MDOT Use Only
Checked _____
Loaded _____
Keyed _____

SM No. CITS021000172

PROPOSAL AND CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

(NONEXEMPT)

1
Installation of Intelligent Transportation System (ITS) improvements on US 49, US 98 & I-59 in Hattiesburg, known as Federal Aid Project No. ITS-0210-00(017) / 105469301 & 302, in the Counties of Forrest and Lamar, State of Mississippi.

Project Completion: June 30, 2011

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 and item totals have been entered in accordance with Subsection 102.06 of the Mississippi Standard Specifications for Road and Bridge Construction.

_____ If the bid sheets were prepared using MDOT's Electronic Bid System, proposal 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 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. Bid bond has been signed by the bidder and has also been signed or countersigned by a Mississippi Resident Agent for the Surety with Power of Attorney attached.

_____ 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 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.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2728 **CODE: (SP)**

DATE: July 23, 2009

SUBJECT: RE-ADVERTISEMENT

PROJECT: ITS-0210-00(017) / 105469301 & 302 – Forrest and Lamar Counties

The contents of this proposal are the same as when advertised for the February 26, 2008 Letting, except as follows:

Revised Table of Contents;

Revised Advertisement;

Revised Notice to Bidders No. 2617;

Revised Notice to Bidders No. 2619;

Replaced Notice to Bidders No. 2642 with Notice to Bidders No. 2696;

Added Notice to Bidders No. 2727.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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CERTIFICATION REGADING NON-COLLUSION, DEBARMENT AND SUSPENSION,
SECTION 902 - CONTRACT FORM, AND SECTION 903 - CONTRACT BOND FORM,
OCR-485.

REVISIONS TO THE ABOVE WILL BE INDICATED ON THE
SECOND SHEET OF SECTION 905 AS AN ADDENDUM

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 9:30 o'clock A.M., Tuesday, September 22, 2009; thereafter, bids will be received in the First Floor Auditorium of the Mississippi Department of Transportation Administration Building, Jackson, Mississippi, until 10:00 o'clock A.M., Tuesday, September 22, 2009, and shortly thereafter publicly opened for:

Installation of Intelligent Transportation System (ITS) improvements on US 49, US 98 & I-29 in Hattiesburg, known as Federal Aid Project No. ITS-0210-00(017) / 105469301 & 302, in the Counties of Forrest and Lamar, State of Mississippi.

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 87-58 1, 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 acquired from the MDOT Contract Administration Division. These proposal are available at a cost of Ten Dollars ($10.00) per proposal. Specimen proposals are also available at the MDOT Contract Administration Division at a cost of Ten Dollars ($10.00) per proposal, or can be viewed or downloaded at no cost at www.gomdot.com.

Plans may be acquired on a cost per sheet basis from MDOT Plans Print Shop, MDOT Shop Complex, Building C, Room 114, 2567 North West Street, Jackson, Mississippi 39216, Telephone (601) 359-7460 or e-mail at plans@mdot.state.ms.us or FAX (601) 359-7461. Plans will be shipped upon receipt of payment.

Bid bond, signed or countersigned by a Mississippi Resident Agent, with Power of Attorney attached or on file with the Contract Administration Engineer of the Department, 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.

LARRY L. "BUTCH" BROWN
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. 3 **CODE: (SP)**

DATE: 05/03/2004

SUBJECT: Final Clean-Up

Immediately prior to final inspection for release of maintenance, the Contractor shall pick up, load, transport and properly dispose of all litter from the entire highway right-of-way that is within the termini of the project.

Litter shall include, but not be limited to, solid wastes such a glass, paper products, tires, wood products, metal, synthetic materials and other miscellaneous debris.

Litter removal is considered incidental to other items of work and will not be measured for separate payment.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 640 **CODE: (IS)**

DATE: 09/26/2005

SUBJECT: Fiber Reinforced Concrete

Bidders are hereby advised that synthetic structural fibers meeting the requirements of Subsection 907-711.04 may be used in lieu of wire mesh in some items of construction. Substitution of fibers for wire mesh will be allowed in the construction of paved ditches, paved flumes, paved inlet apron, driveways, guard rail anchors and pile encasements. Substitution in any other items of work must be approved by the State Construction Engineer prior to use.

SUPPLEMENT TO NOTICE TO BIDDERS NO. 696

DATE: 06/06/2008

The goal is 2 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 (http://www.gomdot.com/applications/bidsystem/currentletting.aspx) for results. Bid tabulations are usually posted by 3:00 pm on Letting Day.

Form OCR-481 is available at
http://www.gomdot.com/Divisions/CivilRights/Resources/Forms/pdf/MDOT_OCR481.pdf
or by calling 601-359-7466.

All OCR-481s must be returned within 10 days following the bid letting to the MDOT Office of Civil Rights, P.O. Box 1850, Jackson, MS 39215-1850.

For answers to questions, contact the MDOT Office of Civil Rights at (601) 359-7466.

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 "Safe, Accountable, Flexible, Efficient Transportation Equity Act, A Legacy For Users (SAFETEA-LU)" and "Part 26, Title 49, Code of Federal Regulation" that the bidder has made a good faith effort to meet the contract goal for DBE participation for which this proposal is submitted.

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.

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 on the Department's list of "Certified DBE Contractors" that is posted online at the time the job is let and approved by MDOT to count towards meeting the DBE goal.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 696 **CODE: (IS)**

DATE: 12/20/2005

SUBJECT: DISADVANTAGED BUSINESS ENTERPRISES IN FEDERAL-AID HIGHWAY CONSTRUCTION

This contract is subject to the "Safe, Accountable, Flexible, Efficient Transportation Equity Act, A Legacy For Users (SAFETEA-LU)" 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 subrecipient 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 Contract Administration Division Form OCR-481, signed by the Prime Contractor and the DBE Subcontractors, no later than the 10th day after opening of the bids.

FORMS ARE AVAILABLE FROM THE CONTRACT ADMINISTRATION DIVISION

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.

DIRECTORY

Included with this Bid Proposal is a list of "Certified DBE Contractors" which have been certified as such by the Mississippi Department of Transportation and other Unified Certification Partners (UCP).

The DBE firm must be on the Department's list of "Certified DBE Contractors" that is attached to this proposal 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 awarded, 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:

(a) 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.

(b) Efforts to negotiate with certified DBE Contractors for specific items shall include as a minimum:

(1) The name, address, and telephone number of each DBE contacted;

(2) A description of the information provided about the plans and specifications for those portions of the work to be subcontracted; and

(3) A statement of why agreements were not reached.

(c) For each DBE contacted that was rejected as unqualified, the reasons for such conclusion.

(d) Efforts made to assist each DBE that needed assistance in obtaining bonding or insurance required by the Contractor.

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.

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 60 percent 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 Contract Administration Division 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.

(3) Bidder must submit **with the bid proposal** 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.

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. 777 **CODE: (IS)**

DATE: 04/13/2006

SUBJECT: On-The-Job Training Program

Payment for training hours will be handled as outlined in Special Provision 906-6. A pay item for trainees will not be included in individual construction projects. Payment for training individuals will be processed in accordance with the conditions in MDOT's ON-THE-JOB TRAINING PROGRAM (Special Provision 906-6).

On Federal-Aid projects, failure on the part of the Contractor to carryout the terms of the Alternate Training Special Provision (Special Provision 906-6) will be considered grounds to preclude the Contractor from participating in the Alternate On-The-Job Training Program. In the event the Department is required to preclude the Contractor from participating in the program, the Contractor will be required to adhere to the requirements of the Training Special Provision (Special Provision 906-3), for which purpose the special provision is also made a part of this proposal.

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 “ $\leq$ ”.

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. 1808 **CODE: (IS)**

DATE: 09/09/2008

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"**.

You can access this final rule at the following link:
http://a257.g.akamaitech.net/7/257/2422/01jan20061800/edocket.access.gpo.gov/2006/pdf/E6-19910.pdf

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1869 **CODE: (SP)**

DATE: 02/01/2008

SUBJECT: Minimum Wage Rate

Bidders are advised of an increase in the minimum federal wage rate established by the United States Department of Labor Wage and Hour Division beginning July 24, 2007. On July 24, 2007, the minimum wage rate was increased to $5.85 per hour.

MDOT gets the minimum wage rates and classifications that are used in proposals from the Department of Labor website. Because of delays in posting to the website, the wages rates and classifications in this proposal may not contain the latest information regarding wage rates and classifications.

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

Below are Federal minimum wage rates and effective dates.

Beginning July 24, 2007	$ 5.85
Beginning July 25, 2008	$ 6.55
Beginning July 24, 2009	$ 7.25

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1922 **CODE: (SP)**

DATE: 03/31/2008

SUBJECT: Non-Quality Control / Quality Assurance Concrete

Bidders are advised that the following pay items will not be accepted based on the Quality Control / Quality Assurance (QC/QA) requirements of Section 804 of the specifications. The acceptance of these pay items will be based on sampling and testing at the project site by MDOT forces. The Contractor is required to submit mix designs to accomplish this work in accordance with Section 804 and perform normal Quality Control functions at the concrete plant. Acceptance will be in accordance with the requirements of 907-601, Structural Concrete, and TMD-20-04-00-000. At the discretion of the Engineer, the Contractor may request that the concrete be accepted based on QC/QA requirements.

Pay Item	**Description**
221	Paved Ditches
601	Structural Concrete, Minor Structures - manholes, inlets, catch basins, junction boxes, pipe headwalls, and pipe collars.
606	Guardrail Anchors
607	Fence Post Footings
608	Sidewalks
609	Curb and Gutter
614	Driveways
616	Median and Island Pavement
630	Sign Footings, except Overhead Sign Supports

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. 2239 **CODE: (SP)**

DATE: 01/06/2009

SUBJECT: Department of Labor Ruling

On December 19, 2008 the U.S. Department of Labor issued a final rule revising their regulations in 29 CFR Parts 3 and 5. This rule takes effect for all Federal funded contracts awarded after January 19, 2009.

The primary change in the rule is a provision that requires Contractors to limit the amount of personal information on the weekly payroll submissions. Personal addresses and full social security numbers may no longer be used. Contractors must use an " . . . individually identifying number for each employee (e.g., the last four digits of the employee's social security number)." Form FHWA-1273 - "Required Contract Provisions Federal-aid Construction Contracts" will eventually be revised to reflect this change.

Until the revised is made to FHWA-1273, bidders are advised to disregard any requirement in FHWA-1273 regarding the use of personal addresses and full social security numbers, such as in Section V, Paragraph 2b.

Bidders are also advised that the requirement for maintaining and submitting form FHWA-47, as referenced in FHWA-1273 Section VI, is no longer required on construction projects.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2361 **CODE: (SP)**

DATE: 01/26/2009

SUBJECT: Mississippi Resident Agent Requirement

Bidders are advised of new changes in the proposal bond forms and required signatures. Commencing with the February 2009 letting, non-resident agents **WILL NOT** be allowed to sign contract documents, including bonds and insurance. Qualified non-resident agents that were allowed to sign contract documents in the January 2009 letting will not be allowed in future contracts until further notice. Only Mississippi Resident Agents will be allowed to sign contract documents.

Another change for the February 2009 letting is that the new performance bond and new payment bond that was utilized in the January 2009 proposals has been replaced with the one contract bond used by MDOT prior to the January 2009 letting.

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
ITS-0210-00(017)
105469-301000
FORREST COUNTY
April 30, 2009

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

NONE.

STATUS OF POTENTIALLY CONTAMINATED SITES
ITS-0210-00(017)
105469-301000
FORREST COUNTY
April 20, 2009

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
ITS-0210-00(017)
105469-301000
FORREST COUNTY
April 20, 2009

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

ITS-0210-00(017) / 105469301

Forrest County(ies)

April 30, 2009

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

ITS-0210-00(017) / 105469301

Forrest County(ies)

April 30, 2009

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. 2400 **CODE: (SP)**

DATE: 02/19/2009

SUBJECT: Removal of Haul Permit

Bidders are advised that the Haul Permit that had been previously included in the back of the proposal is no longer included in MDOT contracts. The Contractor, Subcontractors, Suppliers, and others transporting loads exceeding the posted limit on bridges when making deliveries to and from the project will no longer be allowed. Bidders are advised that when a road is open to the traveling public, the posted weight limit **will** be enforced for everyone, including the successful bidder of the project. Bidders are advised to consider this when preparing their bid.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

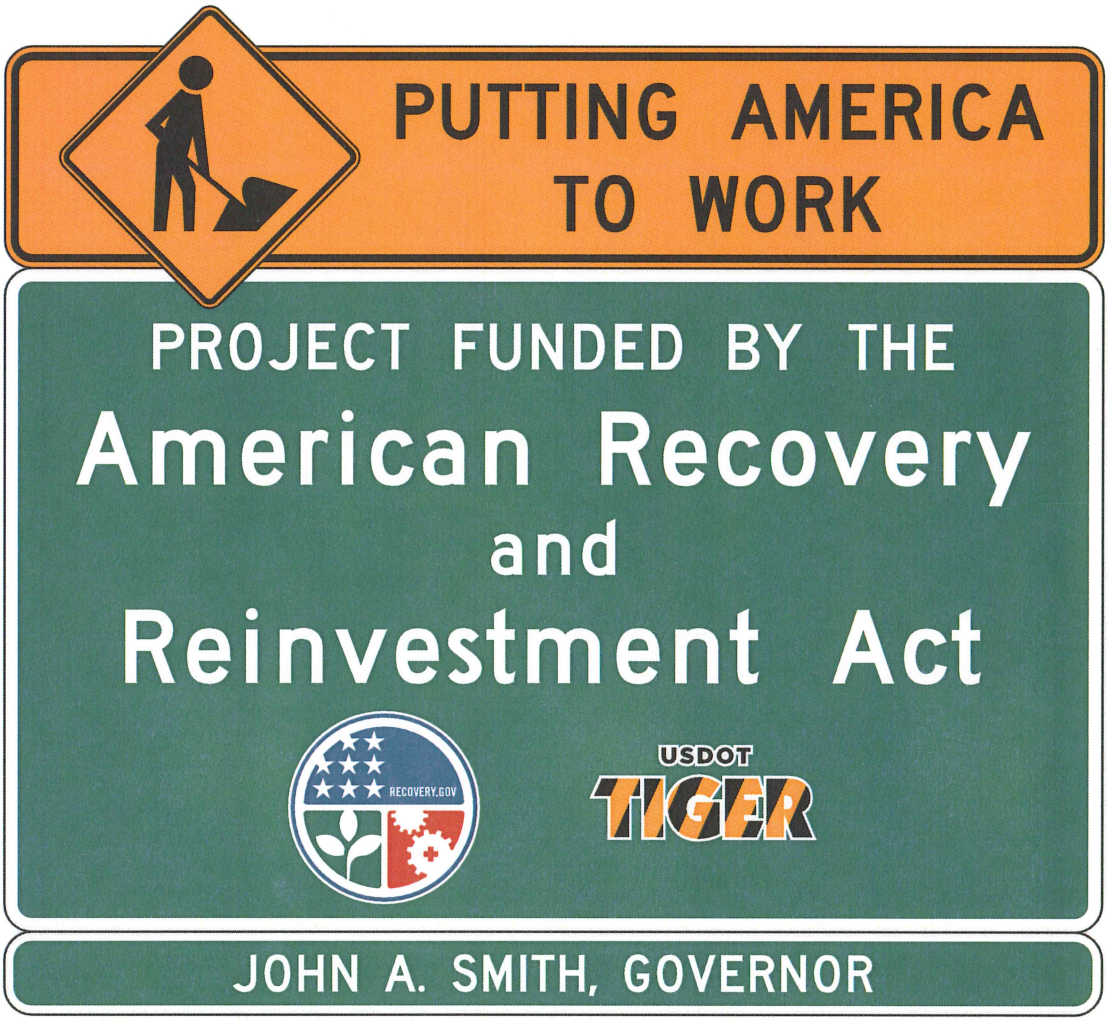
SECTION 904 - NOTICE TO BIDDERS NO. 2438 **CODE: (SP)**

DATE: 03/16/2009

SUBJECT: American Recovery and Reinvestment Act (ARRA) Sign

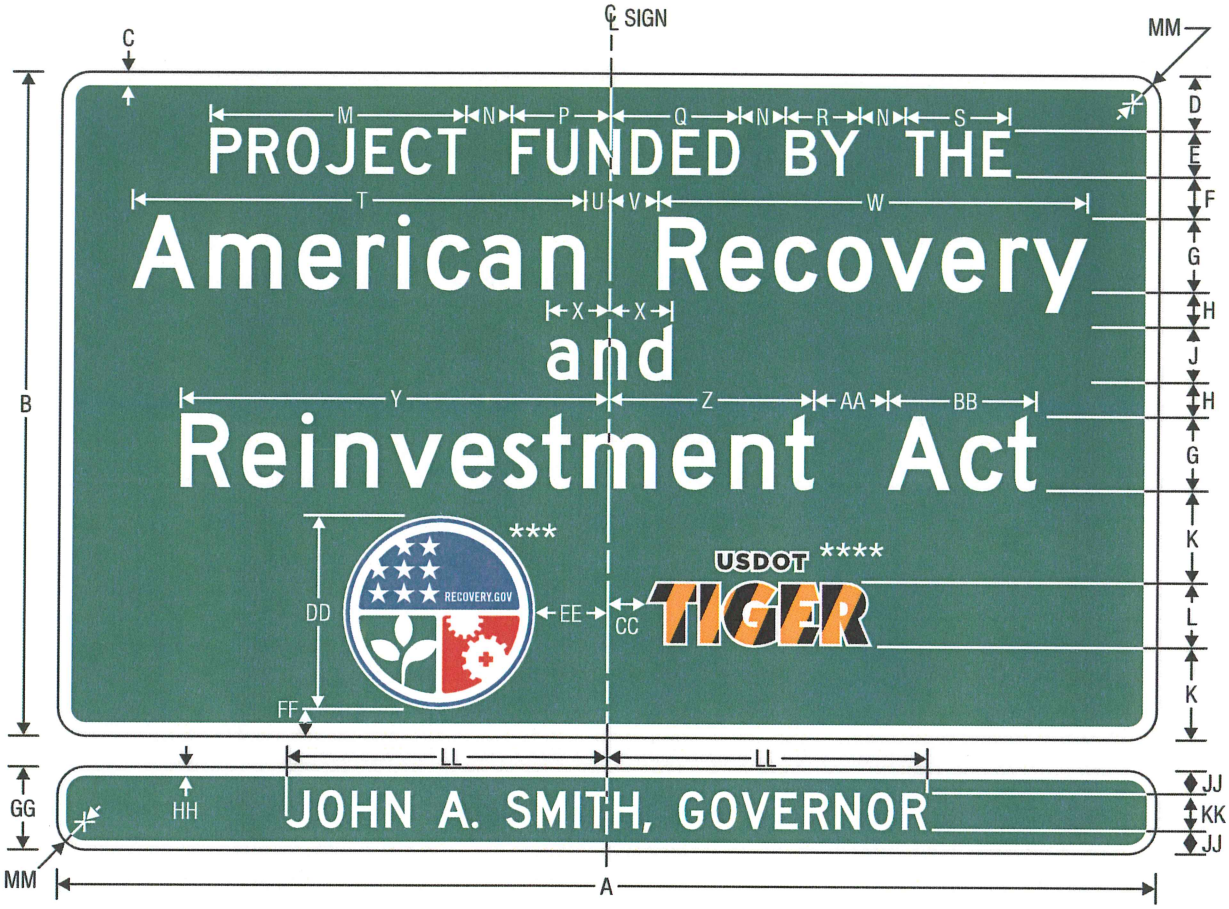
Bidders are hereby advised that the Contractor shall install, maintain, and remove two (2) economic recovery signs at the beginning (BOP) and end (EOP) of this project, unless otherwise directed by the Engineer. A picture of the signs and the dimensions of the signs are shown on the attached sheets. The signs shall be constructed, installed and maintained in accordance with the MUTCD, and Sections 618 & 619 of the Standard Specifications. These signs shall be fabricated from 0.125" sheet aluminum. Signs shall be mounted on three (3) - three pounds per linear foot (3 lbs. / ft.) U-Section posts. Each post shall be 14 feet long mounted onto another 14-foot U-Section post driven halfway into the ground. All cost of installing and maintaining the signs, including material, labor, posts, hardware, etc., will be measured and paid for under the pay item no. 619-D4.

