Testing Program as required below. All costs associated with the Project Testing Program shall be included in overall contract prices; no separate payment will be made for any testing.

The ITS Engineer, Project Engineer and/or theier designee(s) are only responsible for attending and observing each test, and reviewing and approving the Contractor's test results documentation. The ITS Engineer, Project Engineer and/or their designee(s) reserve the right to attend and observe all tests. The Contractor is required to perform the Conditional Acceptance test with the MDOT ITS Engineer or his designee present.

1) The Contractor shall conduct a project testing program for all equipment cabinets. The project testing program shall include but is not limited to the specific requirements in this subsection.
2) All test results shall confirm physical and performance compliance with this Special Provision.
3) Submit all test results documentation to the Engineer within 7 days of completion of the tests. The Engineer will review test documentation.

907-637.03.3.1--Standalone Acceptance Test (SAT). SAT tests shall be as follows.

1) Perform a SAT on all equipment cabinets on this project after field installation is complete, including but not limited to all field devices (RDS, CCTV, communications electronics, etc.) to be installed in or connected to that given cabinet.

2) A SAT for a given equipment cabinet shall only be performed in conjunction with the SAT for all devices installed in or connected to that given cabinet.
3) Visual inspection of installation.
4) Inspection of cabinet documentation.
5) Functional test of all cabinet equipment, including circuit breaker, receptacles, fan and thermostat, and lights and door switches.
6) Measurement of DC power supply operating under full load.

907-637.04--Method of Measurement. Equipment Cabinet of the type specified will be measured per each**.** . Such measurement shall be inclusive of furnishing and installing the equipment cabinet and all related material and equipment specified in the Plans and this Special Provision, and all labor, system integration, testing, system documentation and miscellaneous materials necessary for a complete and accepted installation. It shall also include but is not limited to the cabinet and all interior materials, mounting hardware foundations, external conduit entrances including conduit bodies and nipples, electrical service and pole grounding terminations.

ITS Equipment Cabinet modifications, complete in place, tested, and accepted, will be measured per each installation. Such measurement shall be inclusive of all materials, mounting hardware, fiber splicing identified in the notice to bidders for each cabinet being modified.

907-637.05--Basis of Payment. Equipment Cabinet and Equipment Cabinet Modifications, measured as prescribed above, will be paid for at the contract unit price per each, which shall be full compensation for the labor, tools, materials, equipment and incidentals necessary to complete the work.

Progress payments for Equipment Cabinets will be paid in accordance with the following:

1) 40% of the contract unit price for delivery of the cabinet housings;

2) An additional 40% of the contract unit price for complete installation of equipment cabinet and all interior components, electrical service feed (activated), interior cabinet components, all conduit entrances, grounding connection, and testing;

3) An additional 10% of the contract unit price for completion of Stand Alone Site Test of all field devices housed or connected to the equipment cabinet; and

4) Final 10% of the contract unit price upon Final System Acceptance.

Payment will be made under:

907-637-A: Equipment Cabinet, Type __ -per each

907-637-B: ITS Equipment Cabinet Modifications __ -per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-639-4 **CODE: (SP)**

DATE: 04/10/2009

SUBJECT: Traffic Signal Equipment Poles

Section 639, Traffic Signal Equipment Poles, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-639.02--Materials.

907-639.02.2--Mast Arms. Delete the sentence in Subsection 639.02.2 on page 481 and substitute the following:

Mast arms and mast arm extensions shall be steel meeting the requirements of Subsection 722.16.

907-639-02.3--Foundations. Delete the first sentence Subsection 639.02.3 on page 481 and substitute the following:

Cast-in-place foundations for concrete, steel, and/or aluminum shafts shall be as specified on plans, and shall be cast of reinforced Class "B" Concrete conforming to the requirements of Sections 601 and 602, unless otherwise indicated on the plans.

907-639-03.1--Foundations. Before the first paragraph of Subsection 639.03.1 on page 481, add the following:

Pole foundations shall be constructed as per the details on the plans, these specifications, and Section 803 of the Standard Specifications. Casings, if required, will be in accordance with Section 803 of the Standard Specifications.

In the first sentence of the first paragraph of Subsection 639.03.1 on page 481, change "Section 206" to "Section 801".

After the first paragraph of Subsection 639.03.1 on page 482, add the following:

Due to the soil conditions in certain areas, the plans may indicate locations where the concrete shall be placed with a tremie. When a tremie is used, it shall perform in accordance with the requirements in Subsection 804.03.9 of the Standard Specifications.

In some instances, it may be necessary to use slip casing to keep the holes open. Casing may be required in portions of the holes that are not stable. Casings authorized by the Engineer shall be of suitable size and strength to accommodate the drilling equipment and to withstand ground-pressures and removal operations without deformation of the poured shaft. When removed, the

casings shall revert to the Contractor for disposal.

907-639.04--Method of Measurement. Delete the first and second paragraphs of Subsection 639.04 on page 482, and substitute the following:

Traffic signal equipment pole of the type specified will be measured as unit quantities per each. Such measurement shall include the pole, mast arms and all other incidentals necessary to complete the equipment pole.

Traffic signal equipment pole shaft extension of the type specified will be measured as a unit quantity per each. Such measurements shall include the pole attachment, shaft, and all other mounting attachments necessary to extend a shaft as required in the plans

Pole foundations of the size specified will be measured by the cubic yard, which measurement shall be the area bounded by the vertical planes of the neat lines of the foundation.

Slip casings of the size specified will be measured by the linear foot from the ground elevation to the bottom of the strata needing to be cased.

Traffic signal equipment pole mast arm extension, as indicated, will be measured as a unit quantity per each. Such measurements shall include the mast arm extension and all other mounting attachments necessary to extend the arm as indicated.

907-639.05--Basis of Payment. Delete the first paragraph of Subsection 639.05 on page 482, and substitute the following:

Traffic signal equipment pole and traffic signal equipment pole extension of the type specified, measured as provided in above, will be paid for at the contract unit price per each, which price shall be full compensation for furnishing all materials, erecting, installing, connecting and testing poles, pole bases, mast arms, caps, covers, ground wire, ground rods, hardware and for all equipment, tools, labor and incidentals necessary to complete the equipment pole.

Pole foundations, measured as prescribed above, will be paid for at the contract unit price per cubic yard, which price shall include full compensation for structure excavation, reinforcing steel, anchor bolts; for placing, curing, and installing concrete; for replacing sod and final clean-up; and for all equipment, labor, tools and incidentals necessary to complete the foundation.

Slip casings, measured as prescribed above, will be paid for at the contract price per linear foot, which price shall be full compensation for all materials, tools, equipment, labor, and incidentals necessary to complete to work.

Traffic signal equipment pole mast arm extension, measured as provided above, will be paid for at the contract unit price per each, which price shall be full compensation for furnishing all materials, for installing the mast arm extension and for all equipment, tools, labor, and incidentals necessary to complete the work.

Delete the list of pay items on page 482, and substitute the following:.

907-639-A: Traffic Signal Equipment Pole, Type ____ - per each

907-639-B: Traffic Signal Equipment Pole Shaft Extension, Description - per each

907-639-C: Pole Foundations, ____ Diameter - per cubic yard

907-639-D: Slip Casing, ____ Diameter - per linear foot

907-639-G: Traffic Signal Equipment Pole Mast Arm Extension * - per each

* Additional information may be indicated

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-642-5 **CODE: (SP)**

DATE: 01/23/2013

SUBJECT: Solid State Traffic Actuated Controllers

PROJECT: STP-0014-03(065) / 106424301 & 302 -- Forrest and Lamar Counties

Section 642, Solid State Traffic Actuated Controllers, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-642.01--Description. After the first paragraph of Subsection 642.01 on page 484, add the following.

This work also includes making modifications to a solid state traffic actuated signal controller(s) in accordance with the plans and contract documents.

907-624.02--Materials. Delete Subsections 642.02.2 and 642.02.3 on pages 489 and 490.

907-642.02.8--Documentation. Delete the second, third, fourth, fifth, sixth, and seventh paragraphs of Subsection 642.02.8 on page 498.

907-642.02.9--Cabinets for Control Equipment. Delete Subsections 642.02.9 on pages 499 thru 506 and substitute the following.

Traffic Actuated Controller Types. Traffic Actuated Controllers of the following types as shown on the plans and required in these specifications shall be furnished.

Type 2A - 2 phase
Type 3A - 3 phase
Type 4A - 4 phase
Type 4M - 4 phase
Type 5A - 5 phase
Type 6A - 6 phase
Type 7A - 7 phase
Type 8A - 8 phase
Type 8M - 8 phase

The 'M' Type controllers will be installed in an existing master system. It shall have full upload and download compatibility with the existing master and/or system.

907-642.03--Construction Requirements. Delete Subsection 642.03.2 on page 506.

907-642.04--Method of Measurement. Delete the paragraph in Subsection 642.04 on page 506 and substitute the following.

Solid State Traffic Actuated Controller units, complete in place and accepted, will be measured as unit quantities per each, such measurement being inclusive of controller mechanism and

housing and being inclusive of all materials, work, testing and incidentals necessary for a complete and operable unit in place and accepted.

After the first paragraph of Subsection 642.04 on page 506, add the following.

Solid state traffic actuated signal controller modifications, complete in place and accepted, will be measured as unit quantities per each for a complete and operable unit in accordance with the contract provisions.

907-642.05--Basis of Payment. Delete the paragraph and pay item in Subsection 642.04 on page 506 and substitute the following.

Solid State Traffic Actuated Controllers, measured as prescribed above, will be paid for at the contract unit price per each for each type(s) specified in the contract; which price shall be full compensation for controller mechanism and housing, and all other materials; for constructing, installing, connecting, testing and final cleanup; and for all equipment, labor, tools, and incidentals necessary to complete the work.

Solid state traffic actuated controller modifications, measured as prescribed above, will be paid for at the contract unit price bid per each; which price shall be full compensation for any foundation construction, cabinets, relays, terminals, circuit breakers, controller units and conflict monitors, any communications devices and/or video facilities, connectors, load switches, mounting material, all other materials for constructing, installing, connecting, testing and final cleanup; and for all equipment, labor, tools and incidentals necessary to complete the work in accordance with the contract documents.

Payment will be made under:

907-642-A: Solid State Traffic Actuated Controllers, Type - per each

907-642-B: Solid State Traffic Actuated Controller Modification, * - per each

* Optional Supplemental Description

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-650-5 **CODE: (SP)**

DATE: 01/09/2012

SUBJECT: On-Street Video Equipment

PROJECT: STP-0014-03(065) / 106424301 & 302 -- Forrest and Lamar Counties

Section 650, On-Street Video Equipment, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

Delete in total Section 650 beginning on page 537, and substitute the following:

907-650.01--Description. This Section specifies the minimum requirements for CCTV Camera Systems furnished and installed on this project. The CCTV Camera System will provide TMC personnel with live streaming video of the roadway network via CCTV Camera Systems installed at locations shown in the Plans. The CCTV Camera System will include both fixed and PTZ cameras as called for on the Plans.

907-650.02--Materials. All materials furnished, assembled, fabricated or installed shall be new, corrosion resistant and in strict accordance with all of the details shown in the Plans and described in this Special Provision.

Support equipment for the CCTV Camera Systems shall be provided in a Type B ITS Equipment Cabinet as described in Section 637 of these specifications and as shown on the plans.

The CCTV Camera System shall comply with the following minimum materials specifications:

907-650.02.1--General Capabilities and Performance Requirements. Overall CCTV Camera System capabilities and performance requirements include the following:

1) CCTV PTZ Dome Cameras shall be placed at fixed locations as shown on the Plans to provide full coverage within the project limits including mainline travel lanes and shoulders.
2) CCTV Fixed Cameras shall be placed at fixed locations as shown on the Plans to provide coverage of the mainline travel lanes. The cameras shall be provided with a varifocal lens which shall be adjusted by the Contractor for the desired view of the mainline. At major intersections additional fixed cameras shall be adjusted to the desired view of the surface streets. The Contractor shall record the adjusted views for five minutes and submit to the MDOT ITS Engineer or his designee for approval and the MDOT Project Engineer. This recording shall be in a format playable with Windows Media Player or pre approved by MDOT ITS Engineer.

3) The CCTV Camera System components shall be compatible with each other and be of rugged design and suitable for reliable operation when mounted in the configuration as specified in this Special Provision and the Plans.
4) The Dome PTZ and the Fixed cameras shall be either Analog or Ethernet IP-based as indicated in either project plan sheets or Notice to Bidders or should be assumed analog if description isn't provided.
5) The CCTV Camera System shall be capable of attended and unattended, continuous 24 hours per day operation at the sites as shown on the Plans.
6) The Contractor shall ensure that the installed equipment provides unobstructed video of the roadway, traffic, and other current conditions around a roadside CCTV field site; that it responds to camera control signals from an operator of the system; and that the video images can be transmitted to remote locations interfaced to the system for observation.
7) PTZ and IP based cameras shall be capable of being remotely controlled and programmed.
8) All PTZ enclosures shall be provided with the ability to be pressurized for environmental protection.
9) The Dome camera shall be mounted together with the zoom lens and integrated into the pan and tilt device within the dome enclosure forming a totally integrated, easily removable assembly.
10) All cameras shall include a high quality integrated camera/lens combination.
11) The camera shall also be equipped with an auto-iris lens capability compatible with the zoom lens supplied.
12) Iris capability shall include a provision for manual override via software.
13) The Dome camera shall be capable of auto-focus during zoom-in or zoom-out, with provisions for override via software.
14) Overexposure protection shall be provided - the camera shall not be degraded or damaged under normal reasonable operating conditions.
15) The capability for local control of pan, tilt and zoom functions shall be provided at the roadside cabinet using vendor-supplied software installed on a laptop computer.
16) All CCTV cameras shall support the NTCIP 1205 v1.08 or later version if backward compatible communication protocol.

907-650.02.2--Analog Camera Unit. The minimum Camera Unit requirements include:

1) The camera unit shall incorporate solid-state design and provide digital signal processing (DSP) capable of providing clear and low-bloom color video pictures during daylight hours and monochrome video at night when the roadway is illuminated with minimal roadway lighting.
2) The Analog Camera shall be fully compliant with all aspects of the National Television Standards Committee (NTSC) specification, and produce NTSC compatible video.
3) The Analog camera shall operate over wide dynamic light conditions ranging from low light/dusk to full sunlight having day (color)/night (monochrome) switchover and iris control, with user-selectable manual and automatic control capabilities.
4) The camera unit shall be equipped with a low light level sensor to automatically switch the camera to Black and White mode.

5) The camera unit shall be equipped with an override capability to allow the camera to be manually switched via software to turn off the automatic low light level sensor switch feature for Color or Monochrome operation.
6) Image sensor: ¼-inch charge-coupled device (CCD) employing digital video signal processing (DSP) technology with a minimum Effective Picture Elements of 768 horizontal x 494 vertical pixels.
7) The camera unit shall include integrated image stabilization.
8) Sensitivity: The camera shall maintain usable video under both day and nighttime lighting conditions.
9) Video output synchronization shall be 2 to 1 interlace and will observe the NTSC (color) and EIA RS-170 (black and white) standards.
10) Resolution: 470 lines horizontal and 350 TV lines vertical, NTSC equivalent.
11) Signal-to-noise ratio: 48 dB, minimum with AGC off, un-weighted, and 4.5MHz filter.
12) Video Signal Format: National Television Standards Committee (NTSC) composite video output of 1 $Volt_{p-p}$ at 75 ohms, unbalanced.

907-650.02.3--Internet Protocol IP Camera Unit. IP cameras shall provide the same functionality as the analog camera units specified in Subsection 907-650.02.2, in addition to the following minimum requirements:

1) Power over Ethernet (IEEE802.3af) or 24 VAC Power Input.
2) Open Architecture.
3) Shall utilize H.264 (Video Coding Experts Group (VCEG)/Moving Picture Experts Group)Video Compression Technology types as directed by the Intelligent Transportation Systems Program Manager
4) Shall be capable to take video snapshots in JPEG format and transfer image via FTP.
5) IP encoded streams and Video Compression Technology shall be compatible with the existing video streaming servers and decoders for the MSTraffic.com WEB site or as approved by the Intelligent Transportation Systems Program Manager.
6) Shall be capable of 2 Simultaneous Video Streams.
7) Internet Protocols: TCP, UDP (Unicast, Multicast IGMP V2), UPnP, DNS, DHCP, RTP, NTP
8) Support Real Time Streaming Protocol (RTSP)
9) Multilevel Password Protection.
10) EDR (Extended Dynamic Range).
11) C/CS Lens Mount.
12) Backlight Compensation.
13) Horizontal Resolution of 480 TV Lines.
14) Low Profile Top/Bottom Mount.
15) BNC Service Connector. Tap shall be installed inside cabinet.

907-650.02.4--Dome Camera Lens. The minimum camera lens requirements include:

1) The camera lens shall have a minimum F-Stop of 1.4 to 1.6.
2) Optical and Digital Zoom: Shall provide an optical zoom of 35X.

3) Zoom Control: The zoom magnification shall be fully controllable via the remote PTZ mechanism. The time to pass through the full range of movement of Iris, Zoom and Focus shall in no case exceed 10 seconds.
4) Iris and Focus: Support automatic iris and focus control with manual override capability. The iris shall be in a closed position when there is no power.
5) White or Color Balance: Support automatic or set to yield optical results under various outdoor lighting conditions.
6) Shutter Speed: Support automatic or set to yield optimal results under low lighting conditions without blooming or smearing, auto-iris on. Provide electronic shutter that is selectable in steps.
7) The lens shall be equipped for continuous remote control of zoom, focus and iris.
8) Mechanical or electrical means shall be provided to protect motors from overrunning in extreme positions.
9) The zoom lens shall be an integrated camera/lens combination.
10) Vibration or ambient temperature changes shall not affect the automatic iris function, focus mechanism and zoom mechanism.
11) The lens shall be optically clear, impact resistant and acrylic. The acrylic lens shall not yellow and shall not introduce appreciable light loss or geometric distortion over a 10-year service life when exposed to the environment.
12) The zoom mechanism shall be designed for maintenance-free operations. All gearing and bearings shall be self-lubricating with lubrication and gearing tolerances compatible with the environmental specifications contained herein.

907-650.02.5--Character Generator. The minimum character generator requirements include:

1) The capability of generating and superimposing lines of English language text on the video image/stream shall be provided.
2) A minimum of 20 characters per line that are between 10 and 30 horizontal TV lines in height shall be provided.
3) Control (enable, disable and edit) of this feature shall be available remotely and at the field site using a laptop computer.
4) The text messages shall be stored in non-volatile memory.
5) Characters shall be white with a black border to ensure legibility in varied scenes.
6) The following minimum text insertion requirements shall be provided with the ability to individually turn each one on or off:
   a. Camera ID
   b. Sector Message
   c. Alarm Messages
   d. Pan/Tilt Azimuth/Elevation
   e. Compass Direction in 8 discreet zones

907-650.02.6--Dome Enclosure. The minimum dome enclosure requirements include:

1) Sealed, pressurized dome enclosure that provides complete protection for the camera and lens assembly from moisture and airborne contaminants.

2) Environmental resistant and tamper proof meeting NEMA 4X or IP-67 rating requirements.
3) The dome enclosure shall be constructed in such a way that unrestricted camera views can be obtained at all camera and lens positions.
4) Dome environmental control shall be provided by nitrogen pressurization with a Schrader Valve for pressurization and purging. The enclosure shall be designed to be pressurized to the manufactures recommended level .with dry nitrogen. The notation "CAUTION – PRESSURIZED" shall be printed on the rear plate of the enclosure and shall be clearly visible and readable.
5) An alarm shall be displayed under low-pressure conditions and displayed on the camera video. The low-pressure alarm shall be on/off selectable by the operator at the TMC.
6) The dome enclosure shall consist of a two-piece (upper and lower half) dome.
7) A harness and cables shall be provided with each enclosure to extend the video, power and data from the CCTV Camera System to the field cabinet. No harness shall be exposed. All entry points shall have gaskets to prevent moisture entry. A sealed connector shall be at the top of the dome.
8) The dome enclosure shall assist in preventing lens fogging and effectively reduce internal temperatures.
9) The enclosure shall minimize glare and provide overexposure protection for the camera when pointed directly at the sun.
10) The enclosure shall be equipped with a heater, a defroster and a thermostat.
11) The camera equipment inside the dome enclosure shall meet all its specified requirements when operating under the following conditions:
    a. Ambient Temperatures: -34ºC to +50ºC (-30ºF to +122ºF). A heater/blower shall be used to maintain internal dome temperatures within the manufacturer required operating temperatures for their equipment.
    b. Relative Humidity: 5% and 95%, non-condensing.
12) Total weight of CCTV cameras (including the housing, sunshield, and all internal components shall be less than 18 pounds.
13) At a minimum, dome enclosures shall be secured with a mounting plate/attachment designed to withstand a 90 mph sustained wind speed with a 30% gust factor. For projects that are in areas with higher wind standards, the higher standard is required.

907-650.02.7--Pan and Tilt Unit (PTU). The minimum pan and tilt unit requirements include:

1) The motorized, remotely controlled Pan/Tilt unit shall be mounted within the dome enclosure. The unit shall be integrated with the CCTV control system.
2) The unit shall provide continuous tilt (vertical) movement of 90 degrees from horizontal and continuous pan (horizontal) movement of 360 degrees.
3) Tilt speed shall be variable from zero up to 40 degrees per second, minimum, and the pan speed shall be variable from zero up to 80 degrees per second, minimum.
4) The unit shall be capable of simultaneous pan, tilt movements and zoom on one camera
5) Drive motors shall be capable of instantaneous reversing, be corrosion resistant, not require lubrication, and have overload protection.
6) Braking shall be provided in both pan and tilt movements to enable fast stop and reversal and to prevent drifting.

7) The viewing limits shall be set by a minimum of 8 discreet privacy zones that are software selectable.

907-650.02.8--Camera Control Receiver – Driver. The minimum camera control receiver-driver requirements include:

1) The camera control receiver shall provide a single point interface for control, power and video communications.
2) The camera control receiver-driver shall be included within the dome enclosure and control the camera, pan/tilt and lens functions at each CCTV site.
3) The unit shall provide alphanumeric generation for on-screen titles.
4) The unit shall provide the ability to display diagnostic information on the screen in response to user commands.
5) The diagnostic information shall include current pan, tilt, zoom and focus positions, and error codes for power, communication, position and memory problems.
6) The capability for programmed tours shall be provided.
7) The camera control receiver shall use non-volatile memory to store the required information for presets, camera ID and sector text.
8) Presets shall meet the following requirements:
   a. A minimum of 64 presets shall be supported. Each preset shall consist of pan, tilt, zoom and focus positions.
   b. The Contractor shall develop and install ten (10) presets for each camera. The Contractor shall submit the preset locations to the MDOT ITS Engineer for review and approval.
9) Protocols: CCTV cameras shall support at a minimum the Pelco D and the NTCIP 1205 v1.08 communication protocol. No camera control receiver-driver shall use non-published protocols. The Contractor shall provide protocol documentation.
10) Communications Interface: The communications interface shall support communications compliant with RS-422 and/or 485 (user selectable).
11) The communications interface shall be compatible with the Video Encoder serial port as defined in Section 907-662 of these Specifications.
12) Standard interface connectors shall be provided.
13) The video input and output connections shall be the BNC type.
14) Connector(s) shall also be used for connecting the control outputs from the control receiver-driver unit to the camera, lens and pan/tilt mechanisms.

907-650.02.9--Fixed Camera Lens.

1)	Type:	Varifocal
2)	Format Size:	1/3 Inch
3)	Mount Type:	CS
4)	Focal Length:	5-50
5)	Zoom Ratio:	1.4 -360
6)	Relative Aperture (F):	1.6-360
7)	Iris:	Auto (Direct Drive)
8)	Focus:	Manual

9) Zoom: Manual
10) Minimum Object Distance: 0.5 m
11) Back Focal Length: 10.05 mm
12) The camera lens shall have a minimum F-Stop of 1.4 to 1.6.
13) Shall provide a varifocal zoom of 5-50 mm.
14) Iris: Support automatic iris control with manual override capability. The iris shall be in a closed position when there is no power.
15) White or Color Balance: Support automatic or set to yield optical results under various outdoor lighting conditions.
16) Shutter Speed: Support automatic or set to yield optimal results under low lighting conditions without blooming or smearing, auto-iris on. Provide electronic shutter that is selectable in steps.
17) Vibration or ambient temperature change shall not affect the automatic iris function, focus mechanism or zoom mechanism.
18) The lens shall be optically clear, impact resistant and acrylic. The acrylic lens shall not yellow and shall not introduce appreciable light loss or geometric distortion over a 10-year service life when exposed to the environment.

907-650.02.10--Fixed Camera Enclosure.

1) Designed for Outdoor Applications
2) Maintenance access for servicing
3) Environmental resistant and tamper proof meeting NEMA 4X or IP-66 rating requirements.
4) A harness and cables shall be provided with each enclosure to extend the video, power and data from the CCTV Camera System to the field cabinet. No harness shall be exposed. All entry points shall have gaskets to prevent moisture
5) The enclosure shall minimize glare and provide overexposure protection for the camera when pointed directly at the sun.
6) The enclosure shall be equipped with a heater, a defroster and a thermostat.
7) The camera equipment inside the enclosure shall meet all its specified requirements when operating under the following conditions:
   a. Ambient Temperatures: -10ºC to +50ºC (14ºF to +122ºF). A heater/blower shall be used to maintain internal temperatures within the manufacturer required operating temperatures for their equipment.
   b. Relative Humidity: 5% and 95%, non-condensing.
8) Total weight of CCTV cameras (including the housing, sunshield, and all internal components shall be less than 18 pounds.
9) The enclosure shall be secured with a mounting plate/attachment designed to withstand a 90 mph sustained wind speed with a 30% gust factor. For projects that are in areas with higher wind standards, the higher standard is required.

907-650.02.11--Electrical. The minimum electrical requirements include:

1) The CCTV Camera System shall be furnished with any and all equipment required for a fully functional system, including all appropriate power and communications cables as defined by the manufacturer.
2) The power cables shall be sized to meet the applicable National Electrical Code (NEC) requirements.
3) Total power consumption shall not exceed 125 watts.
4) All devices supplied as system components shall accept, as a primary power source, 120 volts of alternating current (VAC) at an input of 60 hertz. Any device that requires source input other than 120 VAC at 60 hertz, such as cameras, PTUs, receiver/drives and dome heaters/blowers that operate at 24 volts or other, shall be furnished with the appropriate means of conversion.
5) IP fixed cameras shall receive Power over Ethernet (POE) with appropriate cabling.

907-650.02.12--Coaxial Cabling. The minimum coaxial interconnect cable requirements include:

1) The coaxial cable from the CCTV Camera System to the equipment cabinet shall be Belden 8281 or approved equivalent.
2) RG 59/U, 20AWG, bare copper conductor, polyethylene insulation.
3) 98% tinned copper, double braid shield, black polyethylene jacket.
4) Characteristic Impedance: 75 ohms, nominal.
5) Capacitance (conductor to shield): 21pF/ft; Inductance: 0.131uH/ft, nominal.