PROJECT FUNDING SOURCE SIGN ASSEMBLY
AMERICAN RECOVERY AND REINVESTMENT ACT
SIGN LAYOUT DETAILS



PROJECT FUNDING SOURCE
SIGN ASSEMBLY

PROJECT FUNDING SOURCE SIGN ASSEMBLY
AMERICAN RECOVERY AND REINVESTMENT ACT
SIGN LAYOUT DETAILS



PROJECT FUNDING SOURCE SIGN AND OPTIONAL SUPPLEMENTAL PLAQUE

NOTE: SIGN SHALL NOT BE INSTALLED WITHOUT PROJECT FUNDING SOURCE PLAQUE (SEE SHEET 3).

NOTE: SEE SHEET NO. 6 FOR DETAILS OF SUPPLEMENTAL SIGN SHOWING COMMISSIONER'S NAMES.

A	B	C	D	E	F	G	H	J	K	L	M	N	P
84	54	1	5	4 C	3.5	6 C*	3	4 D* (3 LC)	7.25	5	19.047	4	7.362

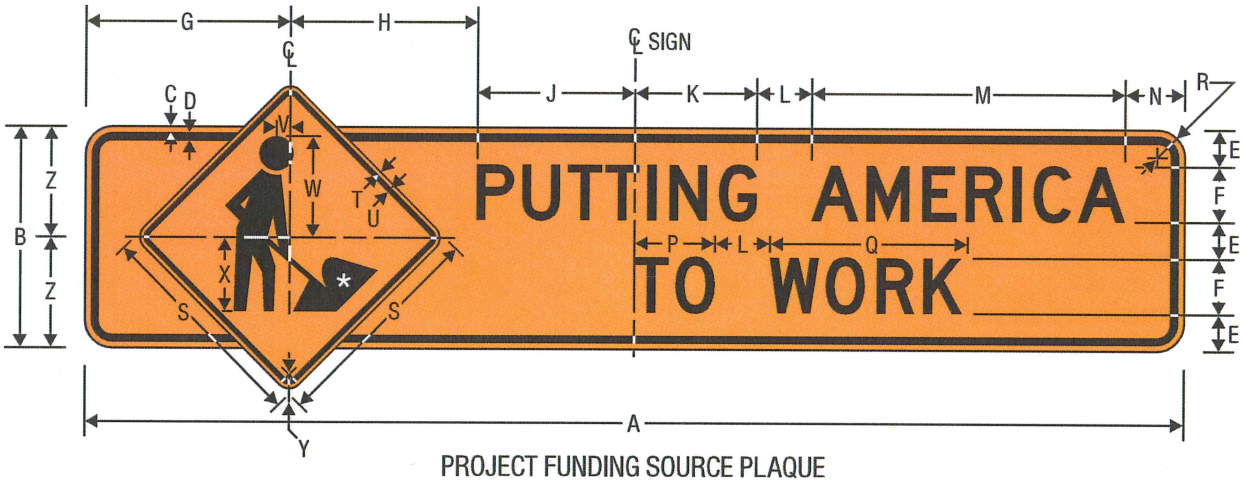
Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD
9.484	5.162	7.763	31.722	2.415	3.585	30.552	4.542	30.911	14.737	6	10.175	3	15

EE	FF	GG	HH	JJ	KK	LL	MM
6	2.25	9	.75	2.75	3.5 C	VAR	2.25

* Increase character spacing 50%
** Series C may be used for longer legends
*** See Pictograph page 4
**** See Pictograph page 5

COLORS: LEGEND, BORDER — WHITE (RETROREFLECTIVE)
BACKGROUND — GREEN (RETROREFLECTIVE)

PROJECT FUNDING SOURCE SIGN ASSEMBLY
AMERICAN RECOVERY AND REINVESTMENT ACT
SIGN LAYOUT DETAILS



PROJECT FUNDING SOURCE PLAQUE

NOTE: PLAQUE SHALL NOT BE INSTALLED WITHOUT SIGN (SEE SHEET 2).

* See *Standard Highway Signs* Page 6-59 for symbol design.

A	B	C	D	E	F	G	H	J	K	L	M	N	P
84	18	0.375	0.625	3.5	4 D	16.607	15.686	9.707	10.667	4	22.813	5	5.843

Q	R	S	T	U	V	W	X	Y	Z
14.009	2.25	18	0.375	0.625	1	7	6	1.5	9

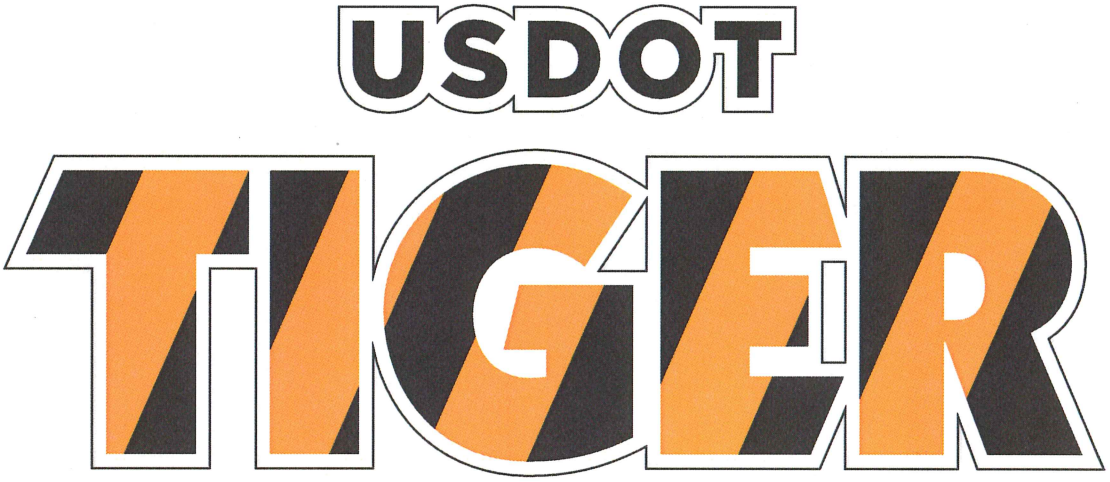
COLORS: LEGEND, BORDER – BLACK
BACKGROUND – ORANGE (RETROREFLECTIVE)

PROJECT FUNDING SOURCE SIGN ASSEMBLY
AMERICAN RECOVERY AND REINVESTMENT ACT
SIGN LAYOUT DETAILS

RECOVERY
Vector-Based, Vinyl-Ready Pictograph

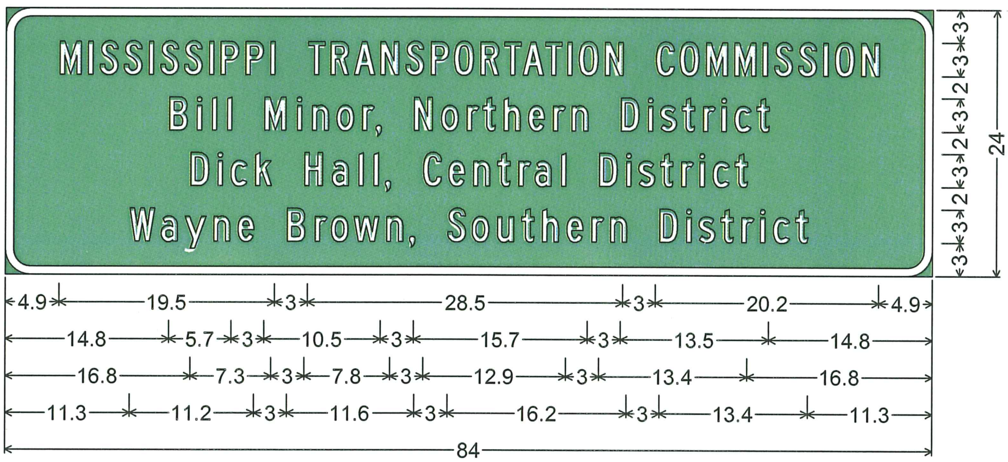
COLORS:	LEGEND, OUTLINE	– WHITE (RETROREFLECTIVE)
	BORDER	– BLUE (RETROREFLECTIVE)
	BACKGROUND (UPPER)	– BLUE (RETROREFLECTIVE)
	BACKGROUND (LOWER RIGHT)	– RED (RETROREFLECTIVE)
	BACKGROUND (LOWER LEFT)	– GREEN (RETROREFLECTIVE)

PROJECT FUNDING SOURCE SIGN ASSEMBLY
AMERICAN RECOVERY AND REINVESTMENT ACT
SIGN LAYOUT DETAILS



USDOT TIGER
Vector-Based, Vinyl-Ready Pictograph

COLORS: OUTLINE — WHITE (RETROREFLECTIVE)
USDOT LEGEND — BLACK
TIGER DIAGONALS — BLACK,
ORANGE (RETROREFLECTIVE)



2.3" Radius, 0.8" Border, White on Green;
"MISSISSIPPI TRANSPORTATION COMMISSION" C; "Bill Minor, Northern District" C;
"Dick Hall, Central District" C; "Wayne Brown, Southern District" C;
Table of distances between letter and object lefts.

	M	I	S	S	I	S	S	I	P	P	I
4.9	2.5	1.1	2.1	2.3	1.1	2.1	2.3	1.0	2.3	2.3	

	T	R	A	N	S	P	O	R	T	A	T	I	O	N
3.4	2.0	2.2	2.3	2.3	2.3	2.1	2.4	2.2	1.6	2.1	2.0	1.0	2.4	

	C	O	M	M	I	S	S	I	O	N	
4.6	2.2	2.3	2.6	2.6	1.1	2.1	2.3	1.0	2.4	1.6	4.9

	B	i	l	l	M	i	n	o	r	,	N	o	r	t	h	e	r	n
14.8	2.5	1.4	1.4	3.4	2.9	1.4	2.2	2.3	1.3	3.4	2.5	2.3	1.4	1.9	2.2	2.3	1.7	

	D	i	s	t	r	i	c	t	
4.4	2.5	1.1	2.0	1.9	1.7	1.2	2.0	1.1	14.8

	D	i	c	k	H	a	l	l	,	C	e	n	t	r	a	l
16.8	2.4	1.2	2.2	4.5	2.5	2.4	1.4	1.0	3.5	2.2	2.3	2.2	1.9	1.5	2.4	

	D	i	s	t	r	i	c	t	
3.4	2.5	1.1	1.9	1.9	1.7	1.2	2.0	1.1	16.8

	W	a	y	n	e	B	r	o	w	n	,	S	o	u	t	h	e	r	n
11.3	2.8	2.1	2.6	2.3	4.4	2.6	1.4	2.1	3.0	2.1	3.4	2.2	2.3	2.1	2.0	2.2	2.2	1.7	

	D	i	s	t	r	i	c	t	
4.5	2.5	1.1	1.9	1.9	1.7	1.2	2.0	1.1	11.3

COLORS: LEGEND, BORDER — WHITE (RETROREFLECTIVE)
BACKGROUND — GREEN (RETROREFLECTIVE)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2476 **CODE: (SP)**

DATE: 03/26/2009

SUBJECT: Requirements Under Section 902 of the ARRA

Bidders are advised that Section 902 of the American Recovery and Reinvestment Act (ARRA) of 2009 requires that each contract awarded using ARRA funds must include a provision that provides the U.S. Comptroller General and his representatives with the authority to:

(1) examine any records of the Contractor or any of its subcontractors, or any State or local agency administering such contract, that directly pertain to, and involve transactions relating to, the contract or subcontract; and
(2) interview any officer or employee of the Contractor or any of its subcontractors, or of any State or local government agency administering the contract, regarding such transactions.

Accordingly, the Comptroller General and his representatives shall have the authority and rights as provided under Section 902 of the ARRA. Section 902 further states that nothing in this section shall be interpreted to limit or restrict in any way any existing authority of the Comptroller General.

Additionally, Section 1515(a) of the ARRA provides authority for any representatives of the Inspector General to examine any records or interview any employee or officers working on this contract. The Contractor is advised that representatives of the Inspector General have the authority to examine any record and interview any employee or officer of the Contractor, its Subcontractors or other firms working on this contract. Section 1515(b) further provides that nothing in this section shall be interpreted to limit or restrict in any way any existing authority of an inspector general.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2594 **CODE: (SP)**

DATE: 05/12/2009

SUBJECT: Special Reporting Criteria

Bidders are advised that this project is using funds from the American Recovery and Reinvestment Act (ARRA) of 2009 and will require the Contractor to report certain information regarding the creation of new positions or employment resulting in the construction of this project. In addition to the Prime Contractor's information, the Prime Contractor will have to collect information from all Subcontractor(s) that were used during the construction of this project.

On a monthly basis, the Contractor shall complete a Department supplied FHWA-1589 reporting form. This form shall also be completed by all Subcontractors that were used during the construction of this project. After receiving the Subcontractor(s) form, the Prime Contractor shall submit the forms (Prime and Subcontractor), to the Project Engineer no later than the 4th of each month **The submission of this form will be required for processing the monthly estimate and the Engineer will withhold payments because of the Contractor's failure to submit the required form(s).**

Attached is a copy of the reporting instruction for FHWA-1589 along with a sample copy of the form. The most current ARRA forms can be obtained by following the link at

http://www.gomdot.com/Divisions/Highways/Resources/ContractAdministration/ARRA/Home.aspx

or by contacting B. B. House in Contract Administration Division at 601-359-7730.

THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009

REPORTING REQUIREMENTS

Federal Highway Administration
U.S. Department of Transportation

March 23, 2009

Version 1.0

Monthly Employment Report (Form: FHWA-1589)

This form is a guide for the States in providing employment information on each ARRA project. Monthly employment information on each ARRA project is used by States for meeting the reporting requirements of Sections 1201 and 1512. In order for States to fulfill their reporting obligations, the States must collect and analyze certain employment data for each ARRA funded contract. The data requirement in ARRA extends beyond the number of workers at the work site and, therefore, FHWA has produced a form for guidance to the States. This data to be reported is identified below and will be used by the States in developing Form 1587, which is to be submitted to FHWA. Since States may not currently collect this data, the States should develop a new specification for each ARRA-funded contract in order to obtain this information from contractors and consultants. In doing so, the States should use the provided model form and require the reporting of this data from the prime contractor or consultant. The prime contractor or consultant shall complete a report for each month from the date of the Notice to Proceed until completion of the contract or September, 2012 whichever occurs sooner. This report is only required for contracts that use ARRA funds. States should require contractors and consultants to provide the required information for their own workforce as well as the workforce of all subcontractors that were active on their ARRA funded project(s) for the reporting month. It will be up to each State to determine when they obtain the necessary data from their contractors or consultants, keeping in mind that the summary form is due from the State to the FHWA Division no later than the 20th day of each month for the preceding month's data.

It is the State DOT's responsibility to report the number of jobs on projects managed by funding recipients, such as other state agencies or local governments. The State DOT must make arrangements with each ARRA funding recipient to assure each recipient reports the required data in a timely manner.

The States shall require the following data be provided by each contractor, consultant and funding recipient working on an ARRA project. The primary contractor or consultant for each project shall be responsible for reporting their firm as well as all sub-contractors data.

Format: The State, contractors, or consultant may use the FHWA provided model form, but the use of the model form is optional and at the discretion of the State.

Due date: As determined by the State, until September 2012.

Due to: To be sent by each ARRA funded project prime contractor or consultant to the designated office in each State DOT or Federal Lands Division Office.

Coding Instructions

BOX 1. **Report Month:** The month and year covered by the report, as *mm/yyyy* (e.g. "May 2009" would be coded as "05/2009").

BOX 2. **Contracting agency:** The name of the contracting agency. Enter "State" for State DOT projects. For non-State projects, enter the name of the contracting

agency (other State agency, Federal agency, tribe, MPO, city, county, or other funding recipient).

BOX 3. **Federal-aid project number:** The State assigned federal-aid project number, consistent with the format reported in FMIS.

BOX 4. **State project number or identification number:** The project number or ID, as assigned by the State of its funding recipient, consistent with the format reported in FMIS.

BOX 5. **Project location:** State where project occurs. If the project performed for Federal Lands, provide the FLH Division or Federal Land Managing Agency (FLMA) region.

BOX 6. **Contractor name and address:** The name and address of the contracting or consulting firm shall include the name, street address, city, state, and zip code.

BOX 7. **Contractor DUNS number:** The unique nine-digit number issued by Dun & Bradstreet. Followed by the optional 4 digit DUNS Plus number. Reported as "*999999999.9999*"

BOX 8. **Employment data:** The prime contractor or consultant will report the direct, on-the-project jobs for their workforce and the workforce of their sub-contractors active during the reporting month. These jobs data include employees actively engaged in projects who work on the jobsite, in the project office, in the home office or telework from a home or other alternative office location. This also includes any engineering personnel, inspectors, sampling and testing technicians, and lab technicians performing work directly in support of the ARRA funded project. This does not include material suppliers such as steel, culverts, guardrail, and tool suppliers. States should include in their reports all direct labor associated with the ARRA project such as design, construction, and inspection. The States reports should include their own project labor, including permanent, temporary, and contract project staff. States are asked not to include estimated indirect labor, such as material testing, material production or estimated macro-economic impacts. FHWA will be estimating all indirect labor based on the information provided in this form along with other FHWA data. The form requests specifically:

a. **Subcontractor name:** The name of each subcontractor or sub-consultant that was active on the project for the reporting month.

b. **Employees:** The number of project employees on the contractor's or consultant's workforce that month, and the number of project employees for each of the active subcontractors for the reporting month. Do not include material suppliers. Total field at bottom will be automatically calculated and reported as a whole number.

c. **Hours:** The total hours on the specified project for all employees reported on the contractor's or consultant's project workforce that month, and the total hours for all project employees reported for each of the active subcontractors that month. Total field at bottom will be automatically calculated and reported as a whole number.

d. **Payroll:** The total dollar amount of wages paid by the contractor or consultant that month for employees on the specified project, and the total dollar amount of wages paid by each of the active subcontractors that month. Payroll only includes wages and does not included overhead or indirect costs. Total field at bottom will be automatically calculated and will be rounded to the nearest whole dollar and reported as a whole number.

BOX 9. **Prepared by:**

a. **Name:** Indicate the person responsible for preparation of the form. By completing the form the person certifies that they are knowledgeable of the hours worked and employment status for all the employees. Contractors, consultants, and their subs are responsible to maintain data to support the employment form and make it available to the State should they request supporting materials.

b. **Date:** The date that the contractor completed the employment form. Reported as"*mm/dd/yyyy*." (e.g. "May 1, 2009" would be coded as "05/01/2009").

MONTHLY EMPLOYMENT REPORT
AMERICAN RECOVERY AND REINVESTMENT ACT

1. Report Month: (mm/yyyy)	2. Contracting Agency	
3. Federal-Aid Project Number	4. State Project Number or ID Number	5. Project Location: State, County or Federal Region

6. CONTRACTOR NAME AND ADDRESS

Name:
Address:
City: State:
Zip:

7. Contractor/Subcontractor DUNS Number:

8. Employment Data

	EMPLOYEES	HOURS	PAYROLL
Prime Contractor Direct, On-Project Jobs (see guidance for definitions)			
Subcontractor Direct, On-Project Jobs			
Subcontractor Name			
Prime and Subcontractor Totals	0	0	0.00

9. PREPARED BY CEO or Payroll Official:	DATE:
Name: Title:	

Form FHWA-1589

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2596 **CODE: (IS)**

DATE: 05/13/2009

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**. Failure to include Form OCR-485 in the bid proposal package will cause the Contractor's bid to be considered **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. 2616 **CODE: (SP)**

DATE: 05/20/2009

SUBJECT: DUNS Requirement for ARRA 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 which they have active federal awards funded with Recovery Act funds. 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.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904- NOTICE TO BIDDERS NO. 2617 **CODE: (SP)**

DATE: **July 23, 2009**

SUBJECT: **Contract Time**

PROJECT: **ITS-0210-00(017) / 105469301 & 302– Forrest & Lamar Counties**

The calendar date for completion of work to be performed by the Contractor for this project shall be **June 30, 2011** which date or extended date as provided in Subsection 108.06 shall be the end of contract time. It is anticipated that the Notice of Award will be issued no later than **October 13, 2009** and the effective date of the Notice to Proceed / Beginning of Contract Time will be **November 5, 2009.**

Should the Contractor request a Notice to Proceed earlier than **November 5, 2009**, the requested date will become the new Notice to Proceed / Beginning of Contract Time date.