907-650.02.13--Surge Protection. All CCTV Camera System electrical interconnects shall be protected from voltage surges caused by lightning and external electromagnetic fields. The minimum surge protection requirements include:

1) Surge protectors shall be furnished for all non-dielectric cable and conductors (video, data/signal and device/assembly power) between the CCTV Camera System and the equipment cabinet.
2) The surge protectors shall have leads that are kept to a minimum length as recommended by the surge device manufacturer.
3) All surge protection devices shall be designed to meet the temperature and humidity requirements expected in this type of outdoor application.
4) All Surge protectors shall be U.L. listed (UL 1449, UL 497, 497A, 497B, etc., as appropriate) and bonded to the same single-point ground point.
5) Coaxial Cable Surge protectors for coaxial cable shall meet/provide the following functionality:
   a. Attenuation: 0.1dB @10 MHz, typical
   b. Input/Output Impedance: 75 ohms nominal
   c. Operating Voltage of the surge protector shall match characteristics of the ITS device/assembly
   d. Peak Surge Current: 5,000-amperes for an 8x20 microsecond waveform
   e. Response Time: 1 nanosecond or less
6) Low Voltage/Signal Cable Surge protectors for data/signal/control cable shall meet/provide the following functionality:

a. Peak Surge Current: 10,000-amperes for an 8x20 microsecond waveform
b. Response Time: 1 nanosecond or less
c. Life Expectancy: Capable of surviving at a minimum of 25 occurrences at 2000-amperes

7) CCTV power surge protectors for power from equipment cabinet power distribution to the CCTV Camera System shall meet/provide the following functionality:
   a. Frequency: DC to 10MHz
   b. Clamping Voltage: < 30VAC (rms) or 42VDC
   c. Insertion Loss: < 0.2dB
   d. Input/Output Impedance: 75 ohms, typical
   e. Peak Surge Current: 3000-amperes
   f. Response Time: 1 nanosecond or less
8) Surge protection for the IP Fixed cameras shall include provisioning for the Power over ETHERNET (POE) cabling and voltages.

907-650.03--Installation Requirements. All equipment shall be installed according to the manufacturer's recommendations, the Plans and as follows:

1) The Contractor shall provide the MDOT with a written inventory of items received and the condition in which they were received. Inventory shall be inclusive of make, model, and serial numbers, MAC address, and installation GPS coordinates. All equipment shall be installed according to the manufacturer's recommendations or as directed by the MDOT.
2) Materials and associated accessories/adapters shall not be applied contrary to the manufacturer's recommendations and standard practices.
3) Shall include all materials needed to permanently mount the CCTV camera to the support structure as indicated in the plans.
4) Furnish and install power, video, and data cables, and any and all ancillary equipment required to provide a complete and fully operational CCTV system site.
5) Verify all wiring meets NEC requirements where applicable.
6) All above requirements apply to both new CCTV sites as well as sites where an existing CCTV is being replaced under the contract.
7) Any new, additional or updated drivers required for the existing ATMS software to communicate and control new CCTV installed by the Contractor shall be the responsibility of the Contractor.

907-650-03.1--CCTV Test Requirements. The Contractor shall conduct a Project Testing Program. All costs associated with the Project Testing Program shall be included in overall contract prices; no separate payment will be made for any testing.

1) The Contractor is responsible for planning, coordinating, conducting and documenting all aspects of the Project Testing Program. The Project Engineer, ITS Engineer, and/or their designee(s) are only responsible for attending and observing each test, and reviewing and approving the Contractor's test results documentation. The ITS Engineer, Project Engineer and/or their designee(s) reserve the right to attend and observe all tests. The Contractor is required to perform the final project acceptance test with the MDOT ITS Engineer or his designee present.

2) Each test shall fully demonstrate that the equipment being tested is clearly and definitely in full compliance with all project requirements. Test procedures shall be submitted and approved for each test as part of the project submittals. Test procedures shall include every action necessary to fully demonstrate that the equipment being tested is clearly and definitively in full compliance with all project requirements. Test procedures shall cross-reference to these Technical Specifications or the Project Plans. Test procedures shall contain documentation regarding the equipment configurations and programming.
3) No testing shall be scheduled until approval of all project submittals and approval of the test procedures for the given test.
4) The Contractor shall provide all ancillary equipment and materials as required in the approved test procedures.
5) The Contractor shall request in writing the Project Engineer's approval for each test occurrence a minimum of 14 days prior to the requested test date. Test requests shall include the test to be performed and the equipment to be tested. The Project Engineer reserves the right to reschedule test request if needed.
6) All tests shall be documented in writing by the Contractor in accordance with the test procedure and submitted to the Project Engineer within seven (7) days of the test. Any given test session is considered incomplete until the Project Engineer has approved the documentation for that test session.
7) All tests deemed by the Project Engineer to be unsatisfactorily completed shall be repeated by the Contractor. In the written request for each test occurrence that is a repeat of a previous test, the Contractor shall summarize the diagnosis and correction of each aspect of the previous test that was deemed unsatisfactory. The test procedures for a repeated test occurrence shall meet all the requirements of the original test procedures, including review and approval by the Project Engineer and ITS Program Manager or his designee.
8) The satisfactory completion of any test shall not relieve the Contractor of responsibility to provide a completely acceptable and operating system that meets all requirements of this project.
9) Standalone Acceptance Test (SAT). The Contractor shall perform a complete SAT on all equipment and materials associated with the field device site, including but not limited to electrical service, conduit, pull boxes, communication links (fiber, leased copper, wireless), control cables, poles, etc. An SAT shall be conducted at every field device site. Where applicable, a SAT shall be conducted for a fully installed and completed connection to the designated Traffic Management Center (TMC) or central data/video collection site.
10) The SAT shall demonstrate that all equipment and materials are in full compliance with all project requirements and fully functional as installed and in final configuration. The SAT shall also demonstrate full compliance with all operational and performance requirements of the project. All SATs will include a visual inspection of the cabinet and all construction elements at the site to ensure they are compliant with the specifications.

907-662.03.2--Warranty. Minimum warranty requirements are as follows:

1) All warranties and guarantees shall be assigned to the Mississippi Department of Transportation.
2) The warranty shall be a **minimum of one (1) year warranty** per CCTV and all other installed and/or attached appurtenances.

3) The warranty period begins upon final acceptance of the video subsystem.
4) During the warranty period, the Contractor shall repair or replace with new or refurbished material, at no additional cost to the State, any product containing a warranty defect, provided the product is returned postage-paid by the Department to the manufacturer's factory or authorized warranty site.
5) Products repaired or replaced under warranty by the manufacturer shall be returned prepaid by the manufacturer.
6) During the warranty period, technical support shall be available from the Contractor via telephone within **four (4) hours** of the time a call is made by the Department, and this support shall be available from factory certified personnel.
7) During the warranty period, updates and corrections to hardware, software and firmware shall be made available to the Department by the Contractor at no additional cost.

907-662.03.3--MDOT Employee Training. Minimum Training requirements are as follows:

1) The Contractor shall provide a camera system training plan that includes a schedule, documentation to be provided, identified trainer, and location at a minimum to MDOT Project Manager. The camera system training plan must be accepted by the MDOT Project Manager and ITS Engineer and training must be completed before burn in period may start.
2) The training shall be approved two (2) weeks ahead of the scheduled date.
3) For provided devices that MDOT already has the same make and model existing in the system:
    1. One (1) day of on site device operation, maintenance, and configuration training for up to 10 individuals.
    2. One (1) day of on site system training at TMC for up to 10 people, that is separate from above training and specifically for software control of integrated devices.
4) For provided devices that MDOT does not have the same make and model existing in the system:
    1. Three (3) days of on site device operation, maintenance, and configuration training for up to 10 individuals.
    2. Three (3) days of on site system training at TMC for up to 10 people, that is separate from above training and specifically for software control of integrated devices.

907-650.04--Method of Measurement. On-Street Video Equipment will be measured per each camera installation. Such measurement shall be inclusive of camera unit, housing, pan/tilt drive, receiver/driver, software driver, mounting hardware and any enclosures necessary. It shall also include any items necessary to mount the camera unit from a mast arm pole, steel strain pole, pole extension pipe, etc. Required cabinet facilities, including transformer and/or disconnects, will not be measured for separate payment.

907-650.05--Basis of Payment. On-Street Video Equipment, measured as prescribed above, will be paid for at the contract unit price bid per each, which price shall be full compensation for furnishing all materials, for all installing, connecting, cutting, pulling and testing and for all equipment, tools, labor and incidentals necessary to complete the work.

Progress payments for the On-Street Video System will be paid as follows:

1) 50% of the contract unit price upon delivery of equipment and approval of any bench and/or pre-installation test results, as prescribed in Project Testing Program;

2) An additional 40% of the contract unit price upon approval of Stand Alone Acceptance Test results; and

3) Final 10% of the contract unit price upon Final Project Acceptance.

Payment will be made under:

907-650-A: On-Street Video Equipment Type Fixed - per each

907-650-B: On-Street Video Equipment Type PTZ - per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-651-6 **CODE (SP)**

DATE: 01/07/2013

SUBJECT: Magnetometer Detection System

PROJECT: STP-0014-03(065) / 106424301 & 106424302 - Forest and Lamar Counties

Section 907-651, Magnetometer Detection System, is hereby added to and made a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-651 -- MAGNETOMETER DETECTION SYSTEM (MDS)

907-651.01--Description. This work consists of furnishing all components and materials required to enable a wireless, battery powered magnetometer detection system that detects vehicles on a roadway using battery powered magnetometers with wireless communications to transmit detection information. The system shall detect vehicles on a roadway using only changes in the earth's magnetic field and provide detection outputs to a roadside master device before the data is relayed to a freeway cabinet, a local traffic controller cabinet, a central software system, and/or data server as required by the application. The application of the MDS shall be shown in the plans or project specifications. These specifications cover both intersection presence based vehicle detection used for traffic controller input, as well as freeway system or advanced system detection data collection of volume, occupancy and speed. This specification sets forth the minimum specifications for the system.

The Magnetometer Vehicle Detection System (MDS) shall provide accurate roadway data as needed to support the traffic management application. The detection system shall consist of one or more battery-powered wireless Vehicle Sensor Nodes (VSN) installed in the pavement with reusable enclosures, one or more wireless Repeaters (RPs) mounted on poles on the side of the roadway, one or more Access Point Contact Closure (APCC) Interface cards (with Extension (EX) Card(s), if required), one or more Serial Port Protocol Digital Radios (DR) with Isolation (ISO) Modules mounted on the side of the roadway.

The MDS may also include Input/Output (I/O) Modules, if required.

The MDS shall also include CAT5E Outdoor Ethernet Cable, Epoxy Sealant for installation, and applicable operating and configuration software. Software shall provide for control and configuration of the sensors, APCC, SPP's, and RP's and operate on a conventional laptop PC. The MDS shall also include any incidental items necessary for a complete and operable unit in place and accepted.

907-651.02--Materials.

907-651.02.1--Functional Capabilities. The VSN shall detect a vehicle by measuring a change in the x, y, and z axis components of the earth's magnetic field near the VSN caused by a stopped or passing vehicle. The VSN shall communicate the detection information to the DR or RP via embedded Direct Sequence Spread Spectrum Offset Quadrature Phase-Shift Keying (DSSS O-QPSK) wireless radio. The VSN shall transmit detection information within 150ms of a detected event. The VSN shall communicate time-stamped ON and OFF vehicle detection events. The VSN shall automatically re-transmit a detected event at least 8 times if no acknowledgement is received from the APCC/DR. The VSN shall automatically recalibrate in the event of a detector lock. If radio connection is lost due to stopped vehicles near VSN, each VSN shall be capable of re-establishing radio link with supporting APCC/DR or RP in less than two (2) seconds. Each MDS system shall consist of one or more VSN's located as identified on the plans. Communications between a VSN and DR can be direct, via a single repeater, or via two repeaters operating in tandem.

The Radio Frequency (RF) link among the DR, RP, and VSN shall conform to the following:

- The RF link shall utilize an IEEE approved wireless communications protocol.
- The center frequencies, bandwidths, and transmit power levels of the radio links shall allow operation in an unlicensed frequency band.
- Frequency channels which are user configurable shall be employed by the VSNs, DRs, and RPs to avoid interference with other devices operating in the unlicensed band. A minimum of 16 channels shall be provided for this purpose.
- The RF link budget shall be 93dB or greater.
- The DR to VSN (or RP to VSN) RF range shall be at least 150 feet for a DR/RP installed at 24 feet above the roadway and at least 100 feet at 18 feet above the roadway.
- The RP to DR or RP to another RP RF range shall be at least 750 feet when both units are installed 18 feet above the roadway with clear line-of-sight.

If detection data is relayed to a central software system or central server for advanced system detection or freeway applications, per the plans and specifications, each installation of the Wireless Battery-Powered Magnetometer Vehicle Detection System shall provide the following measurements, as required by the application:

- Vehicle volume (count) per lane over a specified time interval
- Lane occupancy (percent) over a specified time interval
- Vehicle speed (mph or kph) when more than one sensor is deployed in a lane
  - Per-vehicle speed
  - Median speed over a specified time interval
  - Mean speed over a specified time interval
  - Distribution of speeds over a specified time interval
- Vehicle classification when more than one sensor is deployed in a lane
  - Per-vehicle length
  - Report distribution of vehicle lengths over a specified time interval
  - The time interval for measurements shall be selectable from 30 seconds to 24 hours

Each VSN shall transmit a unique identifying code. Each sensor in an installation shall be capable of being individually configured with its own sensitivity level. Sensitivity of the VSN shall be adjustable as may be required to detect bicycles and/or motorcycles. The VSN shall respond within 100 seconds when the APCC/DR is powered on and transmitting.

Two types of sensor applications of sensors shall be available from the manufacturer. Type A sensors shall provide all sensor functions, including data collection functions. Sensors used for this application shall provide for advanced system detection or stop bar detection. In the advanced system detection scenario a single Type A VSN shall be configurable to approximate the detection zones of 6-foot x 6-foot. In the stop bar detection scenario multiple Type A VSNs shall be configurable to emulate 6-foot x 6-foot to longer lengths. Type B sensors shall support presence detection only. Sensors used for this application shall provide for stop bar detection. In this scenario single or multiple Type B VSNs shall be configurable to emulate 6-foot x 6-foot to longer lengths. The plans shall dictate the sensor type required.

The APCC shall have the capability to transmit detection information to central software or a centralized server through several types of communication media, as required by the application. The APCC shall be capable of simultaneously communicating detection data via the contact closure interface, Ethernet interface, and cellular data modem interface, as applicable. The APCC cards shall provide sensor information processing and support the interface between a DR and the traffic controller using contact closure signals, or, for freeway applications, mounted in a stand-alone cabinet with direct IP communications. The APCC shall have the capability to transmit detection information to 170, 2070, and NEMA TS1 and TS-2 traffic controllers to provide real time detection information via a standard contact-closure based input shelf. The VSN, RP, DR, APCC shall be capable of accepting software and firmware upgrades.

907-651.02.2--Vehicle Sensor Node (VSN) Hardware. The VSN shall consist of a magnetometer, a microprocessor, a wireless transmitter and receiver, battery, an "enclosure case", and epoxy sealant for installation. The VSN components shall be contained within a single housing. The VSN housing shall meet NEMA 6P and IEC IP68 standards. The VSN components shall be fully encapsulated within the housing to prevent moisture from degrading the components. The VSN shall be able to operate at temperatures from -37°F to +176°F. The VSN housing shall be capable of being installed in a 4-inch cored hole that is 2.50" deep. The VSN shall be designed to operate from its battery for a minimum of ten (10) years of life under normal traffic conditions.

907-651.02.3--Serial Port Protocol Digital Radio (DR) Hardware. The Serial Port Protocol Digital Radio (DR) shall support at least 48 sensors with 0.125 second latency. It shall communicate to the APCC utilizing a standard CAT5e or higher Outdoor Ethernet cable. It shall contain a weatherproof Ethernet connector on the bottom of the device, which shall be shipped with a cover firmly attached to provide protection from the elements. The connector shall not require any specialized tools for installation. The DR shall operate at temperatures from -37°F to +176 F, and DR shall be contained within a single housing that conforms to NEMA Type 4X and IEC IP67 standards.

907-651.02.4--Repeater (RP) Hardware. The RP shall extend the effective communication range of the sensor to the DR an additional 750 feet. The RP communicating directly to an APCC/DR shall support at least ten (10) sensors while an RP communicating to a DR via an intermediate RP shall support at least (six) 6 sensors. The RP shall be battery powered. The RP shall operate in the -37°F to +176°F temperature range. All RP components shall be contained within a single housing conforming to NEMA 4X and IEC IP67 standards. The RP shall be no larger than 7" H x 7" W x 4" D and weigh no more than nine pounds (9 lbs.). The RP shall be designed to operate from its battery for a minimum of seven (7) years of life under normal traffic conditions.

907-651.02.5--Access Point Contact Closure (APCC) Interface Card and Extension (EX) Card Hardware. The APCC shall serve as the master device of the MDS. It shall provide all the higher level processing and interface functions of the MDS system and shall only require a single detection rack width slot. The APCC shall be capable of communicating with at least two (2) DRs. Optional Extension (EX) cards daisy-chained to the APCC shall provide additional contact closures in a signal cabinet (user configurable form 1 to 4 outputs each). All required EX cards to handle the number of sensors or controller channels as indicated in the plans or project specifications shall make up the Extension Card system.

Each APCC card shall provide detector data as contact closure signals to the traffic controller. The APCC card shall be capable of plugging directly in to standard 170/2070 input files and NEMA detector racks or shall be supplied within a standard enclosure to supply power for use in freeway applications. The APCC and EX cards front panel shall be configurable either via software or via front panel switches to provide presence/pulse mode, delay timing and extension timing. An APCC and EX card shall operate at temperatures from -37°F to +176 F, and in humidity up to 95% (non-condensing).

907-651.02.6--Isolator (ISO) Module Hardware. The MDS shall include an isolator module (ISO) to be used between each DR and APCC to extend the communication range and protect the APCC from transient surges. The isolator module shall extend the communication range between the APCC and DR from 33 feet (10 m) to 2000 feet (600 m). The isolator module shall provide electrical isolation of 1500V, surge protection of up to 1500V, and AC power cross protection.

907-651.02.7--Input/Output (I/O) Module Hardware. The MDS may include I/O modules to expand the capabilities of an APCC by providing additional communication options, memory options and a battery backed real time clock. The I/O module shall include a SD Memory Card Slot and battery backed up real time clock. The module shall include a RS232 port for serial communications. It shall also allow for detection data shall be communicated as IP data over GSM-based cellular data services via a GPRS cellular modem. The I/O module shall be physically mounted to the APCC to form a double detector slot profile.

907-651.02.8--Epoxy. The epoxy used for installation of the sensor(s) shall be a two part poly-urea based joint sealant having self-leveling characteristics. Surfaces the epoxy will be bonding to shall be free of debris, moisture, and anything else which might interfere with the bonding process. The epoxy used shall be approved by the manufacturer of the detection system.

907-651.02.9--Configuration Software. The MDS shall include the software necessary to configure the VSN, APCC, DR, EX and RP.

907-651.03--Construction Requirements.

907-651.03.1--Installation. The flush mount sensors shall be installed in the roadway using the following procedure: The roadway shall be core drilled to provide a 4-inch diameter hole, 2.50" deep. The hole shall be cleaned out per the manufactures recommendation and leveled prior to placement so that the sensors will remain flush once installed. A small layer of epoxy to cover the bottom of the hole shall be applied. The sensor shall then be placed on top of this layer of epoxy in the correct orientation. The sensor shall be fully encapsulated with the epoxy to the lip of the cored hole. The DR and RP shall be installed within range of the sensors as specified by the manufacturer.

907-651.03.2--Removal. The direction of traffic flow shall be permanently marked on top of the sensor prior to removal. The sensor and its epoxy coating shall be removed from the roadway by coring a 5-inch diameter hole to a depth of 2.50" with the sensor and epoxy being contained in the center of the core. The core shall then be extracted from the roadway using a pry bar as needed and retained for reinstallation upon completion of roadwork.

907-651.03.3--Reinstallation. Cores containing previously removed sensors shall be reinstalled by coring a 5-inch hole in the roadway to a depth of 2.50". The core shall be placed inside the hole in the correct orientation. The sensor shall be fully encapsulated with the epoxy to the lip of the cored hole. The sensors shall be configured as needed to provide vehicle detection and operate with existing system APCC, DRs, and RPs, as well as existing cabinet components.

907-651.03.4--Limited Warranty. The supplier shall provide a limited two-year warranty on the detection system from the point of the project final acceptance. During the warranty period, technical support shall be available from the supplier via telephone within 24 hours of the time a call is made by a user, and this support shall be available from factory-authorized personnel or factory-authorized installers. During the warranty period, standard updates to the software shall be available from the supplier without charge.

907-651.03.5--Testing and Accuracy Requirements. The Contractor or Supplier shall provide a Wireless Magnetometer Vehicle Detection System that meets the below minimum accuracy requirements for all conditions. Accuracy measurements for the testing shall be done with an appropriate sample size of vehicles, over a specific time period.

The Contractor shall submit to the Engineer the Test plan for Accuracy testing at the location(s) that is site specific to the plans. The test plan shall take into account the roadway type (freeway, arterial), location (urban, rural), and traffic conditions in order to determine appropriate testing length and sample size. The following conditions shall be met for each sensor installed.

1) Measurement Accuracy
The following error levels shall be achievable and demonstrated during testing.

Parameter	Error Percentage
Presence	±1%
Lane Occupancy	±5%
Volume	±8%
Average Speed	±10%
Length Classification limits	±10%

2) Testing
Develop and submit plans for post-installation testing to the Project Engineer for consideration and approval. Ensure the plans test all functional requirements and the accuracy requirements. Provide the Engineer with Application Protocol Interface (API) documentation and Software Development Kit (SDK) for the MDS. The testing shall prove that all in-pavement sensors are configured appropriately. The following post installation test procedures shall be utilized after the MDS is installed in its entirety as shown on the Plans and is integrated with the existing central software. No post-installation testing shall begin until all MDS systems in the project have been configured/calibrated to gather speed, volume, classification, and occupancy, or presence, as dictated by the application and programmed to communicate on the MDOT ITS network. Including the accuracy testing requirement, at a minimum, provide the following on the test plan to be submitted and approved by the Engineer:

a. Inspect all detection system field components to ensure proper installation and cable termination.
b. Verify that field construction has been completed as specified in the plans.
c. Inspect the quality and tightness of ground and surge protector connections.
d. Check power supply voltage and outputs and ensure device connections are as specified in the Plans.
e. Verify that the installation of cables and connections between all DR's to APCC's are per manufacturer recommendations and as specified in the Plans
f. Demonstrate that each Wireless In-Pavement Vehicle Detection System is fully operational and gathering the required data types at the specified interval to the central software or controller, as required by the application.

907-651.03.6--Maintenance and Support. The supplier shall maintain a sufficient inventory of parts to provide support and maintenance of the system. These parts shall be available for delivery within 30 days of receipt of a purchase order by the supplier at the supplier's then current pricing and terms of sale.

The supplier shall maintain an ongoing program for customer support for the system. This support shall be via telephone, email or trained personnel sent to the installation upon receipt of a purchase order at the suppliers then current pricing and terms of sale for technical support services.

Installation and/or training support shall be provided by a factory authorized representative. All documentation shall be provided in the English language.

907-651.04--Method of Measurement. Magnetometer detection system will be measured as a unit quantity per each system installation. Measurement shall include controller modifications, connectors, wiring, software, epoxy sealant, other components for which there is no pay item, and other incidental items necessary to complete the work.

Magnetometer detection system component, of the type specified, will be measured as a unit quantity per each. Measurement shall include any needed modifications, hardware, connectors, wiring, cabling, mounting brackets, and other incidental items necessary to complete the work for the component.

Magnetometer detection system component removal and reinstallation will be measured as a unit quantity per each. Measurement shall include all work necessary to completely remove and reinstall an existing component, of the type specified.

907-651.05--Basis of Payment. Magnetometer detection system and magnetometer system components, measured as prescribed above, will be paid for at the contract unit price per each installed, which price shall be full compensation for furnishing all materials, for installing, connecting and testing, and for all equipment, labor, tools, and incidentals necessary to complete the work.

Magnetometer detection system component removal and reinstallation, measured as prescribed above, will be measured as a unit quantity per each, which price shall include all work necessary to completely remove and reinstall an existing component, of the type specified. It shall also include any necessary epoxy sealant, controller modifications, connectors, wiring, software programming, and any other incidental items necessary to complete the work.

Payment will be made under:

907-651-A: Magnetometer Detection System	- per each
907-651-B: Magnetometer Detection System Component, _____	- per each
907-651-C: Magnetometer Detection System Component Removal and Reinstallation, _____	- per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-657-6 **CODE: (SP)**

DATE: 01/09/2012

SUBJECT: Fiber Optic Cable (OSP)

Section 657, Fiber Optic Cable (OSP), of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

Delete in total Section 657 beginning on page 541, and substitute the following:

SECTION 907-657 -- FIBER OPTIC CABLE (OSP)

907-657.01--Description. The work shall consist of the construction of the infrastructure required to install fiber optic cable. The infrastructure shall include all necessary conduits, pull boxes, pole line hardware, building entries, risers and fiber cable to make a complete system.

907-657.02--Materials.

907-657.02.1--Single Mode Fiber Optic Cable (FO Cable). The Contractor shall provide 72-count fiber optic cable that meets the following requirements:

- All-dielectric, outside plant, loose tube cable with central strength/anti-buckling member
- Dry water blocking materials and construction
- Reverse oscillating "SZ" stranded buffer tube construction
- High tensile strength yarn
- Medium density polyethylene outer jacket
- 72-fiber cable with six (6) active buffer tubes and 12 individual stranded fibers per buffer tube
- Cable construction design that allows no more than six (6) buffer tube positions
- Maximum diameter 0.48 inches
- Maximum weight 0.07 pounds per foot.

The Contractor shall provide a Corning ALTOS All-Dielectric, Pirelli FlexLink, OFS MiDia, or approved equivalent cable. This cable shall be designated as a trunk cable.

The Contractor shall ensure that the cable can withstand a maximum pulling tension of 600 pounds (lbf) during installation and 180 pounds (lbf) installed long term (at rest).

The cable shall have a shipping, storage and operating temperature range of -30°C to +70°C and installation temperature range of -30°C to +60°C.

The Contractor shall provide cable with outer jacket marking using the following template:

Manufacturer's Name -"Optical Cable" - Month/Year of Manufacture -Telephone Handset Symbol - "MDOT" - "72F SM"

The Contractor shall include in the outer jacket marking the cable sequential length in accordance with the following:

- In English units every two (2) feet
- Within -0/+1% of the actual length of the cable
- In contrasting color to the cable jacket
- Marking font height no less than 0.10 inch
- On any single length of cable on a reel, the sequential length markings do not run through "00000"

907-657.02.2--Single Mode Fiber Optic Cable Indoor/Outdoor Riser Rated. The Contractor shall provide fiber optic plenum rated cable that meets the following requirements when called for on the Plans:

- All-dielectric, inside plant, loose tube central core cable
- High tensile strength yarn surrounding the central tube core
- Dry water blocking materials and construction
- 72-fiber cable with six (6) active buffer tubes and 12 individual stranded fibers per buffer tube
- Corning Freedm LST All-Dielectric, Pirelli CentraLink, or approved equivalent cables shall be provided. This cable shall be designated as the building entry cable.

The Contractor shall ensure that the cable can withstand a maximum pulling tension of 300 pounds (lbf) during installation.

The cable shall have a shipping, storage and operating temperature range of -30°C to +70°C and an installation temperature range of -10°C to +60°C shall be provided.

The Contractor shall provide cable with outer jacket marking using the following template:

Manufacturer's Name - "Optical Cable" - Month/Year of Manufacture - Telephone Handset Symbol - "MDOT" - "72F SM"

The Contractor shall include in the outer jacket marking the cable sequential length in accordance with the following:

- English units every two (2) feet.
- Within -0/+1% of the actual length of the cable
- Contrasting color to the cable jacket
- Marking font height no less than 0.10 inch
- The sequential length markings do not run through "00000" on any single length of cable on a reel

907-657.02.3--Single Mode Fiber Optic Drop Cable (FO Drop Cable). The Contractor shall

provide 12-Fiber, Pre-Terminated Drop Cable Assemblies. These assemblies shall be employed when connecting a camera, traffic controller, DMS or other device to the main cable.