A progress schedule as referenced to in Subsection 108.03 will not be required for this contract.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2618 **CODE: (SP)**

DATE: **May 20, 2009**

SUBJECT: **COOPERATION BETWEEN CONTRACTORS**

PROJECT: **ITS-0210-00(017) / 105469301 & 302– Forrest & Lamar Counties**

The Bidder's Attention is hereby call to Subsection 105.07, Cooperation Between Contractors, of the 2004 Edition of the Mississippi Standard Specification for Road and Bridge Construction.

This project over laps projects BR-0008-01(084) / 100677302 and HSIP-0008-01(112) / 105326301 & 302 in Forrest and Stone counties that are currently under construction and adjoins project NH-0080-01(017) / 105446301 in Forrest county that is to be let on June 23,2009. The Contractors shall cooperate with each other and with the Department during construction of these projects.

The successful bidder shall familiarize himself with the existing contracts referred to above and comply with the provisions of Subsection 105.07, Cooperation Between Contractors.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2619 **CODE: (SP)**

DATE: **July 23, 2009**

SUBJECT: **Pre-Bid Conference**

PROJECT: **ITS-0210-00(017) / 105469301 & 302– Forrest and Lamar Counties**

A Pre-Bid meeting will be held in the Conference Room of the Mississippi Department of Transportation's Hattiesburg District Office located at 6356 Highway 49N, Hattiesburg, Mississippi at 10:00 A.M. on Tuesday, September 8, 2009. All questions concerning this project will be answered at this time and no additional questions will be taken prior to bid after September 11, 2009.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904- NOTICE TO BIDDERS NO. 2620 **CODE: (SP)**

DATE: May 20, 2009

SUBJECT: Restricted Area

PROJECT: ITS-0210-00(017) / 105469301 & 302– Forrest & Lamar Counties

Bidders are hereby advised that an agreement from the Kansas City Southern Railroad and the Canadian National Railroad allowing access to the railroad right-of-way has not been finalized. The Contractor will be restricted from performing any work on the railroad right-of-way crosses the project at Stations 252+00± and 356+50±. This restriction includes work on, above, or under the restricted area, and stopping any vehicles or equipment in the restricted area. This restriction is from right-of-way to right-of-way and will be in affect until **December 31, 2009 not September 30,2009** as noted in the plans. Should the restriction be lifted earlier than December 31, 2009, the Engineer will advise the Contractor in writing.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2621 **CODE: (SP)**

DATE: **May 20, 2009**

SUBJECT: **Burn-In Period**

PROJECT: **ITS-0210-00(017) / 105469301 & 302– Forrest & Lamar Counties**

Bidders are hereby advised that the six (6) month burn-in period for the newly installed system has been allowed for in the contract time.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2622 **CODE: (SP)**

DATE: **May 20, 2009**

SUBJECT: **Lane Closure Restrictions**

PROJECT: **ITS-0210-00(017) / 105469301 & 302– Forrest and Lamar Counties**

Lane closures will **NOT** be permitted under any circumstances during the time periods shown below unless specifically directed by the Engineer in writing:

- **US HIGHWAY 49, US HIGHWAY 98, AND INTERSTATE 59:** Monday thru Friday from 6:30 A.M. to 8:30 A.M. or from 4:00 P.M. to 6:00 P.M.

- **ALL ROADWAYS WITHIN THE PROJECT LIMITS:** New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day and the day preceding each holiday. For Thanksgiving Day, lane closures will not be allowed the Wednesday preceding through the Sunday following the holiday. No lane closures will be permitted on the preceding Friday from 6:00 A.M. until Tuesday 7:00 P.M. if a State Holiday occurs or is observed on Monday, and no lane closures permitted on the preceding Thursday from 6:00 A.M. until Monday Morning at 7:00 A.M. if a holiday is observed on Friday. No lanes closures will be permitted on any "SPECIAL EVENT" days as directed by the Engineer.

During the above time periods, no excuses will be accepted by the Department, and the Contractor will be assessed a lane rental fee of **$2,500.00** per closure for each full or partial five (5) minute period during which less than the current full travel lanes indicated on the Traffic Control Sheets of the plans are available to the traveling public.

Work requiring a lane closure shall begin within two (2) hours of the closure set-up. The Contractor will be assessed a lane rental fee of **$2,500.00** per closure for each full or partial five (5) minute period should failure to begin work within the allotted time occur.

All lane closures shall be approved by the Engineer.

When a lane closure is not sufficient to perform the work, a road closure will be allowed. The road closure shall be in accordance with the requirements of Plan Sheet TCP-9 and the Traffic Control Plan.

The road closure shall be limited to a 30-minute period within any 1-hour period on weekends between 11:00 PM and 5:00 AM, except that closures may be extended on Sunday mornings up until 9:00 AM.

For purposes of this contract, official time is considered to be the announced time available at Hattiesburg Area telephone number (601) 545-2841.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2623 **CODE: (SP)**

DATE: 05/20/2009

SUBJECT: Location & Configuration of OTN Nodes

PROJECT: ITS-0210-00(017) / 105469301 & 302-- Forrest and Lamar Counties

OTN Node

Bidders are hereby advised of the following OTN Node Locations and Interface Card configuration for each OTN Node. All OTN equipment and Cards shall be paid under Pay Item 907-660-A.

I-59 & Hwy 98 Communications Node (Address)

Hwy 49 & Hwy 98 Communications Node (Address)

I-59 & Hwy 49 Communications Node (Address)

MDOT Hattiesburg Regional TMC Node [6356 Highway 49N, Hattiesburg, Mississippi (Dist. 6)]

Work on the OTN equipment must be done by a certified technician.

OTN Node Locations & Configurations					
Item Description	**Part No.**	**Total #**	**I-59 @ HWY 98**	**HWY 49 @ HWY 98**	**I-59 @ HWY 49**
NODE CHASSIS & POWER SUPPLIES					
N42C Node Chassis	S30826-B30-X	**3**	1	1	1
OTN-N42 Steel Chassis	S30826-B17-X				
Power Supply 90-264 VAC and 125 VDC	V30812-A5020-A42	**6**	2	2	2
Power Cord 230 VAC for OTN Nodes	BET:AT306051A	**6**	2	2	2

COMMON LOGIC CARDS & OPTICAL TRANSCEIVERS					
BORA2500-X3M-ETX for N42	S30824-Q124-X103	**3**	1	1	1
Optical GbE SFP 850nm mm for BORA622-ETX, BORA2500-ETX	V30813-S19-A1				
Optical GbE SFP 1310nm sm for BORA622-ETX, BORA2500-ETX	V30813-S20-A1				
Electrical GbE SFP RJ45 for BORA622-ETX, BORA2500-ETX	V30813-S30-A2	**3**	1	1	1
BORA2500-ETX for N24	S30824-Q106-X101				
M-optic module (MM, 850nm)	V30813-S1-A1				
S2-optic module (1550nm)	V30813-S3-A1	**6**	2	2	2

INTERFACE CARDS					
RS485	BE2:FB052429A	**3**	1	1	1
RS485/422	FB-52429-A				
ET-100DAE (10 + 2 S-LAN ports)	S30824-Q123-X101	**3**	1	1	1
Optical GbE SFP 850nm mm	V30813-S19-A1	**3**	1	1	1
MPEG (4 ports with TTX)	S30824-Q107-X101	**3**	1	1	1
H.264/AVC Video Card (16 analog ports, inputs and outputs), including streaming	S30824-Q131-X501	**3**	1	1	1
Blank panel for interface slot	C30165-A9550-B9	*****	*	*	*

CABLES FOR INTERFACE CARDS					
Fiber Patch Cables (multi-mode) for connection between Type C network Switch and ET-100DAE		**3**	1	1	1
RS485 Drop Cable	S30827-C18-A30	**3**	1	1	1

PANEL					
19" BNC terminal panel 1HU (16 positions)	V30812-A3010-A147	**3**	1	1	1

NETWORK MANAGEMENT / MAINTENANCE SOFTWARE					
OMS License for one N42	OTN:LIC-N42-2500	**3**	1	1	1
OMS Network Protocol License					
OMS Video Switching License					

* The contractor shall provide the appropriate number of Back panels to cover empty card slots.

Communication HUT buildings will be provided at the interchanges of I-59 & Hwy 98, Hwy49 & Hwy 98, and I-59 & Hwy 49 as shown in the plans. The Communications Hut building size shall be a minimum of 10' x 8' x 8'6" for the outside dimensions and layout shall be provided as shown in Diagram 1 and will be paid under pay Item 907-660-B. Alternative layouts

may be submitted to ITS Engineer for approval. The following shall be provided as part of the Communications Hut Building:

- Two free standing equipment racks will be provided by the contractor to be placed and secured in the Communications Hut. The Racks shall be a 19 inch rack with four legs and mounting in front and back. The rack provided by the Contractor shall be a minimum 72 inches tall and a minimum of 30 inches deep.
- An Uninterruptible Power Supply (UPS) APC model Smart-UPS 2200, 19 inch rack mount and 120v version, shall be provided and installed in each new equipment rack.
- WEB based rack mounted remote environmental monitoring system with the following components:
    - Web-based monitoring system.
    - Connects to Ethernet network.
    - Includes a built in web server for viewing status, making programming changes, and reviewing data log history.
    - Minimum of eight sensors can be connected to monitor
    - Minimum sensors provided must include sensors for temperature, humidity, physical security, smoke, fire, power, and motion sensor.
    - Include rechargeable battery backup.
    - Alarm notification via e-mail messages and text messages.
    - Built-in. IP device monitoring

A communication hut vault will not be provided as part of this project, but instead fiber optic pullboxes installed adjacent to the communication hut shall be utilized in storing conduit, fiber, and required slack coils as indicated in the plans.

Communication Node Installation, Configuration

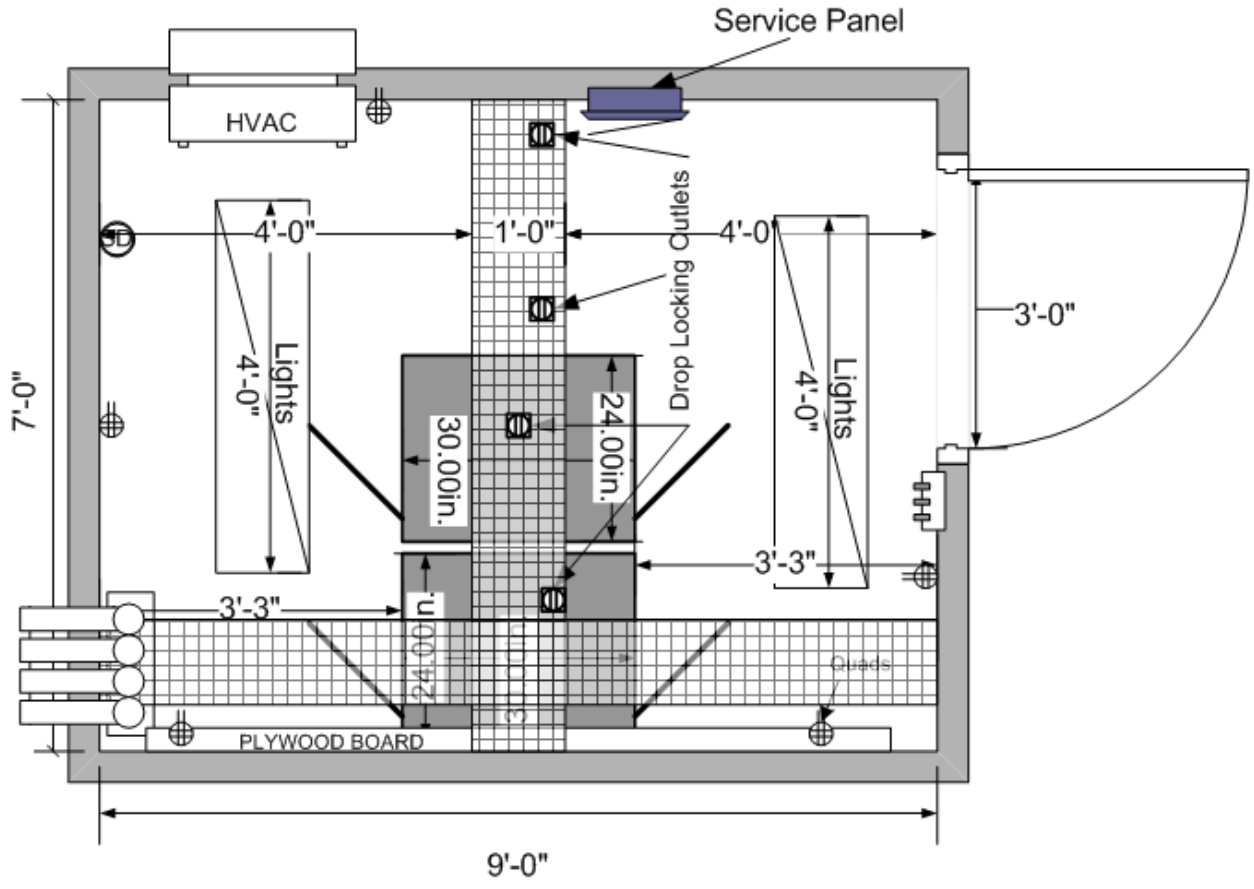
- All installation and configuration of the OTN nodes, switch, ITS equipment located in the Communication hut buildings, and cabling shall be paid under Pay Item 907-660-A.
- The Contractor shall be responsible for installing the OTN interface cards identified in the table above and configuring them to be integrated to the MDOT ITS network as approved by the ITS Program Manager or his/her designee.
- **Work on OTN Node equipment must be done by a technician certified on the OTN Node technology.**
- The Type C network Switch will be provided as indicated in Plans under Pay Item Number 907-658-A Network Switch Type C
- The Type C network Switch as specified in special provision 907-658-3 will be connected in the OTN Hut as follows:
    - The contractor is responsible to mount the Type C network switch in one of two 19 inch racks at each Communications Node Hut.
    - Ports 13 through 24 of each 72 fiber termination cabinet will connect in pairs to the SFP (Optical ports) of the Type C Network Switch via appropriate single mode fiber optic patch cords.
    - The Contractor shall submit to the ITS Engineer for approval a cable connection diagram done in Visio and an excel spreadsheet with port to fiber connections one

week prior to connecting the type C switch in the HUT building or TMC to the fiber panels or to the OTN equipment.
    - The contractor shall provide fiber optic patch cords at least 6 ft in length. In addition, the contractor shall provide 10 spare fiber optic patch cords per OTN node location listed in the table above.
    - The Contractor shall connect one of the uplink ports on the Type C network switch to one of the Gigabit optical ports on the 100DAE card on the OTN Node at each location as directed by the ITS Engineer.
    - The connection between the Type C Network Switch and the OTN card shall be made via a 6ft multimode fiber optic patch cable.
- WEB based rack mounted remote environmental monitoring system and MPEG IV IP based PTZ camera provided per SPECIAL PROVISION NO. 907-660-2 shall be connected to Type C Network Switch via network cables. The MPEG IV IP based PTZ camera shall be mounted within the Communication Hut such that the interior of the building may be viewed.

Part Numbers are provided for informational purposes and are subject to change by the manufacturer. Any part substitutions due to revision or version changes must be approved by the MDOT Project Manager. All required OTN components shall be included the price bid for Item No. 907-660-A.

OTN Node Training: A minimum of 24 hours of on site training, testing, and support shall be provided for OTN Nodes and the MSTraffic network for a minimum of 8 people.

Diagram 1:


Service Panel
HVAC
4'-0"
1'-0"
4'-0
Drop Locking Outlets
3'-0"
7'-0"
4'-0"
Lights
30.00in.
24.00in.
4'-0"
Lights
3'-3"
3'-3"
24.00in.
Quads
PLYWOOD BOARD
9'-0"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

DATE: 05/20/2009

SUBJECT: Radar Detection System (RDS) Cabling

PROJECT: ITS-0210-00(017) / 105469301 & 302-- Forrest and Lamar Counties

Bidders are hereby advised that all RDS cabling referenced in Special Provision No. 907-641-3, Radar Detection System (RDS), shall be cost absorbed under pay item 907-641-A Radar Detection System.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2625 **CODE: (SP)**

DATE: 05/20/2009

SUBJECT: Traffic Management Center (TMC) Modifications

PROJECT: ITS-0210-00(017) / 105469301 & 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 Dynamic Message Signs (DMS), Radar Detection Systems (RDS), CCTV, and Highway Advisory Radio (HAR) and 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 the 360 Surveillance ITS Software Suite installed at the Hattiesburg Regional TMC. The software is currently configured for controlling cameras only, but the contractor shall be required to configure the software to utilize and operate the DMS, RDS, and CCTV once this project is complete.

The Contractor shall provide and allocate on the system the appropriate number of 360 licenses to operate and manage each of the devices added to the system on this project. The licensing requirements per device are as follows:

PC Client:	10 Licenses per PC Client
Camera:	1 License per CCTV
DMS:	5 Licenses per DMS
Detector:	1 License per Detector per direction of traffic monitored (if a detector is counting 2 directions of traffic, 2 licenses for that device is required)

The Contractor is required to fully configure the existing 360 Surveillance software for operation of the DMS, RDS, and CCTV that are installed on this project. At a minimum, this shall include:

- Update and configure the existing map to show the locations of the DMS, RDS, and CCTV with dynamic icons.
- Install and configure all DMS, RDS, and CCTV into the software's database.
- Configure a database of up to 20 preprogrammed messages provided by the MDOT Statewide TMC Manager into the 360 software for the DMS.

- Configure the 360 speed map of the project area and RDS locations. The base map shall be reviewed and approved prior to configuration and use. Install and configure all RDSs and speed zone segments for each direction of travel. The color code ranges shall be approved by MDOT prior to finalizing the configurations.
- Configure the software to export snapshots of the speedmap through FTP for use on the MDOT website.
- Update all 360 client software within the TMC to be able to fully utilize the changes noted above.

The Contractor is required to arrange for the 360 surveillance vendor to be on-site to complete this configuration and provide the required testing to show that the software is fully functioning for each dynamic message sign, radar detection station, and CCTV.

The Contractor is required to configure the HAR server at the TMC as is called out in the Highway Advisory Radio Special Provision 907-655-1. The Contractor shall be responsible for software installation, providing licenses, and full configuration of the HAR software to operate the HAR equipment and beacons from the TMC as dictated by the Highway Advisory Radio Special Provision 907-655-1. In addition to the server software license, the contractor shall provide at a minimum three (3) client workstation software licenses for use in the regional TMC.

Equipment:

- Eight video decoders will be required to be provided and installed in the TMC equipment room racks and shall be 100% compatible with and from the same manufacturer as the encoders provided on this project for the CCTV field locations. The decoders must be compliant with all requirements set forth in Section 907-662 of these Specifications. The decoders shall be configured by the Contractor to receive the streams from the field encoders installed on this project. All cables required for installation shall be considered incidental.

- Security Appliance Server
  The Server shall manage, and control field security appliances from a single location and report on all security appliances and users of the authenticated system.
  The server shall define and receive instant status alerts and updates regarding any changes to the secured network, and receive alerts regarding any unauthorized access attempts based on secure private network appliance location.

  The server shall include:
  a) SQL based database
  b) Web based Graphic user Interface (GUI), to configure and monitor the security appliances on the network
  c) Intrusion detection, location, and notification functionality, including automated alarm and events management system
  d) Intrusion detection, location, and notification functionality, including automated email notice system
  e) Intrusion detection, location, and notification functionality, including system monitoring logs and automated report generation
  f) Cross-platform compatibility with any operating system and field control hardware

g) Intrusion detection in the field, which includes "Stateful" Packet Inspection (SPI) that keeps track of the state of network connections in the traffic cabinet (such as TCP streams or UDP communication) traveling across Appliance ports.

The Server shall meet the following minimum hardware requirements:

a) A minimum of a 40 GB Hard Drive
b) 1 GB RAM minimum
c) x86 (Dual-Core 1.73 GHz or higher)
d) 1 Gigabit Ethernet NIC

Technical Support shall include:

a) Administrative documentation
b) Two-year warranty on hardware
c) One-year software upgrade available

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.

Training:
Four (4) hours of training and assistance shall be provided for operations, testing, and maintenance of the TMC Systems provided on this contract.

MDOT TMC Modifications SITE #2
The Statewide TMC is located at 2567 North West Street, Jackson, MS, 39216. The Center is in the MDOT Shop Complex, Building A, on the 3rd Floor.

Software:
The Contractor shall initially use vendor supplied software to test the Dynamic Message Signs (DMS), Radar Detection Systems (RDS), CCTV, and Highway Advisory Radio (HAR) and 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 the 360 Surveillance ITS Software Suite installed at the Statewide TMC. The software is currently configured for controlling cameras only, but the contractor shall be required to configure the software to utilize and operate the DMS, RDS, and CCTV once this project is complete.

The Contractor shall provide and allocate on the system the appropriate number of 360 licenses to operate and manage each of the devices added to the system on this project. The licensing requirements per device are as follows:

PC Client:	10 Licenses per PC Client
Camera:	1 License per CCTV
DMS:	5 Licenses per DMS
Detector:	1 License per Detector per direction of traffic monitored (if a detector is counting 2 directions of traffic, 2 licenses for that device is required)

The Contractor is required to fully configure the existing 360 Surveillance software for operation of the DMS, RDS, and CCTV that are installed on this project. At a minimum, this shall include:

- Update and configure the existing map to show the locations of the DMS, RDS, and CCTV with dynamic icons.
- Install and configure all DMS, RDS, and CCTV into the software's database.
- Configure a database of up to 20 preprogrammed messages provided by the MDOT Statewide TMC Manager into the 360 software for the DMS.
- Configure the 360 speed map of the project area and RDS locations. The base map shall be reviewed and approved prior to configuration and use. Install and configure all RDSs and speed zone segments for each direction of travel. The color code ranges shall be approved by MDOT prior to finalizing the configurations.
- Configure the software to export snapshots of the speedmap through FTP for use on the MDOT website.
- Update all 360 client software within the TMC to be able to fully utilize the changes noted above.

The Contractor is required to arrange for the 360 surveillance vendor to be on-site to complete this configuration and provide the required testing to show that the software is fully functioning for each dynamic message sign, radar detection station, and CCTV.

As part of this project the contractor will be required to provide five (5) HAR client workstation software licenses for the Statewide TMC. The contractor shall configure the Statewide TMC's HAR client software to remotely control HAR devices through the Hattiesburg Regional TMC's HAR server software as dictated by the Highway Advisory Radio Special Provision 907-655-1.

Equipment:
• Eight video decoders will be required to be provided and installed in the TMC equipment room racks and shall be 100% compatible with and from the same manufacturer as the encoders provided on this project for the CCTV field locations. The decoders must be compliant with all requirements set forth in Section 907-662 of these Specifications. The decoders shall be configured by the Contractor to receive the streams from the field encoders installed on this project. All cables required for installation shall be considered incidental.

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.

Training:
Four (4) hours of training and assistance shall be provided for operations, testing, and maintenance of the 360 Software for DMS, RDS, and CCTV Systems provided on this contract.

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2695 **CODE: (SP)**

DATE: **June 26, 2009**

SUBJECT: **Project Number Change**

PROJECT: **ITS-0210-00(017) / 105469301 & 302 – Forrest & Lamar**

Anywhere in the plans, proposal and specifications for the above Project that reference is made to Federal Aid Project No. **ITS-0210-00(017) / 105469301 – Forrest County,** it is understood that Federal Aid Project No. **ITS-0210-00(017) / 105469301 & 302– Forrest & Lamar Counties** is the correct project number.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 – NOTICE TO BIDDERS NO. 2696 **CODE: (SP)**

DATE: **7/10/2009**

SUBJECT: **Petroleum Products Base Prices For Contracts Let in August, 2009**

REFERENCE: **Subsection 109.07**

The following base prices are to be used for adjustment in compensation due to changes in costs of petroleum products:

FUELS

	Per Gallon	Per Liter
Gasoline	$2.1394	$0.5652
Diesel	$2.1721	$0.5738

MATERIALS OF CONSTRUCTION

ASPHALT CEMENT	Per Gallon	Per Ton	Per Liter	Per Metric Ton
Viscosity Grade AC-5	$1.7197	$408.00	$0.4543	$449.74
Viscosity Grade AC-10	$1.7282	$410.00	$0.4565	$451.94
Viscosity Grade AC-20	$1.6895	$400.83	$0.4463	$441.83
Viscosity Grade AC-30	$1.6755	$397.50	$0.4426	$438.16
Grade PG 64-22	$1.6439	$390.00	$0.4343	$429.89
Grade PG 67-22	$1.6981	$402.86	$0.4486	$444.07
Grade PG 76-22	$2.2901	$543.33	$0.6050	$598.91
Grade PG 82-22	$2.5360	$601.67	$0.6700	$663.22

EMULSIFIED ASPHALTS, PRIMES, & TACK COATS

Grade EA-4 (SS-1)	$2.2690	$0.5994
Grade RS-2C (CRS-2)	$1.9135	$0.5055
Grade CRS-2P	$2.2776	$0.6017
Grade EA-1, MC-70 & AE-P	$2.4113	$0.6370
Grade SS-1 & 1H	$2.3000	$0.6076
Grade CSS-1 & 1H (Undiluted)	$2.3000	$0.6076
Grade CSS-1 & 1H (Diluted 1 to 1 Fog Seal)	$1.4750	$0.3897

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2727

DATE: JULY 23, 2009

SUBJECT: Specialty Items

PROJECT: ITS-0210-00(017) / 105469301 & ITS-0210-00(017) / 105469301 - Forrest & Lamar Counties

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

CATEGORY: EROSION CONTROL

Line No	Pay Item	Description
0260	907-225-A001	Grassing
0270	907-225-B001	Agricultural Limestone

CATEGORY: GUARDRAIL, GUIDERAIL

Line No	Pay Item	Description
0070	606-B001	Guard Rail, Class A, Type 1
0080	606-C003	Guard Rail, Cable Anchor, Type 1
0090	606-E001	Guard Rail, Terminal End Section

CATEGORY: TRAFFIC CONTROL - PERMANENT

Line No	Pay Item	Description
0150	630-F001	Delineators, Guard Rail, White
0160	630-F002	Delineators, Guard Rail, Yellow
0310	907-630-I005	Metal Overhead Sign Supports, Assembly No. 5, Contractor Designed
0320	907-630-M001	Pedestal Sign Support, Assembly No 1, Contractor Designed
0330	907-630-M002	Pedestal Sign Support, Assembly No 2, Contractor Designed
0340	907-630-M006	Pedestal Sign Support, Assembly No 3, Contractor Designed
0350	907-630-M007	Pedestal Sign Support, Assembly No 4, Contractor Designed
0360	907-630-M008	Pedestal Sign Support, Assembly No 6, Contractor Designed
0370	907-630-M009	Pedestal Sign Support, Assembly No 7, Contractor Designed

CATEGORY: TRAFFIC CONTROL - TEMPORARY

Line No	Pay Item	Description
0120	619-D4001	Directional Signs
0130	619-E1001	Flashing Arrow Panel, Type C

SUPPLEMENT TO FORM FHWA-1273

The following MINIMUM HOURLY WAGE RATES have been predetermined by the Secretary of Labor in General Decision No. **MS20080212** dated January 16, 2009.

FORREST COUNTY

CLASSIFICATION	MINIMUM HOURLY WAGE RATE
Carpenter	13.00
Cement Mason / Concrete Finisher	11.54
Electrician	22.40
Laborer, Common or General	8.34
Laborer, Pipelayer	10.17
Operator, Backhoe	12.57
Operator, Broom	8.00
Operator, Bulldozer	11.63
Operator, Grader / Blade	11.10
Operator, Mechanic	13.00
Operator, Piledriver	12.50
Operator, Roller	9.31
Operator, Scraper	10.00
Truck Driver	10.34

Authorized Payroll Code may be used in lieu of classification titles on weekly payrolls submitted to this Department. Codes or classification titles not conforming to those listed will not be acceptable.

SUPPLEMENT TO FORM FHWA-1273

The following MINIMUM HOURLY WAGE RATES have been predetermined by the Secretary of Labor in General Decision No. **MS20080217** dated January 16, 2009.

LAMAR COUNTY

CLASSIFICATION	MINIMUM HOURLY WAGE RATE
Cement Mason / Concrete Finisher	11.54
Electrician	22.40
Laborer, Common or General	8.34
Laborer, Pipelayer	10.17
Operator, Backhoe	12.57
Operator, Broom	8.00
Operator, Bulldozer	11.63
Operator, Grader / Blade	11.10
Operator, Mechanic	13.00
Operator, Piledriver	12.50
Operator, Roller	9.31
Operator, Scraper	10.00
Truck Driver	10.34

Authorized Payroll Code may be used in lieu of classification titles on weekly payrolls submitted to this Department. Codes or classification titles not conforming to those listed will not be acceptable.

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. 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.

2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.

3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.

4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;
Section IV, paragraphs 1, 2, 3, 4, and 7;
Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 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 DOL, or the contractor's employees or their representatives.

6. **Selection of Labor:** During the performance of this contract, the contractor shall not:

a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or

b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $10,000 or more.)

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 and 41 CFR 60) 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 Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American 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 State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.

b. The contractor will accept as his 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, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO 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 minority group employees.

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 minority groups 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 minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group 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, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)

c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group 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 takecorrective 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 his 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 his avenues of appeal.

6. **Training and Promotion:**

a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.

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. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.

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 minority group and women employees 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 his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. 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 best efforts to develop, in cooperation with the unions, joint training programs aimed toward

qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

b. The contractor will use best 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 SHA 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 minority and women referrals within thetime 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 minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) 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 SHA.

8. **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.

a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.

c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

9. **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 completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

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

(1) The number 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;

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and

(4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. The contractors will submit an annual report to the SHA 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. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $10,000 or more.)

a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of $10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding $2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. **General:**

a. All mechanics and laborers 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 (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c)] the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) 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. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, 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 paragraphs 4 and 5 of this Section IV.

b. 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.

c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. **Classification:**

a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

(1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;

(2) the additional classification is utilized in the area by the construction industry;

(3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(4) with respect to helpers, when such a classification prevails in the area in which the work is performed.

c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification 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 DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour 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.

d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional 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. Said 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

e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. **Payment of Fringe Benefits:**

a. 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 or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.

b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a 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.

4. **Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:**

a. Apprentices:

(1) 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 DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/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 Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

(2) The allowable ratio of apprentices to journeyman-level employees 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 employee 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 listed in 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 or subcontractor 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-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

(3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level ofprogress, expressed as a percentage of the journeyman-level 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 for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

(4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

(1) 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 DOL, Employment and Training Administration.

(2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. 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.

(3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level 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-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.

(4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor 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. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under a approved definition, shall be paid not less than the applicable wage rate on the wagedetermination for the classification of work actually performed.

5. **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.

6. **Withholding:**

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor 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, as 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 SHA contracting officer 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.

7. **Overtime Requirements:**

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. **Violation:**

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her 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, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. **Withholding for Unpaid Wages and Liquidated Damages:**

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies 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 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding $2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. **Compliance with Copeland Regulations (29 CFR 3):**

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. **Payrolls and Payroll Records:**

a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof 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. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found 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 and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

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

(1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;

(2) that such 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 the Regulations, 29 CFR 3;

(3) that each laborer or mechanic has been paid not less that the applicable wage rate and fringe benefits or cash equivalent for the classification of worked performed, as specified in the applicable wage determination incorporated into the contract.

e. 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 2d of this Section V.

f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, 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 SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions 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.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than $1,000,000 (23 CFR 635) the contractor shall:

a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.

b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.

c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.

2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

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 State. 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).

a. "Its own organization" shall be construed to include only workers employed and paid directly 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, assignee, or agent of the prime contractor.

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 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 VII 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 SHA 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 SHA 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 SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

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 provideall safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA 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. 333).

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. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

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, the following notice 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:

NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS

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 represen-tation 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 andsupplemented;

Shall be fined not more that $10,000 or imprisoned not more than 5 years or both."

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

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $100,000 or more.)

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

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.

3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.

4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such require-ments.

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

1. **Instructions for Certification - Primary Covered Transactions:**

(Applicable to all Federal-aid contracts - 49 CFR 29)

a. By signing and submitting this proposal, the prospective primary 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 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 primary 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 department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowinglyrendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary 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," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.

f. The prospective primary 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 primary 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 Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

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 may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.

i. 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.

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.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

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 3-year period preceding this proposal been convicted of or had a civil judgement 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 paragraph 1b of this certification; and

d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the prospective primary 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 Covered Transactions:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions of $25,000 or more - 49 CFR 29)

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," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive

Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

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.

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 may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

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 Covered Transactions:

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 participation in this transaction 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.

* * * * *

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(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 his or her bid or proposal that he or she 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 goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Timetables	Goals for female participation in each trade (percent)
From April 1, 1978 until March 31, 1979	3.1
From April 1, 1979 until March 31, 1980	5.1
From April 1, 1980 until March 31, 1981	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. 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

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

SUPPLEMENT TO SPECIAL PROVISION NO. 907-105-3

DATE: 03/31/2008

SUBJECT: Cooperation By Contractor

Delete the first sentence of the first paragraph under 907-105-05 on page 1, 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.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-105-3 **CODE: (IS)**

DATE: 02/14/2006

SUBJECT: **Cooperation By Contractor**

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.

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.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-107-1

DATE: 03/21/2006

SUBJECT: Liability Insurance

In the first sentence of the first paragraph of Subsection 907-107.14.2.1 on page 1, change "$300,000 each occurrence" to "$500,000 each occurrence".

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-107-1 **CODE: (IS)**

DATE: 05/03/2004

SUBJECT: **Liability Insurance**

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:

907-107.14.2--Liability Insurance. Delete in toto Subsection 107.14.2 beginning on page 60 and substitute:

907-107.14.2.1--General. The Contractor shall carry Contractor's liability, including subcontractors and contractual, with limits not less than: $300,000 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 Resident 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) **Regular Contractor's Liability**, 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.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-107-6

DATE: 11/16/2007

SUBJECT: Legal Relations and Responsibility to Public

After Subsection 907-107.15 on page 1, add the following:

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.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-107-6 **CODE: (IS)**

DATE: **07/03/2007**

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.

907-107.15--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".

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-108-17 **CODE: (IS)**

DATE: 06/11/2008

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 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.

907-108.06--Determination and Extension of Contract Time.

907-108.06.1--Based on Time Units.

907-108.06.1.2--Contract Time Assessment. At the end of the eighth paragraph of Subsection 108.06.1.2 on page 81, add the following:

When the approved progress schedule indicates that a controlling phase(s) is to be completed prior to December 1 and the physical features of the phase(s) have not been satisfactorily completed, beginning on December 1 the miscellaneous phase will be shown as the only active phase during the months of December, January, and February. Under this condition, time units, monthly time units divided by monthly calendar days, will be assessed in accordance with the applicable column in the TABLE OF TIME UNITS. If the physical features of the phase(s) have not been completed by March 1, the phase will resume as a controlling phase and time assessment will be made accordingly.

Delete the fourth and fifth sentence of the thirteenth paragraph of Subsection 108.06.1.2 on page 82, 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 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.

907-108.06.2--Based on Calendar Date Completion. After Subsection 108.06.2.1 on page 85, add the following:

907-108.06.2.2--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.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-109-3

DATE: 11/21/2006

SUBJECT: Changes in Material Costs

After the last paragraph of Subsection 907-109.06.1 on page 1, add the following:

907-109.07--Changes in Material Costs. Delete the second sentence of the first paragraph of Subsection 109.07 on page 95, and substitute the following:

When a pay item on the bid sheets indicate that an adjustment is allowed and when a notice to bidders is included in the contract showing current monthly base prices, an adjustment will be provided as follows:

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-109-3 **CODE: (IS)**

DATE: 04/21/2006

SUBJECT: Partial 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:

907-109.04--Extra and Force Account Work. Delete the first sentence of the second paragraph of Subsection 109.04 under (d) 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.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-213-2 **CODE: (IS)**

DATE: 01/25/2008

SUBJECT: Agricultural Limestone

Section 907-213, Fertilizing, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-213.05--Basis of Payment. Delete the first sentence of the first paragraph of Subsection 213.05 on page 136 and add the following as the first paragraph of this subsection.

Hard rock agricultural limestone will be paid for at the contract unit price per ton. Hard rock agricultural limestone with a relative neutralizing value (RNV), determined in accordance with Subsection 907-715-02.2.1.3, of between 60.0% and 62.9% will be paid for at half (½) the contract unit price per ton. No payment will be made for hard rock agricultural limestone with an RNV less than 60.0%.

Delete the first pay item listed on page 137 and substitute the following:

907-213-A: Agricultural Limestone - per ton

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-225-1

DATE: 04/29/2008

SUBJECT: Grassing

Delete the first paragraph of Subsection 907-225.05 on page 1 and substitute the following:

Hard rock agricultural limestone will be paid for at the contract unit price per ton. Hard rock agricultural limestone with a relative neutralizing value (RNV), determined in accordance with Subsection 907-715-02.2.1.3, of between 60.0% and 62.9% will be paid for at half (½) the contract unit price per ton. No payment will be made for hard rock agricultural limestone with an RNV less than 60.0%.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-225-1 **CODE: (IS)**

DATE: 09/23/2004

SUBJECT: Grassing

Section 907-225, Grassing, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-225.04--Method of Measurement. After the second sentence of Subsection 225.04 on page 163, add the following:

Acceptable quantities of agricultural limestone will be measured by the ton.

907-225.05--Basis of Payment. After the first paragraph of Subsection 225.05 on page 163, add the following:

Agricultural limestone will be paid for at the contract unit price per ton. Grade "A" agricultural limestone with an equivalent neutralizing value (ENV), determined in accordance with Subsection 907-715-02.2.1.3, of between 60.0% and 62.9% will be paid for at half (½) the contract unit price per ton. No payment will be made for Grade "A" agricultural limestone with an ENV less than 60.0%.

Delete the first pay item listed on page 163 and substitute the following:

907-225-A: Grassing - per acre

907-225-B: Agricultural Limestone - per ton

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-304-12 **CODE: (IS)**

DATE: 06/01/2009

SUBJECT: Granular Courses

Section 907-304, Granular Courses, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-304.02--Materials. After the first paragraph of Subsection 304.02.1 on page 183, add the following:

When the contract includes pay item 907-304-E, Granular Material, LVM, RAP, it shall be milled recycled asphalt pavement and shall be visually inspected by the Engineer to insure it is free from chunks and deleterious materials.

Crushed concrete meeting the requirements of Subsection 907-703.04.4 may be used in lieu of other crushed courses specificed in the contract.

907-304.03--Construction Requirements.

907-304.03.5--Shaping, Compacting and Finishing. Delete the sixth paragraph of Subsection 304.03.5 on page 185.

Delete the first table in Subsection 304.03.5 on page 186 and substitute the following:

Granular Material Class	Lot Average	Individual Test
7,8,9 or 10	97.0	93.0
5 or 6	99.0	95.0
3 or 4	100.0	96.0
1 or 2	102.0	98.0
Crushed Courses*	99.0	95.0

* When placed on filter fabric on untreated subgrade, the individual tests and the average of the five (5) tests shall equal or exceed the following values:

Lot Average	Individual Test
96.0	92.0

Before the last paragraph of Subsection 304.03.5 on page 186, add the following:

Unless otherwise specified, density for granular material, RAP, shall be achieved by two passes of an approved roller and density tests will not be required.

907-304.05--Basis of Payment. Add the "907" prefix to the pay items listed on page 187.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-401-2

DATE: **06/25/2009**

SUBJECT: **Hot Mix Asphalt (HMA)**

Add the following before 907-401.02.6.2 on page 1.

907-401.02.4--Substitution of Mixture. Delete the table in Subsection 401.02.4 on page 242, and substitute the following:

Mixture	Single Lift Laying Thickness Inches	
	Minimum	Maximum
25 mm	3	4
19 mm	2 ¼	3 ½
12.5 mm	1 ½	2 ½
9.5 mm	1	1 ½
4.75 mm	½	¾

After Subsection 907-401-02.6.2 on page 2, add the following:

907-401.02.6.4.1--Roadway Density. Delete subparagraphs 1., 2., & 3. on page 251 and substitute the following:

1. For all leveling lifts, when full lane width and with a thickness as specified in the table in Subsection 401.02.4, the required lot density shall be 92.0 percent of maximum density.

2. For all single lift overlays, with or without leveling and/or milling, the required lot density shall be 92.0 percent of maximum density.

3. For all multiple lift overlays of two (2) or more lifts excluding leveling lifts, the required lot density of the bottom lift shall be 92. 0 percent of maximum density. The required lot density for all subsequent lifts shall be 93.0 percent of maximum density.