Assemblies shall be factory assembled and terminated on one end with ceramic ferrule, LC compatible, heat cured epoxy connectors with an operational temperature of -40°C to +70°C. Each connector shall have a minimum of a 1-inch strain relief boot.

Insertion loss for each connector shall not exceed 0.30 dB.

Return loss for single mode connectors shall be greater than 45 dB.

Each assembly shall be fully tested and those test results placed on a test tag for each assembly.

Each assembly shall be individually packaged within a box or reel, with the submitted manufacturer's part number marked on the outside of the package.

Individual 250-µm coated fibers shall be up-jacketed to 1/8-inch using fan-out tubing. This tubing shall contain a 900-µm Teflon inner tube, aramid yarn strength members and an outer jacket.

The fan-out tubing shall be secured to the cable in a hard epoxy plug transition. Length of the individual legs shall be a minimum of three feet with the length difference between the shortest and longest legs of the assembly being no more than two inches.

The 12-Fiber, Pre-terminated Drop Cable Assemblies provided shall meet the following minimum requirements:

- All-dielectric, outside plant, loose tube central core cable shall be used
- High tensile strength yarn surrounding the central tube core
- Dry water blocking materials and construction
- Twelve (12) individual stranded fibers contained within the central tube core
- Corning Freedm LST All-Dielectric, Pirelli CentraLink, or approved equivalent cables shall be used. This cable shall be designated as the drop cable

The Contractor shall ensure that the cable can withstand a maximum pulling tension of 300 pounds (lbf) during installation.

The cable shall have a shipping, storage and operating temperature range of -30°C to +70°C and an installation temperature range of -10°C to +60°C.

The Contractor shall provide cable with outer jacket marking using the following template:

Manufacturer's Name - "Optical Cable" - Month/Year of Manufacture - Telephone Handset Symbol - "MDOT" - "12F SM"

The Contractor shall include in the outer jacket marking the cable sequential length in accordance with the following:

- English units every two (2) feet
- Within -0/+1% of the actual length of the cable
- Contrasting color to the cable jacket
- Marking font height no less than 0.10 inch
- The sequential length markings do not run through "00000" on any single length of cable on a reel

907-657.02.4--Plenum Rated Nonmetallic Corrugated Raceway. The Contractor shall provide plenum rated nonmetallic corrugated raceway inside buildings when cable is not in rigid conduit when called for on the plans.

The installation shall conform to NEC articles 770 and 800.

Raceway shall meet UL Standards 910 and 2024.

The Contractor shall provide 2-inch diameter raceway unless larger is called for in the plans.

The Contractor shall provide Fiber Optic Fusion Splice (FO Splice Fusion) for splicing of all fibers with a fully automatic portable fusion splicer that provides consistent low loss (max 0.10 dB) splices.

Splicer shall provide three-axis fiber core alignment using light injection and loss measurement techniques.

The fusing process shall be automatically controlled.

The splicer shall provide splice loss measurements on an integral display, as well as a magnified image of the fiber alignment.

The Contractor shall retain ownership of the fusion splicer.

907-657.02.5--Fiber Optic Connectors. The Contractor shall provide fiber optic connectors for all fiber optic infrastructures including but not limited to fiber optic termination cabinets, fiber optic drop panels, and fiber optic patch cords.

The Contractor shall provide only factory-installed keyed LC compatible connectors for all fiber optic infrastructures.

Field-installed connectors shall not be used.

Adapter couplers shall not be used to change connector types.

Ceramic ferule connectors, factory-installed, with a thermal-set heat-cured epoxy and machine polished mating face shall be used.

Connectors shall be installed as per manufacturer application and recommendations, including

proper termination to the outer-tubing (900-micron tubing, 3-mm fan out tubing, etc.) required for the application.

Connectors rated for an operating temperature of -40°C to +75 °C shall be used.

Simplex connectors for all male LC connectors shall be used and a latching cover for two male connectors being used in a duplex configuration shall be provided. Female couplers may be duplex but must allow simplex mating connectors.

Dust caps shall be provided for all exposed male connectors and female couplers at all times until permanent connector installation.

907-657.02.6--Fiber Optic Termination Cabinet (FO Termination Cabinet). Fiber optic termination cabinets shall be provided in communications hubs, field junctions, and the MDOT Traffic Management Center (TMC) as shown in the Plans for termination of 72-fiber outside plant (OSP) cable.

The Contractor shall provide wall/shelf mount 12-fiber distribution cabinet equipped with fiber optic connector modules in a 12-fiber configuration. These will be used in field equipment and communication cabinet locations.

Termination cabinets with cable management features included shall be provided.

The Contractor shall use termination cabinets that are fully compatible with all components of the fiber optic infrastructure as specified, including, but not limited to, fiber optic cable, fiber optic fusion splices and fiber optic connectors.

The Contractor shall provide rack-mount termination cabinets designed to fit standard 19-inch EIA equipment racks.

The Contractor shall provide all mounting hardware and supports to mount the termination cabinets in the locations shown in the Plans.

The Contractor shall provide fiber optic termination cabinets providing 72-fiber connectors and capable of storing 72 fusion splices in splice trays.

The Contractor shall provide termination cabinets that integrate the splice trays and connector modules into one compartment within one cabinet, or houses the splice trays and connector modules in separate compartments integrated into one cabinet.

The maximum dimensions of a complete termination cabinet shall be 7-rack units, 12.25 inches high by 16 inches deep.

Fiber optic termination cabinets shall be fully enclosed metallic construction with a protective hinged front cover for the connector ports.

The cabinet shall have cable access on all sides of the enclosed area behind the connector port panel.

The Contractor shall provide sufficient splice trays for storing 72 fusion splices in 12 or 24-splice increments.

The Contractor shall provide termination cabinets with fiber optic connector modules in a 12 fiber configuration of six (6) rows of one (1) duplex connector couplers. Connector modules shall mount vertically in the termination cabinet front panel.

Connector modules shall include clearly legible and permanent labeling of each of the 12 fiber connector couplers, and shall be labeled and identified as shown in the Plans.

The Contractor shall provide factory-assembled 12-fiber termination interconnect cables (pigtail cables) to be fusion spliced to the outside plant or indoor cable and connected to the rear of the connector modules.

Termination interconnect cables shall be all-dielectric, single jacketed cable with high tensile strength yarn surrounding 12 individual 900-micron fibers following EIA/TIA-598B color identification with factory-installed connectors.

The Contractor shall provide all incidental and ancillary materials including but not limited to grommets, cable strain relief and routing hardware, blank connector panels and labeling materials.

The cable shall be new (unused) and of current design and manufacture.

907-657.02.7--OSP Closures for Aerial, Pole Mount, Pedestal and Hand Hold Environments. OSP closures for aerial, pole mount, pedestal and hand hold shall be capable of accepting up to eight cables. The closures shall be capable of storing up to eight 90-inch lengths of expressed buffer tubes and up to 96 splices.

Assembly shall be accomplished without power supplies, torches, drill kits or any special tools. Re-entry shall require no additional materials.

Sealing shall be accomplished by enclosing the splices in a polypropylene case that is clamped together with a stainless steel latch and sealed with an O-ring.

Closure shall be capable of strand mounting with the addition of a strand mounting bracket.

Splice case shall be non-filled, non-encapsulate to prevent water intrusion, and shall allow re-entry without any special tools.

The closure shall be capable of preventing a 10-foot water head from intruding into the splice compartment for a period of seven (7) days.

It is the responsibility of the Contractor to ensure that the water immersion test has been performed by the manufacturer or an independent testing laboratory, and the appropriate documentation has been submitted to the Engineer.

907-657.02.8--OSP Closures for Drop Cable Splice Points. OSP closures for aerial, pole mount, pedestal and hand hold shall be capable of accepting the trunk cable and two drop cables. The closures shall be capable of storing up to eight 90-inch lengths of expressed buffer tubes and up to 48 splices.

Assembly shall be accomplished without power supplies, torches, drill kits or any special tools. Re-entry shall require no additional materials.

Sealing shall be accomplished by enclosing the splices in a polypropylene case that is clamped together with a stainless steel latch and sealed with an O-ring.

Closure shall be capable of strand mounting with the addition of a strand mounting bracket.

Splice case shall be non-filled, non-encapsulate to prevent water intrusion, and shall allow re-entry without any special tools.

The closure shall be capable of preventing a 10-foot water head from intruding into the splice compartment for a period of seven days.

It is the responsibility of the Contractor to ensure that the water immersion test has been performed by the manufacturer or an independent testing laboratory, and the appropriate documentation has been submitted to the Engineer.

907-657.02.9--Patch Cords and Jumper Cables. Any patch cords or jumper cables required to connect the new fiber and equipment at existing locations shall be considered incidental and shall be included in the cost of pay items 907-657-A and 907-657-B.

Any patch cords used for system configuration shall be compatible with fiber types and connectors specified herein.

Single-mode patch cords shall be yellow in color.

Jacketing material shall conform to the appropriate NEC requirement for the environment in which installed.

All cordage shall incorporate a 900-µm buffered fiber, aramid yarn strength members and an outer jacket.

Patch cords may be simplex or duplex, depending on the application.

Attenuation shall be less than 1.0 dB/km @ 1310 nm, 0.75 dB/km @ 1550 and have a total attenuation of less than .5 dB.

The Contractor shall be responsible to determine and provide attenuators with the proper attenuation to not exceed the optical budgets of the equipment connected by patch cables.

907-657.02.10 Cable Labels. The Contractor shall provide cable labels that meet the following requirements:

- Self-coiling wrap-around type
- PVC or equivalent plastic material with UV and fungus inhibitors
- Base materials and graphics/printing inks/materials designed for underground outside plant use including solvent resistance, abrasion resistance and water absorption
- Minimum size of 2.5 inches wide by 2.5 inches long
- Minimum thickness of 0.010 inches
- Orange label body with pre-printed text in bold black block-style font with minimum text height of 0.375 inches
- The Contractor shall pre-print the following text legibly on labels used for all fiber optic trunk cables:

  Caution Fiber Optic Cable Mississippi Department of Transportation (601) 359-1454

- The Contractor shall pre-print the following text legibly on labels used or all fiber optic drop cables (FO Drop Cable):

  Caution Fiber Optic Drop Cable Mississippi Department of Transportation (601) 359-1454

- On all cable labels, the Contractor shall print the text specified above twice on the label with the text of the second image inverted. The end result shall be text which "reads correctly" when the label is coiled onto a cable.

907-657.02.11--Cable Markers. The Contractor shall provide low profile soil cable markers which meet the following requirements:

- 3.5 inches in diameter
- UV stabilized for Maximum fade resistance
- Durable and abrasion resistant
- Lawn mower resistant
- Orange in color
- Printed Legend:

Fiber Optic Cable
Mississippi Department of Transportation
Traffic Engineering Division (601)359-1454

The Contractor shall install cable markers with a 13-inch nylon stake every 500 feet along the fiber run.

907-657.02.12--Conduit Detection Wire. Conduit detection wire shall be #10 AWG stranded copper, orange-insulated, THHN -THWN conductor.

The Contractor shall furnish and install a detection wire surge protection system. The Contractor shall ensure that detection wires are attached to a surge protection system designed to dissipate

high transient voltages or other electrical surges.

The Contractor shall ensure that the detection wire surge protection system is grounded to a driven rod within 10 feet of the system using AWG #6 single conductor wire. Grounding must be done through a stand alone system not connected to power or ITS device grounding.

The Contractor shall ensure that the surge protection system normally allows signals generated by locate system to pass through the protection system without going to ground.

907-657.02.13--Project Submittal Program Requirements. The Contractor shall provide project submittals for all fiber optic infrastructures. The project submittals for fiber optic infrastructure shall include all items in this provision and any additional requirements included in any Notice to Bidders.

The Contractor shall provide project submittals including manufacturer recommended operations, maintenance and calibration procedures for the following equipment:

- Fiber optic installation and testing tools
- Fusion splicers
- Cable pulling strain dynamometers and breakaway links
- Cable air jetting/blowing systems
- OTDRs
- Optical attenuation testers (light sources and power meters)

The Contractor shall submit documentation and proof of manufacturer recommended operator training and certification for the following equipment:

- Fusion splicers
- Cable air jetting/blowing systems
- OTDRs
- Optical attenuation testers (light sources and power meters)

907-657.03--Installation Requirements. All equipment shall be installed according to the manufacturer's recommendations, the Plans and as follows.

907-657.03.1—General Requirements.

a) The Contractor shall install all fiber optic infrastructures according to the manufacturer's recommended procedures and specifications.
b) The Contractor shall provide all necessary interconnections, services and adjustments required for a complete and operable data transmission system.
c) The Contractor shall install all fiber truck, drop, and patch cables such that attenuation shall be less than 1.0 dB/km @ 1310 nm, 0.75 dB/km @ 1550.
d) All pole attachments, service loops and conduit risers shall be placed to minimize the possibility of damage as well as to facilitate future expansion or modernization.
e) The cable shall be installed in continuous runs as indicated on the plans. Splices shall be allowed only at drop points or reel end points specified in the plans.

f) At drop locations only, those fibers necessary to complete the communication path shall be spliced. Other fibers in the cable(s) shall be left undisturbed, with a minimum of five feet of buffer tube coiled inside the closure.
g) Sufficient slack shall be left at each drop point to enable access of the cable components and splicing to occur on the ground. This is typical two times the pole height plus 15 feet.
h) For aerial installations, the following minimum slack requirements shall apply:
   - For aerial slack storage at splice points, a radius controlling device, commonly referred to as a SNO-SHOE, shall be used for securing resulting cable slack at aerial splice points and shall be mounted directly to the strand.
   - For aerial cable runs exceeding 6-pole spans between splice points as indicated on the plans, two opposing SNO-SHOES shall be placed on the span 50 feet apart to provide for a 100-foot service loop for future drops and for slack for repair and pole relocations.
i) Drop cable shall be routed to the controller cabinets via conduit risers as illustrated in the plans. The cable entrance shall be sealed with a duct plug designed for fiber optic cable to prevent water ingress.
j) The minimum requirement for fiber protection outside a fiber optic enclosure in ALL cases shall be 1/8-inch fan-out tubing, containing a hollow 900-µm tube, aramid strength members and an outer jacket, and shall be secured to the cable sheath.
k) The minimum requirement for fiber protection inside wall mount or rack mount fiber enclosure shall be 900-µm buffering, intrinsic to the cable in the case of tight buffered fibers, or in the case of 250-µm coated fibers, a fan-out body and 900-µm tubing secured to the buffer tube(s).
l) During installation, even if the tension specifications for the cable are not exceeded, the first ten feet shall be discarded.
m) Warning tape shall be placed 12 inches above the cable not to deviate ±18 inches from the centerline of the optical cable. Warning tape shall be at least two inches wide and colored orange.

907-657.03.2--Cable Shipping and Delivery. The cable shall be packaged on reels for shipment. Each package shall contain only one continuous length of cable. The packaging shall be constructed as to prevent damage to the cable during shipping and handling.

Both ends of the cable shall be sealed to prevent the ingress of moisture.

A weatherproof reel tag shall be attached to each reel identifying the reel and cable so that it can be used by the manufacturer to trace the manufacturing history of the cable and the fiber. A cable data sheet shall be included with each reel containing the following information:

- Manufacturer name
- Cable part number
- Factory order number
- Cable length.
- Factory measured attenuation of each fiber

The Contractor shall cover the cable with a protective and thermal wrap.

The outer end of the cable shall be securely fastened to the reel head so as to prevent the cable

from becoming loose in transit. The inner end of the cable shall be projected a minimum of 6.5 feet into a slot in the side of the reel, or into housing on the inner slot of the drum, in such a manner as to make it available for testing.

Each reel shall be plainly marked to indicate the direction in which it is to be rolled to prevent loosening of the cable on the reel.

907-657.03.3--Cable Handling and Installation. The Contractor shall not exceed the maximum recommended pulling tension during installation as specified by the cable manufacturer.

The Contractor shall continuously monitor pulling tensions with calibrated measuring devices, such as a strain dynamometer.

The Contractor shall ensure that the minimum depth of the cable is a minimum of 36 inches unless shown otherwise in plans.

All pulled installations shall be protected with calibrated breakaway links.

The Contractor shall ensure that the minimum recommended bend radius is not exceeded during installation as specified by the cable manufacturer. Unless the manufacturer's recommendations are more stringent, the following guidelines shall be used for minimum bend radius:

- 20 X Cable Diameter Short Term - During Installation
- 10 X Cable Diameter Long Term - Installed

Before cable installation, the cable reels and reel stands shall be carefully inspected for imperfections or faults such as nails that might cause damage to the cable as it is unreeled.

All necessary precautions shall be taken to protect reeled cable from vandals or other sources of possible damage while unattended. Any damage to reeled cable or the reel itself shall necessitate replacement of the entire cable section at no additional cost to the State.

Whenever unreeled cable is placed on the pavement or surface above a pull box, the Contractor shall provide means of preventing vehicular or pedestrian traffic through the area in accordance with the safe maintenance of traffic provisions.

The cable shall be kept continuous throughout the pull. Cable breaks and reel end splices are permitted only in Type 5 pull boxes and occur at a minimum of 10,000 feet.

Where a cable ends in an underground fiber optic closure, all unused fibers and buffer tubes shall be secured and stored in splice trays in preparation for future reel end splicing and continuation.

907-657.03.4--Cable Storage. The Contractor shall properly store all cable to minimize susceptibility to damage. The proper bend radius shall be maintained, both short and long term, during cable storage.

Storage coils shall be neat in even length coils, with no cross over or tangling.

Storage coils of different cables shall be kept completely separate except when the cables terminate in the same splice closure.

Storage coils shall be secured to cable racking hardware with tie wraps, Velcro straps, or non-metallic cable straps with locking/buckling mechanism. No adhesive or self-adhering tapes, metal wires and straps, or rope/cord shall be used to secure coils.

Unless otherwise noted on the plans, the following are the requirements for cable storage for underground applications:

- Trunk cable in Type 4 pull box ..... 25 feet
- Trunk cable in Type 5 pull box ..... 200 feet
- Drop cable in Type 4 pull box ..... 10 feet
- Drop cable in Type 5 pull box, not terminated in a splice closure ..... 10 feet
- Drop cable in Type 5 pull box, terminated in a splice closure with the trunk cable ..... 100 feet
- Trunk cable end in Type 5 pull box ..... 200 feet
- Drop cable terminated in same splice closure as trunk cable end ..... 200 feet

The Contractor shall label each pull box with a numbered disk obtained from the traffic engineering department. The disk shall be installed in accordance with the manufactures specification on the lid of each pull box. Numbers shall be noted on the As-Built plans for each pull box.

No slack cable shall be stored inside the communications hub building or Control Center.

907-657.03.5--Cable Labels. Cable labels shall be installed on all trunk and drop fiber optic cables. The installed cable shall be cleaned of all dirt and grease before applying any label.

The Contractor shall label all cables in or at every location where the cable is exposed outside of a conduit, innerduct or pole using the cable IDs for trunk cables or the device number for drop cables.

As a minimum, cable labels shall be installed in the following locations:

- Within 12 inches of every cable entry to a pull box, equipment cabinet, communications hub, or the TMC
- Within 12 inches of the exterior entry point of every fiber optic splice closure, termination cabinet and drop panel
- Every 30 feet for the entire length of cable in any storage coil in pull boxes
- Within one (1) foot of every pole attachment
- On every riser
- On every splice enclosure

907-657.03.6--Conduit Detection Wire. The Contractor shall install one conduit detection wire

in all conduit banks. Conduit detection wire is required in all conduit banks installed by any installation method, including trenching, directional boring or plowing.

Only one conduit detection wire is required per installed conduit bank regardless of the number of conduits installed in that segment. Conduit detection wire shall be installed inside the conduit.

Conduit detection wire is not required for structure mounted conduit, except where underground segments of structure mounted conduit are greater than 20 feet in length.

The conduit detection wire shall be continuous and unspliced between pull boxes and shall enter the pull boxes at the same location as the conduit with which it is installed, entering under the lower edge of the pull box.

Four (4) feet of conduit detection wire shall be coiled and secured in each pull box or vault.

When two or more detection wires are in any pull box, the Contractor shall mechanically splice all detection wire together.

Conduit detection wire is required in drop cable conduits.

A detection wire surge protection system shall be furnished and installed. Detection wires shall be attached to surge protection systems designed to dissipate high transient voltages or other electrical surges. The detection wire surge protection system shall be grounded to a driven rod within 10 feet of the system using AWG #6 single conductor wire. Grounding shall be done through a stand alone system not connected to power or ITS device grounding. The surge protection system shall normally allow signals generated by locate system to pass through the protection system without going to ground.

907-657.03.7--Splicing into Existing Fiber Optic Cable. At some locations, the Contractor may be required to splice new drop cable into existing fiber optic cable at existing pull boxes. The Contractor is responsible to protect all existing fiber during this work. No separate payment shall be made for splicing into the existing fiber. The cost for all fiber optic work and equipment shall be included in the bid price for pay items 907-657-A and 907-657-B.

The Contractor must notify the Project Engineer in writing no less than ten (10) days in advance of doing any work to existing fiber optic cable. Before any work can begin the Contractor must have obtain approval from the Project Engineer.

907-657.03.8--Fiber Optic Connections at Existing Communication Nodes. In some locations, the Contractor shall be required to pull new fiber optic cable into an existing communications huts. No separate payment will be made for this work. The cost for pulling the fiber into the hut, providing and installing the termination equipment, and terminating all the fibers shall be included in the cost of pay items 907-657-A and 907-657-B.

907-657.03.9--Drop and Insert Applications. The signal from the TMC to local controllers, cameras, and/or dynamic message signs will be conveyed via the backbone and branch cables.

The appropriate closure (Subsection 907-657.02.8) shall be used.

A 12-port fiber distribution cabinet and appropriate jumper shall be installed within the cabinet at locations approved by the Engineer.

At each device, the applicable fibers will be routed in and out of the equipment cabinet using a pre-terminated drop cable.

Only fibers required for the drop and insert shall be cut, no other fibers in the cable shall be cut without the approval of the Engineer.

The fibers shall be connected to the transmission equipment via LC/LC fiber optic patch cables.

The drop cable shall be routed in a position that will allow access to all installed components without movement of the cable.

In traffic signal control boxes the drop cable shall be routed up the left rear corner to a shelf mounted fiber optic termination cabinet.

In ITS equipment or communication cabinets the cable shall be routed neatly allowing for service of all installed components.

907-657.03.10--Testing.

907-657.03.10.1--General Requirements. The project testing program for fiber optic infrastructure shall include but is not limited to the specific requirements in this subsection.

All test results shall confirm physical and performance compliance with this TSP including but not limited to optical fibers and fusion splices. No event in any given fiber may exceed 0.10 dB. Any event measured above 0.10 dB shall be replaced or repaired at the event point.

The Contractor shall provide the tentative date, time and location of fiber optic infrastructure testing no less than seven (7) days in advance of the test. The Contractor shall provide confirmed date, time and location of fiber optic infrastructure testing no less than 48 hours before conducting the test.

The Contractor shall provide test results documentation in electronic format (3 copies) and printed format (3 copies). Electronic formats shall be readable in Microsoft Excel or other approved application. Printed copies shall be bound and organized by cable segment.

- Two sets are for the Traffic Engineering ITS Department
- One set are for the Engineer

All test results shall be provided in English units of measure of length.

All test results documentation shall be submitted to the Engineer within 14 days of completion of the tests.

The ITS Engineer, Project Engineer and/or their designee(s) are only responsible for attending and observing each test, and reviewing and approving the Contractor's test results documentation. The ITS Engineer, Project Engineer and/or their designee(s) reserve the right to attend and observe all tests. The Contractor is required to perform the Pre-Installation test and the Standalone Acceptance test with the MDOT ITS Engineer or his designee present.

907-657.03.10.2--Pre-Installation Test (PIT). The Contractor shall perform a PIT on all FO Cable prior to any cable removal from the shipping reels.

The Contractor shall perform a PIT on each cable reel delivered to the job site.

The PIT for FO Cable shall include but is not limited to:

- A visual inspection of each cable and reel
- An OTDR Test and documentation as required in the Standalone Acceptance Test (SAT) for three randomly selected fibers from each buffer tube

An Optical Attenuation Test is not required. However, if the Contractor decides to perform one of these tests for his or her own protection, it should be documented and provided to the Engineer.

907-657.03.10.3--Standalone Acceptance Test (SAT). The Contractor shall perform an SAT on all fiber optic infrastructures on this project after field installation is complete, including but not limited to all splicing and terminations. All fiber in pull boxes shall be in its final position mounted to the racks prior to the start of testing.

An SAT for each fiber in each cable shall include OTDR Tests and Optical Attenuation Tests.

For the Attenuation Tests, all fibers in all FO Cables and FO Drop Cables shall be tested from termination point to termination point, including:

- Fibers from FO Termination Cabinet to FO Termination Cabinet
- Fibers from FO Termination Cabinet to FO Drop Panel
- Fibers from FO Drop Panel to FO Drop Panel
- Fibers from FO Termination Cabinet to the end of the cable run in the last FO closure

All test results shall confirm compliance with this TSP including but not limited to optical fibers and fusion splices. No event in any given fiber may exceed 0.10 dB. Any event measured above 0.10 dB shall be replaced or repaired at the event point.

Test documentation shall include but is not limited to:

- Cable & fiber identification
- Cable & fiber ID and location - Physical location (device ID and station number of FO Termination Cabinet, FO Drop Panel, or cable end FO closure), fiber number, and truck or drop cable ID for both the beginning and end point
- Operator name

- Engineer's representative
- Date & time
- Setup and test conditions parameters
- Wavelength
- Pulse width Optical Time Domain Reflectometer (OTDR)
- Refractory index (OTDR)
- Range (OTDR)
- Scale (OTDR)
- Ambient temperature
- Test results for OTDR test (each direction and averaged)
- Total fiber trace (miles)
- Splice loss/gain (dB)
- Events > 0.05 dB
- Measured length (cable marking)
- Total length (OTDR measurement)
- Test results for attenuation test (each direction and averaged)
- Measured cable length (cable marking)
- Total length (OTDR measurement from OTDR test)
- Number of splices (determined from as-builts)
- Total link attenuation

The OTDR Test shall be conducted using the standard operating procedure and recommended materials as defined by the manufacturer of the test equipment.

The Contractor shall use a factory patch cord ("launch cable") of a length equal to the "dead zone" of the OTDR to connect the OTDR and the fiber under test.

Bi-directional OTDR tests shall be conducted and bi-directional averages calculated for each fiber.

All tests shall be conducted at 1310 and 1550 nm for single mode cable.

The Contractor shall conduct the Optical Attenuation Test using the standard operating procedure and recommended materials as defined by the manufacturer of the test equipment.

Bi-directional Optical Attenuation tests shall be conducted and bi-directional averages calculated for each fiber.

A continuity or tone test shall be performed after installation to confirm that a continuous run of conduit detection wire was installed between pull boxes or vaults.

The Contractor shall prepare a test plan, supply equipment, conduct the test and document the results.

The test plan shall be submitted at least 15 working days prior to the desired testing date.

Testing shall not begin until the Engineer has approved the test plan, and all tests shall be conducted in the presence of the Engineer. The Traffic Engineering ITS Department representative shall be notified of the testing dates and invited to observe all testing.

The Traffic Engineering ITS Department may perform additional testing of any and all infrastructure using their own equipment. The Contractor may observe this testing.

The burn in period can not start until the Traffic Engineering ITS Department is satisfied with the installation.

907-657.03.11--Documentation - As-Built Plans. The Contractor shall provide GPS locations of all pull boxes, splices, termination equipment cabinets, DMS, CCTV, Detectors and all pole locations.