4. For all pavements on new construction, the required lot density for all lifts shall be 93.0 percent of maximum density.

907-401.03.1.2--Tack Coat. Delete the three sentences of Subsection 401.03.1.2 on page 259, and substitute the following:

Tack coat shall be applied to previously placed HMA and between lifts, unless otherwise directed by the Engineer. Tack coat shall be applied with a distributor spray bar. A hand wand

will only be allowed for applying tack coat on ramp pads, irregular shoulder areas, median crossovers, turnouts, or other irregular areas. Bituminous materials and application rates for tack coat shall be as specified in Table 410-A on page 293. Construction requirements shall be in accordance with Subsection 407.03 of the Standard Specifications.

907-401.03.1.4--Density. Delete the first sentence of the first paragraph of Subsection 401.03.1.4 on page 259 and substitute the following:

The lot density for all dense graded pavement lifts, except as provided below for preleveling, wedging [less than fifty percent (50%) of width greater than minimum lift thickness], ramp pads, irregular shoulder areas, median crossovers, turnouts, or other areas where the established rolling pattern cannot be performed, shall not be less than the specified percent (92.0% or 93.0%) of the maximum density based on AASHTO Designation: T 209 for the day's production. For all leveling lifts, when full lane width and with a thickness as specified in the table in Subsection 401.02.4, the required lot density shall be 92.0 percent of maximum density.

907-401.03.9--Material Transfer Equipment. Delete the paragraph in Subsection 401.03.9 on page 264 and substitute the following:

Excluding the areas mentioned below, the material transferred from the hauling unit when placing the top lift, or the top two (2) lifts of a multi-lift HMA pavement with density requirements, shall be remixed prior to being placed in the paver hopper or insert by using an approved Materials Transfer Device. Information on approved devices can be obtained from the State Construction Engineer. Areas excluded from this requirement include: leveling courses, temporary work of short duration, detours, bridge replacement projects having less than 1,000 feet of pavement on each side of the structure, acceleration and deceleration lanes less than 1,000 feet in length, tapered sections, transition sections for width, shoulders less than 10 feet in width, crossovers, ramps, side street returns and other areas designated by the Engineer.

907-401.03.12--Joints. Delete the third paragraph of Subsection 401.03.12 on page 265 and substitute the following:

The contact surface of transverse joints and longitudinal joints in the surface lift, except hot joints, shall be sealed by spraying a thin, uniform coat of Pavon™, Crafco™ Pavement Joint Adhesive No. 34524, or approved equal, prior to placement of additional HMA against the previously placed material. Manufacture's recommendations shall be followed if the material needs to be re-heated, and when placing the thin, uniform coat.

Prior to application of the sealant, the face of the joint shall be thoroughly dry and free from dust or any other material that would prevent proper sealing. All joints shall be swept or blown free of loose material, dirt, vegetation, and other debris by means of compressed air or a power sweeper.

Truck and vehicle traffic shall not drive across a sealed joint until it has dried sufficient to prevent damage from tracking.

The Contractor shall furnish the Engineer three copies of the manufacturer's certification stating that the material used meets the requirement of the specifications.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-401-2 **CODE: (IS)**

DATE: 11/04/2005

SUBJECT: Hot Mix Asphalt (HMA)

Section 401, Hot Mix Asphalt (HMA) - General, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

Delete in toto Subsection 401.02.6.2 on pages 248 and 249, and substitute:

907-401.02.6.2--Assurance Program for Mixture Quality. The Engineer will conduct a quality assurance program. The quality assurance program will be accomplished as follows:

1) Conducting verification tests.
2) Validate Contractor test results.
3) Periodically observing Contractor quality control sampling and testing.
4) Monitoring required quality control charts and test results.
5) Sampling and testing materials at any time and at any point in the production or laydown process.

The rounding of all test results will be in accordance with Subsection 700.04.

The Engineer will conduct verification tests on samples taken by the Contractor under the direct supervision of the Engineer at a time specified by the Engineer. The frequency will be equal to or greater than ten percent (10%) of the tests required for Contractor quality control and the data will be provided to the Contractor within two asphalt mixture production days after the sample has been obtained by the Engineer. At least one sample shall be tested from the first two days of production. All testing and data analysis shall be performed by a Certified Asphalt Technician-I (CAT-I) or by an assistant under the direct supervision of the CAT-I. Certification shall be in accordance with the *MDOT HMA Technician Certification Program* chapter in the Materials Division Inspection, Testing, and Certification Manual. The Department shall post a chart giving the names and telephone numbers for the personnel responsible for the assurance program.

The Engineer shall be allowed to inspect Contractor testing equipment and equipment calibration records to confirm both calibration and condition. The Contractor shall calibrate and correlate all testing equipment in accordance with the latest versions of the Department's Test Methods and AASHTO Designation: R 18.

Random differences between the Engineer's verification tests and the current running average of four quality control tests at the time of obtaining the verification sample will be considered acceptable if within the following limits:

Item	Allowable Differences
Sieve - % Passing	
3/8-inch and above	6.0
No. 4	5.0
No. 8	4.0
No. 16, for 4.75 mm mixtures ONLY	3.5
No. 30	3.5
No. 200	2.0
AC Content	0.4
Specimen Bulk SG, Gmb @ N_{Design}	0.030
Maximum SG, Gmm	0.020

If four quality control tests have not been tested prior to the time of the first verification test, the verification test results will be compared to the average of the preceding quality control tests. If the verification test is the first material tested on the project or if a significant process adjustment was made just prior to the verification test, the verification test results will be compared to the average of four subsequent quality control test results. For all other cases after a significant process adjustment, the verification test results will be compared to the average of the preceding quality control tests (taken after the adjustment) as in the case of a new project start-up when four quality control tests are not available.

In the event that; 1) the comparison of the Contractor's running average quality control data and Engineer's quality assurance verification test results are outside the allowable differences in the above table, or 2) if a bias exists between the results, such that one of the results is predominately higher or lower than the other, and the Engineer's results fail to meet the JMF control limits, the Engineer will investigate the reason immediately. As soon as the need for an investigation becomes known, the Engineer will increase the quality assurance sampling rate to the same frequency required for Contractor testing. The additional samples obtained by the Engineer may be used as part of the investigation process or for routine quality assurance verification tests. The Engineer's investigation may include testing of the remaining quality control split samples, review and observation of the Contractor's testing procedures and equipment, and a comparison of split sample test results by the Contractor quality control laboratory, Department quality assurance laboratory and the Materials Division laboratory. The procedures outlined in the latest edition of MDOT's Field Manual for HMA may be used as a guide for the investigation. In the event that the Contractor's results are determined to be incorrect, the Engineer's results will be used for the quality control data and the appropriate payment for the mixture will be based on the procedures specified in Subsection 401.02.5.8(j).

The Engineer will periodically witness the sampling and testing being performed by the Contractor. The Engineer, both verbally and in writing, will promptly notify the Contractor of any observed deficiencies. When differences exist between the Contractor and the Engineer which cannot be resolved, a decision will be made by the State Materials Engineer, acting as the referee. The Contractor will be promptly notified in writing of the decision. If the deficiencies are not corrected, the Engineer will stop production until corrective action is taken.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-403-4

DATE: 02/12/2009

SUBJECT: Hot Mix Asphalt (HMA)

Before Subsection 907-403-05.2 on page 1, add the following:

Delete Subsection 403.03.5.5 on page 273 and substitute the following:

907-403.03.5.5--Preliminary Leveling. All irregularities of the existing pavement, such as ruts, cross-slope deficiencies, etc., shall be corrected by spot leveling, skin patching, feather edging or a wedge lift in advance of placing the first overall lift.

907-403.04--Method of Measurement. After the second paragraph of Subsection 403.04 on page 274, add the following:

Joint sealant will be measured by the linear foot for each joint sealed.

907-403.05--Basis of Payment. After the first paragraph of Subsection 403.05 on page 275, add the following:

Joint sealant will be paid for at the contract unit price per linear foot for each joint which shall be full compensation for furnishing the joint sealant material, cleaning the joint, applying the sealant, and for all equipment, tools, labor, and incidentals necessary to complete the work.

After the last pay item listed on page 276, add the following:

907-403-S: Joint Sealant for HMA - per linear foot or mile

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-403-4 **CODE: (IS)**

DATE: 11/04/2005

SUBJECT: Hot Mix Asphalt (HMA)

Section 403, Hot Bituminous Pavement, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-403.05.2--Pay Items. Add the "907" prefix to the pay items listed on page 275 & 276.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-407-1 **CODE: (SP)**

DATE: 02/26/2008

SUBJECT: Tack Coat

Section 407, Tack Coat, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-407.02.1--Bituminous Material. Delete the second sentence of the first paragraph of Subsection 407.02.1 on page 281, and substitute the following:

When not specified, the materials shall be as specified in Table 410-A on page 293.

907-407.03.3--Application of Bituminous Material. Delete the first paragraph of Subsection 407.03.3 on page 281, and substitute the following

Tack coat shall be applied with a distributor spray bar. A hand wand will only be allowed for applying tack coat on ramp pads, irregular shoulder areas, median crossovers, turnouts, or other irregular areas. Bituminous materials and application rates for tack coat shall be as specified in Table 410-A on page 293. Tack coat shall not be applied during wet or cold weather, after sunset, or to a wet surface. Emulsions shall be allowed to "break" prior to superimposed construction.

907-407.05--Basis of Payment. Delete the pay item at the end of Subsection 407.05 on page 282, and substitute the following:

907-407-A: Asphalt for Tack Coat * - per gallon

* Grade may be specified

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-630-6

DATE: 04/16/2009

SUBJECT: Contractor Designed Overhead Sign Supports

PROJECT: ITS-0210-00(017) / 105469301 & 302-- Forrest and Lamar Counties

After the last sentence of the sixth full paragraph of Subsection 907-630.01.1 on page 2, add the following:

The handrail for the catwalk shall be designed such that it can be lowered when it is not in use.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-630-6 **CODE: (SP)**

DATE: 04/02/2009

SUBJECT: Contractor Designed Overhead Sign Supports

PROJECT: ITS-0210-00(017) / 105469301 & 302-- Forrest and Lamar Counties

Section 630, Traffic Signs and Delineators, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-630.01--Description. Delete the last two paragraphs of Subsection 630.01 on page 454 and substitute the following:

The Contractor shall submit to the Bridge Engineer a design using steel. The design shall be a rectangular box truss connected at both the top and bottom to the vertical support posts. With the exception of cantilever mounts, overhead support structures shall have two vertical support posts at each end of the truss. Design drawings, calculations and other necessary supporting data shall be submitted as soon as possible after the Pre-Construction Conference. The design shall be prepared by a Professional Engineer registered in the State of Mississippi proficient in the design of overhead sign structures.

The design wind speed for all parts of the structure shall be as shown in the design specifications with a minimum of 120 mph. In addition to the loads required in the design specifications, overhead sign supports shall be designed to support a uniform load of 40 pounds per linear foot applied to the vertical truss to which the signs are attached, extending along the truss across the roadway below from points four feet outside each outer edge of pavement, unless otherwise specified. Appropriate damping or energy absorbing devices shall be installed in the event that an overhead structure is erected without installation of the permanent sign panels or if the area of permanent sign panels installed is not sufficient to prevent detrimental wind-induced vibration.

The larger of the following sign configurations shall be used in the design of overhead sign support structures:

1) The sign dimensions and configuration shown in the contract plans
2) Sign Height: 20 feet; Sign Width: Pavement Edge to Pavement Edge plus 6 feet
3) Sign Height: 20 feet; Sign Width: Post to Post Clear Spacing minus 60 feet

The sign widths in configurations 2) and 3) should be located symmetrically about the center of the truss.

901-630.01.1--Dynamic Message Sign Supports. In addition to the requirements above, supports for Dynamic Message Signs (DMS) shall also meet the following requirements.

The sign structure manufacturer shall consider truck induced wind loading in deflection calculations. The natural frequency response of the structure to truck induced wind loads when span type DMS structure are used shall be considered. More information can be obtained on this subject in the Transportation Research Board (National Research Council) "Truck Induced Wind Loads on Variable Message Signs", Research Record No. 1594, published in 1997.

The Contractor shall be responsible for the complete design of the structure, catwalk, footing, median barrier replacement, DMS attachments and all other related hardware.

Each structure shall be fully warranted for but not limited to rust, corrosion and structural failure as a complete assembly by the manufacturer.

The Contractor shall determine the actual span length and the actual length of support columns for all sign structures on the basis of existing field conditions and detailed survey completed by the Contractor.

All DMS over the roadway sign structures shall include a catwalk. The Contractor shall be responsible for the catwalk design and shall submit the design calculations to the Bridge Engineer for approval. For over the roadway signs, the catwalk shall span from the outside edge of the shoulder to the door on the DMS. The bottom of the catwalk shall be covered with a heavy galvanized wire mesh which shall have openings no larger than ¼ inch. The handrail for the catwalk shall be designed such that it can be lowered when it is not in use.

All pedestal mounted DMS sign structures shall consist of a single steel pole with the DMS centered over the front face of the pole. The top of the pole shall not extend above the top of the DMS.

Pedestal mounted structures shall also include a catwalk "Landing" area on the same side as the door of the DMS. This Landing area shall be of sufficient size and design to allow someone to stand on the landing area prior to opening the door and entering the walk-in structure. If a non-walkin DMS is provided, the pedestal mounted structure shall include a catwalk of sufficient length for the entire DMS to be serviced from the catwalk.

The Contractor shall be responsible for performing soil borings at each location to be used in the design of the foundations and sign supports. If soil conditions required the use of any shoring, casings, or sonotube for proper installation of the foundations, the cost of the shoring, casings or sonotube shall be included in the price of the structure.

907-630.04--Method of Measurement. After the last paragraph of Subsection 630.04 on page 463, add the following:

Pedestal Sign Supports will be measured per lump sum for each specific assembly.

907-630.05--Basis of Payment. After the first paragraph of Subsection 630.05 on page 463, add the following:

Pedestal Sign Supports will be paid for at the contract bid price per lump sum, which price shall include the support structure, foundations, catwalk, connection hardware, conduit on the structure and foundation, soil borings, sign and footing design, connections to the support structure, median barrier repair, required repaving around median barrier foundations and all work, equipment and appurtenances as required to have the structure complete, in place and ready for use. This price shall be full compensation for all labor, tools, materials, equipment and incidentals necessary to complete the work.

Add the "907" prefix to pay item nos. 630-I and 630-J on page 463.

After the last pay item listed on page 463, add the following:

907-630-M: Pedestal Sign Support ,* Contractor Designed - lump sum

* Assembly No.may be indicated

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-637-3 **CODE: (SP)**

DATE: 04/30/2009

SUBJECT: ITS Equipment Cabinets

PROJECT: ITS-0210-00(017) / 105469301 & 302-- Forrest and Lamar Counties

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 special provision 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.

This work may also include 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--General. The Contractor shall only 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.).

Equipment cabinets shall be furnished, configured and installed at locations as shown in the Plans. All equipment and materials for each specific location shall be furnished and configured as shown in the Plans.

Electrical system and components shall have UL-listings.

Unless otherwise specified, wire and cable shall be provided with stranded copper conductors, 75°/90° Celsius wet/dry rated insulation, and sized for the maximum voltage and current in the circuit.

907-637.02.2--Rail Mounted Components. Components specified as Rail-Mounted shall be DIN EN 50022 (NS35) component rails. 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. They shall be UL 1059, UL 486E, and NEMA ISC-4 rated.

Alternate Rail configurations may be submitted to the Engineer for consideration and approval.

907-637.02.3--Terminal Blocks and Component Terminals. Terminal blocks and component terminals shall be nickel-plated copper, copper alloy or brass.

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:

1. 120 VAC line/hot: black
2. 120 VAC neutral: white
3. 24 VDC positive: red
4. 24 VDC negative: gray
5. RS485 communications: orange
6. Ground: green or green/yellow

907-637.02.4--Door Locks. Door locks shall be provided 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. Two (2) keys shall be provided with each cabinet.

907-637.02.5--Labels. All cabinets shall be labeled with the agency name, device name and ID. 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 one (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.

All cabinets or enclosures shall be provided with a voltage label 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.

907-637.02.5--Type A Cabinet. All Type A cabinets shall be identical in manufacture and assembly, capable of supporting Radar Detection System units. A Type A cabinet shall be provided for outdoor use with a minimum NEMA 3R rating. The cabinet enclosure shall be manufactured from 0.125-inch aluminum. 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. The cabinet shall be intended for strapped pole-mounting; with all necessary mounting hardware, including ½-inch stainless steel mounting straps. The Type A cabinet enclosure shall be 18 inches (H) by 14 inches (W) by 8 inches (D) with a tolerance of $\pm$0.25 inches. Cabinet door shall reveal the entire front opening of the cabinet for accessibility. The hinge shall be designed to prevent the door from sagging. A single-piece 0.125-inch aluminum back panel shall be provided which covers 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. The cabinet shall be furnished with doorstops, which retain the doors open in a 90 degree and 120 degree positions. A grounding lug shall be provide on the back panel which is directly bonded to the back panel and capable of terminating #6 AWG wire.

907-637.02.5.1--RDS Communications Wiring. The 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-232 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.

907-637.02.6--Type B Cabinet. All Type B cabinets shall be uniform in manufacture and assembly, and 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. A complete Type B cabinet shall be an assembly consisting of a cabinet housing and electrical subsystems. Type B cabinet housing

shall conform 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.

907-637.02.6.1--Hardware. All mounting hardware necessary for base or pole mounting cabinets shall be provided as shown in the plans. As a minimum, three (3) ¾-inch stainless steel mounting straps shall be provided for pole mounted cabinets. Hooks shall be welded to the inside of each cabinet door for hanging a side-opening, opaque re-sealable, heavy-duty plastic documentation pouch with metal or hard-plastic reinforced holes for the door hooks. One pouch shall be provided with each cabinet.

A rack-mounted cabinet sliding storage drawer shall be provided in accordance with the following:

- Approximate exterior dimensions 1.75 inches (H) x 16 inches (W) x 14 inches (D).
- Telescoping drawer guides to allow full extension from the rack cage.
- Opening storage compartment lid to access storage space for cabinet documentation and other items.
- Supports a weight of 25 lb when extended.
- Non-slip plastic laminate surface attached to the compartment lid which covers a minimum of 90% of the surface area of the lid.
- Mounted in the rack cage with the bottom surface approximately 9 inches above the bottom of the rack cage.

Hardware shall include side panels within the two sides of the rack cabinet cage, inserted and fastened from the inside of the cage. The side panels shall be 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 cabinet door hinge side and by upper or lower as related to the sliding storage drawer. Upper right side panel (cabinet door hinge side of cabinet, above the drawer) and lower left side panel (opposite side from the cabinet door hinge side, below the drawer) are example side panel surface names. A 12-inch long DIN rail (for future components) shall be included and mounted in the horizontal and vertical center of the lower left side panel.

907-637.02.6.2--Electrical Subsystems. A Type B cabinet electrical subsystems meeting the following requirements:

1. Electrical distribution module which consist of a DIN rail-mounted 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. Two red, orange or green/yellow labels with minimum 0.25-inch lettering with the legend "300 WATTS MAX" permanently affixed to the receptacle. This receptacle is for technician use only and shall not be used to power equipment.
9. 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. 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.

907-637.02.6.3--Lighting Subsystem. A cabinet lighting subsystem shall be provided 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.

907-637.02.6.4--RDS Communications Subsystem. Where RDS are shown in the Plans, DIN rail-mounted components shall be provided 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 one (1) inch (W) X seven (7) inches (H) X seven (7) inches (D). The power supply shall be connect to the EQUIP POWER distribution block for 120VAC input.

2. Surge suppressor for a RS485 data signal, wired between the video encoder and the RDS units. 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 (in the RDS comm cable.

Interconnection wiring shall be provided between the RDS communications subsystem and the Terminal Server.

907-637.02.6.5--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 Installation Requirements. The cabinet shall be installed and configured as shown in the Plans.

All cabinets shall be bonded to the pole grounding lug with minimum #6 AWG stranded copper bare or green-insulated cabinet grounding wire. Alternately on existing poles only, the cabinet grounding wire shall be bonded to an existing pole grounding wire with a cast brass or copper alloy threaded compression connector within four (4) inches of the existing pole grounding lug.

Do not install electrical service or electronic devices in the cabinet or connect to the cabinet until ground testing has been successfully completed and accepted, and the cabinet ground connection has been installed.

A cabinet wiring and interface diagram shall be provided and included with each cabinet. The documents shall be stored in the cabinet door pouch which shall be a side-opening, re-sealable, opaque, heavy-duty plastic documentation pouch.

907-637.03.2--Type B. Equipment in the Type B cabinets shall be installed and configured 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.

Do not install electronic devices in the cabinet until electrical service has been installed and activated, and the cabinet ventilation fan is operational.

Type A network switches and video encoders shall be installed in the top most area of the cabinet rack. The equipment receptacles shall be used for power.

Supporting equipment/electronics for CCTV shall be installed 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.

Fiber drop panels shall be installed 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 for all equipment cabinets. The project testing program shall include but is not limited to the specific requirements in this subsection. All test results shall confirm physical and performance compliance with this Special Provision. All test results documentation shall be submitted to the Engineer within 14 days of completion of the tests. The Engineer will review test documentation.

907-637.03.3.1--Standalone Acceptance Test (SAT). A SAT shall be performed 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.

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.

The installation shall be visually inspected. The cabinet documentation shall be inspected.

Functional test of all cabinet equipment, including circuit breaker, receptacles, fan and thermostat, and lights and door switches shall be performed.

907-637.04--Method of Measurement. Equipment Cabinet of the type specified will be measured per each. Such measurement shall include all items necessary to complete the installation.

Equipment Cabinet will be paid per each as follows:

1) 40% of the contract unit price for delivery of the cabinet housings.
2) 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) 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.
4) Final 10% of the contract unit price upon Final System Acceptance.

ITS Equipment Cabinet modifications, complete in place, tested, and accepted, will be measured as unit quantities per each for a complete and operable unit in accordance with the contract provisions.

907-637.05--Basis of Payment. Equipment Cabinet, measured as prescribed above, will be paid for at the contract price per each, which price shall include furnishing and installing the equipment cabinet and all related material and equipment specified in the Plans and this specification, and all labor, system integration, testing, system documentation and miscellaneous materials necessary for a complete and accepted installation. The unit price shall also include but is not limited to the cabinet and all interior materials, mounting hardware, foundations and

bases, external conduit entrances including conduit bodies and nipples, electrical service and pole grounding terminations. This price shall be full compensation for all labor, tools, materials, equipment and incidentals necessary to complete the work.

Equipment Cabinet Modifications shall be paid for as each, which price shall include all materials, mounting hardware, fiber splicing identified in the contract for each cabinet being modified.

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. 907-639-5 **CODE: (SP)**

DATE: 05/06/2009

SUBJECT: ITS Equipment Poles

PROJECT: ITS-0210-00(017) / 105469301 & 302-- Forrest and Lamar Counties

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:

Delete in total Section 639 beginning on page 481, and substitute the following:

SECTION 907-639--ITS EQUIPMENT POLES

907-639.01--Description. This Section specifies the minimum requirements for poles and foundations furnished and installed to support Intelligent Transportation Systems (ITS) equipment. This work shall consist of assembling, constructing, erecting and installing ground-mounted equipment poles with foundations, and equipment poles attached to existing or proposed structures, in conformity with these specifications and in accordance with the design(s) shown on the plans or as directed.

907-639.02--Materials. The materials used in this construction shall conform to the general requirements of these specifications and the specific requirements set out hereunder.

907-639.02.1--Galvanized Steel Poles for Cameras. Ground-mounted camera poles and foundations, conduits, connections, clamps, anchor bolts, shoe bases and all other members shall be designed and fabricated in accordance with the standards and requirements listed below. Design and materials documentation shall be furnished as part of the approval request submittal. Certifications will be furnished upon request by the Engineer.

1) Poles shall be designed in accordance with the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals", current edition, including all interims and updates. Design life shall be 50 years for all poles. The design wind speed for all parts of the structure shall be as shown in the design specifications with a minimum of 120 mph. The pole shall meet design wind loading with camera(s) installed.
2) The Contractor shall submit manufacturer's shop drawings, layout drawings and specifications for equipment and appurtenances for approval by the Engineer no later than ninety (90) days after notice to proceed.
3) Pole fabricator shall be certified under Category I, "Conventional Steel Structures" as set forth by the American Institute of Steel Construction Quality Certification Program. Proof of this certification will be required.
4) All welding shall be in accordance with Sections 1 through 8 of the American Welding Society (AWS) DI. 1 Structural Welding Code. Tackers and welders shall be qualified in

accordance with the American Welding Society Structural Welding code. Tube longitudinal seam welds shall be free of cracks and excessive undercut, performed with automatic processes, and be visually inspected. Longitudinal welds suspected to contain defects shall be magnetic particle inspected. All circumferential butt welded pole and arm splices shall be ultrasonically and radio graphically inspected. All inspection records will be furnished to the Engineer.

5) Camera pole system shall consist of a pole, anchor bolts, base plate, ground rod array, communication and power conduits to nearest pull box, grounding conduit, spare conduit and foundation.

6) Design computations for the camera poles shall be complete and shall include but not be limited to the following:
   a. Consideration shall be given for all parts of the structure.
   b. Consideration shall be given for all possible loading combinations including wind and ice loads.
   c. Computations shall include design stresses and allowable stresses for all components which comprise the proposed structure.
   d. Top of pole deflection shall not exceed the following:
      1. one (1) inch deflection from center due to 30 mph (non-gust) winds for 50-foot poles;
      2. 1.5 inches deflection from center due to 30 mph (non-gust) winds for 80-foot poles; and
      3. 0.5% of pole height due to the design wind loading.
   e. All complete shop drawings and design computations shall bear the stamp of a Professional Engineer registered in the State of Mississippi.
   f. Shop drawings shall be approved by the Engineer prior to fabrication. Approval of the shop drawings does not relieve the Contractor of responsibility for the design, fabrication and erection of the structure.
   g. The Engineer reserves the right to reject a pole design if the calculated deflection exceeds that specified herein.
   h. The foundation design shall be based on actual soil conditions from soil borings conducted by the Contractor. The cost of the soil borings shall be included in the cost of the pole.
   i. The calculations shall include a pole, base plate, and anchor bolt analysis. The pole calculations shall be analyzed at the pole base, 5-foot pole intervals, and at each slip joint splice.

7) For each pole shown in the Plans, the following information shall be given:
   a. Top/bottom diameter, taper rate, wall thickness for each pole segment and section modulus, moment of inertia, and cross sectional area at each pole section.
   b. The centroid, weight, projected area, drag coefficient, velocity pressure, and wind force of each trapezoidal pole segment.
   c. The axial force, shear force, primary moment, total moment, axial stress, bending stress, allowable axial stress, allowable bending stress, allowable shear stress and combined stress ratio (CSR) at each pole section.
   d. The pole's angular and linear deflection at each section.

8) Pole Mounted Cabinet Access Conduit Nipple:
   a. Each pole will be manufactured with a 2-inch diameter rigid threaded nipple for conduit

connection to a pole-mounted cabinet.

b. The height of this nipple above the base of the pole shall be such that a cabinet mounting height of three (3) feet above ground can be provided.

9) Hand Holes:
   a. Hand hole openings shall be reinforced with 2-inch wide hot rolled steel bar. The opening shall be rectangular and 5-inch x 8-inch nominal.
   b. The cover shall be 11-gauge steel and shall be secured to a clip-on lock with a tamper-proof screw.
   c. The reinforcing rim shall be provided with a ½-inch tapped hole and ½-inch hex head cap screw for grounding.
   d. Hand holes on poles with pole-mounted cabinets and transformers shall be placed toward oncoming traffic. For all other poles, hand holes shall face away from traffic.
   e. Section at hand hole to be reinforced to have equivalent section modulus as the section without the hand hole.
10) Cable Supports (J-Hooks & Eyelets): Top and bottom J-hooks and eyelets shall be located within the pole directly aligned with each other.
11) Base Plate:
   a. Base plates shall conform to ASTM A572 (50 ksi min. yield).
   b. Plates shall be integrally welded to the tubes with a telescopic welded joint or a full penetration butt weld with backup bar.
   c. Plates shall be hot dip galvanized.
12) Anchor Bolts:
   a. Anchor bolts shall conform to the requirements of AASHTO M3 14-90 (105 ksi min. yield.). The upper 12 inches of the bolts shall be hot dip galvanized per ASTM A 153.
   b. Each anchor bolt shall be supplied with two (2) hex nuts and two (2) hardened washers.
   c. The strength of the nuts shall equal or exceed the proof load of the bolts.
   d. The top nut shall be torqued so as to produce 60% yield stress of anchor bolt.
   e. The Contractor shall not grout between bottom of base plate and top of concrete foundation.
13) Pole heights shall be as indicated on the plans.

907-639.02.2--Aluminum Poles for Detectors. Ground-mounted detector poles and foundations, conduits, connections, clamps, anchor bolts, breakaway bases and all other members shall be designed and fabricated in accordance with the standards and requirements listed below. Design and materials documentation shall be furnished as part of the approval request submittal. Certifications will be furnished upon request by the Engineer.

1) Poles shall be designed in accordance with the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals", current edition, including all interims and updates. Design life shall be 50 years for all poles. The design wind speed for all parts of the structure shall be as shown in the design specifications with a minimum of 120 mph. The pole shall meet design wind loading with detector(s) installed.
2) The Contractor shall submit manufacturer's shop drawings, layout drawings and specifications for equipment and appurtenances for approval by the Engineer no later than ninety (90) days after notice to proceed. Poles shall be spun or formed from aluminum

seamless tubing meeting requirements of ASTM Designation: B 210, Alloy 6063-T4 and after fabrication shall have mechanical properties not less than those specified for Alloy 6063-T6. The poles may also be formed from aluminum plates or sheets meeting the requirements of ASTM Designation: B 209, Alloys 5052-H34 or 5086-H34.

3) External surface of poles shall have a satin-type finish, clean and smooth, with all details defined and true to pattern.
4) Poles shall have a constant taper of 0.14 inch nominal per foot.
5) All poles shall be equipped with a breakaway device which conforms to the latest AASHTO and FHWA requirements, which have been approved by same. The Contractor shall submit a manufacturer's certification with the pole shop plans stating that the device meets, or exceeds, these standards.
6) Pole heights shall be as indicated on the plans.
7) Detector pole system shall consist of, but not be limited to a pole, anchor bolts, breakaway base, base plate, ground rod array, communication and power conduit to nearest pull box, grounding conduit, spare conduit and foundation as shown on the Plans.
8) Anchor bolts, washers and hex nuts shall be made of steel in accordance with ASTM Designation: F 1554, Grade 55, and shall be galvanized as per ASTM Designation: A 153. Anchor bolts shall be provided for each pole with two (2) hex nuts and washers per bolt. Anchor bolts shall be "L" shaped. A bolt layout template shall be provided by the manufacturer for proper bolt installation. The number of anchor bolts and design yield strength shall be as recommended by the manufacturer.

907-639.02.3--Foundations for Ground-Mounted Poles. Cast-in-place foundations for ground-mounted equipment poles shall be as specified on plans, and shall be cast of reinforced Class "B" Concrete conforming to the requirements of Sections 601 and 602. Anchor bolts, washers and hex nuts for use in the foundation shall conform to requirements set forth in these specifications. Conduit for electric cable and fiber optic cable shall comply with the requirements for such materials as set out in Subsection 722.05.

907-639,02.4--Structure-Mounted ITS Equipment Poles. Structure-mounted equipment poles and conduits, connections, clamps, mounting hardware and all other members shall be designed and fabricated in accordance with the standards and requirements listed below. Design and materials documentation shall be furnished as part of the approval request submittal. Certifications will be furnished upon request by the Engineer.

1) Poles shall be designed in accordance with the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals", current edition, including all interims and updates. Design life shall be 50 years for all poles. The design wind speed for all parts of the structure shall be as shown in the design specifications with a minimum of 120 mph. The pole shall meet design wind loading with all equipment installed.
2) The Contractor shall submit manufacturer's shop drawings, layout drawings and specifications for equipment and appurtenances for approval by the Engineer no later than ninety (90) days after notice to proceed.
3) Pole fabricator shall be certified under Category I, "Conventional Steel Structures" as set forth by the American Institute of Steel Construction Quality Certification Program. Proof

of this certification will be required.

4) All welding shall be in accordance with Sections 1 through 8 of the American Welding Society (AWS) DI. 1 Structural Welding Code. Tackers and welders shall be qualified in accordance with the American Welding Society Structural Welding code. Tube longitudinal seam welds shall be free of cracks and excessive undercut, performed with automatic processes, and be visually inspected. Longitudinal welds suspected to contain defects shall be magnetic particle inspected. All circumferential butt welded pole and arm splices shall be ultrasonically and radio graphically inspected. All inspection records will be furnished to the Engineer.

5) ITS equipment pole system shall consist of a pole, connectors, clamps, mounting hardware, ground wires and rods, grounding conduit, and communication and power conduits to nearest pull box.

6) Design computations for structure-mounted poles shall be complete and shall include but not be limited to the following:
   a. Consideration shall be given for all parts of the structure.
   b. Consideration shall be given for all possible loading combinations including wind and ice loads.
   c. Computations shall include design stresses and allowable stresses for all components which comprise the proposed structure.
   d. Top of pole deflection shall not exceed the following:
      1. One (1) inch deflection from center due to 30 mph (non-gust) winds;
      2. 0.5% of pole height due to the design wind loading.
   e. All complete shop drawings and design computations shall bear the stamp of a Professional Engineer registered in the State of Mississippi.
   f Shop drawings shall be approved by the Engineer prior to fabrication. Approval of the shop drawings does not relieve the Contractor of responsibility for the design, fabrication and erection of the structure.
   g. The Engineer reserves the right to reject a pole design if the calculated deflection exceeds that specified herein.
   h. The calculations shall include a pole, base plate, and anchor bolt analysis. The pole calculations shall be analyzed at the pole base, 5 foot pole intervals, and at each slip joint splice.

7) For each pole shown in the Plans, the following information shall be given:
   a. Top/bottom diameter, taper rate, wall thickness, section modulus, moment of inertia, and cross sectional area for each pole section.
   b. The centroid, weight, projected area, drag coefficient, velocity pressure, and wind force of each trapezoidal pole section.
   c. The axial force, shear force, primary moment, total moment, axial stress, bending stress, allowable axial stress, allowable bending stress, allowable shear stress and combined stress ratio (CSR) at each pole section.
   d. The pole's angular and linear deflection at each section.

8) Hand Holes:
   i. Hand hole openings shall be reinforced with 2-inch wide hot rolled steel bar. The opening shall be rectangular and 5-inch x 8-inch nominal.
   j. The cover shall be 11-gauge steel and shall be secured to a clip-on lock with a tamper-proof screw.

k. The reinforcing rim shall be provided with a ½-inch tapped hole and ½-inch hex head cap screw for grounding.
l. Section at hand hole to be reinforced to have equivalent section modulus as the section without the hand hole.

9) Cable Supports (J-Hooks & Eyelets): Top and bottom J-hooks and eyelets shall be located within the pole directly aligned with each other.
10) Pole heights shall be as indicated on the plans.

907-639.03--Construction Requirements. All equipment shall be installed according to the manufacturer's recommendations. Materials and associated accessories/adapters shall not be applied contrary to the manufacturer's recommendations and standard practices. ITS equipment pole systems shall be installed as indicated on the Plans and shall conform to the following requirements:

1) All poles shall be installed in accordance with the National Electric Safety Code and the latest AASHTO standards.
2) Foundations for ground-mounted poles:
   a. The Contractor shall submit a design for each pole foundation that has been sealed by a Professional Engineer registered in the State of Mississippi.
   b. Excavation for concrete foundations shall be opened vertically in accordance with the methods of Section 206 with a tolerance of plus two inches from neat lines and grades as shown on the Plans or required by local conditions. Adjacent earth shall be compacted sufficiently to withstand the loadings set out in Subsections 907-639.02.1 and 907-639.02.2.
   c. If soil conditions require the use of any shoring, casings, or sonotube for proper installation of the foundations, the cost of the shoring, casings or sonotube shall be included in the cost of the pole and foundation.
   d. Before placing concrete, the Contractor shall place reinforcing bars, conduit and anchor bolts, all in accordance with plan details, and held rigidly in place by approved methods.
   e. Concrete foundations shall be formed, cast and cured in accordance with the provisions of Section 601. The top surface shall be finished smooth, and sloped to drain.
   f. Concrete shall cure a minimum of seven (7) days before any load is applied to the foundation.
   g. Conduit shall be installed in the pole foundation for access and includes conduit to the nearest pull box as shown in the Plans.
   h. A minimum of one 2-inch spare conduit shall be installed in all pole foundations as shown in the Plans. Spare conduits in pole foundations shall be sealed with blank duct plugs.
3) Grounding System:
   a. The Contractor shall supply and install a grounding system with ground rod array at the base of all poles as shown on the Plans.
   b. The ground rod array system shall be connected to the pole through an appropriate ground clamp.
   c. A #6 AWG copper stranded bonding wire shall be installed between the pole and the field cabinet providing a common ground system for each site.

d. All ground bonding wires shall be un-spliced.

4) The installation method for the CCTV poles and cameras shall be such that the camera can be rotated as needed around the pole for optimum placement.

907-639.04--Method of Measurement.

907-639.04.1--Camera Pole with Foundation. Camera pole with foundation will be measured as a unit quantity per each. Such measurement shall include but is not limited to a steel pole, foundation, conduit inside foundation and to nearest pull box as indicated on the Plans, wiring between camera and field cabinet, connections to support structures, satisfactory completion of testing and training requirements, and all work, equipment and appurtenances as required to effect the full operation including remote and local control of the camera site complete in place and ready for use.

Progress payments may be measured in accordance with the following:

1) 25% of the contract unit price upon complete installation of foundations;

2) Additional 45% of the contract unit price upon delivery of poles or structure to the site; and

3) Final 30% of the contract unit price upon complete installation of pole system.

907-639,04.2--Detector Pole with Foundation. Detector pole with foundation will be measured as a unit quantity per each. Such measurement shall include but is not limited to an aluminum pole, breakaway base, foundation, conduit inside foundation and to nearest pull box as indicated on the Plans, wiring between detector and field cabinet, connections to support structures, satisfactory completion of testing and training requirements, and all work, equipment and appurtenances as required to effect the full operation including remote and local control of the detector site complete in place and ready for use.

Progress payments may be measured in accordance with the following:

1) 25% of the contract unit price upon complete installation of foundations;

2) Additional 45% of the contract unit price upon delivery of poles or structure to the site; and

3) Final 30% of the contract unit price upon complete installation of pole system.

907-639.04.3--Structure-Mounted ITS Equipment Pole. Structure-mounted equipment pole will be measured as a unit quantity per each. Such measurement shall include but is not limited to a steel pole; conduit between structure attachment location and nearest pull box as indicated on the Plans; wiring between pole-mounted devices and field cabinet; all structure-mounting hardware indicated on the Plans, and as otherwise needed for a complete and secure installation; satisfactory completion of testing and training requirements; and all work, equipment and appurtenances as required to effect the full operation including remote and local control of the ITS equipment site complete in place and ready for use.

907-639.05--Basis of Payment. Camera pole with foundation and detector pole with foundation, 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 excavating, backfilling, replacing sod, and for all constructing, placing, curing, erecting, installing, connecting and testing; for foundations, poles, pole bases, caps, covers, ground wire, ground rods, hardware and for all equipment, tools, labor and incidentals necessary to complete the work.

Structure-mounted equipment pole, 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 all constructing, placing, erecting, installing, connecting and testing, for poles, caps, covers, ground wire, ground rods, hardware and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

907-639-E: Camera Pole with Foundation, ___ Pole	- per each
907-639-F: Detector Pole with Foundation, ___ Pole	- per each
907-639-G: ITS Equipment Pole, Structure Mounted, ___ Pole	- per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-641-3 **CODE: (SP)**

DATE: 04/30/2009

SUBJECT: Radar Detection System (RDS)

PROJECT: ITS-0210-00(017) / 105469301 & 302-- Forrest and Lamar Counties

Section 907-641, Radar Detection System (RDS), is hereby added to and becomes a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-641--RADAR DETECTION SYSTEM (RDS)

907-641.01--Description. This special provision specifies the minimum requirements for Radar Detection Systems (RDS) furnished and installed on this project. The work shall consist of providing all labor, materials, equipment, and incidentals necessary to furnish, install, test, train and operate the RDS.