The Contractor shall record the sequential footage markers from the fiber optic trunk and drop cables for each GPS location.

The Contractor shall provide scanned PDF files of all plan sheets with pen and ink markups.

The Contractor shall also provide MDOT with an electronic file containing all of the data and test reports required above in a format that is compatible with Microsoft Excel.

A copy of all documentation shall be provided to the MDOT Traffic Engineering ITS Department and Project Office

The Contractor shall provide a site location inventory of ITS devices to include manufacturer model, serial numbers, and quantity. It shall also include the following:

- OTN Nodes and OTN Cards
- Fiber modems
- Video Encoders and Decoders
- Cameras
- Dome Camera housings
- DMS Signs
- Any other serial numbered devices installed

907-657.03.12--MDOT Employee Training. Minimum training requirements are as follows:

1) After the installation is complete, the Contractor shall provide formal classroom training and "hands-on" operations training for proper operation and maintenance of the fiber optic plant. The training shall be provided for up to six personnel designated by the Engineer and shall be a minimum of one day in duration. The training shall cover as a minimum preventive maintenance, troubleshooting techniques, fault isolation and OTDR trace analysis. All training materials shall be provided by the Contractor.
2) A Training Plan shall be submitted within 90 days of the Notice-to-Proceed. Approval of the Plan shall be obtained from the Engineer and the Traffic Engineering ITS Department. A detailed explanation of the contents of the course and the time schedule of when the training

shall be given shall be included in the Training Plan.

3) Prior to training, the Contractor shall submit resume and references of the training instructor(s) along with an outline of the training course in a Training Plan. Training instructor(s) shall be manufacturer-certified, experienced in the skill of training others. The training shall be conducted by a trainer with a minimum of four years of experience in training personnel on the operation and maintenance of fiber optic systems.
4) The Contractor shall furnish all handouts, manuals and product information for the training. The same models of equipment furnished for the project shall be used in the training. The Contractor shall furnish all media and test equipment needed to present the training. Training shall be conducted in the Jackson area.

907-657.04--Method of Measurement. Fiber optic cable of the type specified will be measured by the linear foot, measured horizontally along the conduit or aerially along the messenger cable. No differentiation will be made for cable installed underground or aerially.

Fiber optic drop cable and of the type specified will be measured by the linear foot from the trunk line to the controller cabinet.

The cost for all fiber optic work, equipment and testing shall be included in the bid price for pay items 907-657-A and 907-657-B.

All required cabinet facilities shall not be measured for separate payment. All standard or special fiber optic modems, fan out boxes, connectors, termini nation cabinets, patch cords, raceways, splicing devices, splicing, detection wire, warning tape, above ground markers, backplane facilities, twisted pair communications cable interface devices, etc., and any other cabinet modifications required for the fiber optic system shall be included in the price bid for other items of work.

907-657.05--Basis of Payment. Fiber optic cable, fiber optic drop cable, and fiber optic video drop cable, measured as prescribed above, will be paid for at the contract unit price bid per linear foot, which price shall be full compensation for furnishing all materials, for all installing, connecting, cutting, pulling and testing and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

907-657-A: Fiber Optic Cable, 72 SM - per linear foot

907-657-B: Fiber Optic Drop Cable, 12 SM - per linear foot

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-658-6 **CODE: (SP)**

DATE: 11/21/2012

SUBJECT: Networking Equipment

Section 658, Network Switch, is hereby added to and becomes part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-658 -- NETWORKING EQUIPMENT

907-658.01--Description. This section specifies the minimum requirements for network switches furnished and installed. Type A, Type B, and Type D shall be hardened. These switches support Intelligent Transportation Elements deployed on arterial streets and the highway system. Elements include but are not limited to traffic signals, dynamic message signs, surveillance cameras, and vehicle detection systems. Type C switches will support the Intelligent Transportation System and be installed in the Traffic Management Center and Communications Huts which are environmentally controlled. Type C switches are not required to be hardened. This Section also specifies the minimum requirements for Terminal Servers and Category 6 cable furnished and installed on this project. The Terminal Servers shall be hardened. The work shall consist of providing all labor, materials, equipment and incidentals necessary to furnish, install and test Terminal Servers. The Terminal Server device, also commonly referred to as a Port Server device, will be used to communicate bi directionally between IP-based Ethernet network systems and existing field devices that communicate or are controlled via a full-duplex serial interface. The Category 6 cable will be installed in conduit between elements that are within 300 feet of each other to eliminate the need for two hardened switches.

907-658.02--Materials. Network Switches Type A, Type B, Type C, Type D, Terminal Servers and associated cabling will be placed in the field device cabinets and shall meet the following requirements:

907-658.02.1--Network Switch Requirements. The Type A, Type B, Type C, and Type D Network switches shall adhere to the following minimum requirements:

1) Field switch optical ports shall meet the following:
    a. The minimum optical budget between transmit and received ports shall be 19dB.
    b. Shall include LC connector types.
    c. Optical receiver maximum input power level shall not be exceeded.
    d. Optical attenuators shall be added as needed; fiber optic attenuator patch cords shall be in accordance with Section 657 of the Mississippi Standard Specifications for Road and Bridge Construction. It is the Contractor's responsibility to determine where attenuators are needed and shall be included in the cost of the switch.

e. The Contractor shall be required to measure the optical power on each optical port to ensure that power entering the receiver is within the acceptable power budget of the optical port.
f. Optical interface equipment shall operate at 1310 nm.

2) Operate from 100 VAC to 200 VAC.
3) The field switches shall operate between -34 to +74 degree Celsius, including power supply.
4) The field switches shall operate from 10% to 90% non-condensing humidity.
5) Meet the IEEE 802.3 (10Mbps Ethernet) standard.
6) Meet the IEEE 802.3u (Fast Ethernet 100 Mbps) standard.
7) Meet the IEEE 802.3x (Full Duplex with Flow Control) standard.
8) Meet the IEEE 802.1p (Priority Queuing) standard.
9) Meet the IEEE 802.1Q (VLAN) standard per port for up to four VLAN's.
10) Meet the IEEE 802.1w (Rapid Spanning Tree Protocol) standard.
11) Meet the IEEE 802.3ad (Port Trunking) standard for a minimum of two groups of four ports.
12) The field switches shall meet IEEE 802.3D (Spanning Tree Protocol) standard.
13) Capable of mirroring any port to any other port within the switch.
14) Password manageable through:
    a. SNMP
    b. Telnet/CLI
    c. HTTP (Embedded Web Server) with Secure Sockets Layer (SSL)
16) Full implementation of SNMPv1 and SNMPv2c.
17) Full implementation of GVRP (Generic VLAN Registration Protocol).
18) Full implementation of IGMP and IGMP snooping.
19) Minimum MTBF of 100,000 hrs using Bellcore TS-332 standard.
20) Full implementation of RFC 783 (TFTP) to allow remote firmware upgrades.
21) UL approved.
22) The field switch shall provide status indicators as follows: 1) power on an off, 2) network status per port (transmit, receive, link, speed), and 3) status indicators shall be LED.
23) Unused ports (copper and optical) shall be covered with rubber or plastic dust caps/cover.

907-658.02.2--Type A Network Switch. Type A Network Switch shall meet the following.

1) Minimum of six 10/100/1000 Base-TX ports. Each port shall connect via RJ-45 connector.
2) Minimum of two 1000 Base Long Reach optical ports.
3) Full implementation of RMON I and RMON II.
4) Rack, shelf or DIN Rail mountable. If shelf mounted, the Contractor must furnish and install a shelf if shelf space is not available in the facility. Any shelf used shall be ventilated as per the Network Switch manufacturer recommendation.
5) All power transformers provided shall be "fastening mechanism" type. No plug-in types shall be permitted. All corded transformers shall be mountable with the ability to neatly secure power cords.

907-658.02.3--Type B Network Switch. Type B Network Switch shall meet the following.

1) Minimum of twelve 10/100 Base-TX ports. Each port shall connect via RJ-45 connector.
2) Minimum of one 10/100/1000 Base-TX ports. Each port shall connect via RJ-45 connector.
3) Full implementation of RMON I and RMON II.
4) Minimum of two 1000 Base Long Reach optical ports.
5) Rack, shelf or DIN Rail mountable. If shelf mounted, the Contractor must furnish and install a shelf if shelf space is not available in the facility. Any shelf used shall be ventilated as per the Network Switch manufacturer recommendation.
6) All power transformers provided shall be "fastening mechanism" type. No plug-in types shall be permitted. All corded transformers shall be mountable with the ability to neatly secure power cords.

907-658.02.4--Type C Network Switch Requirements. The Type C Network Switch will be installed in the Communication Hubs and shall meet the following requirements:

1) Each switch shall be populated with the following modules:
   a. Two redundant switch fabric modules that meet the following minimum requirements:
      i. Layer 2/3/4 switching and routing services
      ii. 64Gbps/48Mpps module Bandwidth
      iii. Min of 2-GE uplinks available per card. The Contractor shall provide an uplink SFP optical module compatible with the interface for the uplink as indicated in the Comm Node notice to bidders for each uplink
   b. In one (or more) SFP-based module(s): a minimum of 48 ports of 1000Base-X (SFP-based) compatible. The Contractor shall provide whichever is greater between a min number of SFP optic modules to interface to the fiber as indicated in the plans and NTBs, or a min of 14 and shall meet the following minimum requirements:
      i. Optical budget of 19dB
      ii. Hot-swappable
      iii. Same optical wavelength as Type A & B switches
      iv. Same optical transmitter power as Type A & B switches
   c. In one (or more) modules: 24 Ethernet 10/100/1000 ports
2) Optical receiver maximum input power level shall not be exceeded.
3) Optical attenuators shall be added as needed; fiber optic attenuator patch cords shall be in accordance with Section 657 of the Mississippi Standard Specifications for Road and Bridge Construction. It is the Contractor's responsibility to determine where attenuators are needed and shall be included in the cost of the switch.
4) 19" rack mountable.
5) Operate from 5 to 40 degree Celsius.
6) NEBS Level 3 compliant.
7) Operate from 5 to 80 non-condensing humidity
8) Designed as a chassis with easy to remove modules.
9) Chassis backplane shall be passive.
10) All modules shall be hot-swappable.
11) Meet the IEEE 802.1d (Virtual Bridge) standard.
12) Meet the IEEE 802.1x (authentication) standard.
13) Meet the requirements of :
   a. IEEE 802.3z

b. IEEE 802.3ah
c. GR-20-CORE: Generic requirements for Optical Fiber and Optical Fiber Cable
d. GR-326-CORE: Generic Requirements for Singlemode

14) Full implementation of RIP protocol as outlined by RFCs: 1058, 1723, 1812
15) Full implementation of OSPF protocol as outlined by RFCs: 2178, 1583, 1587, 1745, 1765, 1850, 2154, 2328, 1850, 1997, 2385, 2439, 2842, 2918, 2370.
16) Capable of mirroring any port to any other port within the switch.
17) Password manageable through:
    a. SSHv2 (Secure Shell)
18) Full implementation of GMRP (Generic Multicast Registration Protocol).
19) Full implementation of IGMPv2.
20) Full implementation of PIM-SM and PIM-DM.
21) Full implementation of DVMRPv3.
22) Full implementation of VRRP.
23) Comply with FCC 47 CRF Part 15 Class A emissions.
24) Bandwidth flow rate limiting policing support per port.
25) Full security implementation of
    a. Support SSH2, 802.1x (rel 2)
    b. Access Control Lists (ACL's)
    c. RADIUS
    d. TACACS
26) Have redundant power supplies installed.
27) The power supply units shall be hot swappable.
28) Switch chassis shall have a minimum of 6 module slots.
29) Blank covers for all remaining slots.

907-658.02.5--Type D Network Switch Requirements. The Type D Network Switch shall be of chassis design. The switch shall be able to accept a minimum of 4 different type modular cards and have Layer 2 switch and Layer 3 routing cababilities. The Type D Network Switch shall meet the minimum requirements specified below:

1) The switch shall be chassis designed with a minimum of 4 module slots.
2) Each switch shall be able to accept the following type modules:
    a. Ethernet module:
        i. A minimum number of six (6) 10/100/1000Base-TX compatible RJ45 ports.
        ii. The Contractor shall provide the minimum number of modules necessary to meet or exceed the required number of ports as indicated in the plans and NTBs.
        iii. Total required bandwidth shall per chassis shall not exceed 10 Gbps
    b. Fiber based modules:
        i. The module shall accept SFP type fiber modules
        ii. The Contractor shall supply any necessary fiber modules that meet the requirements of speed, type of fiber, and link budget connection.
        iii. The Contractor shall provide the minimum number of modules necessary to meet or exceed the required number of ports as indicated in the plans and NTB
    c. WAN module:

i. T1 Interface
   1) The Interface shall be T1
   2) The ports shall connect via RJ45 connector.
ii. Cellular Iterface
   1) Contractor shall provide information to the Project Engineer to enable activation of the modem.
   2) Contractor shall get prior approval from the Projcet Engineer on selection of cellular radio type (HSPA/EVDO)

d. Power Supply module:
   i. The power module provided shall be "screw terminal block" type. No pluggable terminal block.
   ii. Input power: Same as Type A and Type B switches.
   iii. Power module shall be hot-swappable.
   iv. The Contractor shall supply the necessary amount of power supplies to meet power requirements for all cards installed and the chassis itself

3) Software license shall provided to match functionality of installed modules.
4) Shall be DIN or Panel mountable.
5) The swich shall provide layer 2 and 3 switching and routing services
6) Meet the IEEE 802.1d (Virtual Bridge) standard.
7) Meet the IEEE 802.1x (authentication) standard.
8) Password manageable through:
   a. SSHv2 (Secure Shell)
9) Full implementation of GMRP (Generic Multicast Registration Protocol).
10) Full implementation of IGMPv2.
11) Full implementation of PIM-SM and PIM-DM.
12) Full implementation of DVMRPv3.
13) Full implementation of VRRP.
14) Comply with FCC 47 CRF Part 15 Class A emissions.
15) Bandwidth flow rate limiting policing support per port.
16) Full security implementation of
   a. Support SSH2, 802.1x (rel 2)
   b. Access Control Lists (ACL's)
   c. RADIUS
   d. TACACS
17) Blank covers for all remaining slots.
18) Electronic surfaces shall be covered with conformal coating for additional environmental protection.

907-658.02.6--Terminal Server. Terminal Server shall meet the following.

1) 10/100 Base-T Ethernet port connection
2) RJ-45/DB9 Serial port connection
3) RS-232/422/485 selectable serial connections
4) Baud rates up to 230 Kbps
5) Full Modem and hardware flow control
6) TCP/UDP Socket Services
7) UDP Multicast
8) Telnet and Reverse Telnet

9) Modem emulation
10) SNMP (Read/Write)
11) PPP
12) Port buffering
13) HTTP
14) Remote management
15) DHCP/RARP/ARP-Ping for IP address assignment
16) LED status for link and power
17) The Terminal Server shall support a minimum of Four (4) bi-directional serial communications over Ethernet 10/100 Base-TX.
18) Each Terminal Server shall have a minimum of four (4) EIA-232/422/485 serial interface ports. These ports shall be individually and independently configurable, directly or over the network, to EIA-232/422/485 mode of operation as defined by the EIA for data format, data rate and data structure (e.g., the number of bits, parity, stop bits, etc.). Each serial port shall support up to 230 Kbps.
19) Each serial port shall support IP addressing and socket number selection.
20) The equipment shall provide the capability to establish an IP connection directly from a workstation to any encoder IP address and socket number transport serial data.
21) Each Terminal Server shall have an Ethernet Interface (10/100Base-TX protocol, Full/Half-Duplex, Auto Sense (802.3), RJ-45).

907-658.02.7--Category 6 Cable. Category 6 Cable shall meet the following.

1) 4 Pair #24 AWG UTP Category 6 Cable
2) This item is paid for Category 6 cables installed between cabinets and does not apply to other patch cords installed inside cabinets or huts.
3) Supplied Category 6 cable shall be suitable for use outdoors in duct and as a minimum meet the following requirements:
4) Fully water blocked
5) Conforms to the National Electrical Code Article 800
6) UL 1581 certified
7) Voltage Rating 300 Volts or greater
8) Operating and installation temperature (-4°F to 140°F)
9) Bend Radius 10 x Cable OD or smaller
10) Recommended for 1000Base-T applications for a distance of 100 meters.

907-658.02.8--Category 6 Patch Cords. The Cat 6 Patch Cords shall be furnished and installed as needed to connect the Network Switches with other equipment. Cat 6 Patch Cords shall be considered an incidental component for this project and furnished and installed as needed to provide a functional system. Cat 6 Patch Cords shall meet the following minimum requirements:

1) All patch cords shall be from the same manufacturer.
2) Shall incorporate four (4) pair 24 AWG stranded PVC Category 6.
3) Shall be factory made; Contractor or vendor assembled patch cords are not permitted.
4) Shall be TIA/EIA 568-B.2-1 compliant. Patch Cords shall be compliant to T568B pin configuration (which ever is used).
5) Certified by the manufacturer for Category 6 performance criteria.
6) Length as needed. Excessive slack is not permitted.

907-658.02.9--Project Submittal Program Requirements. The Contractor shall provide project submittals for network switches including scheduling requirements. The project submittals for network switches and terminal servers shall include but are not limited to the specific requirements in this subsection.

1) The Contractor shall submit detailed cut sheets which document compliance with all parameters required in this section. If a parameter is not covered in the cut sheet a signed statement from the manufacturer on letterhead shall be submitted as an attachment. Failure to address all requirements will result in rejection of the submittal.
2) The Contractor shall submit documentation and proof of manufacturer-recommended training and certification for the installation and configuration of network switches.
3) The Contractor shall submit technical specifications for the minimum transmitter port to receiver port optical attenuation required for the switches to function in accordance with this specification for the optical links shown on the plans.

907-658.03--Installation Requirements. All Networking Equipment shall be installed according to the manufacturer's recommendations, the Plans and as follows:

1) Network switches shall only be configured and installed by the switch manufacturer trained personnel.
2) Network switches shall be installed in accordance with manufacturer's guidelines and requirements.
3) The Contractor shall request from the Department, switch configuration information (such as IP address, VLAN Tag values, etc.) not more than 30 days after the switch submittals have been approved.
4) The Contractor shall provide as needed the necessary Cat 6 patch cords and fiber optic patch cords for a complete and functional installation.
5) Category 6 cable installed in conduit shall be installed and terminated per the manufacturers recommended procedures. Five feet of spare slack shall be provided in the pull boxes nearest each Type B or Type C cabinet.
6) The Contractor shall provide training for proper management of the equipment installed. This training should cover daily operation as well as maintenance and configuration of the switching equipment installed as part of this project and meet the requirements of subsection 658.03.3 of this document.
7) The Contractor shall provide the MDOT with a written inventory of items received and the condition in which they were received. Inventory shall be inclusive of make, model, and serial numbers, MAC address, and installation GPS coordinates. All equipment shall be installed according to the manufacturer's recommendations or as directed by the MDOT.
8) Any new, additional or updated drivers required for the existing ATMS software to communicate and control new Networking Equipment installed by the Contractor shall be the responsibility of the Contractor.

907-658.03.1--Switch Configuration Requirements. The Contractor shall configure Network Switches as follows:

1) All 100 Base-TX ports shall be configured as follows:
   a. RSTP/STP – Off.

b. Unused TX ports shall be disabled.
c. Operating TX ports shall be programmed to filter only for the MAC address of the connected device.

2) All 1000 Base-FX ports shall be configured as follows:
   a. RSTP/STP – On.
   b. IGMP Snooping – On.
3) The Type D switch configuration shall be as outline in the Project plans and details.
4) All network switches shall be installed and configured with the same firmware configuration. The optimum settings shall be used consistently system-wide. Any locations that require different settings for optimum performance shall be approved by the Engineer.
5) The Switches shall be configured to enable multicasting of video.
6) The Contractor may submit an alternate switch configuration to the ITS Engineer for review and approval; The ITS Engineer will review alternate switch configuration documentation. The goal of the switch configuration is to reduce the network delay, as well as provide network redundancy.
7) The Contractor shall submit an electronic copy of all final and approved configurations of all switches to the Project engineer and to the ITS Engineer.

907-658.03.2--Documentation. The Contractor shall submit documentation and proof of manufacturer-recommended training and certification for the installation and configuration of network switches.

As-built Plans showing switch configuration and connections shall be provided to the Project Engineer and ITS Engineer in electronic format.

The Contractor shall submit documentation and proof of measured optical power budgets to all optical links of all type switches.

907-658.03.3--MDOT Employee Training. After the installation is complete, the Contractor shall provide formal classroom training and "hands-on" operations training for proper operation and maintenance of the network switch. The training shall be provided for up to six personnel designated by the ITS Engineer and shall be a minimum of four hours in duration. The training shall cover as a minimum preventive maintenance, troubleshooting techniques, fault isolation and circuit analysis. All training materials shall be provided by the Contractor.

1) Prior to training, submit resume and references of instructor(s). Also submit an outline of the training course in a Training Plan. Submit the Training Plan within 90 days of Contract Notice-to-Proceed. Obtain approval of the Plan from the Engineer and the Traffic Engineering ITS Department. Explain in detail the contents of the course and the time schedule of when the training will be given.
2) Furnish all handouts, manuals and product information.
3) For the training, use the same models of equipment furnished for the project. Furnish all media and test equipment needed to present the training.
4) Training shall be conducted in the Jackson area.
5) Training instructor(s) shall be manufacturer-certified, experienced in the skill of training others.

6) The training shall be conducted by a trainer with a minimum of four years of experience in training personnel on the operation and maintenance of fiber optic systems.

907-658.04--Method of Measurement. Network Switches of the type specified will be measured per each installation as specified in the Project plans. Such measurement shall be inclusive of furnishing, installing, system integration and testing of a Network Switch including all chassis, modules, power cables, power supplies, software, license, fiber optic patch cords, fiber optic attenuator patch cords, Cat 6 patch cords, and all incidental components, attachment hardware, mounting shelf and hardware, testing and training requirements, and all work, equipment and appurtenances as required to provide a fully functional switch ready for use. Type D Network Switch module cards shall be specified per Project plans for each site location. It shall also include all system documentation including: shop drawings, operations and maintenance manuals, wiring diagrams, block diagrams, and other material necessary to document the operation of the switch and network.

Terminal Server will be measured per each installation. Such measurement shall be inclusive of furnishing, installing, system integration and testing of a Terminal Server including all incidental components, attachment hardware, mounting shelf and hardware, testing and training requirements, and all work, equipment and appurtenances as required to provide a fully functional Terminal Server ready for use.

Category 6 cable installed between cabinets will be paid for by linear foot measured horizontally.

907-658.05--Basis of Payment. Network Switches, measured as prescribed above, will be paid for at the contract unit price bid per each. The price shall be full compensation for all labor, tools, materials, equipment and incidentals necessary to complete the work.

Terminal Servers, measured as prescribed above, will be paid for at the contract unit price bid per each. The price shall be full compensation for all labor, tools, materials, equipment and incidentals necessary to complete the work.

Category 6 cable installed between cabinets will be paid for by linear foot measured horizontally.

Payment will be made under:

907-658-A: Network Switch, Type __	-per each
907-658-B: Terminal Server	- per each
907-658-C Category 6 Cable, Installed in Conduit	per linear foot

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-659-3 **CODE: (SP)**

DATE: 01/09/2012

SUBJECT: Traffic Management Center (TMC) Modifications

Section 907-659, Traffic Management Center (TMC) Modifications, is hereby added to and becomes part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-659 -- TRAFFIC MANAGEMENT CENTER (TMC) MODIFICATIONS

907-659.01--Description. The MDOT Statewide Traffic Management Center (TMC) is located in the Traffic Engineering Division in the MDOT Shop Complex at 2567 North West Street, Jackson, Mississippi. Regional and City Traffic Management Centers may be located statewide. The following is a list of existing/planned centers and their addresses:

City of Jackson TMC – 300 North State Street, Jackson, Mississippi (basement)
Northwest Regional Combined TMC – 8791 Northwest Drive, Southaven, Mississippi (Police Department)
City of Ridgeland TOC – 304 Hwy 51, Ridgeland, Mississippi (City Hall)
Oxford Combined TMC – 715 Mollybarr Road, Oxford, Mississippi (Oxford Police Department)
Hattiesburg Regional TMC/EOC – 6356 Hwy 49N, Hattiesburg, Mississippi (MDOT District 6 Headquarters)
Batesville Regional TMC/EOC – 150 Hwy 51N, Batesville, Mississippi (MDOT District 2 Headquarters)
Natchez Combined TMC – 233 Devereaux Drive, Natchez, Mississippi (Police Department)
Gulf Regional TMC – 16499 Hwy 49, Saucier, Mississippi (MDOT Lyman Project Office)

Additional Traffic Management Centers may be added as needed.

907-659.02--Blank.

907-659.03--Construction and Operation Requirements.

907-659-03.1--TMC Modifications. The MDOT TMC modifications required to integrate and operate the traffic systems and devices shall be provided. These include, but are not limited to, expanding the central video management system, interconnecting the appropriate number of video interfaces to the TMC video management systems, expanding the MSTraffic backbone network through radio communications, wireless communications, T1 lines or fiber communications, expanding the Advanced Central Traffic Response Algorithm (ACTRA) signal system, or upgrading existing signal systems, expanding the Automated Traffic Management System (ATMS), and integrating all the existing computing facilities. All TMC modifications must meet U.S. Department of Transportation Intelligent Transportation System (ITS) Standards, Policies, and Architectures as well as MDOTs applicable Statewide or Regional Architecture.

907-659.03.2--TMC Modifications - Monitor Systems. Roadway traffic monitor locations shall provide local control functions related to traffic slowdowns and other congestion monitors as defined by MDOT Traffic Engineering. Additionally, the traffic monitor systems shall provide on-line data for use by the existing MDOT ATMS for engineering, operations, planning, incident, and mstraffic.com purposes. This data shall include, but is not limited to, per vehicle data raw data which shall be transmitted to and stored and managed by the ATMS. The traffic monitor systems shall be capable of utilizing both or either loop, microloop, radar, and/or video detection information. The system shall provide a consistent communication and management system regardless of detection methods used. All Traffic Monitoring Systems must meet U.S. Department of Transportation Intelligent Transportation System (ITS) Standards, Policies, and Architectures as well as MDOT's applicable Statewide or Regional Architecture.

907-659.03.3--TMC Modifications – Installation Requirements. All equipment shall be installed according to the manufacturer's recommendations, the Plans and as follows:

1) Any new, additional or updated drivers required for the existing ATMS software to communicate and control new devices installed by Contractor shall be the responsibility of the Contractor.
2) Installation of all equipment and software shall be included. The Contractor must provide the MDOT ITS Manager with an Installation Schedule. The Installation Schedule must be approved by the State Traffic Engineer.
3) All equipment and software must be fully functional and pass a Final Inspection by the ITS Manager and Project Engineer before being accepted by MDOT.

907-659.03.4—MDOT Employee Training. Training shall be provided covering the system architecture, operations, and maintenance of the TMC systems. If training requirements include travel on the part of training participants then the cost of the travel shall be included.

907-659.04--Method of Measurement. Traffic Management Center Modifications, Traffic Management Center Modifications – Monitor Systems, and Traffic Management Center Modifications – Training, complete in place, tested and accepted, will be measured on a lump sum basis.