The RDS will provide roadway monitoring capabilities via microwave radar detectors. The data provided includes, but is not limited to, speeds, volume, lane occupancy and classification.

907-641.02--Materials.

907-641.02.1--Microwave Transmission. The microwave radar detector shall transmit in the 24 GHz frequency band (Center Frequency 24.125 GHz).. The RDS shall not interfere with any known equipment.

907-641.02.2--Area of Coverage. The RDS's field of view shall cover an area with a minimum detection range of 6 feet from the RDS and a maximum detection range of 250 feet from the RDS.

907-641.02.3--Detection Zones. The minimum number of detection zones defined shall be no less than ten (10) for simultaneous detection. The range resolution of each zone shall be no greater than 1.3 feet, and the zone width shall be user defined within a range of 6 to 20 feet for the area of coverage limits described above.

907-641.02.4--Capabilities. The RDS shall be a true presence detector. It shall be suitable for mounting on roadside poles or on overhead structure and provide the following:

1. Presence indication of moving or stopped vehicles in its detection zones, provided by contact closure to existing controllers.

2. Traffic data, periodically accumulated over user defined time intervals in a 10 to 600 sec range, shall be transmitted to the TMC via the communications network.

3. Traffic data shall be available simultaneously with detection zone contact closures and serial communications.

4. Side-fired configuration data shall include the following in each of up to ten (10) detection zones (lanes): Volume, lane occupancy, and average speed, as well as vehicle classification by length in up to 6 user-defined classes.

5. RDS in forward-looking configuration shall monitor traffic in one lane and be capable of providing the following data: Volume, occupancy, average speed and travel direction in the lane.

6. Furnish the unit with the required software for data collection, processing, configuration and set-up, and data logging and retrieval. An operator shall be able to use the software to set detector count periods, sensitivities, and other operational features and parameters. The software must be capable of providing both manual and automatic setup and calibration.

907-641.02.5--Measurement Accuracy. The following error levels shall be achievable and demonstrated during testing:

Parameter	Error Percentage
Volume	±8%
Average Speed	±10% or ±5 mph
Lane Occupancy	±10%

907-641.02.6--Environmental Conditions and Protection. Except as stated otherwise herein, the equipment shall meet all its specified requirements during and after subjecting to any combination of the following:

1. Ambient temperature range of -37° to +74°C
2. Relative humidity from 5 to 95 percent, non-condensing
3. Winds up to 90 mph (sustained) with a 30% gust factor
4. Rain and other precipitation up to 3.5 inches/hour
5. Power surge that meets the EN 61000-4-5 standards shall be included.

907-641.02.7--Mechanical. The microwave radar detector shall be enclosed in a rugged weatherproof box and sealed to protect the unit from wind up to 90 mph, dust and airborne particles, and exposure to moisture).

The mounting assembly shall have all coated steel, stainless steel, or aluminium construction, and shall support a load of 20 pounds. The mounting assembly shall be constructed in a manner to provide the necessary degrees of rotation to ensure proper installation.

907-641.02.8--Electrical. The RDS unit and power supply shall operate on 12 to 24 volt AC or DC or 115 or 220 VAC input voltage with power converter provided.. The AC to DC power converter shall be provided in the cabinet. The actual RDS shall consume less than 8 Watts with a DC input between 12VDC and 28VDC.

Surge Suppression shall be provided to protect the equipment from surges on the RDS power supply and the RS 232 or RS 485 communications wiring. Surge suppression shall meet all manufacturer recommendations

907-641.02.9--RDS Comm Cables. The RDS Comm Cable shall be a composite cable for power and communications. RDS Comm Cable shall be provided between the RDS and the cabinet located on the same pole as the RDS. This length of RDS Comm cable shall be included in the cost of the RDS and is not called out separately on the plans.

The plans also identify additional locations where RDS Comm Cable is measured and paid separately. These longer runs are between the standalone RDS and the closest Type B cabinet. These longer runs of RDS Comm Cable shall provide power and communications to the RDS. The size and design of this RDS Comm Cable shall meet manufacturers recommendations based on a maximum length of 4,000 feet from the RDS to the Type B cabinet. The same cable type shall be used at all locations.

Cable connectors and termination pin-out on all cables shall be in accordance with the manufacturer's recommendations.

Connection between the RDS and the cabinet equipment shall be provided by a single RDS Comm Cable using a single MS crimp multi-pin connector providing multiple options of power and output signals meeting all manufacturer's recommendations.

At a minimum, the RDS Comm Cable shall be outdoor wet/dry rated UV-resistant and provide multiple twisted pairs of stranded AWG wire size and materials as recommended by manufacturer based on specific field conditions.
The MS connector pins must be crimped to the cable conductors and assembled and tested by the manufacturer prior to installation and pulling of cable on site.

907-641.02.10--Electrical Isolation and Surge Protection. All communication and power lines, contact closures and the serial port shall be surge protected within the unit. Contact closures and the serial port shall be isolated. When RDS Comm cable lengths exceed 40 feet, surge suppression shall also be provided on each end of the RDS Comm Cable. All surge suppression shall meet RDS manufacturers recommendations for the specific field conditions present and shall be included in the cost of the RDS. . Surge protection shall be provided in a cabinet mounted on the same pole as the RDS. If the RDS is mounted on a CCTV pole, the surge protection shall be provided inside the Type B cabinet. If the RDS is mounted on a standalone pole, a separate fiberglass enclosure cabinet shall be provided. This cabinet size and design shall meet manufacturer recommendations and shall be included in the cost of the RDS.

Surge suppressor for the RS485 data signal, wired between the terminal server and the RDS units. 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

907-641.02.11--Data Interface. Data communications shall be full duplex asynchronous, configurable as:

1. The RDS shall include isolated Serial ports programmable to RS-232 or RS-485.
2. Both point-to-point and multi-dropped configurations shall be supported.
3. The RDS shall be upgradable (optional) to include integral 10/100 Base-T Ethernet supporting TCP, UDP, IP, ARP, ICMP.

907-641.03--Construction Requirements. The RDS shall be mounted in side-fired configuration on poles as shown in the Plans, using mounting brackets. The brackets shall be attached with approved 3/4-inch wide stainless steel bands.

The Contractor shall install the detector unit on a pole at the manufacturers recommended height above the road surface so that the masking of vehicles is minimized and that all detection zones are contained within the specified elevation angle as suggested by the manufacturer.

When installing a detector near metal structures, such as building, bridges, or sign supports, the sensor shall be mounted and aimed so that the detection zone is not under and does not pass through any structure to avoid distortion and reflection.

The RDS mode of operation, detection zones and other calibration and set up will be performed using an MS-Windows-based software and a Notebook PC. The software shall allow verification of correct setup and diagnostics. It shall include facilities for saving verification data and collected data as well as saving and retrieving sensor setup from disk file.

Unused conductors in the RDS Comm Cable shall be grounded or terminated in the cabinet in accordance with the manufacturer's recommendations. Terminated conductors shall be individually doubled back and taped, then loosely bundled and secured.

907-641.03.1--RDS Test Requirements. 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 Contractor is responsible for planning, coordinating, conducting and documenting all aspects of the Project Testing Program. The Project Engineer and/or the Project Engineer's representatives are only responsible for attending and observing each test, and reviewing and approving the Contractor's test results documentation. The Project Engineer and/or the Project Engineer's representatives reserve the right to attend and observe all tests.

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 Special Provisions or the Project Plans. Test procedures shall contain documentation regarding the equipment configurations and programming.

No testing shall be scheduled until approval of all project submittals and approval of the test procedures for the given test.

The Contractor shall provide all ancillary equipment and materials as required in the approved test procedures.

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.

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.

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 Manager.

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.

907-641.03.2--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.

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.

907-641.03.3--Warranty. The Radar Detection System shall be warranted to be free of manufacturer defects in materials and workmanship for a period of one year from the date of Final Acceptance. Equipment covered by the manufacturer's warranties shall have the registration of that component placed in MDOT's name prior to Final Inspection. The Contractor is responsible for ensuring that the vendors and/or manufacturers supplying the components and providing the equipment warranties recognize MDOT as the original purchaser and owner/end user of the components from new. During the warranty period, the supplier 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 supplier's factory or authorized warranty site. Products repaired or replaced under warranty by the supplier shall be returned prepaid by the supplier.

During the warranty period, technical support shall be available from the supplier via telephone within four hours of the time a call is made by the Department, and this support shall be available from factory certified personnel. During the warranty period, updates and corrections to control unit software shall be made available to the Department by the supplier at no additional cost.

907-641.03.4--MDOT Employee Training. The supplier of the Radar Detection System shall, at a minimum, provide a 4-hour operations and maintenance training class with suitable documentation for up to eight (8) persons selected by the Department. The training must include both classroom style training and hands-on training in the field of the maintenance and troubleshooting procedures required for the system. The training should also consist of a hands-on demonstration of all software configuration and functionality where applicable. The operations and maintenance class shall be scheduled at a mutually acceptable time and location.

907-641.03.5--Maintenance and Technical Support. The supplier shall maintain an adequate inventory of parts to support maintenance and repair of the Radar Detection System. The manufacturer of the Radar Detection System must provide, and have a parts support system capable of providing parts for a period of five (5) years from the date of system acceptance. Spare parts shall be available for delivery within 30 days of placement of an acceptable order at the supplier's then current pricing and terms of sale of said spare parts.

The suppliers shall maintain an ongoing program of technical support for the Radar Detection System. This technical support shall be available via telephone or via personnel sent to the installation site upon placement of an acceptable order at the supplier's then current pricing and terms of sale of said technical support services.

907-641.04--Method of Measurement. The Radar Detection System provided, constructed and installed as specified in the Plans will be measured in units of each, which shall include furnishing, installing, system integration and testing and training of a complete RDS including the unit, the RDS Comm Cable between the unit and the cabinet, pole mounted cabinet (except where Type B cabinet is required), surge suppressions, Communication Converters (if required), all conduit, risers and weatherhead between the RDS and the cabinet, interconnection wiring, power supply, surge suppression, connections to support structures (includes all incidental

components, attachment hardware, mounting brackets, mounting arms, bolts, or any other items to mount the RDS as intended), satisfactory completion of testing and training requirements and all work, equipment and appurtenances as required to effect the full operation including remote and local control of the RDS site complete in place and ready for use. The price bid 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 RDS.

The Radar Detection System will be measured for payment on a per each basis as follows:

- 30% of the contract unit price upon delivery to the site. Delivery cannot be more than 60 days before anticipated installation.
- 70% of the contract unit price upon complete installation and Stand Alone testing of the Radar Detection System
- 90% of the contract upon Conditional System acceptance.
- 100% of the contract unit price upon Final System Acceptance.

RDS Comm Cable, where specified in the plans, will be measured by the linear foot, measured horizontally along the conduit. Note that the RDS Comm Cable between the actual RDS unit and the cabinet on the same pole is NOT measured or paid separately and shall be included in the cost of the RDS.

907-641.05--Basis of Payment. Radar Detection System, 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, construction installation, connecting, testing, for all equipment, tools, labor, and incidentals required to complete the work.

RDS Comm Cable, measured as prescribed above, will be paid for at the contract unit price per linear foot, which price shall be full compensation for furnishing, installing, system integration, all connections and terminations, and testing of the RDS Comm Cable.

Payment will be made under:

907-641-A: Radar Detection System - per each

907-641-B: RDS Comm Cable - per linear foot

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-650-3 **CODE: (SP)**

DATE: 02/24/2009

SUBJECT: On-Street Video Equipment

PROJECT: ITS-0210-00(017) / 105469301 & 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 Dome 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.

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 Engineer for approval. This recording shall be in a format playable with Windows Media Player.
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 TSP and the Plans.

4) The Dome PTZ cameras shall be Analog and the Fixed cameras shall be Ethernet IP-based.
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) The CCTV PTZ Dome Cameras shall be capable of being remotely controlled and programmed.
8) All 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 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: 1/4 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) Sensitivity: The camera shall maintain usable video under both day and nighttime lighting conditions.
8) Video output synchronization shall be 2 to 1 interlace and will observe the NTSC (color) and EIA RS-170 (black and white) standards.
9) Resolution: 470 lines horizontal and 350 TV lines vertical, NTSC equivalent.
10) Signal-to-noise ratio: 48 dB, minimum with AGC off, un-weighted, and 4.5MHz filter.
11) 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) 3 Simultaneous Video Streams.
   a. Dual MPEG-4 (30 ips)
   b. Scaleable MJPEG
4) Internet Protocols: TCP, UDP (Unicast, Multicast IGMP), UPnP, DNS,
5) DHCP, RTP, NTP
6) Multilevel Password Protection.
7) EDR (Extended Dynamic Range).
8) C/CS Lens Mount.
9) Backlight Compensation.
10) Horizontal Resolution of 480 TV Lines.
11) Low Profile Top/Bottom Mount.
12) BNC Service Connector.
13) Resolution: 470 lines horizontal and 350 TV lines vertical, NTSC equivalent.

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 23X and a digital zoom of 8X, minimum.
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) Dome enclosure shall be secured with a mounting plate/attachment designed to withstand a 90mph sustained wind speed with a 30% gust factor.

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 Department for review and approval.
9) Protocols: CCTV cameras shall support 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) Connectors: Standard connectors compatible with communications and interface equipment/cables 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) The minimum fixed enclosure requirements include:
4) Sealed, pressurized enclosure that provides complete protection for the camera and lens assembly from moisture and airborne contaminants.
5) Environmental resistant and tamper proof meeting NEMA 4X or IP-67 rating requirements.
6) Environmental control shall be provided by nitrogen pressurization with a Schrader Valve for pressurization and purging. The enclosure shall be designed to be pressurized at 5 PSI of dry nitrogen. The notation "CAUTION – PRESSURIZED" shall be permanently printed on the rear plate of the enclosure and shall be clearly visible and readable.
7) An alarm shall be displayed under low-pressure conditions and displayed on the camera video. The low-pressure alarm shall be on/off selectable.
8) 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.
9) The enclosure shall assist in preventing lens fogging and effectively reduce internal temperatures.
10) The enclosure shall minimize glare and provide overexposure protection for the camera when pointed directly at the sun.
11) The enclosure shall be equipped with a heater, a defroster and a thermostat.
12) The camera equipment inside the dome enclosure shall meet all its specified requirements when operating under the following conditions:
13) 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.
14) Relative Humidity: 5% and 95%, non-condensing.
15) Total weight of CCTV cameras (including the housing, sunshield, and all internal components shall be less than 18 pounds.

The enclosure shall be secured with a mounting plate/attachment designed to withstand a 90mph sustained wind speed with a 30% gust factor.

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.

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 (Ω), 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

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

1) Materials and associated accessories/adapters shall not be applied contrary to the manufacturer's recommendations and standard practices.
2) Shall include all materials needed to permanently mount the CCTV camera to the support structure as indicated in the plans.
3) 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.
4) Verify all wiring meets NEC requirements where applicable.
5) All above requirements apply to both new CCTV sites as well as sites where an existing CCTV is being replaced under the contract.

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.

a) The Contractor is responsible for planning, coordinating, conducting and documenting all aspects of the Project Testing Program. The Project Engineer and/or the Project Engineer's representatives are only responsible for attending and observing each test, and reviewing and approving the Contractor's test results documentation. The Project Engineer and/or the Project Engineer's representatives reserve the right to attend and observe all tests.

b) 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.

c) No testing shall be scheduled until approval of all project submittals and approval of the test procedures for the given test.

d) The Contractor shall provide all ancillary equipment and materials as required in the approved test procedures.

e) 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.

f) 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.

g) 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 Manager.

h) 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.

i) 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.

j) 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.

907-650.04--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, 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.

The On-Street Video System will be measured for payment per each 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) Additional 40% of the contract unit price upon approval of Stand Alone Acceptance Test results.

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

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. Required cabinet facilities, including transformer and/or disconnects, will not be measured for separate payment.

Payment will be made under:

907-650-A: On-Street Video Equipment * - per each

* Type may be specified as an option

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-655-1 **CODE: (SP)**

DATE: 04/30/2009

SUBJECT: Highway Advisory Radio

PROJECT: ITS-0210-00(017) / 105469301 & 302-- Forrest and Lamar Counties

Section 907-655, Highway Advisory Radio, 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 907-655--HIGHWAY ADVISORY RADIO

907-655.01--Description. This Special provision describes furnishing, installing and integrating a Highway Advisory Radio (HAR) System. The work consists of providing all labor, materials, equipment, and incidentals necessary to furnish, install, test, and make functional the HAR System. The work includes complete Federal Communications Commission (FCC) licensing services and all documentation necessary to operate and maintain the equipment.

The HAR System will provide broadcast up-to-the-minute AM radio traffic advisories and be equipped to allow messages to be changed or transmitted via the communications system.

907-655.02--Materials.

907-655.02.1--General. A HAR system shall consist of but is not limited to the following components and materials:

1. AM radio transmitter,
2. Digital recorder/player,
3. Global Positioning System (GPS) synchronizer,
4. National Oceanic and Atmospheric Administration (NOAA) weather receiver,
5. HAR cabinet,
6. Antenna mounting pole,
7. Antenna and grounding,
8. Power distribution / supply,
9. Battery backup system with recharging subsystem,
10. Surge protection,
11. HAR flashing beacons and remote pager control, and
12. Communications and control center (hardware and software) equipment.

907-655.02.2--System Capabilities and Performance Requirements. Overall system capabilities and performance requirements include the following:

1. Each HAR subsystem shall have a minimum coverage radius of 4 miles for broadcasting messages to motorists.
2. The network of HAR subsystems shall be synchronized to provide seamless message receptions from one transmission area (zone) to another.
3. System shall provide digital message recording and storage capabilities.
4. Provide National Weather Service (NWS) transmission/broadcast capabilities.
5. Each HAR transmitter shall be capable of being controlled through both a dial-up phone line and through an Ethernet port.
6. Messages to each HAR transmitter shall be through an Ethernet port.
7. Provide battery back-up power for a minimum of 72 hours without primary power source.
8. Provide HAR advisory static signs, flashing beacon lights, solar power subsystem, and pager-based control of the flashing beacon lights.
9. All HAR structures, including the antenna, shall be able to withstand a steady-state 90-mile per hour (mph) wind with ½-inch ice buildup.

907-655.02.3--General Requirements. General HAR system requirements include the following:

1. The Contractor is responsible for determining and providing any other equipment that is needed for safe and reliable operation of the HAR system.
2. Prototype equipment will not be acceptable.
3. HAR electronics shall be of solid-state design and modular construction.
4. The HAR system consisting of transmitters, digital recorder players, digital communications controllers, GPS synchronizers, power supplies, and NOAA receiver shall be provided, integrated, and warranted by a single HAR vendor.

907-655.02.4--Frequency Selection and FCC Licensing Services. The Contractor shall determine optimal HAR operational frequency and provide complete and comprehensive FCC licensing services which includes the following:

1. The Contractor is responsible for obtaining all required licenses on behalf of the Department, for the Department to operate the HAR stations.
2. The Contractor shall also perform all necessary testing to select the clearest and most appropriate operating frequency for all HAR transmitters at the proposed locations.
3. All transmitters shall operate at the same frequency. Frequency selection shall be submitted to the Department for approval prior to application for FCC licenses.
4. The Contractor shall provide all location maps, field strength contour maps, engineering drawings (identifying adjacent commercial stations and other possible HAR system using FCC data bases), and paperwork necessary as part of the FCC licensing process.
5. All FCC licensing effort shall be coordinated with MDOT.

907-655.02.5--Standards. All materials, equipment, supplies, installations and testing shall comply with the project requirements, the latest editions of the following standards and industry practices, as applicable, and all other standards and requirements, industry practices, and any state and local codes or ordinances that may apply.

1. Standards and industry practices shall include, but not be limited to, the following:
    a. Federal Communications Commission (FCC) regulations
    b. National Electric Code (NEC)
    c. Underwriters' Laboratories Inc. (UL)
    d. National Electrical Manufacturer Association (NEMA)
    e. Institute of Electrical and Electronic Engineers (IEEE)
    f. American Society of Testing and Materials (ASTM)
    g. American National Standards Institute (ANSI)
    h. Lightning Protection Institute (LPI)
    i. National Electrical Safety Code (NESC)
    j. Occupational, Safety, and Health Act (OSHA)
2. All materials, equipment, accessories and components that are not in accordance with the specific standards and requirements shall require approval by the Department. The Contractor shall bring any conflicts between referenced industry specifications and this Special Provision to the attention of the Department.
3. The Contractor shall use the latest version of referenced industry specifications, standards, and practices in force and in existence as of this project's advertisement date unless otherwise noted.
4. The Contractor shall acquire and use all applicable manuals, guidelines, and standards and practices that apply to the design, construction, and testing activities required to complete this project.