907-659.05--Basis of Payment. Traffic Management Center Modifications, Traffic Management Center Modifications – Monitor Systems, and Traffic Management Center Modifications - Training, measured as prescribed above, will be paid for at the contract lump sum price, which price shall be full compensation for furnishing all materials for all installing, connecting, cutting, pulling and testing and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

907-659-A: Traffic Management Center Modifications	- lump sum
907-659-B: Traffic Management Center Modifications – Monitor Systems	- lump sum
907-659-C: Traffic Management Center Modifications – Training	- lump sum

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-662-3 **CODE: (SP)**

DATE: 04/02/2009

SUBJECT: Video Communication Equipment

Section 907-662, Video Communication Equipment, is hereby added to and made a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-662--VIDEO COMMUNICATION EQUIPMENT

907-662.01--Description. This Section specifies the minimum requirements for video communications equipment furnished and installed on this project. The work shall consist of providing all labor, materials, equipment, and incidentals necessary to furnish, install, and test a Video Communications System for this project.

The Video Communication equipment will transport digitized video signals and data communications for the CCTV Camera System over the IP-based Ethernet network utilizing video encoders and decoders, via a full duplex serial interface.

The Contractor shall supplied, install, test and integrate the video equipment as indicated in the Contract Documents and Plans as specified in this section.

907-662.02--Materials. All proposed encoding and decoding equipment and software shall comply with the following minimum requirements:

907-662.02.1--General Requirements. All digital Video Encoders (VE) and Video Decoders (VD) provided on this project shall support the following general requirements:

1) New VE and VD shall be provided under this Contract and shall be from the same manufacturer and be fully compatible and interoperable with each type provided, the network equipment and the MDOT central video control system.
2) Interoperability: The VE shall fully interoperate with the VD (hardware and/or software) as defined in these Special Provisions.
3) Mean Time Between Failures (MTBF): The VE shall have a minimum MTBF of 20,000 hours
4) Latency: The end-to-end system latency between the VE appliance and the VD appliance shall be no more than 300 msec, not including network delays. The VE shall support various frame adjustments to minimize latency.
5) Remote Control: VE shall be remotely adjustable via a video management system or command set so that a technician can adjust image quality controls for contrast, brightness, hue and color levels.

6) Decoding: The Contractor shall provide encoders from a manufacturer that also has hardware and software products capable of auto-detecting the compression, resolution and bit rate and capable of decoding the encoded digitized video signal .
7) Video equipment shall support the NTSC signal format.

907-662.02.2--Type A – Video Encoder/Decoder Requirements. The minimum Type A – Video Encoder (VE) and Video Decoder (VD) requirements are as follows:

907-662.02.2.1--Video and Data Requirements. The Type A VE/VD shall meet the following minimum video and data requirements:

1) Video Compression Technology: Moving Picture Experts Group (MPEG-4).
2) VE shall be a hardware-based network device able to accept a minimum of one analog National Television System Committee (NTSC) video input and digitize it for transport across IP networks.
3) VE and VD shall be specifically designed for network operation, and adhere to ISO standard for MPEG-4 technology.
4) VE MPEG-4 video streams shall be compatible with Jupiter Video wall controller MPEG IV video cards or as approved by the Intelligent Transportation Systems Program Manager.
5) Support the following minimum encoded resolutions:
   a. NTSC - Full D1
   b. CIF/SIF
   c. QCIF/QSIF
6) Dynamic bandwidth control: Provide up to 3 Mbps or greater rates. The data rate shall be defined as the maximum committed bandwidth to be utilized, which includes data bursting..
7) Bandwidth increments shall be user configurable via the network. The minimum bandwidth setting shall be 56Kbs or less.
8) The default bandwidth for the VE as furnished shall be set to 2 Mbps,.
9) Provide on-board buffered video memory for protection against potential network disruptions.

907-662.02.2.2--Serial Data Interface Requirements. The Type A VE/VD shall meet the following minimum serial data interface requirements:

1) The VE/VD shall provide bi-directional serial communications over Ethernet 10/100 Base-TX via the following methods:
   a. VE serial port to VD serial port data stream.
   b. IP socket to VE/VD serial port by TCP protocol.
   c. The serial interface shall be transparent to the device (i.e. no additional or special protocols shall be used to communicate between the CCTV control interface).
2) Category 5e or higher quality patch cords shall be used between VE/VD and the network device (i.e., Ethernet switch/router, etc.).
3) The video equipment shall provide the ability to establish an IP connection directly from an Operator Workstation or server application to any VE IP address and socket number transport serial data.

4) Each VE/VD shall have a minimum of one serial port that can be configured to provide EIA-232/422/485 serial interface port.
5) Each serial port shall provide full-duplex serial interface and data rates up to 115.2 Kbps (minimum).
6) Serial port shall be software configurable, locally or over the network, to EIA-232/422/485 mode of operation as defined by the EIA for data format, data rate, and data structure (e.g., baud rate, the number of bits, parity, stop bits, flow control, etc.) via the management software provided.
7) No serial adaptors or interface converters shall be permitted.
8) Each VE shall provide encapsulation of the video streams in a UDP packet for network transmission.
9) Each VE shall use the serial interface port to support PTZ camera control functions.
10) VE serial port shall provide IP addressing and socket number selection.
11) The video equipment shall provide the capability to establish an IP connection directly from an Operator Workstation to any VE IP address and socket number to transport serial data, independent of whether or not the video stream for that VE is being viewed.

907-662.02.2.3--Network Requirements. The Type A VE/VD shall meet the following minimum network requirements:

1) Network connection shall be Ethernet Compliant IEEE 802.3, 802.3u, and 802.3x; 10/100 Mbps or higher, auto sensing full/half-duplex operations.
2) Each VE shall provide encapsulation of the video streams in a UDP packet for network transmission.
3) The VE/VD shall connect to a network device (i.e., media converter, Ethernet switch/router, IP wireless device, etc.) via a RJ-45 connector through Category 5e or higher quality patch cords.
4) All Category 5 ports shall be standard EIA/TIA-568-A pin-outs and shall be rated at 10/100Mbps.
5) The 10/100Base-TX, as required in the IEEE 802.3 standards and amendments shall be the network connection to the network devices with Type RJ-45 connectors.
6) All VE and VD included within this project shall be fully interoperable without customization or the addition of appliances within either the remote or primary communications network. All devices shall be fully interoperable with the backbone communications network.
7) Static IP Addressing (class A, B, and C).
8) RTP, UDP, Unicast and IP Multicast (Internet Group Multicast Protocol / IGMP V2) features for digital video transmission.

907-662.02.2.4--Physical and Environmental Requirements. The Type A VE/VD shall meet the following minimum physical and environmental requirements:

1) The Video Encoder/Decoder shall have the following ports:
   a. Network: 10/100 Mbps RJ-45 or as directed by MDOT.
   b. Video Connector: BNC

c. Serial Data Interface: One (1) minimum RJ-45 ports/connector. Serial port may utilize D-sub connectors or screw terminals as approved by the MDOT.

2) The video input performance measures shall comply with NTSC and EIA requirements, including the EIA-170 standard, with a nominal composite video of 1 volt peak-to-peak (Vp-p). The equipment shall have an electrical impedance of 75 ohms
3) The VE at field locations shall operate in outdoor weatherproof field cabinets where the inside cabinet temperature range is -4ºF to +158ºF, and the relative humidity is between 10% and 90% non-condensing.
4) VE shall be installed in a field cabinet with protection from moisture and airborne contaminants, blowing rain, wind, blowing sand, blowing dust, humidity, roadside pollutants, vandalism, and theft.
5) The VE shall be resistant to vibration and shock, and conforms to Sections 2.1.9 and 2.1.10, respectively, of the NEMA TS 2 standard.
6) The VD shall operate in the following minimum environment: Temperature ranging from +32ºF to +122ºF, and the relative humidity is between 10% to 90% non-condensing.
7) VE shall be PCB conformal coated to provide a level of protection from humidity, contaminants, dust, pollution, etc.
8) VE/VD shall provide a local status display capability for video, data, network interfaces and power. Status indicators shall be LED.
9) Cable connections (data/video/power) shall require no tools for installation or removal and be designed with positive locking devices such that they will not vibrate loose.
10) Provide external markings for all connectors and indicators. Replaceable components shall be permanently marked and traceable to the supplied documentation, including schematics and parts list. The external markings shall include the product function name, model number, serial number, and manufacturer's name.
11) All parts required for a completed video system shall be made of corrosion-resistant materials, such as stainless steel, anodized aluminum, brass, or gold-plated metal.
12) All VE shall be shelf, rack/module, or DIN rail mountable. Other mounting options may be submitted for review and approval by the Engineer.

907-662.02.2.5--On-Screen Display Requirements. The minimum on-screen text insertion and display requirements include:

1) VE / VD shall support a static text insertion capability and shall be capable of inserting a minimum of one (1) user configurable text messages of up to 20 characters in length.
2) VE / VD shall be able to generate a date and time stamp in the video stream and shall be synchronized to a time-server on the network.
3) VE / VD shall be able to display camera title in the video stream.
4) VE / VD shall have the option to display or not display the on-screen text.

907-662.02.2.6--Management Requirements. The minimum management system requirements shall include:

1) The VE/VD shall be manageable through SNMP (v2), HTTP, FTP/TFTP, and/or Telnet/CLI.
2) The management system shall be provided to remotely configure and diagnose the VE/VD.

3) Have capability to reset/reboot and firmware upload via the methods listed above.
4) The Contractor shall work with the MDOT to provide graphical icons of video devices and groups of devices, which can be displayed on a GIS map and accessed and provide real-time color-coded status information.
5) Have the capability to remotely change any of the device configuration settings including bit rates, image resolution and compression settings and serial interface type.
6) Provide for screen text insertion of user messages.
7) Provide pre-defined optimized MPEG settings for various bit rates.
8) Provide update capability for the firmware in the VE from the central site. Ability to access the serial number, firmware number, IP address and equipment configuration. Have the capability to upload firmware to multiple units automatically.
9) Provide ability for remote firmware upgrades.
10) Provide software video decoding capability as part of the overall hardware management software.

907-662.02.2.7--Electrical Requirements. The minimum electrical/power requirements include:

1) Power: nominal input voltage of 120 VAC, 60 Hz. ±3 Hz
2) The equipment shall operate within a voltage range of 89 VAC to 135 VAC.
3) If the device requires operating voltages of less than 120 VAC, supply the appropriate voltage converter. All voltage conversion devices shall also be temperature hardened as specified herein for location (field or central).
4) Power Consumption shall not exceed 30 Watts for each video device.
5) The VE/VD shall provide for automatic recovery from an over or under voltage condition when prime power has returned to the tolerance values specified herein. All configuration parameters shall be stored in non-volatile memory and no reprogramming or manual adjustments shall be required upon power recovery.
6) The VE/VD shall be provided with surge protection for a 100% over voltage condition for a 10 ms duration and with a response time of 1 ps or less.
7) Plug type transformer/power supplies shall be provided with a fastening device that shall securely attach the unit to the power outlet. No plug-in types will be accepted without a fastening mechanism. All corded transformers shall be mountable with the ability to neatly secure power cords.
8) Include UL listing.

907-662.03--Construction Requirements. All video equipment shall be installed according to the manufacturer's recommendations, the Plans and as follows:

1) The Contractor shall furnish and install auxiliary video equipment in support of a communications network that will transport video as specified in the Special Provisions.
2) Materials and associated accessories/adapters shall not be applied contrary to the manufacturer's recommendations and standard practices.
3) The Contractor shall furnish all tools, equipment, materials, supplies, and manufactured hardware, and shall perform all operations and equipment integration necessary to provide

complete, fully operational video equipment as specified herein, within the Plan set, and/or in the Contract Documents.

4) The Contractor shall provide the MDOT with a written inventory of items received and the condition in which they were received. Once received, the equipment becomes the Contractor's responsibility. The Contractor shall provide all labor and equipment necessary to move inventory out of the designated storage facility and to transport it to the installation location. All equipment shall be installed according to the manufacturer's recommendations or as directed by the MDOT.

907-662.03.1--Testing Requirements. Testing shall include, but not be limited to, the following:

907-662.03.1.1--Testing General Requirements. The Contractor shall conduct a project testing program for all VE and VD provided on this project. The project testing program for VE/VD shall include but is not limited to the specific requirements in this subsection.

All test results shall confirm physical and performance compliance with these Special Provisions.

Submit all test results documentation to the Engineer for review within 14 calendar days of completion of the tests.

All test results shall be reviewed and approved prior to continuing with further tests and deployment activities.

907-662.03.1.2--Stand Alone Acceptance Test (SAT). The Contractor shall perform a complete SAT on all video equipment and materials associated with the field device site, including but not limited to electrical service, fiber optic infrastructure, cable, etc. A SAT shall be conducted at every field device site with video equipment.

The SAT shall demonstrate that all video equipment and materials are in full compliance with all MDOT project requirements and fully functional as installed and in final configuration. The SAT shall demonstrate full compliance with all operational and performance requirements of the project requirements including communications and control from the TMC. All SATs also include a visual inspection of the cabinet and all construction elements at the site to ensure they are compliant with the Special Provisions. The SATs for each site type shall include but are not limited to the following:

1) Verify that physical construction has been completed as detailed in the plans.
2) Inspect the quality and tightness of ground and surge protector connections.
3) Verify proper voltages for all power supplies and related power circuits.
4) Connect devices to the power sources.
5) Verify all connections, including correct installation of communication and power cables.
6) Verify video image is present and free from over-saturation and any other image defect in both color and monochrome mode.
7) Verify network connection to the VE through ping and telnet session from a remote PC.

8) Verify serial data transmission (for Type A devices) through the VE serial ports.
9) Verify support of unicast, multicast and network management features.

907-662.03.2--Warranty. Minimum warranty requirements are as follows:

1) All warranties and guarantees shall be assigned to the Mississippi Department of Transportation.
2) The warranty shall be a minimum of one (1) on-site warranty for VE and VD and all other installed and/or attached appurtenances.
3) The warranty period begins upon final acceptance of the video subsystem.
4) During the warranty period, the Contractor shall repair or replace with new or refurbished material, at no additional cost to the State, any product containing a warranty defect, provided the product is returned postage-paid by the Department to the manufacturer's factory or authorized warranty site.
5) Products repaired or replaced under warranty by the manufacturer shall be returned prepaid by the manufacturer.
6) During the warranty period, technical support shall be available from the Contractor via telephone within four (4) hours of the time a call is made by the Department, and this support shall be available from factory certified personnel.
7) During the warranty period, updates and corrections to hardware, software and firmware shall be made available to the Department by the Contractor at no additional cost.

907-662.04--Method of Measurement. Video Encoders and Decoders will be measured in units of each.

907-662.05--Basis of Payment. Video Encoders and Decoders will be paid for at the contract price per each, which price shall include furnishing, installing, warranties, full operation and configuring the Video Encoder and Video Decoder in accordance with applicable Standards, Specifications, and requirements. The price bid shall also include the mounting hardware, Cat-5e patch cords, power cable, user manuals, testing, warranties, serial cable/port converters as necessary, and any and all other equipment required to complete installation of the unit. This price shall be full compensation for all labor, tools, materials, equipment and incidentals necessary to complete the work.

Payment will be made under:

907-662-A: Video Encoder, Type A - per each

907-662-B: Video Decoder, Type A - per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-663-1 **CODE: (SP)**

DATE: 3/12/2013

SUBJECT: Traffic Signal Software

PROJECT: STP-0014-03(065) / 106424301 & 106424302 - Forest and Lamar Counties

Section 907-663, Traffic Signal Software, is hereby added to and made a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-663 -- TRAFFIC SIGNAL SOFTWARE

907-663.01--Description. This work consists of furnishing and installing Central Management Signal Control and Full Traffic Adaptive Signal Control Software that operates at the Traffic Management Center (TMC) in accordance with requirements set forth in these specifications.

907-663.01.1--Central Management Signal Control Software. These requirements apply to all aspects including, but not limited to, the materials, installation, measurement and payment requirements for the TMC Central Management Signal Control Software. The individuals responsible for TMC installation and coordination for the Department shall be identified during the Project's pre-construction meeting. The Contractor shall follow the Department's schedule for downtime of the existing system and swap over to the new Central Management Software.

The Contractor must supply information regarding successful implementations of Central Management Signal Control System software comprised of a similar number of signal devices communicating on the same type of Ethernet topology and with the Full Adaptive Software provided. These references must also be provided along with the initial cut-sheet submittals.

907-663.01.2--Full Traffic Adaptive Signal Control Software. The Full Traffic Adaptive Signal Control Software shall be a commercially available, off-the-shelf, previously installed and tested fully operational adaptive control software. The software shall be designed to monitor traffic flows and automatically adjust traffic signal timings on a second-by-second basis to significantly reduce travel time, minimize environmental impact, and provide economic benefits by reducing vehicle stops, and the wasted fuel and time associated with extended stopping. The software shall provide a rapid response to changes in traffic conditions and shall vary signal timing on a cycle-by-cycle basis. The software shall be a "real-time" adaptive control system. Changes to splits, offsets, and cycle lengths are made in response to traffic currently approaching or departing an intersection as measured in real-time by detection placed in advance of each intersection approach, or 10 feet beyond the stop bar, as shown in the plans.

The software shall be configured as a centralized system; all modeling, optimization, and control decisions are made at a central computer, and then transmitted to the local controller for action. As such, the software system shall require its own Microsoft Windows® based central server for

control of the adaptive functions and communications. The Contractor shall be responsible for providing the appropriate servers and database needed for the adaptive and central software.

The Full Traffic Adaptive Signal Control Software shall be accompanied by a Central Signal Control System Software for monitoring, reporting, and controlling the intersections, as specified in these specifications. The centralized system shall seamlessly be integrated with the Full Traffic Adaptive Signal Control Software.

This work also includes making modifications to detection and solid state traffic actuated signal controller(s) in accordance with the plans and contract documents.

907-663.02--Materials.

907-663.02.1--Central Management Signal Control (CMSC) Software. The CMSC software shall consist of server application and database software installed on Contractor provided servers, as necessary for proper central management software operation. CMSC client interface software shall be installed on Department PC computers. The Contractor shall furnish and install the software on two separate servers, one for the database and one for the applications. The two servers shall work together as one Central Management Signal Control Software interface and shall be able to interface with the Full Adaptive Control software.

907-663.02.1.1--Existing System. The Department currently has a central system called ACTRA that is accessed by both Department and City personnel. The current system is soon to become outdated and shall be replaced with an updated system under this Contract. The field equipment is 100% Eagle EPAC signal controllers, and the new central system must be integrated with the existing equipment with no additional field equipment being installed, beyond what is shown in the plans and specifications. The current system communicates over a fiber optic IP Ethernet system, with all field controllers connected using the Ethernet port of the signal controller, or through a terminal server. The CMSC and Full Adaptive software installed under this Contract must be capable of performing all required functions using IP Ethernet communication protocols on the existing signal controller equipment.

907-663.02.1.2--System Architecture. The System shall be a highly customizable central office traffic management application based on the Microsoft Windows™ XP 64-bit/Windows™ 7 and Windows™ Server 2008 client/server environment. The System may be configured for multiple agencies with varying levels of access privileges for a large-scale Integrated Transportation Management System (ITMS). All software applications shall share common components. The basic System shall be a client/server-based implementation. Processing shall be distributed across multiple machines using industry standard technologies.

907-663.02.1.3--Operating Systems and Platforms. The operating system for the Central server shall be Microsoft ™ Windows 2008 Server. Servers of appropriate requirements for the central software shall be supplied, integrated and tested by the Contractor. System clients can be run on Microsoft ™ Windows XP Professional 64-bit, or Windows 7.

907-663.02.1.4--Local Area Network and Dial-up Access. Any physical networking technology supported by Windows XP or Windows 7 which supports the TCP/IP protocol shall be supported. The System shall provide for multiple simultaneous client Users (including remote Users) of the traffic control system application. These Users can connect via a LAN/WAN connection or through a dial-up to the Central Server. Dial-up shall be supported via standard Windows RAS. Dial-in access shall be allowed, or disallowed, based on standard Windows XP or Windows 7 authentication rules. Users, subject to their System security privileges, shall have access to the same system operations regardless of the type of network connection.

907-663.02.1.5--On-Street Controllers. The System shall be able to support the following on-street controllers:

a.) Eagle M50 Series local controllers
b.) Eagle M30 Series local controllers

907-663.02.1.6--System Capacity. The System shall be highly scalable and capable of upgrade. The Contractor is responsible for providing a system that will work will all currently deployed field equipment without additional hardware being added to field controller cabinets, beyond what is shown in the plans and project specifications. The contractor shall provide a system that will support up to 250 intersections when installed and be upgradeable in the future to support an additional 100 field controllers. Each System Control Group shall be able to have up to 48 timing plans – 16-cycle and split combinations with three offsets for each.

907-663.02.1.7--Time/Date Synchronization. CMSC software shall manage all of the paging, email, and heads up alarm operations of the system. The service operates according to configurations established through the GUI component and the settings below.

a.) The System shall provide for two levels of time/date synchronization. These include:
    i. Synchronization of the system clock with an external clock.
    ii. Synchronization of the internal clocks of all local controllers or field masters with the system clock.
b.) The system clock shall be the internal clock on the computer containing the System software. The external clock shall be:
    i. An internet connection to the NIST in Fort Collins, Colorado.
    ii. Both levels of time synchronization shall occur at User-specified intervals.

907-663.02.1.8--NTCIP Compliance. The National Transportation Communications for ITS Protocol (NTCIP) system shall comply with the following.

a.) The System shall comply with the National Transportation Communications for ITS Protocol (NTCIP) Standards. It shall comply with NTCIP 1101 (formerly TS 3.2-1996) – Simple Transportation Management Framework, and shall meet the requirements for Level 2 Conformance.
b.) The System shall comply with NTCIP 2001 (formerly TS 3.3-1996) – Class B Profile.
c.) The System shall also implement conformance groups as defined in NTCIP 1201 (formerly TS 3.4-1996) – Global Objects Definitions.

d.) The System shall comply with NTCIP standards for communication over TCP/IP.

907-663.02.1.9--Port Server. The System shall support one or more field communications servers to communicate with traffic devices. One of the servers may be the same as the central sever, or separate as required by software provider. The communication server(s) shall be PC based, running Windows 7 or Windows XP. If a separate communications server is desired by the software provider, it must be connected via a high-speed LAN (10/100 or faster) to the central server and provided by the Contractor.

907-663.02.1.10--Communications with On-Street Equipment. The System shall provide a flexible control equipment interface with the following capabilities:

- Communicate with all equipment periodically to monitor status.
- Allow handling of extended monitoring and upload/download requests concurrently.
- Allow up to 64 ECOM devices per serial communications channel. The actual number of ECOM devices allowed shall be constrained by the configured communication speed.
- Poll devices once per minute.

The System shall provide for local backup operation in case of failure of the System file server, communications server, or the communication system. Whenever communication is absent for a User-specified number of consecutive attempts, the local controllers shall revert to standby mode where each controller runs according to its local time-based control (TBC) settings.

907-663.02.1.11--Communications with On-Street Controllers. The System shall have the capability of communicating with controllers once per second.

The System shall support all of the following communications media:

- 1200 baud, two- or four-wire, half-duplex, TDM/FSK via twisted pair or telephone line
- 1200-19,200 baud single or multi-mode fiber optic
- 1200-19,200 baud CATV
- 1200-19,200 baud fixed or spread spectrum radio
- 1200-19,200 baud private coaxial cable
- TCP/IP on Ethernet, fiber or radio

The System shall support the use of multiple media simultaneously.

The System shall support the following communications protocols over serial and IP simultaneously:

- ECOM
- NTCIP

Protocols may not be mixed on the same serial channel.

907-663.02.1.12--Communications with Other Systems. Center to Center module is not requested or required at the current time but should be available for future purchase.

Communication with external systems shall be accomplished using industry standard methods and shall be reasonably transparent to the user. Failure of an external system shall not affect operation of the System or entities under its control.

The System shall support the NTCIP C2C interface revision 3 for connectivity and status interchange with other systems.

The System shall support an extended markup language (XML) interface to allow external systems that use XML to communicate with the System.

907-663.02.1.13--System Startup and Shutdown. Upon the initial start-up of the Central server, the System shall begin normal operation with no prior state information. The traffic control system shall accommodate a User-initiated shutdown. All data shall be saved and all processes properly closed. The system shall also allow for Emergency Shutdown. Three types of emergencies shall be accommodated by the System:

a.) Power failure
b.) Unplanned stoppage of program execution
c.) Operator observation of improper operation

On computer equipment protected by a "Smart" UPS, the UPS may be configured to initiate an orderly shutdown of the Windows operating system. User-defined alarms (e.g., on-screen, paging) and automatic entries into the System Log shall signify the beginning and ending of system failures.

907-663.02.1.14--System Failure and Recovery. If the System detects a non-fatal error within one or more of its processes, it shall alert the operator via an alarm on the operator stations and make an entry in the System Log. The System shall continue to operate when a non-fatal failure occurs. If the System detects a fatal error within one or more of its processes, it shall attempt to alert the operator via an alarm on the operator stations and make an entry in the System Log. The System shall then attempt an orderly shutdown of the System followed by an automatic restart.

907-663.02.1.15--System Access and Security. The System shall allow multiple Users to access the System simultaneously from client workstations in the central control center, from remote locations, and from multiple agencies. The System shall include built-in security features such as unique passwords and privilege levels for different Users, and privileges assigned based on affiliation with a particular jurisdiction or agency.

The System shall support clients that can run on any Windows XP or Windows 7 workstations. Multiple Users with different access privileges can simultaneously log in to the System.

Remote access shall be supported via a WAN, either high-speed or a dial-up. Both types of connections require properly configured and functioning Windows XP or Windows 7 User authentication. Once connected and authenticated, the user can use the System as if locally connected.

The System shall allow multiple agencies to simultaneously utilize the System without interfering with each other's operations. It may be desirable to restrict access to an entity to members of its owning agency. The application shall achieve this functionality by defining multiple jurisdictional agencies to which Users and entities may be assigned. This allows a User's access privileges to be assigned based on his affiliation with a particular agency.

907-663.02.1.16--Documentation. Documentation shall be provided that completely describes the System software as installed. This documentation shall include drawings, sample screen images, text, and on-line help screens as appropriate. The tools provided shall enable the user to fully understand the operation and maintenance of the System, as well as to modify the System as requirements change and additional areas of control are added.

Software documentation shall be provided through a context sensitive online help system, providing the user with detailed operation and troubleshooting information. The on-line help shall be indexed and searchable.

907-663.02.1.17--Graphical User Interface. The system shall provide a Windows® Graphical User Interface (GUI) for user interactions with the system. All menus shall support a set of keyboard equivalent accelerators or hot keys, arrow key navigation of the menu bar and individual pull-down menus.

Menu and dialog box options that are not appropriate in a particular context or not available to a given User shall be either not present or "grayed-out" and unavailable for selection.

Traffic engineering and Geographical Information Systems (GIS) mapping terminology shall be used throughout the programming displays. Display organization and data entry approach shall allow System operators ease of use and a wide range of graphical databases to use.

The System shall allow the user to link dynamic graphics such as intersection lanes or other intersection graphics directly to System database elements without programming or recompilation. The System graphics library shall also include standard graphic objects the user can select to define directional roadway links, turn lanes. Proper representation of directional status attributes shall be available at all zoom levels.

The GUI shall provide control and access to all System displays, reports, and dialog boxes. All workstation User interface functions shall be implemented using GUI concepts conforming to Microsoft Windows® standards.

907-663.02.1.18--System Guide. The Client Interface supplied with the System shall provide a System Guide, a tree browser style interface similar to Windows® Explorer. All of the available operations and devices in the System shall be displayed in the Guide. This view provides control

and access to all System displays, reports, and dialog boxes. Workstation User interface functions shall be implemented using GUI concepts conforming to Windows® standards.

907-663.02.1.19--System Maps. The System Maps shall display a geographic overview of the control area, or a map with icons denoting different objects and their respective properties. Examples of objects are intersections, dynamic message signs (DMS), and closed circuit television cameras (CCTV). These icons shall be automatically updated in real-time to display current object information such as the mode of operation of an intersection. Icons can be double-clicked or right-clicked to access further information or perform System operations subject to the user's access privileges, per the Department's direction.

System Maps shall provide current signal, operation, link, and System Detector status, as well as System Control Group membership. It shall be possible to display specific data through a filtering mechanism.

The System Map shall provide an intersection selection interface enabling the user to make a selection by pointing to a particular intersection object. When that object is selected, a more detailed view can be displayed. Right clicking on the intersection icon shall provide a popup menu for phase data, unit data, etc.

The Contractor is responsible for the creation of both a regional map of the City as well as detailed intersection maps as they exist at the time of system acceptance. This will be for a minimum of no less than 40 intersections. The DEPARTMENT may add to that quantity, at their discretion, not to exceed 10 additional intersections.

907-663.02.1.19.1--Background. The System-wide maps shall be capable of containing commercial vector images of geographically accurate maps or scanned images as backgrounds. Common, industry standard image formats, such as: .bmp, .rlc .jpg .bip .rs .bsq .ntf ..tif .gis .img .ras .svf shall be supported.

The vector image formats supported shall include GIS data formats: ESRI Shape files (.shp .shx .dbf) ESRI ArcInfo Coverage files (.adf .tat .pat .rat) CAD drawings (.dwg, .dxf) Vector Product Format (VPF) table files (.pft .lft .aft .tft) and Spatial Database Engine (SDE) layers.

It shall be possible to have all files used for backgrounds be geographically referenced and use the same projection to allow the mapping display software to properly locate each layer relative to the other layers.

It shall also be possible to use simple bitmap files or vector drawings as map backgrounds.

907-663.02.1.19.2--Pan and Zoom. The user shall be able to dynamically zoom in on the graphic by selecting a box that defines the desired extent of the displayed area. Pull-down menus and toolbar buttons shall allow incremental zooms out, as well as zooming to fit the entire graphic into the window.

Scroll bars along the bottom and right edges of the graphic window shall allow the user to shift the portion of the graphic that is displayed. A Grab tool (represented by a hand icon) shall allow the user to use the mouse to point to any spot on the displayed map and drag it to any other point in the window and the map shall be panned so that the selected point is displayed in the newly selected location.

907-663.02.1.19.3--Multiple Layers. The System Map shall support multiple layers, so that different types of background information can be turned on and off as necessary.

Each layer shall be input from a separate file. Each file shall be geographically referenced so that the layer can be properly located relative to the other layers. Also, all layers in a given map shall use the same projection.

907-663.02.1.19.4--Layer Manager. A Layer Manager feature within the map program shall allow the user to control many aspects of the display of the layers. Using this feature it shall be possible to Hide or Show individual layers. It shall also be possible to set the color used to display the layer. For ESRI Shape files it shall be possible to Show or Hide text and to control its Font, Size, and Color.

907-663.02.1.19.5--Congestion Level and Link Status. The user shall be able to add one or more objects (links) to the map to present the congestion level on roadways. For each link the user shall be able to select a series of points on the map to be connected by line segments to represent the link location. This allows the user to draw a link in each direction along a roadway. These link objects can be assigned to System Detectors. Each link can be configured to present volume, occupancy, volume plus occupancy, or. For each link the user defines a set of thresholds (at least three (3)) and associates a different color with each threshold (four (4) colors can be used to classify all values between, above and below the three thresholds). So for example, the user can assign green to low congestion, yellow for medium congestion, orange for medium-high congestion, and red for high congestion.

907-663.02.1.19.6--Link to Intersection Graphics. The user shall be able to select an intersection and display its intersection graphic using the mouse.

907-663.02.1.19.7--Viewing and Modifying Objects. Objects on a Map, shall be denoted as icons, and shall be user-selectable. Clicking on an icon shall display a pop-up menu with all of the entity's components and operations listed. Clicking on one of the components shall bring up a window with the component's detailed information.

907-663.02.1.19.8--Adding Objects. The user shall be able to add objects to a Map by clicking on the graphic where the entity's icon should appear. It shall be possible to add existing objects to the map, or to create new entities while adding them to the map. Dialog boxes shall guide the operator through all of the steps required to define a new entity. The user shall have the capability to reposition objects as necessary. The user shall be able to add Intersections, on-street Masters, System Detectors, CCTV Cameras, Dynamic Message Signs, and other Maps as entities to a System Map.

907-663.02.1.19.9--Removing Objects. The user shall be able to remove objects from a System Map by right clicking on the entity's icon and selecting "Remove…" from the pop-up menu. The user shall be required to confirm the entity's removal prior to the action being completed.

907-663.02.1.19.10--Zoom-level View Control. The user shall be able to set the current Zoom Level as the Minimum Zoom Level below which selected Entity Types or Layers shall not be displayed. This is a decluttering feature. It allows the user to control the amount of detail visible at any zoom level.

It shall also be possible for the user to set the current zoom level to the minimum zoom level required to view a selected layer or entity type.

907-663.02.1.19.11--Background Color Control. It shall be possible to set the Background Color for the System Map. A field of this color shall be visible at any point not occluded by a layer.

907-663.02.1.19.12--Legend. The user shall be able to cause a legend to be displayed in a separate moveable window. This legend shall display all of the possible visible states of the icons of all of the entity types.

907-663.02.1.19.13--Entity Icon Size Control. It shall be possible to control the entity icon size.

907-663.02.1.19.14--Labels. The user shall be able to add any number of text labels to the map. The user shall be able to control the visibility, font, size and color for each label.

907-663.02.1.19.15--Hyperlinks. The user shall be able to add any number of hyperlink icons to the map. For each hyperlink the user shall be able to assign an icon, a name, a description, and a filename or URL. When the mouse pointer is over one of these, the name and description shall be displayed. When the user double-clicks one of these the map program shall open the file or URL in an appropriate browser application.

907-663.02.1.19.16--Monitor Mode. The user shall be able to activate a monitoring mode in which all Intersections and other devices shall be polled for status once per minute and the status icon is updated for each as needed.

907-663.02.1.19.17--Tree View. The map window shall display a tree of all entities represented on the map including link status, labels and hyperlinks. The entities shall be organized in the tree by type. For example, at the top level of the tree there shall be a node labeled "Intersections" under which there shall be listed all of the Intersections added to the map. It shall be possible for the user to expand and collapse each node with subnodes. When collapsed, the tree only displays the node name. When expanded, the tree displays the node name and all of its subnodes.

907-663.02.1.19.18--Tree View Pane. The map tree shall be displayed in a window pane next to the map display. It shall be possible to hide the tree pane so that only the map is displayed. It

shall be possible to make the tree pane wider or narrower by dragging the sash between the tree pane and the map pane. The tree pane shall be scrollable as necessary.

907-663.02.1.19.19--System Control Group Nodes. When an entity is added to the map, a node is added for that entity under the entity type node in tree. If the entity is an Intersection then a node is also added for that entity under the System Control Group to which that intersection belongs.

907-663.02.1.19.20--Hiding Entities. By right-clicking a node in the tree, the user is presented with a pop-up menu. For a map entity, this menu shall include options to Hide and Show the icon for the entity. When hidden, the node is grayed in the tree.

907-663.02.1.19.21--Blinking Entities. One of the pop-up menu options shall be to Blink an entity. When selected, a dot shall appear on the map at the location of the entity and shall blink for a few seconds to allow the user to locate it.

907-663.02.1.19.22--Highlight Children. One of the pop-up menu options shall be to Highlight Children. When selected, a dot shall appear on the map at the location of each subnode. For example, this feature shall allow the user to locate all of the intersections in a System Control Group.

907-663.02.1.19.23--Center on Entity. One of the pop-up menu options shall be to Center the map display at the location of the entity.

907-663.02.1.20--Intersection Level Maps. The intersection maps shall display both static and dynamic information updated in real-time. The static information shall include the geometry of the intersection (including a graphic display of the number of lanes and their associated use), adjacent land use, the location of the controller, and a layout of the intersection with the intersection's signal inventory number and name. The dynamic information to be displayed shall include:

a.) Vehicle signal phase status for each active phase and up to sixteen (16) overlaps
b.) Pedestrian phase status for a minimum of sixteen (16) active phases
c.) Call status of up to sixteen (16) vehicle phase detectors
d.) Call status of up to sixteen (16) pedestrian phase detectors
e.) Call status for up to eight (8) special detectors
f.) Status of up to six (6) Special Alarms
g.) Control mode in effect
h.) Coordination plan in effect, if any (with cycle length and offset)
i.) Cycle timer (if in coordinated mode)
j.) Split timer (for coordinated phases)
k.) Status of up to eight (8) special functions
l.) Status of up to three (3) auxiliary outputs

The user shall be able to add, delete, and modify the phases on these graphical features. The graphical features shall be able to be placed anywhere on the intersection graphics background.

The System shall also provide a text window to display data such as intersection name, cycle length, cycle counter, offset, etc. The user shall be able to select intersection backgrounds from a standard library of backgrounds or create a background using any tool that can create a bitmap graphic in a format that is supported by The System.

The intersection display shall use standard terminology. The dynamic information shall be updated in real-time in accordance with the once-per-second monitor messages. The intersection display shall provide a user the same information (in a similar format) that is available at the front panel of the controller. The intersection display shall be capable of being dynamically sized by a workstation user. Resizing the window shall not reduce the amount of data displayed on a workstation monitor and the same aspect ratio shall be maintained as before the resizing.

The Contractor is responsible for the creation of an intersection map for all City intersections.

907-663.02.1.21--Multiple Intersection Maps. The user shall be able to create any number of Multiple Intersection Maps. A Multiple Intersection Map is a window divided into a grid of up to 7 by 7 panes. The user can assign a previously defined Local Map to each pane. The Contractor is responsible for the creation of up to 10 multiple intersection maps selected and as directed by the Department.

The System and the intersection mapping programs shall include the following enhancements:

a.) Symbol graphics displayed on the screen shall change size accordingly with the map scale. If the user increases the size of the map, the map shall also increase the size of the symbol. This shall be done automatically and also the end user shall have the ability to changes sizes based on personal preferences.
b.) Intersection map symbols should be readily available for rotation.
c.) The System shall have the ability to copy existing intersection map symbols and display them on different parts of the intersection map while maintaining the scale and rotation factors.
d.) The mapping system shall add the scroll bar functionality to the maps and allow the user to pan around using only those bars.
e.) It shall be possible to bring up the intersection map window by clicking on an intersection icon. It shall also be possible to bring up a popup window with additional information concerning that icon and access to other functionality, by clicking on the icon.
f.) The system map shall add a legend to the map upon request. It shall show current dataset representation, as well as the current symbols on the map.

907-663.02.1.22--Database. The System shall use Microsoft SQL Server 2008 (MS-SQL). The database shall be used to store, retrieve, and maintain System data and parameter files and shall be available for common computer hardware platforms.

a.) System General Principles on Database Entry/Edit
The following principles shall apply to the data entry/editing process provided by the database software:

i. The database management software shall allow programming of the intersection controller databases. Each intersection controller shall have separate database programming pages. These pages shall contain all the programming options unique to each intersection.
ii. Scroll bars may be used to view and edit the information on the page if all the data cannot be displayed on the screen. Formatted screens with cursor positioning via the tab key or mouse shall be used

b.) Database Entry Values
i. All database entries shall consist of alphanumeric values, Boolean values (YES/NO or ON/OFF entries), date values, or other value types supported by ANSI SQL. During program entry, the new data shall overwrite the old data.
ii. If the data has a detectable error, then changes shall not be permitted and the user shall be alerted by an on-screen error message.

c.) Type Checking
i. All data items entered from any workstation shall be tested for data type (numeric, text, date, etc.) and allowed range. All string data items shall be tested to insure that they do not exceed the allowed length. The program shall not terminate because any data item is incorrectly entered. When errors or potential errors are detected, the program shall display a specific diagnostic message on the screen.
ii. The System shall allow the operator to re-enter the item or items that are in error or conflict with other entries. Errors shall be reported until all incorrect or conflicting entries have been corrected.

d.) Range Checking
i. All numeric data items shall be tested to insure that they are within the ranges allowed by the software.
ii. A specific warning message shall be displayed whenever a data item falls outside the reasonable benchmarks and the operator shall be allowed to change the data item if desired.

e.) Data Viewing and Editing
The same screen formats shall be used for initial data entry and for editing.

f.) Data Commitment
i. The user may save a logical grouping of data (such as phase or unit data) after it has been entered or edited satisfactorily.
ii. Data shall be committed to the database when the user saves or exits and saves from a particular GUI. This shall be done in a manner common to all Windows® applications.

g.) Ease of Use
i. The screen organization and data entry/edit method shall enable the operator to use all functions without the need to use reference manuals or cards.

ii. On-line help shall be provided to allow the user to quickly access information required to complete any given System operation.

h.) Simple English Required

i. All field descriptions and inputs shall be presented in simple English, using common traffic engineering terminology.

ii. It shall not be necessary to perform any decoding to read the information. All necessary field descriptions shall be specifically and discretely provided on the same display screen, as they are needed.

i.) Copy Function

i. It shall be possible to copy from within the database software all logical segments of the database to other like segments of the database using "copy and paste" commands.

j.) Upload/Download of Database

i. From any System workstation, the System User shall be able to upload (from the controller) and download (to the controller) each controller's database including the local controller unit and the field master using the System's upload/download feature. Automatic uploads and downloads shall occur by time-of-day as required by the System configuration.

ii. The event log shall record that an upload/download request was made.

iii. Uploads shall not interrupt normal operation of the controller involved in the transfer, and shall not require the controller to go off-line.

iv. Downloads shall not interrupt normal operation of the controller involved in the transfer unless the updated data requires the controller to re-initialize before operating with the newly downloaded parameters (e.g., a change in ring structure), or unless it is dictated by the protocol.

v. The upload/download feature shall use block transfer techniques with verification of receipt. Non-verified data shall cause termination of the upload or download operation after retry. An error message shall be displayed when improper termination of the upload or download operation occurs.

vi. The software shall provide for the upload and download of all controller-timing parameters.

k.) Time of Day Compare

i. The user shall have the capability of comparing the controller's local database with the System's database. Any discrepancies found shall be displayed to the user who then shall have the option of overwriting one with the other or keeping them different for each discrepancy.

ii. The user shall also be able to compare data based on the time-of-day. The System software shall provide for uploading (copying) the database and logical segments thereof from any controller to any workstation while all equipment is performing its traffic control functions. The software shall provide for downloading (copying) the database for a controller (and logical segments thereof) from any workstation to the controller.

l.) Data Entry Aggregation
   i. The software shall allow data to be entered in logical traffic engineering groupings. That is, all data for an intersection shall be entered together and in logical groupings, all System data shall be entered together and in logical groupings, etc.
   ii. Any codes needed for data entry or editing shall be displayed on the same screen or display, together with the data to be entered or edited.

m.) Use of Mnemonics
   i. The software shall minimize the use of mnemonics to interface with the user on the screen, in printed reports, and in the System's documentation or worksheets
   ii. Only mnemonics consisting of standard traffic engineering abbreviations and other straightforward abbreviations shall be acceptable.

n.) Configuration Information
   i. The database shall store all static information about System entities, such as device type, model, software version, phase orientation, and group affiliation.

907-663.02.1.23--Traffic Control. The System shall operate in a distributed control mode, making full use of the intelligence in the local controller. Each intersection may be assigned to a System Control Group, a master group, or designated as a solo. All entities under System Control Group control shall be monitored once per minute. Selected controller poll entities shall be monitored once per second. When a controller is in standby mode, it is receptive to group-level commands. However, a controller shall operate according to its locally stored program when any of the following conditions applies:

a.) It is not a member of a group (it is a solo)
b.) It is set to local manual control
c.) Its System Control Group is in standby mode
d.) A local priority or preemption routine has been initiated
e.) The conflict monitor has sent the intersection into flash
f.) It is in its start-up flash state

The following local control modes shall be provided:

a.) Flash
   i. There shall be two main types of inputs that may initiate flashing mode: planned and unplanned. Planned inputs are those scheduled by time of day and the corresponding mode is called remote or automatic flash. This flashing mode is begun and ended systematically. All minimum vehicle and pedestrian clearance times are observed, and the user must specify the flash entry and exit phases. Normal operation following start-up flash shall not proceed unless the user specifies an entry phase.
   ii. Unplanned flashing modes begin immediately regardless of the point in cycle or current phase. These may be initiated by manual initiation at the cabinet, an MMU conflict, or some other error condition. Such conditions shall be reported to the System in the once-per-minute poll.

b.) Free
   i. An intersection in free mode, by definition, has no coordination plan in effect.

c.) Coordination
   i. An intersection may run coordination patterns set manually, by local time-based schedule, or by System time-of-day.

d.) Priority/Preemption
   i. Intersections in the System shall respond to the following local preempt conditions:
      1. High Priority Preemption – for railroad or emergency vehicles
      2. Low Priority Preemption – for bus or transit vehicles
   ii. There shall be six high levels and six low levels of preemption available. All priority and preemption activity shall be logged and reported.

907-663.02.1.24--Control Groups. The System shall have the capability of assigning the intersections to User-defined Control Groups. System Control Groups shall have unique names for use in reports or for display in a graphic.

Depending on the type of group (see below), certain group-level commands may be implemented, such as the selection of a timing plan for the entire group. The System shall utilize the software in the local controller to provide for a smooth, orderly transition between timing plans. Whenever a new timing plan is implemented, each controller shall achieve the new offset by implementing a transition with respect to the new cycle clock. For each intersection that is currently being displayed and filtered by the user, the System shall recognize and display a message that local transition is in effect. The user shall have the ability to modify the mode of offset correction implemented at any System intersection.

907-663.02.1.24.1--Master Groups. Master groups are those controlled by on-street masters and shall be subject to the capabilities and limitations of the master controller.

907-663.02.1.24.2--System Control Groups. System Control groups shall be controlled directly by the central software, which allows certain group-level commands to be implemented for all intersections in the group. Specifically, transition between free, flash, standby, traffic-responsive and coordinated modes may be enacted. Traffic-responsive algorithms may apply within a group and coordination plans may be changed by time-of-day. Whereas on-street masters are limited in the number of intersections controlled, there shall be no physical limit to the number of intersections in a System Control group. Intersections may be assigned to a Control Group manually, by time-of-day, or by quick response. Each intersection may only belong to one System Control Group at a time.

907-663.02.1.24.3--Solo Groups. Although solo intersections shall be, by definition, not subject to group-level traffic control, they may be placed in groups with other solos for other purposes. Certain time-of-day commands may be implemented on solo groups, including uploads, downloads, setting the time, printing reports, and other auxiliary tasks.

907-663.02.1.25--Group Control. The following group controls shall be provided.

a.) Intersections that are members of a group may be subject to group control.
b.) Group-level control modes provided shall be:
    i. Manual
    ii. Traffic Responsive
    iii. Time of Day (TOD)
    iv. Quick Response (via TOD)
    v. Standby
    vi. Free Flash
c.) The modes of operation shall be:
    i. Flash
    ii. Free
    iii. Manual
    iv. Auto

Group-level control modes may be selected manually by the user, scheduled by time-of-day, or implemented in response to current conditions by Quick Response and traffic-responsive algorithms. Control modes shall be selectable by intersection, by group, or by the System.

907-663.02.1.25.1--Manual Control. A User shall have the capability to manually override any control mode currently in effect at any time. The user may set a coordination pattern, free, or flash for any intersection or group from any workstation.

907-663.02.1.25.2--Central Flash. Individual intersections and control groups shall be capable of being placed in flashing mode by time-of-day. The type of flash mode (remote or local), the intersection name, and the date and time, shall be logged for each transition to and from flash. Controllers shall be brought back on-line upon termination of the flash mode. The return to normal operation shall occur only when the controller begins to time the major street walk interval (or green interval if WALK is not used).

907-663.02.1.25.3--Time-Based Control (TBC). The Time-Based Control shall meet the following.

a.) The Time-based (i.e., time-of-day (TOD), day-of-week (DOW), day-of-year (DOY)) mode of operation shall allow the advance scheduling of signal timing plans to be implemented for a group. Group commands may select the timing plan for the group to follow, but the specifics of the plan shall be stored in the local controller.
b.) The software shall include a User-friendly TOD/DOW/DOY event scheduler, which shall allow certain operator commands to be scheduled in addition to mode and timing plan changes. Some specific requirements are as follows:
c.) Events may be scheduled from any workstation provided that the user has appropriate security level
d.) The number of events scheduled shall be limited only by the database capacity.
e.) Event scheduling shall have a resolution of one minute.
f.) Scheduling of events for multiple entities through a single entry shall be accommodated

g.) Flash and special function implementation shall be accommodated
h.) Schedules shall contain the schedule of events for each day of the week and for recurring holidays. Functions stored in the schedule shall remain unchanged after they have been executed.
i.) The scheduler should not limit the number of day schedules. Each day schedule for each controller should not limit the number of event (state-change) times. Each event time shall be programmable for all possible function changes that are supported by the controller/time¬-based coordinator.
j.) All System functions executed by the System shall be recorded in the System Event log. The System Event log shall identify the source of the executed function as being either the scheduler or the interactive User and shall log the source (TOD, Quick Response or User) as well as the user responsible for the function.
k.) The software shall provide for the programming of a minimum of seven (7) days in advance to implement any of up to a minimum of three (3) temporary schedules to accommodate special circumstances. The temporary schedules shall override the normal daily plans.
l.) The scheduler shall accommodate automatic adjustment for both the beginning and the end of leap year up to one (1) year in advance and Daylight Savings.
m.) The Contractor is responsible for matching the existing schedules in the central system being replaced. All existing schedules shall be replicated by the Contractor in the new Traffic Central Software, and shall be updated accordingly with the new software technology.

907-663.02.1.25.4--Traffic-Responsive Control. The Traffic-Responsive Control shall meet the following.

a.) In traffic-responsive operation, the System software shall select the coordination plan whose defined parameters most closely match the detected traffic pattern based on volume and occupancy data provided by detectors specially chosen as System Detectors.
b.) The System database shall assign System Detectors to each control group for traffic-responsive operation. System Detectors may be assigned to more than one control group. The user shall have the option to allow automatic substitution of saved historical data in the event of one or more failed detectors.
c.) The operator shall establish minimum time and minimum threshold criteria in order to prevent excessive switching between timing plans. The minimum time between timing plan changes for any given section shall be measured in one-minute increments and shall be defined separately for each group.
d.) The operator shall also be able to define the averaging time in minutes, in order to smooth out short-term fluctuations; an occupancy correction, to account for non-standard loop sizes; and a minimum volume, below which the Occupancy is not used in the V+O calculations, in order to prevent false results due to vehicles parked over detectors.
e.) The Contractor shall be required to set one group of intersections to respond to traffic-responsive operation. The Department will select the group to be used and notify the Contractor accordingly.

907-663.02.1.25.5--Quick Response. The Quick Response shall meet the following.

a.) A Traffic Incident/Demand Management (Quick Response) mode of operation shall allow the System to dynamically react to current street conditions. For Quick Response to function, the control group shall use the TOD group mode. The user shall define a series of commands, referred to as the activation response, coupled with a Boolean statement comprised of logically connected (with and/or operators) conditions referred to as the trigger. When the entire logic statement (trigger) is true, the associated activation response shall be executed. The trigger definition, activation response and optional deactivation response together is termed an event.
b.) A Quick Response event is subject to a User-selected minimum duration time and a lock-out time. The minimum duration time is the minimum time the event must remain active unless manually disabled by the user. The lock-out time is the minimum time the event must remain inactive following deactivation before it may be reactivated. The event is followed by the deactivation response schedule, which is a series of commands to be executed upon deactivation of the trigger.
c.) Conditions comprising the trigger may include time-of-day; volume, occupancy, or speed on a specified detector; intersection or System status; special function on/off; external command; or even another trigger.
d.) Actual event activation and deactivation, User abort and activation errors shall be recorded in the System log. The System shall warn the user of conflicting activation response files, allowing the user to define conditions to alleviate the problem.
e.) Quick response events shall be enabled or disabled by the user. A disabled event is one not eligible for execution even if its trigger condition is satisfied.
f.) The Contractor shall program five quick response events as selected by the Department to demonstrate this capability and for use by the Department.

907-663.02.1.25.6--Other Control Functions. The following functions shall also be provided.

a.) Coordination across groups – The software shall achieve coordinated operation across the boundaries of all control groups operating on the same cycle length or on multiples of the same cycle length by ensuring that all such control groups shall be time synchronized to a common reference.
b.) Dual coordination – The software shall provide the capability of simultaneous coordination on crossing streets. To this end, it shall be possible for the operator to select a secondary coordinated phase (phase pair in dual-ring controllers) for each intersection. When so selected, the software shall not permit termination of the secondary coordinated phase or phase pair until the planned (yield point) point in the cycle, even if the secondary coordinated phase would otherwise gap out.
c.) Double-cycling – The software shall permit signals in a control group to operate at one-half the group cycle length. The intersections operating on both cycle lengths shall share a common reference so that coordination can be maintained.

907-663.02.1.25.7--Special Functions. Up to eight special functions shall be available for SEPAC firmware controllers. Special Functions may have a unique name with up to 40 characters for reporting and other purposes.

907-663.02.1.26--Monitoring.

907-663.02.1.26.1--Automatic Polling. The System shall allow automatic polling of entity controllers for status information, and shall be configurable to synchronize entities as well as compare data stored locally at entities with the central database's record of the same data.

907-663.02.1.26.2--Intersection Level. The status of each controller shall be monitored and any detected error condition shall be logged. Error conditions shall be stored in a form that specifies the type, date, and time of the error. Error processing shall be performed during both coordinated and free modes.

When the software identifies a communications or controller failure, an error message shall be logged and the intersection shall be dropped from System monitoring. When the fault has been corrected and the pick-up has been completed, the controller shall be returned to coordinated status and transitioned to the current timing plan.

The software shall test for the following on-line error conditions:

- Communication Error – If communication between the communications server and a local intersection is lost for a User-specified number of consecutive minutes, a failure shall be identified.
- Controller Cycling – For actuated controllers operating locally in either coordinated or free mode, the software shall check the controller to determine if it leaves the current phase a minimum of once in a User-specified number of minutes. If this does not occur, a cycle controller command shall be issued to simulate vehicle calls. If the controller still does not cycle, a failure shall be identified and logged. A controller cycling error shall result in a coordinated intersection being placed in free mode. If already in free mode, a controller cycling error shall result in the intersection being placed in flashing mode.

In standby mode, the software shall use the same error checking and error processing procedures for communication error testing, controller cycling, and conflict error checking, as for the coordinated mode. Communication of detector data and other status information shall continue even when the local controller is in free mode. An error condition detected while a controller is in free mode shall be reported and logged by the System.

907-663.02.1.26.3--Local Preemption. The System shall monitor and recognize the occurrence of preemption at each local intersection. A local preempt shall cause the controller to suspend coordinated operation at that intersection. Accordingly, the intersection shall not be erroneously diagnosed as having experienced a coordination failure. When the local preempt status is removed, the controller shall transition back to coordinated operation. System log messages shall be recorded to note the beginning and ending times, as well as the type of preemption (High or Low priority and 1 to 6).

907-663.02.1.26.4--Local Manual Control. Local manual control shall be initiated and controlled by hardware at the intersection. The System shall identify any intersection in local manual control by means of a status message. Local manual control shall cause the controller to

suspend coordinated operation at that intersection. Accordingly, the intersection shall not be erroneously diagnosed as having experienced a coordination failure. When the local manual control status has been removed, the controller shall transition back to coordinated operation. System log messages shall be recorded to note the beginning and end of local manual control. This is contingent upon appropriate cabinet wiring.

907-663.02.1.26.5--Cabinet Door Open. The System shall monitor the opening and closing of the cabinet door and log an appropriate status message. This is contingent upon appropriate cabinet wiring.

907-663.02.1.26.6--Communication Status. The System shall report the present status of the communication system at the controller. It shall be possible to monitor and log messages to and from the field. A graphic shall display all channel status, on-line, intermittent errors, off-line, and other messages.

907-663.02.1.26.7--Detector Monitoring. The local software shall be able to recognize and report local intersection detector failures (e.g., constant call, no activity, erratic output). The software shall also allow remote set-up, retrieval of internal loop diagnostic records, and status information.

The software shall also provide the following channel selectable parameters:

i. Sensitivity thresholds
ii. Detection mode
iii. Delay time
iv. Extend time
v. Adjustable shorted loop fault frequencies

907-663.02.1.26.8--Detector Data Validity Checks. The local controller software shall continuously monitor the detectors for undercounting, over counting, minimum/maximum presence, and communication errors. The local controllers shall log errors that are detected.

A detector shall be classified as failed when the data from the detector is not within the allowable range of values.

A detector shall be automatically suspended from use if it is failed. Detector data smoothing shall be provided to prevent short-term fluctuations from incorrectly influencing traffic responsive control algorithms.

907-663.02.1.27--Status Displays.

907-663.02.1.27.1--Controller Unit Status Display. The Controller Unit status display shall show the current ring and phase status for the local controller, dynamically updated once per second. Data displayed shall include:

a.) Intersection Name

b.) Group / Master name
c.) Date and Time – current System date and time
d.) Mode – includes:
Manual – controller is running a pattern called for manually at the controller
System – controller is running the pattern called for by the System
Standby – controller has communicated with the System and is awaiting the broadcast of a pattern
Lock Out – controller is transitioning out of startup or preemption
Start Flash – controller is in startup flash
Start Flash w/ Preempt – controller is in startup flash with preemption active
Preempt XX – controller is in preemption for the indicated preempt (XX)
e.) Pattern – the active pattern number and name, or Free or Flash
f.) Cycle Count
g.) For each Phase:
On/Next – On, Next, or blank
Vehicle Call Type– Non-Actuated, Max recall, Min recall, Vehicle call, or blank
Ped Call Type– Non-Actuated, Ped recall, Ped call, or blank
Hold/Omit– Hold, Phase omit, Ped omit, or blank
h.) Ring 1 Counter / Ring 2 Counter – ring status and counter. Ring status includes:
Min Green
Added Initial
Yellow Change
Red Clear
Red Rest
Last Car Pass
Walk
Ped Clear
Walk Hold
Walk Rest
Gapped Out
Time B4 Reduce
Time To Reduce
Cars B4 Reduce
Effective Gap
Overlaps

907-663.02.1.27.2--Coordination Status Display. The Coordination status display shall show the current status for the local controller, dynamically updated once per second. Data displayed shall include:

a.) Intersection Name
b.) Group / Master name
c.) Date and Time – current System date and time
d.) Mode – includes
Manual – controller is running a pattern called for manually at the controller
System – controller is running the pattern called for by the System

Standby – controller has communicated with the System and is awaiting the broadcast of a pattern
Lock Out – controller is transitioning out of startup or preemption
Start Flash – controller is in startup flash
Start Flash w/ Preempt – controller is in startup flash with preemption active
Preempt XX – controller is in preemption for the indicated preempt (XX)

e.) Coordination
f.) Sequence
g.) Coord Mode – Actuated, Coordinated Phase, Min recall, Max recall, Ped recall, Ped & Max, phase omit, or dual coord
h.) Max Mode – Inhibit, Max I, or Max II
i.) Offset Mode – Beg of Coord Phase or End of Coord Phase
j.) Force Mode – Pattern or Cycle
k.) Cycle, Offset, and Ring 1–4 for:
Setting
Active
Adjust – cycle and offset adjustment this cycle
Phase
Phase Mode – Actuated, Coord, Min recall, Max recall, Ped recall, Max+Ped recall, Phase omit, or Dual coord
Perm Phase – permissive phase
Perm Type – Ped, Vehicle, Forced or blank
Sync Timer
Correction Mode – Dwell, Dwell w/ interrupt, Short Way, or Short Way +

907-663.02.1.27.3--Preemption Status Display. The Preemption status display shall show the current status for the local controller, dynamically updated once per second. Data displayed shall include:

a.) Intersection Name
b.) Group / Master name
c.) Date and Time – current System date and time
d.) Interval – includes Min Green/Walk, Sel Ped Clear, Sel Yellow Sel Red Clear, Track Green, Track Ped Clear, Track Yellow, Track Red Clear, Dwell Green, Return Ped Clear, Return Yellow, Return Red Clear, Cycling, and Lockout
e.) Name, Call State, and Timer for up to six Preempts and up to six Priorities
f.) Call State: Active, Extension, Max Call, or blank
g.) Timer: includes delay and duration timers

907-663.02.1.27.4--Time Base Status Display. The Time Base status display shall show the current status of the local time base data for the local controller, dynamically updated once per second. Data displayed shall include:

a.) Intersection Name
b.) Group name
c.) System Date and Time – current System date and time

d.) Controller Date and Time – current controller date and time
e.) Program Day – controller local time based day number and User-created day name
f.) Program Week – controller local time based week number
g.) TOD Pattern – the active Time Of Day pattern number and name, or Free or Flash
h.) Dimming – On or Off
i.) Detector Diag Value = Detector Diagnostic Value
    Max Presence – time in minutes
    No Activity – time in minutes
    Erratic Cnt – counts per minute
j.) Detector Reporting – On or Off
k.) Detector Raw Multiplier – set to 10 or 100 x
l.) Phase Function
    Max II – On or Off
    Omit – On or Off
m.) Special Functions – On or Off for each special function
n.) Auxiliary Outputs – On or Off for each auxiliary output

907-663.02.1.27.5--Detector Status Display. The Detector status display shall show the current status for the detectors assigned to a local controller, dynamically updated once per second. Data displayed shall include:

a.) Intersection Name
b.) Group/Master Name
c.) Date and Time – current System date and time
d.) Phase Detector, Special Detector, and Ped Detector – on-line, max presence, no activity, or erratic count.

907-663.02.1.27.6--MMU Status Display. The MMU status display shall show the current status of the signal states of each MMU (Malfunction Management Unit) channel and the current MMU faults and status for the local controller, dynamically updated once per second. Data displayed shall include:

a.) Intersection Name
b.) Group / Master name
c.) Date and Time – current System date and time
d.) Channel –number of the MMU channel
e.) Red, Yellow, and Green signal states – indicated by x's, when active
f.) Faults and Status – Yes or No

907-663.02.1.27.7--Master Group Status Displays.

907-663.02.1.27.8--Group Active Status Display. The Group Active Status display shall show updating active status information for the two groups belonging to the selected Master controller. Data displayed shall include:

a.) Master Name

b.) Date and Time – current System date and time
c.) For each Group:
    Mode
    Current Pattern
    Cycle Length and Cycle Counter
    Special Functions Active
    Patterns for four reference modes
        TR (Traffic Responsive)
        TBC (Time Based Control)
        MAN (Manual)
        REM (Remote)

907-663.02.1.27.9--Locals and Detectors Display. The Locals and Detectors display shall show updating information on the local and detector status for each of the Intersections in the selected Master group. Data displayed shall include:

a.) Master Name
b.) Date and Time
c.) For each Intersection:
    INT – Intersection number
    GR – Group number
    ST – Local status
    DET – System Detector status
d.) Status codes shall be used to indicate Online, Failed, Inactive, and Standby

907-663.02.1.27.10--Time Base Status Display. The Time Base Status display shall show updating TBC data for the two groups belonging to the selected Master controller. Data displayed shall include:

a.) Master Name
b.) System Date and Time
c.) Week Day, Date and Time
d.) Day Program and Week Program
e.) For each Group:
    Pattern
    Traffic Responsive
    Sample Interval
    Log Interval
    Active Special Outputs

907-663.02.1.27.11--Traffic Responsive Display. The Traffic Responsive display shall show updating traffic responsive status information for the two groups belonging to the selected Master controller. Data displayed shall include:

a.) Master Name
b.) Date and Time

c.) For each Group:
V+O Out data for the two Computational Channels
DR1 and 2 = Directionality (Offset) for channels 1 and 2
CS1 and 2 = Cycle Select for channels 1 and 2
NA1 and 2 = Non-Arterial (Split) for channels 1 and 2
Queue 1 and 2 for channels 1 and 2
Occ1 and 2 = Occupancy for channels 1 and 2
V+O Level In and Out data
Cycle, Split, and Offset
Queue 1 and 2
Occ 1 and 2 = Occupancy 1 and 2

907-663.02.1.27.12--Coordination Green Chart Display. The Coordination Green Chart display shall show a bar chart of updating information on the Coordination status for Intersections assigned to the selected Master group. Data displayed shall include:

a.) The Master Name, System Date, and Time shall be shown above the bar chart
b.) The Intersection numbers shall be listed along the horizontal axis.
c.) The vertical axis shall indicate the percentage of the cycle, showing the relative positions of the Coord Green and Coord Red/Yellow times for each Intersection cycle.
d.) The vertical bars show the relative positions of the Coord Green and Coord Red/Yellow as a percentage of the cycle for each Intersection.
e.) The position of the green time shall be shown in green and the rest of the cycle is in red.
f.) Local controllers that have failed shall be shown as dark gray, those that did not respond or responded incorrectly shall be in yellow, and those that are not running coordination shall be in brown. Inactive controllers shall be blank.
g.) The current cycle position shall be shown as a horizontal line and correcting is shown as crosshairs.
h.) A legend shall be displayed.

907-663.02.1.28--Signal Control Status.

907-663.02.1.28.1--Group Broadcasts status. The Group Broadcasts status display shall show the current System broadcast data for each System Group. Data displayed includes:

a.) Name - System Group name
b.) Current Broadcast - the current Mode for the System Group: Standby, Free, Flash, or Pattern
c.) Dial / Split / Offset - when Mode = Pattern, these fields show the traffic pattern broadcast to the group. Otherwise, these fields say "n/a".
d.) Source - lists who (or what component) requested the Signal Control Manager to broadcast the commands to the System Group. Options: User, TOD, Traffic Responsive, Third party, System, or Default (or Quick Response, when implemented).
e.) Special Function - name of the Special Function broadcast to the System Group, if any. Special Functions are enabled in the Special Functions table of the System Group Data program module, discussed in the System Group Data Tables chapter.

907-663.02.1.28.2--Failed Intersections status. The Failed Intersections status display shall show data for the local controllers currently listed as failed. Data displayed shall include:

a.) Name - Intersection name
b.) Failure Reason - short description of why the Intersection is listed as Failed. Reasons include: No Communication, Wrong Mode, Wrong Pattern, Invalid Sync, and Wrong Mode-Other Control (example: the controller is being manually overridden in the field)
c.) Group - System Group to which the failed Intersection is assigned
d.) Port - number of the computer port to which this Intersection is connected
e.) Address - address number for the Intersection controller

907-663.02.1.29--Reports. The System shall include a variety of predefined reports, which may be displayed on-screen, printed to a line printer, or saved to a file. These reports shall be fully integrated with the System database via ODBC using the Seagate Crystal Reports application. Additional User-definable reports may be generated with any data in the database. All reports may be scheduled to run at a User-defined interval starting and terminating at a User-specified date and time.

907-663.02.1.29.1--Intersection Measures of Effectiveness Report. Measures of Effectiveness (MOE) reports shall be calculated for a particular timing plan (e.g., 1/1/1) based on measurements taken while that timing plan was in effect. This permits the user to evaluate the effectiveness of a particular plan. The data output for this report shall include:

a.) Local Name
b.) Date and Time – current system date and time (when report was generated)
c.) Report Start / Report End – the time range this report covers
d.) Volume – the average number of vehicle actuations per cycle for each phase
e.) Stops – the average number of vehicle actuations received during the non-green time for each phase
f.) Delay – the average waiting time (number of cars waiting □ time) per cycle for each phase
g.) Utilization – the average green time used per cycle for each phase

907-663.02.1.29.2--Cycle Measures of Effectiveness Report. Cycle MOE Reports shall allow the user to view a cycle-by-cycle listing of green time utilization for a timing plan and the time at which the cycle began. The data output for this report shall include:

a.) Local Name–
b.) Date and Time – current system date and time (when report was generated)
c.) Report Start / Report End – the time range this report covers
d.) Date/Time– when data were collected
e.) Dial/Split/Offset = traffic pattern this report covers
f.) Mode – options shall be:
DBASE = Database reference for the following data,
CORR–/CORR+ = Correcting, in which the Offset shortened or extended the cycle, respectively

TRANS = Transition cycle, the first cycle for a coordination pattern
COORD = a cycle for which there was no Offset correction
FREE = non-coordinated

g.) Phase = numbered 1-16
h.) Utilization – the per cycle phase utilization in seconds. Value is negative when the phase used less than the entered pattern time or positive if the phase used more than the entered pattern time

907-663.02.1.29.3--Detector Volume Report. Up to 24 vehicle, pedestrian or special detectors for each intersection may return count data to the System at a time interval between 0 and 120 minutes. Each controller shall have a capacity to store up to 72 count periods. Once that capacity is reached, the oldest stored data shall be overwritten. The data output for this report shall include:

a.) Local Name
b.) Date and Time – current system date and time (when report was generated)
c.) Report Start / Report End – the time range this report covers
d.) Date/Time – start time for that line of data
e.) Detector Number – identification of the detector
f.) Volume – counts

907-663.02.1.29.4--Speed Trap Report. The Speed Trap Report shall list the percentage of vehicles below, within, or above, a User-specified speed range for a given detector pair. Values shall be given by timing plan with the beginning and ending time. This report shall have capacity for up to 24 patterns of speed data. When this capacity is reached, the oldest data shall be overwritten. To avoid losing data, it can be uploaded from the controller to the System database by time of day. The data output for this report shall include:

a.) Local Name
b.) Date and Time – current System date and time (when report was generated)
c.) Report Start / Report End – the time range this report covers
d.) Date/Time – beginning time for the pattern monitored
e.) Dial / Split/ Offset of the pattern monitored
f.) Percent Lower, Percent Within, and Percent Higher– the percentage of the vehicles that were lower, within, or higher than the set speed range for the specified pattern.

907-663.02.1.29.5--Intersection System Detector Report. This report shall list the System Detector data for the selected Intersection. The data output for this report shall include:

a.) Local Name
b.) Date and Time – current system date and time (when report was generated)
c.) Report Start and Report End dates and times – the interval covered by this report
d.) Sample Time – date and starting time
e.) Interval – the sample interval in minutes
f.) Detector number
g.) Raw Volume – counts

h.) Raw Occupancy– counts (number of seconds)
i.) Average Volume
j.) Average Occupancy

907-663.02.1.29.6--Intersection System Detector Graphic. This report shall list identical information to the Intersection System Detector Report, except volume and occupancy data shall be expressed in bar charts. The data output for this report shall include:

a.) Local Name
b.) Date and Time the report was generated
c.) Report Start and Report End dates and times – the interval covered by this report
d.) Sample date and time
e.) Multiplier – for the Raw Volume and Raw Occupancy graphs only. The multiplier is used to allow the data to fit on a standardized chart and may be 1, 10, or 100, as needed. (multiplier value) x (Raw Volume or Occupancy shown in the graph) = actual Raw Volume or Occupancy counts.

907-663.02.1.29.7--Communication Faults Report. The Communications Faults Report shall list all communications failures with the date and time of occurrence. The data output for this report shall include:

a.) Local Name
b.) Date and Time – current system date and time (when report was generated)
c.) Report Start / Report End – the time range this report covers
d.) Fault Time – the date and time the fault occurred
e.) Communication Fault Description – a brief description of the fault

907-663.02.1.29.8--Detector Faults Report. The Detector Faults Report shall list all detector failures with the date and time of occurrence. The data output for this report shall include:

a.) Local Name
b.) Date and Time – current system date and time (when report was generated)
c.) Report Start / Report End – the time range this report covers
d.) Fault Time – the date and time the fault occurred
e.) Detector – which detector reported the fault
f.) Detector Failure Description

907-663.02.1.29.9--Local Alarms Report. This report shall list all local alarms with the time and data of occurrence. The data output for this report shall include:

a.) Local Name
b.) Date and Time – current system date and time (when report was generated)
c.) Report Start / Report End – the time range this report covers
d.) Alarm Time – the date and time the alarm occurred
e.) Alarm Description – brief description of the alarm

907-663.02.1.29.10--MMU Monitor Faults Report. This report shall list all MMU Monitor Faults, the date and time of occurrence and the status of each channel input (i.e., red, yellow, or green) at the time of the fault. The data output for this report shall include:

a.) Local Name
b.) Date and Time – current system date and time (when report was generated)
c.) Report Start / Report End – the time range this report covers
d.) Fault Type and Time
e.) Channel
f.) Red, Yellow, and Green Signal status

907-663.02.1.29.11--Master Group Reports.

907-663.02.1.29.11.1--Communication Faults Report. The Communications Faults Report shall list all communications failures with the date and time of occurrence. The data output for this report shall include:

a.) Master name
b.) Date and Time – current system date and time (when report was generated)
c.) Report Start / Report End – the time range this report covers
d.) Fault Time – the date and time each fault occurred
e.) Location
f.) Communication Fault Description – a brief description of the fault

907-663.02.1.29.11.2--Off-line / On-line Report. An intersection shall be deemed "off line" when after five successive polls by the Master, at least one of the following is not received or is not correct:

a.) Mode (System or standby)
b.) Pattern (dial, split, offset)
c.) Position in cycle
d.) Otherwise, it shall be deemed "on line." This report shall list all occurrences when an intersection goes on line or off line with the date and time and intersection number. The data output for this report shall include:
e.) Master name
f.) Date and Time – current system date and time (when report was generated)
g.) Report Start / Report End – the time range this report covers
h.) Event Time –the date and time the event occurred
i.) Location
j.) Event – a brief description of the event

907-663.02.1.29.11.3--Master Alarms Report. This report shall list all master alarms with the time and date of occurrence. The data output for this report shall include:

a.) Master name
b.) Date and Time – current system date and time (when report was generated)

c.) Report Start / Report End – the time range this report covers
d.) Alarm Time – date and time each alarm occurred
e.) Alarm Descriptions – a brief description of the master alarm

907-663.02.1.29.11.4--Critical Alarms Report. Up to sixteen intersection or master alarms may be designated as critical. This report shall list the occurrence of all critical alarms with the time and date of occurrence. The data output for this report shall include:

a.) Master name
b.) Date and Time – current system date and time (when report was generated)
c.) Report Start / Report End – the time range this report covers
d.) Alarm Time – date and time each alarm occurred
e.) Location
f.) Critical Alarm Description – a brief description of the alarm

907-663.02.1.29.11.5--Group Pattern Changes Report. This report shall list all timing plan changes for a group with the date and time and source (e.g., time base, traffic responsive, manual). The data output for this report shall include:

a.) Master name
b.) Date and Time – current system date and time (when report was generated)
c.) Report Start / Report End – the time range this report covers
d.) Date and Time of each pattern change
e.) Group number (1 or 2)
f.) Pattern – cycle / split / offset
g.) Source of the pattern change

907-663.02.1.29.11.6--System Detector Report. This report shall list the volume + occupancy data for each System Detector. The data output for this report shall include:

a.) Master name
b.) Date and Time – current system date and time (when report was generated)
c.) Report Start / Report End – the time range this report covers
d.) Sample time – the time data collection began
e.) Interval – time in minutes that data were collected
f.) Group – group 1 or 2
g.) Detector Number
h.) Channels

907-663.02.1.29.11.7--System Detector Graphic. This report shall display the same information as the System Detector Report, except the volume and occupancy data shall expressed in bar charts. The detector numbers shall be listed along the horizontal axis, with the bars representing the V+O percentage.

907-663.02.1.29.11.8--Traffic Responsive Pattern Change Report. This report shall list all timing plan changes made by the traffic responsive control algorithm. The date and time and

source (e.g., directionality, queue, split) shall be given for each change. The data output for this report shall include:

a.) Master name
b.) Date and Time – current system date and time (when report was generated)
c.) Report Start / Report End – the time range this report covers
d.) Date and Time of the event
e.) Group – one or two
f.) Pattern – cycle / split / offset
g.) Source of the pattern change.

907-663.02.1.29.11.9--Traffic Responsive Volume and Occupancy Percent Report. This report shall list the traffic responsive volume and occupancy (V+O) data for the selected on-street master for each of the reporting channels. The data output for this report shall include:

a.) Master name
b.) Date and Time – current system date and time (when report was generated)
c.) Report Start / Report End – the time range this report covers
d.) Start time – the date and time data collection began
e.) Group
f.) Channel

907-663.02.1.29.12--Additional Reports. Additional reports generated through the Seagate Crystal Reports application shall be available. A Report Viewer program shall be provided to allow users to display these reports.

These reports shall include Access Data, All Intersection Alarms, All Intersection Communication Log, Channel and Address, Cycle and Offset, Cycle and Offset values, Detector Faults, Group Broadcasts, Group Intersections, Group Mode, Intersection List, Local Coordination, Local Preemption, Offset Cross, Orphaned Intersections, Pedestrian Push Button, Phase Data, Split times, Split times with data, System Intersection Log, TBC Traffic, Volume Detector, and Volume detector with data.

907-663.02.1.29.13--Custom Reports. In addition to the reports described above, the System shall permit the operator to develop his own custom reports via Crystal Reports. The user shall be able to define the format of those reports and add the new reports to the report menu. Once in the reports menu these reports can be run manually, by time of day, or via quick response.

907-663.02.1.29.14--System Event Log. The Event Log shall record System activity and allow the user to view or print all log entries. Filters shall permit the user to view or print only specific commands, events, or time periods.

907-663.02.1.30--Advanced System Functions. The System shall support the creation of real-time time-space diagrams for a selected group of adjacent intersections, which shall show the actual green usage for each intersection for the most recently completed cycle. The data shall be shall be collected for a User specified number of cycles. The diagram shall be based on the

average over those cycles. The real-time time-space diagram shall visually represent leading/lagging greens to show an accurate picture of the green band for both directions.

The System shall have the capability of interfacing with the Synchro software application. The same features available with AAP shall be available with Synchro. Data exchange shall be via Universal Traffic Data Format (UTDF) version 2.1.

The System shall provide an option for converting laptop computers to and from workstation and stand-alone modes, including a procedure for maintaining database integrity.

Once per second monitoring shall be supported using ECOM communications protocols. A minimal set of data shall be returned, including signal status and communications status. Up to eight intersections per communications channel shall be supported, with one pair of wires to each intersection. Periodic additional communications such as uploads and downloads of controller parameters shall suspend once per second monitoring while active.

Any number of Pagee Lists can be defined. A Pagee List is an ordered list of Users with a page offset for each. A Pagee List also has a repage delay and a maximum number of pages. List can be assigned to an intersection, a group or the System. When a critical alarm occurs, the corresponding pagee list shall be activated and paging shall be done until the alarm is acknowledged.

The System shall be integrated with the Full Adaptive Signal Control software. The CMSC software shall recognize that the signal controller is under Full Adaptive Signal Control, and shall not be able to send commands to the controller while under adaptive control. The CMSC software shall provide a screen that allows the user to upload/download the Adaptive stage-to-phase mapping table to the SEPAC controller.

907-663.02.2--Full Traffic Adaptive Signal Control Software.

907-663.02.2.1--General Requirements of the Adaptive System. The Full Traffic Adaptive Signal Control Software shall adhere to the following requirements:

a.) The adaptive system shall operate on an automated split, cycle and offset adjustment basis.
b.) The adaptive system shall interface directly via IP communications to wireless magnetometer detection technology, without the need for additional detector wiring and harnesses in the signal cabinet. The adaptive system shall not have to rely on the controller inputs for wireless magnetometer detector data.
c.) The adaptive system shall have the capability to work with multiple models of video detection for stop bar presence detection, but shall not be reliant on the video detection or a cabinet processor for adaptive control.
d.) The adaptive system shall have the capability to work with conventional loop detection.
e.) The adaptive system must work with the appropriate, direct IP version of SEPAC intersection signal control software, used by the signal control agency. All necessary

upgrades to the SEPAC software in the field, for proper IP communications and adaptive operation, shall be the responsibility of the Contractor.

f.) The system shall have the capability for a detector to communicate with the intersection connected to the system in the closest geographic proximity while supplying data for a different intersections' adaptive control. (in other words, it must be possible to use a detector connected to one intersection as an input to a different intersection, either upstream or downstream.)

g.) The adaptive system must have the capability to turn on and off by an internal scheduler.

h.) The adaptive system shall be fully integrated with the Central Signal Control System, such that when the adaptive system is activated, a special status is shown for graphical representation of the intersections under adaptive control.

i.) The adaptive system shall be integrated with the Central Signal Control System such that when the adaptive system is activated, a special status is shown for the reports that include the intersections under adaptive control.

j.) The adaptive system shall be integrated with the Central Signal Control System such that when the adaptive system is activated, the Central Signal Control System recognizes that intersections are under adaptive control and does not attempt to send commands to the intersections which are under adaptive control.

k.) The adaptive system shall have the capability to adjust green times to enforce gating constraints upon areas that require restricted traffic.

l.) The adaptive system shall utilize a split optimizer with a minimum and maximum split range adjustment.

m.) The adaptive system shall have the capability to make a temporary or permanent split change.

n.) The adaptive system shall have the capability to make offset changes once per cycle.

o.) The adaptive system shall have the capability to dynamically make a cycle length change a minimum of every five (5) minutes based on system detector data, without the input of traffic personnel, or an automated scheduler.

p.) The adaptive system shall develop a profile of traffic approaching the intersection and change the signal timing of that phase in real time. Should the system detection be placed after the stop bar, or configured as a departure detector, the adaptive system shall have the ability to increase green time of that phase on the next cycle.

q.) The adaptive traffic system shall maintain a network wide Traffic Model that is continuously updated with real time data.

r.) The adaptive control system shall maintain a Queue Model that can make a prediction of the current value of the queue of vehicles at the downstream stop line, as dependent on placement and location of the system detection in the plans.

s.) The adaptive traffic system shall have an Incident Management module that will allow the development of predesigned logic triggers and specific responses to abnormal traffic conditions.

t.) The adaptive control system shall contain a bus priority optimizer that can shorten the time a bus has to wait to receive a green light. The optimizer shall use the degree of saturation and spare capacity of the network to make decisions without disrupting the normal adaptive control benefits.

u.) The adaptive control system shall allow the traffic engineer to use weighting factors to provide a primary arterial the ability to have more green time to allow optimized offsets, or allow side roads to run at a higher saturation.
v.) The adaptive control system shall have been deployed in at least four municipalities of thirty of more intersections in North America.
w.) The system shall have the capability to modify the timing parameters as opposed to being limited to fixed timing plans (such as in a traffic responsive operation.)
x.) The system shall be capable of running cycle times of up to 240 seconds.
y.) The adaptive system shall have been proven to operate successfully and improve overall efficiency in grid, corridor and crossing arterial applications. References will be required for each type of corridor operation and deployment.
z.) Only systems that offer full adaptive control will be considered. The centrally located traffic control server or servers must continually adjust Split, Offset and Cycle time. Systems that call pre-defined timing plans in response to changing traffic patterns or do not fully control these parameters in local controllers will not be considered as true full adaptive system for this project.
aa.) The system offered shall be of an "off the self" system of proven design. Results and case studies from the installed systems should be in the public domain, and completed by independent reviewers.
bb.) All Software System training must be offered by an accredited training representative.
cc.) Each traffic control server should be capable of handling up to 300 intersections under adaptive control.

907-663.02.2.2--Adaptive Optimizer Requirements. The adaptive algorithm shall include optimizers for splits, offsets and cycle calculations. Each optimizer estimates the effect of a small incremental change in signal timings on the overall performance of the traffic signal network. These optimizers shall operate as follows:

a.) The Split Optimizer shall calculate at every phase change by analyzing the current split timings to determine whether the split time should be advanced, retarded, or retained to achieve the degree of saturation desired. Split changes shall be in increments of ± 1 to 4 seconds.
b.) The Offset Optimizer shall calculate once per cycle for each intersection. The optimizer shall operate by analyzing the current situation at each intersection using the cycle flow profiles predicted for each of the links with upstream or downstream intersections. It shall then assesses whether the existing offset time should be advanced, retarded, or retained. Offset changes shall be in ±4 seconds intervals.
c.) The Cycle Optimization shall operate on a region, or section basis once every five minutes or every two and one-half minutes when cycle times are rapidly changing. It shall identify the "critical intersection" within the region or section, and shall attempt to adjust the cycle time to maintain this intersection with 90% link saturation on each phase. If the optimizer calculates that a change in cycle time is required, it shall increase or decrease the cycle time in 4, 8, or 16-second increments depending on the current cycle time value.

907-663.02.2.3--Adaptive Detection Requirements. The adaptive system shall utilize advance, upstream detection, or detection placed after the stop bar, as shown in the plans in order to

effectively collect the real-time data needed for the adaptive calculations. Upstream detection shall be used to collect flow profile data by the adaptive system, and existing stop bar detection shall be used for actuated control and phase calling. Departure detection shall be used only as shown on the plans, and shall provide information to the algorithm for adjustment of green splits of those phases on the following cycle. The adaptive and central system shall interface directly to the adaptive system detection technology via IP communications. The system shall not have the need to get upstream detector data from the signal controller or cabinet wiring harnesses via contact inputs. New adaptive advance system detectors shall be wireless, in-pavement magnetometer technology, fully proven and operational in the field, unless otherwise noted on the plans.

The minimum requirements of the detection for the adaptive system are as described below:

a.) At least one detector is required on each signal controller link
b.) One detector is required per lane, for data collection and archiving purposes
c.) Detectors shall be situated at the upstream end of a link, or as shown in the plans.
d.) Links with significant turning volumes should have a separate turn lane upstream detector. If it is determined that the detection that is shown on the plans is not adequate for the volumes of a left turn or side street movement, the Contractor shall notify the Department as such, along with recommended changes to the placement of the detection.
e.) Detector information is collected every 0.25 of a second in the controller, and sent to the central computer once per second.

907-663.02.2.4--Data Collection Module. The adaptive and central system shall include a module that allows the archiving of all traffic data collected by the system detectors, making it available for off-line analysis. The system can also act as a reference against which to compare current traffic conditions, as well as before/after data for when Adaptive is on or off.

The data shall be derived from a special format of output from the adaptive system, which produces compressed data every minute. The data displayed by the module shall be either collected directly from the adaptive system in real-time, or calculated from stored information.

The following data shall be collected directly from the adaptive software messages and stored in the module's database:

a.) Flow - The flow in vehicles per hour arriving at a stop line, as modeled by the adaptive system.
b.) Delay - The total delay in vehicle hours per hour, which is equivalent to the average queue length in vehicles on a link, as modeled by the adaptive system
c.) Congestion - The percentage of four second intervals during a green period when a detector is occupied by traffic. This value shall be independent of the adaptive system model.
d.) Detector Flow - The flow recorded as vehicles cross a system detector.
e.) Detector Occupancy - A value for the occupancy of a detector calculated by taking the total number of quarter-seconds for which the detector is operating as a percentage of the whole period.

907-663.02.2.5--Computer Hardware. The Contractor shall provide all servers, including power and communications cables (Cat 6 cables) necessary for a full and complete adaptive software system. Combining servers for the Central Management Signal Control software and Full Adaptive Control software shall be approved by the DEPARTMENT. It shall be the Contractor's responsibility for specifying and providing the operating system and the appropriate server hardware and cable lengths, necessary for both the Full Traffic Adaptive Signal Control Software and Central Signal Control System Software.

PC workstations shall not be provided by the Contractor, however, the Contractor shall be responsible for full testing and integration of the client software interface on the DEPARTMENT provided workstations. The Contractor shall notify the DEPARMENT of any necessary hardware or operating system requirements for the PC workstations prior to integration of the system.

907-663.03--Construction Requirements.

907-663.03.1--Central Management Signal Control (CMSC) Software.

907-663.03.1.1--General Requirements. The Contractor shall be responsible for all server hardware and cabling, configuration, integration, testing, and training of the Central Management Signal Control Software system and related components. Installation and Integration shall occur at the traffic signal operations center at the District 6 Hattiesburg, MS District Office. The installation requirements include onsite support for all deployment phases of the central software. The Contractor shall submit a plan for the cut-over of the old ACTRA system to the new CMSC software. The plan shall outline the steps for the cut-over, including system down time, intersection down time, system turn-on, and back up plans should the CMSC encounter issues with communications to the existing field devices. All configurations in the database and application software shall be completed and tested prior to system cut-over. Should communications to intersections be down more than seven (7) days, the Contractor shall submit an alternative plan for keeping all signal controller timing plans coordinated in the field.

907-663.03.1.2--Integration & Configuration. The Contractor shall be responsible for the full onsite installation and configuration of the CMSC software and associated equipment, at the central traffic operations center. This integration includes both pre-installation as well as onsite work, including database configuration, map generation, and coordination for the appropriate parameters needed for a fully functional central management signal control system, as necessary for a full and complete operation.

Although the system can be set up in a bench area and tested prior to delivery, it is the Contractor's responsibility to be onsite at all times during the physical installation, configuration, turn-on, and cut over of the system. Remote access to the system for the installation, configuration, and turn-on shall not be allowed.

907-663.03.1.3--Testing. The Contractor shall be responsible for testing all components, servers and software functional requirements, and the full operation of the Software system once it is installed and configured in the field. The Contractor shall submit a testing requirements

document, or Acceptance Test Plan (ATP), to the DEPARTMENT, prior to configuration and implementation of the system. This testing document shall be reviewed and approved by the Engineer and the DEPARTMENT prior to system installation.

The ATP shall state each software requirement and expected outcome of the test, so it can be verified that the software is working as specified. The ATP is meant to exercise the entire central control system, including any provided hardware necessary for operation. The ATP shall demonstrate, at a minimum that the CMSC Software conforms to all requirements within this Special Provision at each intersection and corridor wide.

The ATP shall be conducted in the presence of the Engineer and the DEPARTMENT in the signal operations center. Each test requirement shall be signed off on as 'pass', 'fail' or 'incomplete'. All failed or incomplete tests shall either be retested, or submitted in a written summary explaining why the testing requirement could not be completed as written in the ATP. Upon receipt of the final ATP and explanation summary, the Engineer shall determine if the ATP was satisfactorily completed, or if some of the requirements will need to be retested prior to system acceptance.

907-663.03.1.4--Training. The Contractor shall conduct onsite training sessions for the CMSC Software. For each training session type, the Contractor shall submit a syllabus to the Engineer for approval, prior to scheduling the meeting. These training sessions shall consist of:

a.) Manager's Operation and Configuration Training – This training shall review the PC client-based detailed operation and device configuration parameters of the Central Signal Control System software. All Graphic User Interfaces (GUI's), alarms, and reporting features of the central software client interface shall be reviewed in this training. The trainer shall discuss all parameters in the timing and configuration data sheets of the controller timing sheet GUI's. At the end of this training, operations engineering and management staff shall be able to understand, open and recognize map features, be able to understand the different operating modes and central commands to the field controllers or devices, timing sheet GUI's, system and local alarms, generation of reports and count data from system detectors, and the settable parameters of the system software. The detailed operation of the Central software shall also be shared with the managers, with specific attention to detailed report generation, and troubleshooting techniques, as well as startup and shut down of the server systems. The intended audience for this training is traffic signal engineers and advanced system operators/technicians. This training shall be no longer than 4 days.

b.) Operators Monitoring, Reporting and Troubleshooting – This training shall review the PC/Server/Controller relationship, the general GUI and screen outputs of the system, general troubleshooting and reporting techniques, and what information should be monitored on a day to day basis. Reporting and monitoring features of the central software shall be reviewed with "hands-on" training by the attendees. Each attendee shall be able to pull general reports from the system and be able to monitor necessary functioning of the central software, and identify errors or issues for the Manager or Timing Engineer to address. Should there be problems with the central or adaptive system, the attendees shall

know general troubleshooting tips, and how to start, stop and restart the system and the server/client interface. This training shall be no longer than two (2) days.

The Contractor shall provide all training materials, including manuals, 'quick tips' sheets, and written instructions for up to 10 attendees for each training module. These materials shall be in a neat, bound and tabbed format for easy and quick identification of the necessary sections. All training courses shall be coordinated with the DEPARTMENT, prior to scheduling. Each course or session shall be on successive days, but shall not run concurrent to each other, unless approved by the DEPARTMENT. Each type of training shall be scheduled with the appropriate personnel, as determined by the DEPARTMENT. Training shall be Monday through Thursday only, and shall not be scheduled on a DEPARMENT recognized holiday.

907-663.03.1.5--Warranty and Support. The Contractor shall provide a one year warranty on the CMSC Software from the date of final acceptance of the Acceptance Test Plan (ATP). The support shall include one week long on-site visit, to be used by the DEPARTMENT at any time during the warranty year, as well as unlimited phone, email and remote support of the central software. Telephone and email support shall be available 24 hours per day, seven days a week. Remote Access Support shall be available during normal business hours, Monday through Friday from 8 am to 6 pm CST, excluding recognized holidays.

907-663.03.2--Full Traffic Adaptive Signal Control Software.

907-663.03.2.1--General Requirements. The Contractor shall be responsible for all configuration, integration, testing, and operational training of both the Full Traffic Adaptive Signal Control Software and Central Signal Control Software system and related components. Installation and Integration shall occur both in the field and at the traffic signal operations center at the District 6 Hattiesburg, MS traffic operations center. The installation requirements include onsite support for all deployment phases of the adaptive and central software.

907-663.03.2.2--Integration & Configuration. The Contractor shall be responsible for the full onsite installation and configuration of the adaptive software and associated equipment, at the central traffic operations center, as well as in the field at each signal cabinet. This integration includes both pre-installation as well as onsite work, including inputting the necessary timing parameters and detection configuration into each signal controller, as necessary for a full and complete adaptive operation.

Although the system can be set up in a bench area and tested prior to delivery, it is the Contractor's responsibility to be onsite at all times during the installation, configuration, and turn-on of the system. Remote access to the system for the installation, configuration, and turn-on shall not be allowed.

The Contractor shall observe traffic operation and conditions both before and after adaptive turn on and make the appropriate adjustments. The Contractor shall make the necessary adjustments at all periods of the day, including AM Peak, AM Offpeak, PM Offpeak, and PM peak. The Contractor shall also be responsible for the weekend operation of the adaptive system after turn-on. Since portions of the corridor produce high weekend traffic variations, due to businesses in

the area, it is important that technicians are onsite during weekend turn-on to make the appropriate adjustments for weekend traffic. Installation and the subsequent adjustments of adaptive parameters shall be during fully loaded, daily traffic conditions of the corridor. This period is defined as during the K-12 and University school year, dry weather conditions, and typical work week conditions. Weekend conditions for onsite adaptive parameter adjustments shall be during a typical, non-holiday weekend with dry weather conditions.

907-663.03.2.3--Testing. The Contractor shall be responsible for testing all components, servers and software functional requirements, and the full corridor-wide operation of the Full Traffic Adaptive Signal Control Software system once it is installed and configured in the field. The Contractor shall submit a testing requirements document, or Acceptance Test Plan (ATP), to the DEPARTMENT, prior to configuration and implementation of the system. This testing document shall be reviewed and approved by the Engineer and the DEPARTMENT prior to system installation.

The ATP shall state each requirement and expected outcome of the test, so it can be verified that the software is working as specified. The ATP is meant to exercise the entire adaptive system, including any provided hardware necessary for operation. The ATP shall demonstrate, at a minimum that the Full Traffic Adaptive Signal Control Software conforms to all requirements within this Special Provision at each intersection and corridor wide.

The ATP shall be conducted in the presence of the Engineer and the DEPARTMENT in the signal operations center. Each test requirement shall be signed off on as 'pass', 'fail' or 'incomplete'. All failed or incomplete tests shall either be retested, or submitted in a written summary explaining why the testing requirement could not be completed as written in the ATP. Upon receipt of the final ATP and explanation summary, the Engineer shall determine if the ATP was satisfactorily completed, or if some of the requirements will need to be retested prior to system acceptance.

907-663.03.2.4--Training. The Contractor shall conduct onsite training sessions for the Full Traffic Adaptive Signal Control Software. For each training session type, the Contractor shall submit a syllabus to the Engineer for approval, prior to scheduling the meeting. These training sessions shall consist of:

a.) Manager's Operation and Configuration Training – This training shall review the PC client-based operation and configuration parameters of the Full Adaptive Signal Control Software and detailed operation of the Central Signal Control System software. All Graphic User Interfaces (GUI's) of the central software client interface shall be reviewed in this training, with special attention to the adaptive configuration and parameters (timing data) and database modifications. The trainer shall discuss all parameters in the timing and configuration data sheets/GUI's, which data is acceptable to change, and by what increment it should be changed. At the end of this training, operations staff shall be able to understand the different operating modes of the adaptive software, how to turn the modes on/off, and which operational parameters can be adjusted, as well as the increments they should be adjusted for appropriate operational changes to the system and database. The detailed operation of the Central software shall also be shared with the managers, with

specific attention to detailed reporting features, and troubleshooting techniques. The intended audience for this training is traffic signal engineers and advanced system operators/technicians. This training shall be no longer than four (4) days.

b.) Operators Monitoring, Reporting and Troubleshooting – This training shall review the PC/Server/Controller relationship, the general GUI and screen outputs of the system, general troubleshooting and reporting techniques, and what information should be monitored on a day to day basis. Reporting and monitoring features of the adaptive and central software shall be reviewed with "hands-on" training by the attendees. Each attendee shall be able to pull reports from the system and be able to monitor necessary functioning of the adaptive software, and identify errors or issues for the Manager or Timing Engineer to address. Should there be problems with the central or adaptive system, the attendees shall know general troubleshooting tips, and how to start, stop and restart the system and the server/client interface. This training shall be no longer than four (4) days.

c.) Theory of Adaptive Operation Training – This training shall review the specific operational theory behind the adaptive software and algorithms principles. The training shall be specific as to the inputs needed for the algorithm to function, including detection data collected, controller data used, etc. and the resulting output values used for the adaptive function. The intended audience for the training is traffic signal engineers and signal engineering technicians that have been through either the Operators or Managers training. This training shall be no longer than 3 days.

The Contractor shall provide all training materials, including manuals, 'quick tips' sheets, and written instructions for up to 10 attendees for each training module. These materials shall be in a neat, bound and tabbed format for easy and quick identification of the necessary sections. All training courses shall be coordinated with the DEPARTMENT, prior to scheduling. Each course or session shall be on successive days, but shall not run concurrent to each other. Each type of training shall be scheduled with the appropriate personnel, as determined by the DEPARTMENT. Training shall be Monday through Thursday only, and shall not be scheduled on a DEPARMENT recognized holiday.

907-663.03.2.5--Warranty and Support. The Contractor shall provide a one year warranty on the Full Traffic Adaptive Signal Control Software from the date of final acceptance of the Acceptance Test Plan (ATP). The support shall include one week long on-site visit, to be used by the DEPARTMENT at any time during the warranty year, as well as unlimited phone, email and remote support of the adaptive and central software. Telephone and email support shall be available 24 hours per day, seven days a week. Remote Access Support shall be available during normal business hours, Monday through Friday from 8 am to 6 pm CST, excluding recognized holidays.

907-663.04--Method of Measurement.

907-663.04.1--Central Management Signal Control (CMSC) Software. The Central Management Signal Control Software shall be measured on a lump sum basis. This measurement shall include the cost of the server hardware, database software, cabling and necessary operating systems for the Central Signal Control Software and Full Adaptive Traffic Control central software, as necessary for a full interoperable central system. The measurement

shall include all required database software and database license fees associated with the database software. Database licenses shall be provided for fifty (50) intersections. All database setup and testing shall be included in this pay item. This pay item shall include all labor, materials and equipment necessary for a complete central software system. This payment shall also include all testing, documentation, training and warranty support as outlined in this special provision.

The Contractor shall submit a schedule of software implementation including onsite installation and integration tasks. The schedule shall show significant software deployment timelines and milestones, including delivery, turn-on, testing, and training for a full and complete system deployment.

907-663.04.2--Full Traffic Adaptive Signal Control Software. The Full Adaptive Traffic Signal Control Software shall be measured on a per intersection basis (each). The per intersection cost shall include all man hours associated with the setup, pre-configuration of adaptive parameters, onsite controller upgrades, onsite deployment, fine tuning, and testing of the adaptive signal control operational parameters. The cost of each intersection shall also include adding it to the central database, including central system intersection graphics, full communication configuration, detector setup and monitoring capability of the intersection on the central system. The configuration and implementation of each intersection of adaptive control shall be measured by each intersection fully completed, deployed and tested, however, each adaptive intersection shall not be measured as complete until each intersection on an adaptive section, or corridor, has been completed and the adaptive software is running as a corridor or section-wide adaptive signal system. The measurement will be for a minimum of no less than the quantity indicated in the plans. The DEPARTMENT may add to that quantity, at their discretion, not to exceed 10 additional intersections.

The Contractor shall submit a schedule of software implementation including onsite installation and integration tasks. The schedule shall show significant software deployment timelines and milestones, including delivery, turn-on, testing, and training for a full and complete system deployment.

907-663.05--Basis of Payment.

907-663.05.1--Central Management Signal Control (CMSC) Software. The CMSC software, measured as prescribed above, will be paid for at the contract unit price bid for full deployment of all central system software, modules and necessary companion hardware and software; which price shall be full compensation for integration, configuration, testing and training, and all other materials, equipment, labor, tools and incidentals necessary to complete the work in accordance with the contract documents.

907-663.05.2--Full Traffic Adaptive Signal Control Software. Adaptive signal control intersection software, measured as prescribed above, will be paid for at the contract unit price bid per each intersection, and for full deployment of all central system software, modules and necessary companion hardware and software; which price shall be full compensation for

integration, configuration, testing and training, and all other materials, equipment, labor, tools and incidentals necessary to complete the work in accordance with the contract documents.

Payment will be made under:

907-663-A:	Central Management Signal Control Software	- lump sum
907-663-B:	Full Adaptive Traffic Signal Control Software	- per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-668-1 **CODE: (SP)**

DATE: 04/01/2009

SUBJECT: Traffic Signal Conduit

Section 668, Traffic Signal Conduit, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-668.03--Construction Requirements. After the last paragraph of Subsection 668.03.1 on page 556 add the following:

(i) Where indicated on the plans, individual conduits shall be configured into a continuous duct bank from terminal to terminal.

907-668.04--Method of Measurement. Delete Subsection 668.04 on page 559 and substitute the following:

Traffic signal conduit or conduit bank will be measured by the linear foot computed horizontally along the signal conduit or conduit bank, such measurement being made from the point of beginning to the point of termination of all sections of conduit or conduit bank, in trench, under roadways, or supported on structures.

Jacking, drilling, excavating, backfilling and replacement of sod will not be measured for separate payment, but shall be incidental to and included in the contract unit prices for Direct Burial and Jacked or Drilled underground installations as applicable.

Messenger cable and other supporting devices for aerial supported signal conduit or conduit bank will not be measured for separate payment but shall be incidental to and included in the contract unit price for traffic signal conduit, aerial supported.

When a "conduit bank" is specified, the per linear foot price of the conduit bank shall include the total number of conduits specified. Each conduit is NOT paid for separately.

The bid price for underground conduit shall be the same regardless of whether it is installed by trenching, plowing or boring, except for locations specifically identified as "Bored" in the contract plans and those items shall be paid for under the drilled or jacked pay item.

907-668.05--Basis of Payment. Delete the first paragraph of Subsection 668.05 on page 559, and substitute the following:

Traffic signal conduit or conduit bank, measured as prescribed above, will be paid for at the contract unit price per linear foot, which price shall be full compensation for furnishing, laying, placing, forming, curing, connecting, supporting aerially, cleaning and testing all conduit, pull

boxes, junction boxes not specified on plans or ordered, and incidental materials; for all excavating, backfilling, boring, drilling and/or jacking necessary for subsurface installations; for replacing sod; encasement in concrete; final cleaning up; and for all labor, equipment, tools and incidentals necessary to complete the work.

After the last Pay Item on page 560, add the following Pay Items:

907-668-E: Traffic Signal Conduit Bank, Underground, Type ,
Size and Number - per linear foot

907-668-F: Traffic Signal Conduit Bank, Underground Drilled or Jacked,
Type , Size and Number - per linear foot

907-668-G: Traffic Signal Conduit Bank, Aerial Supported, Type ,
Size and Number - per linear foot

907-668-H: Traffic Signal Conduit Bank, Underground Encased in Concrete,
Type , Size and Number - per linear foot

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 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.

Attached hereto is a certified check, cashier's check or Proposal Guaranty Bond in the amount as required in the Advertisement (or, by law).

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.

S E C T I O N 9 0 5 -- P R O P O S A L (CONTINUED)

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) enclose 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.

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.

Adaptive Signal System on US 98 and US 49, known as Federal Aid Project Nos. STP-0014-03(065) / 106424301 & 302 in Forrest & Lamar Counties.

Line No.	Item Code	Adj Code	Quantity	Units	Description [Fixed Unit Price]
					Roadway Items
0010	202-B194		14	Each	Removal of Sign Post and Footing
0020	234-A001		1,200	Linear Feet	Temporary Silt Fence
0030	618-A001		1	Lump Sum	Maintenance of Traffic
0040	619-D1001		8	Square Feet	Standard Roadside Construction Signs, Less than 10 Square Feet
0050	619-D2001		60	Square Feet	Standard Roadside Construction Signs, 10 Square Feet or More
0060	619-E1001		2	Each	Flashing Arrow Panel, Type C
0070	619-G4001		123	Linear Feet	Barricades, Type III, Single Faced
0080	620-A001		1	Lump Sum	Mobilization
0090	646-A001		1	Lump Sum	Removal of Existing Traffic Signal Equipment
0100	647-A003		16	Each	Pullbox, Type 4
0110	647-A004		12	Each	Pullbox, Type 5
0120	647-A005		1	Each	Pullbox, Type 2
0130	666-B040		60	Linear Feet	Electric Cable, Underground in Conduit, THHN, AWG #8, 3 Conductor
0140	668-A029		170	Linear Feet	Traffic Signal Conduit, Underground, Rolled Pipe, 2"
0150	668-B024		385	Linear Feet	Traffic Signal Conduit, Underground Drilled or Jacked, Rolled Pipe, 2"
0160	907-237-A003		700	Linear Feet	Wattles, 20"
0170	907-619-E3001		2	Each	Changeable Message Sign
0180	907-637-A001		2	Each	Equipment Cabinet, Type B
0190	907-639-B001		2	Each	Traffic Signal Equipment Pole Shaft Extension, 10-foot, Video Camera Mount
0200	907-639-F003		25	Each	Detector Pole with Foundation, 20' Pole
0210	907-642-A005		7	Each	Solid State Traffic Actuated Controllers, Type 8M
0220	907-642-B001		4	Each	Solid State Traffic Actuated Controller Modification
0230	907-650-A002		4	Each	On Street Video Equipment, Fixed Type
0240	907-650-A003		2	Each	On Street Video Equipment, PTZ Type
0250	907-651-B009		47	Each	Magnetometer Detection System Component, Repeater
0260	907-651-B012		28	Each	Magnetometer Detection System Component, Extension Card
0270	907-651-B013		205	Each	Magnetometer Detection System Component, Wireless Detection Sensor
0280	907-651-B018		39	Each	Magnetometer Detection System Component, Access Point Controller Card
0290	907-651-B019		77	Each	Magnetometer Detection System Component,
0300	907-657-A001		18,705	Linear Feet	Fiber Optic Cable, 72 SM
0310	907-657-B001		350	Linear Feet	Fiber Optic Drop Cable, 12 SM
0320	907-658-A001		3	Each	Hardened Network Switch, Type A

Line No.	Item Code	Adj Code	Quantity	Units	Description [Fixed Unit Price]
0330	907-659-A001		1	Lump Sum	Traffic Management Center Modifications
0340	907-662-A001		2	Each	Video Encoder, Type A
0350	907-663-A001		1	Lump Sum	Central Management Signal Control Software
0360	907-663-B001		40	Each	Full Adaptive Traffic Signal Control Software
0370	907-668-E002		4,575	Linear Feet	Traffic Signal Conduit Bank, Underground, Rolled Pipe, 2 @ 2"
0380	907-668-F002		14,130	Linear Feet	Traffic Signal Conduit Bank, Underground, Drilled or Jacked,Rolled Pipe, 2 @ 2"

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.

* *

COMBINATION BID PROPOSAL

I. 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 option (a) has been selected, then go to II, and sign Combination Bid Proposal.

B. If option (b) has been selected, then complete the following, go to II, and sign Combination Bid Proposal.

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 option (c) has been selected, then initial and complete one of the following, go to II. and sign Combination Bid Proposal.

_____ 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.

II. 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), the undersigned, agree to complete each contract on or before its specified completion date.

SIGNED _____

_____

_____

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 ____, proposed Subcontractor ____, 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)

BY _____

_____
(TITLE)

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
(Execute in duplicate)

I, _____,
(Name of person signing certification)

individually, and in my capacity as _____ of
(Title)

_____ 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. **STP-0014-03(065) / 106424301 & 302**,

in **Forrest & Lamar** 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.

Initial here "_____" if exceptions are attached and made a part thereof. 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 and attachments (when indicated) is true and correct.

Executed on _____ _____

Signature

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

CERTIFICATION
(Execute in duplicate)

I, _____,
(Name of person signing certification)

individually, and in my capacity as _____ of
(Title)

_____ 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. **STP-0014-03(065) / 106424301 & 302**,

in **Forrest & Lamar** 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:

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

f) 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;

g) 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

h) 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.

Initial here "_____" if exceptions are attached and made a part thereof. 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:

3) 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.

4) 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 and attachments (when indicated) is true and correct.

Executed on _____ _____

Signature

S E C T I O N 9 0 2

CONTRACT FOR **STP-0014-03(065) / 106424301 & 302**

LOCATED IN THE COUNTY(IES) OF **Forrest & Lamar**

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 _____ MISSISSIPPI TRANSPORTATION COMMISSION

Title _____ By _____
Signed and sealed in the presence of: Executive Director
(names and addresses of witnesses)

_____ _____
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

S E C T I O N 9 0 3
PERFORMANCE AND PAYMENT BOND

CONTRACT BOND FOR: **STP-0014-03(065) / 106424301 & 302**

LOCATED IN THE COUNTY(IES) OF: **Forrest & Lamar**

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, 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.

Signed and sealed this the _____ day of _____ A.D. _____.

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.

Witness our signatures and seals this the _____ day of _____ A.D. _____.

_____	_____
(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 **Adaptive Signal System on US 98 and US 49, known as Federal Aid Project Nos. STP-0014-03(065) / 106424301 & 302 in Forrest & Lamar Counties.**

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. 3/13

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
OFFICE OF CIVIL RIGHTS
JACKSON, MISSISSIPPI

LIST OF FIRMS SUBMITTING QUOTES

I/we received quotes from the following firms on Project No: ______________________________
County: ____

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

____
SUBMITTED BY (Signature)

____
FIRM NAME

Submit this form to **Contract Administration as a part of your bid package**. If at least one copy of this form is not **signed** and included as part of the bid packet, your bid will be deemed irregular. Question regarding this form shall be directed to www.gomdot.com under the current letting webpage. Please make and add copies of this form when needed or attach additional sheets containing the information required by this form and add these sheets to the bid package.