907-655.02.6--AM Transmitter. The transmitter subsystem shall meet the following minimum specifications:

1. The transmitter shall be FCC certified under CFR Title 47, Section 90.242 and conform to the Traveler Information Service (TIS) requirements in the United States.
2. Capability for adjustment of RF output power and audio input levels through easily accessible controls.
3. A provision for automatic station identification (Automatic ID) shall be included.
4. The HAR AM transmitter unit shall meet the following minimum requirements:
    a. Operational Frequency Range: 530 kHz to 1700 kHz inclusive
    b. Modulation Type: Amplitude Modulation (6A3)
    c. Transmitter Amplifier Type: High Efficiency Class D (80% or Better)
    d. Radio Frequency Output Power: Adjustable up to 10 Watts
    e. RF Output Impedance: 50 Ohms
    f. Frequency Stability: ±0.002 % (20 PPM) from 32° to 95°F or provided by phase locking to GPS.
    g. AF Input Impedance: Both, 600-Ohm and Hi "Z" (Match Digital Recorder)
    h. Audio Frequency Response: 20 Hz to 15 kHz $\pm$1.0 dB maximum
    i. Audio Distortion: Less than 1.5% from 200 Hz to 3.5 kHz
    j. Modulation Limiter: Built-in 100% peak modulation limiter
    k. Audio Filter: Built-in FCC compliance audio filter (-3dB at 3kHz, 18dB/octave roll-off)
    l. Audio Noise Level: At least 70 dB below 80 percent modulation level
    m. Operational Temperature Range: -22° to +165°F

n. Operational Humidity: 0% to 95% non-condensing

907-655.02.7--Digital Recorder / Player. A Digital Recording Unit shall be provided with the following minimum features/functions and specifications:

1. Digitally record and store messages, or audio files.
2. Provide direct, local and remote control of all functions.
3. Provide security access codes for local and remote operations.
4. Interface: Provide capability for interfacing with a dial-up phone line and an 10/100 Base-T Ethernet network supporting TCP/IP.
5. Provide capability for scheduling of automated broadcasts by day, week, month, year, and time.
6. Store a minimum of 250 distinct digital messages or audio files, with variable length messages, which can be recorded, stored, or deleted independently.
7. Provide a minimum of 80 minutes of total recording time.
8. Sequences of up to 100 messages shall be possible
9. Up to 20 message sequences that can be stored and selected.
10. Allow the recording of a message while another message is being recorded. (Simultaneous record/playback).
11. Allow for multiple modes of operation including:
    a. Transmitter on or off
    b. Record a message and monitor the recorded message
    c. Play pre-recorded message(s) by inputting codes
    d. Emergency broadcast mode (Live messages)
    e. NOAA Weather Radio broadcast when emergency alert system event code is activated
12. Provide capability for message retention (indefinitely) without the use of a battery, in the event main site power is lost.
13. Provide the capability for automatic call-sign announcement.
14. The Digital Recorder/Player shall be capable of providing Standard DTMF tones as applicable
15. AF Input Impedance: both, 600-Ohm and Hi "Z" (Contractor shall provide a compatible microphone)
16. Audio Frequency Response: 20 Hz to 15 kHz $\pm$1.0 dB maximum
17. Audio Distortion: Less than 5% @ from 200 Hz to 3.5 kHz
18. Modulation Limiter: Built-in 100% peak modulation limiter
19. Temperature: -22° to +165°F; Humidity: 95% non-condensing

907-655.02.8--Simulcast Synchronization. The HAR synchronization subsystem shall meet the following minimum requirements:

1. The system shall be prepared to be part of a wide area broadcasting system with other HAR transmitters as shown in the Plans of the same type for simultaneous broadcast of messages in a synchronized system.
2. This feature shall avoid interference or audio distortion within possible overlapped areas.

3. Each synchronized HAR system shall be equipped with a GPS synchronizer, which shall provide the capability to phase-lock the transmitters to a common reference carrier to minimize heterodyne.
4. The GPS Synchronizer subsystem shall have been successfully tested in conjunction with the transmitter and certified by the FCC in accordance with the provisions of FCC Section No. 90.242.

907-655.02.9--NOAA Weather Receiver. The Contractor shall provide a weather receiver unit meeting the following requirements:

1. Shall receive up-to-the-minute information directly from the National Weather Service (NWS).
2. The unit shall work in conjunction with the HAR digital recorder/player to automatically interrupt the current message being broadcast upon receipt the Emergency Alert System (EAS) event codes from NOAA.
    a. The system shall have fully programmable EAS entry capability allowing the Department to select only the alerts they specifically need for this specific area and application.
3. The Alert feature (on/off) as well as the feature to set the duration for broadcasting the alert, shall be selectable from within the digital recorder/player's voice prompts
4. The NOAA Weather Receiver module shall comply with the following functionality and requirements:
    a. Component shall provide selectable frequencies that are selectable through a series of dip switches or push-buttons
    b. The weather receiver shall provide internal speaker and headphone jack
    c. Weather alert shall detect 1050 Hz alert tones
    d. Component shall provide antenna and required cabling
5. The system shall also automatically activate all flashing beacons whenever a NOAA weather message has been broadcast.

907-655.02.10--HAR Transmitter Cabinet. All HAR shall be designed to operate inside the cabinet described herein. The Contractor shall provide a ground-mounted cabinet for each HAR station. The HAR cabinet shall be included in the cost of the HAR system and shall meet the following minimum specifications:

1. The HAR cabinet shall be approximately the same size as a Type C cabinet as indicated in the Plans.
2. The HAR electronic components shall be housed in a locking, weather resistant, aluminum cabinet that shall completely protect the equipment.
3. The HAR cabinet shall be a NEMA 3R rated aluminum enclosure. It shall provide protection from falling dirt, rain, sleet, snow, windblown dust, splashing water, vandalism and will be undamaged by the external formation of ice on the enclosure.
4. The complete cabinet / enclosure shall be constructed from 0.125-inch thick aluminum alloy type 5052-H32 to provide strong and rigid construction. All exterior seams shall be ground smooth or sealed weather-tight.

5. The door frame/opening shall be designed to help prevent dust and liquids from dropping in the cabinet when the door is opened.
6. The cabinet shall be equipped with adjustable mounting channels to provide versatile positioning of shelves or optional panels or rack mounting angles.
7. The cabinet / enclosure door shall be lockable and provisions for cabinet door handle padlocks shall be included.
8. Provide with an AC power service panel and ground bus.
9. The cabinet shall include a thermostatically controlled ventilation fan to adequately remove heat within the cabinet to prevent performance degradation and reduced reliability. Ventilation fan and filter louver shall be screened against the entrance of dust and foreign matter. A replaceable filter for incoming air shall be provided. The fan shall include a resistor-capacitor network noise suppressor installed across the fan motor power terminals.
10. The cabinet shall include a fluorescent lighting fixture, minimum 15 watts, 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. The light shall be door switch controlled. The light shall include a resistor-capacitor network noise suppressor installed across the light fixture power terminals.
11. Provide sunshields and mounting fasteners on all HAR transmitter cabinets. Sunshields and fasteners shall meet the following minimum requirements:
    a. Sunshields shall be 0.125-inch aluminum with smoothed, deburred edges and rounded corners. Provide cutouts for door handles and/or locks as required.
    b. Cabinets shall be equipped with press-in threaded inserts on the cabinet interior. Sunshields shall be mounted by fasteners and aluminum or stainless steel standoffs tightened into the threaded inserts. Provide a minimum of four inserts/fasteners for top face sunshields.
    c. Provide a minimum of six inserts/fasteners for any door or side sunshield.
    d. For doors or sides greater than 54 inches tall, provide inserts and fasteners sufficient for a maximum vertical or horizontal distance of 27 inches between any fasteners.
    e. Furnish and install a top face sunshield on all cabinets.
    f. Furnish and install door or side sunshields on any cabinet face that is within 60 degrees in either direction of due south. A minimum of two door or side faces shall have sunshields on any cabinet. A cabinet with a face exactly perpendicular to the south shall have three shields.
12. Provide agency name, device name and ID labels on all cabinets. Labels shall meet the following minimum requirements:
    a. Labels shall be flat black lettering on a reflective white background. Lettering shall be a minimum of 1 inch in height.
    b. Labels shall be manufactured from pre-coated adhesive backed reflective sheeting material meeting the minimum requirements of AASHTO M 268, Type 1.
    c. The agency name labels shall be "MDOT ITS" in one continuous adhesive sheet.
    d. The device ID labels shall include the device name as an acronym and a hyphen, and shall be one continuous adhesive sheet.
    e. The device ID shall be numerals corresponding to the location and shall be installed adjacent to the acronym sheet.

f. The device ID labels shall also include large 3-inch letters on the side of the cabinet that the ground plane is located that states "WARNING: GROUND PLANE LOCATED XXX' FROM CABINET. NO DIGGING"
g. 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.

13. Provide a voltage label on all HAR transmitter cabinets in accordance with the NEC labeling requirements. Voltage labels shall meet the following minimum requirements:
    a. Labels shall be flat black lettering on a reflective yellow background. Lettering shall be a minimum of 1 inch in height.
    b. Labels shall be manufactured from pre-coated adhesive backed reflective sheeting material meeting the minimum requirements of AASHTO M268 Type 1.
    c. Labels shall include the voltages entering the cabinet and shall be one continuous adhesive sheet. Examples are "120VAC" or "120/240VAC".
    d. Labels shall be installed on all cabinet doors.
14. Provide door locks for all HAR transmitter, pager controller and solar power/battery cabinet doors all keyed to the same master. Provide one key with each cabinet.

907-655.02.11--Mounting Pole. The mounting pole shall meet the following minimum requirements:

1. The antenna shall be mounted on a freestanding, vertical pole support utilizing adequate antenna mounting hardware.
2. All mounting hardware used shall be stainless steel except for the anchor bolts, which shall comply with the Plans.
3. The combined height between the pole support and the tip of the antenna element shall not exceed 49.2 feet in height from ground level in order to comply with FCC regulations.
4. The antenna pole support shall have the following physical characteristics:
    a. Structurally constructed in one continuous piece
    b. Standard 30 to 35 foot wooden or fiberglass utility pole
    c. Withstand severe weather and heavy winds of >90 mph
5. Foundation of the antenna pole shall conform to the detail requirements in the Plans.

907-655.02.12--Antenna Subsystem. The antenna subsystem consists of an antenna and its grounding components and shall meet the following minimum requirements and features:

1. Omni-directional, vertically polarized antenna providing high efficiency with low radiation angle performance.
2. Manufactured for and tuned to the same frequency as the transmitter.
3. Provide an Effective Isotropic Radiated Pattern (EIRP) of 2.0 mV/m @ 1.5Km (0.93 miles) per FCC regulations.
4. Provide an overall Voltage Standing Wave Ratio (VSWR) 1:4 or better with direct feed (without antenna tuner).
5. Provide direct base feed, center coil loaded.

6. Antenna length will depend on final selected frequency – approximately 15 feet will be required for 1700 kHz and 25 feet for 530 kHz. The total antenna height (tip) above ground including the mounting pole shall not exceed 49.2 feet as per FCC regulations.
7. Antenna shall be constructed from anodized aluminum with adjustable tip to minimize the standing waves.
8. Antenna subsystem shall be self-supporting and capable of withstanding severe weather conditions with winds of up to 90 miles per hour (steady state) with ½-inch of ice build-up.
9. Antenna subsystem shall include all hardware, mounts, surge protectors, and ground terminals in cabinet/enclosure for a complete subsystem.

907-655.02.13--Grounding. The Contractor shall document and submit to the Department for review and approval, an antenna/grounding subsystem design for this project that meets the following minimum grounding requirements:

1. The antenna/grounding design shall be provided for each proposed HAR site taking into account local site conditions, soil conditions, antenna type and exact location, along with the ground plane designed.
2. The HAR antenna/grounding design and design submittal shall be either conducted by or signed off by the HAR equipment manufacturer. The submittal shall include antenna and grounding details showing design configuration and proposed equipment and materials, supporting design calculations, recommended installation methods/procedures to be utilized, and equipment and proposed material specifications / cut-sheets.
3. The HAR antenna subsystem shall be provided with an efficient ground plane properly tuned to the operational frequency and ground/soil type and conditions.
4. The Contractor shall be responsible to provide a grounding system that provides the overall HAR system performance as described herein.
5. The grounding subsystem shall consist of a set of horizontal radials of heavy gauge wire or radial loops extending outward from the base of the antenna to ensure proper grounding and performance requirements.
6. An alternate ground system method and configuration may be designed and submitted as part the HAR grounding subsystem design submittal depending on site conditions to the Department for review and approval prior to construction.
7. Regardless of the grounding type; the Contractor shall be responsible for providing a complete grounding subsystem that supports the minimum 4-mile transmission radius system performance as described herein.
8. Care shall be taken to minimize disruption to the existing landscape and to avoid possible underground utilities or conduits. After installation the landscape of the site shall be restored to the state that it was in prior to installation of the ground system.

907-655.02.14--Power Supply/Regulation. The power supply subsystem shall meet the following minimum specifications:

1. The equipment proposed shall be capable of operating from a primary power (115-volt, 60 Hz.) source.
2. The equipment shall have fuse protection against internal short circuit and power surges.

3. The electrical power distribution and regulation/conditioning shall be supplied with a power subsystem equipped with an automatic power transfer switch to the battery back-up system for power failure management or equivalent method. The subsystem shall have no interruptions of power or spikes.
4. Provide low voltage battery protection capability.
5. Provide power regulation/conditioning: ±3% output voltage regulation with input voltage variations ±15%. Provide noise attenuation and harmonic filtering
6. The subsystem is responsible for distribution of the power required to all components of the HAR system. It shall have built-in visual indicators to show power and alarm status at a minimum.

907-655.02.15--HAR Back-up Battery System. The battery backup system shall meet the following minimum specifications:

1. The Contractor shall provide a battery backup system that will provide sufficient battery power to operate all components of the HAR subsystem, including the AM transmitter operating at 10 watts full power output, for minimum of 72 hours (3 days) without normal 115-volt primary power or other external service.
2. The current draw of each component of the HAR subsystem including the AM transmitter, digital recorder/player, communications equipment and any other electrical loads present during operation shall be measured and provided by the Contractor to the Department for verification of proper sizing of the back-up battery system.
3. The back-up system shall have an automatic charging unit and power changeover with no interruption to HAR transmissions. The system shall also include automatic charging circuitry to prevent overcharging and thermal (overheat) protection.
4. Batteries shall be maintenance free, industrial, deep-cycle gel cell or absorbed glass mat (AGM) type.
5. The battery charger shall trickle charge the batteries from the normal 115-volt primary power.
6. The back-up system shall not overcharge the batteries and shall include a load controller and a charge regulator in addition to automatic battery temperature compensation. Provide a method (voltmeters, ammeters) to indicate the current state and rate of charge of the batteries.
7. One set of rechargeable batteries shall be furnished for each local transmitter included in this project.
8. A separate NEMA 3R aluminum, weather resistant cabinet/enclosure, located adjacent to the HAR cabinet, shall be included for housing the battery back-up system components. Cabinet shall be lockable.

907-655.02.16--Antenna Cabling. The antenna cabling shall meet the following minimum specifications:

1. The Contractor shall use high quality, low-loss transmission cable to connect the antenna, inline lightning suppressor, and transmitter. Belden 9913 or Times LMR-400 low-loss coaxial cable or equivalent.

2. The coax cable shall be recently manufactured and certified for having factory testing performed to verify the cable design characteristics.
3. The Contractor shall provide weatherproofing for the transmission cable/connector ends, suitable for direct environmental exposure.

907-655.02.17--Surge Protection. The HAR system shall be provided with surge protection on all input and output audio lines, antenna lines and power feeds, in order to protect the equipment during inclement weather conditions and common transients (transient voltage surges and induced current) along the primary power source.

The surge protection equipment shall meet the following minimum requirements:

1. The surge protectors shall include but are not limited to the following types and requirements:
2. Power Line Surge Protector Response: Surge suppression in cabinet shall meet all equipment manufacturers recommendations.
3. Antenna Surge Projector Response: <4.0 ns @ 18,000 Amp
4. All surge protection devices shall be UL listed.
5. Radio surge protectors shall introduce low insertion losses (≤0.1 dB)

907-655.02.18--HAR System Software Application. Provide a network-ready, client-server HAR control and monitoring application software package that operates over the network the existing TMC Network.

HAR Client Software Requirements. The HAR software application shall provide centralized operator control and monitoring of dispersed HAR and flashing beacon subsystems with the following minimum features and capabilities:

1. Shall be responsible for serving as the user interface to view and control the HARs.
2. Shall be installed on each of the existing TMC workstations.
3. Shall allow the TMC Operator to select, display, schedule, and modify messages, transmit messages, list diagnostic information, and control of HAR field stations via the network.
4. Shall support message recording through external audio sources and by a microphone via audio line inputs in the workstations.
5. Shall support review, selection, scheduling and playback of recorded messages from a HAR message library.
6. Shall support control of flashing beacons over a pager subsystem.
7. Shall provide for multiple modes of operation as follows:
    a. Transmitter control
    b. Record and monitoring of messages
    c. Playing of pre-recorded messages
    d. Emergency broadcast mode (live)
    e. NOAA weather radio broadcast when alert is activated.
8. Shall provide the capability for user-definable HAR groups and HAR Sign groups that will allow the user to execute commands on the entire Group with a single command.

9. Shall provide status information based on control commands sent to indicate which HAR Signs with Flashing Beacons are currently activated.
10. Shall be capable of to importing audio files created externally and log updates
11. Shall be capable to convert typed text into voice that can be used for a clear understandable message.

HAR Server Software Requirements. The HAR Server is responsible for management of all HAR device configuration and communications. The HAR Server Software shall meet the following minimum requirements:

1. Shall support control of flashing beacon controllers over a pager subsystem.
2. Shall support and be licensed for a minimum of fifteen (15) HAR clients.
3. Shall support up to 40 HAR stations on a single server without additional software or upgrades. The Contractor shall provide a current HAR Server software license for a minimum of 10 HARs.
4. Shall allow devices to be added, removed or modified any time after the initial software installation and configuration.
5. Shall generate a dynamic geographic map viewable from the HAR Clients. The map shall include the following features:
    a. Displays icons for HARs and HAR Signs with Flashing Beacon locations.
    b. Capability to zoom in or out.
    c. When a HAR location is selected, associated HAR Sign with Flashing Beacons shall be highlighted.
    d. Shall allow the capability for placing dynamic icons representing installed HARs and Flashing Beacons in their appropriate locations.
    e. Other ITS device icons shall be statically placed on the same site map for TMC Operator reference.
6. All software configurations shall be through a graphical user interface.
7. Shall prevent more that one user to simultaneously control the same HAR or HAR groups.
8. Shall support communication to HAR transmitters through dial-up lines and through the Ethernet network.

HAR Software System Configuration. The Contractor shall fully configure the HAR Control System for operation. At a minimum, this shall include:

1. Install and configure map of the project area with HAR locations and HAR Sign locations. The map image must be approved by the Engineer prior to installation and configuration.
2. Configure the HAR Server communications and establish and test service to all HAR and HAR signs.
3. Install and configure all HAR stations and flashing beacon controllers.
4. Configure a minimum of fifteen (15) users (provide capability to support local and remote users).
5. Duplicate configurations shall be made at both the Regional TMC location and the Statewide TMC location in Jackson, MS.

Hardware Requirements. The Contractor shall provide and configure one server at the Regional TMC and another server at the Statewide TMC in Jackson, MS. The server shall meet or exceed the minimum server requirements specified by the HAR software vendor.

907-655.02.19--HAR Flashing Beacons and Pager Control Subsystem. The flashing beacon and pager-based control subsystem shall meet the following minimum requirements:

1. The Contractor shall be responsible for establishing and setting up an account with a local Service Provider providing paging services as required for the HAR subsystem operations. All activation and operational / monthly billing costs shall be paid by the Contractor during the test phases. Upon Final Acceptance the account will be transferred to the MDOT.
2. The Contractor shall verify pager service is available and FCC license is approved for that particular site prior to construction.
3. Static signs will be used with stationary HAR systems as shown in the Plans. The bottom of the sign will notify motorists that information is on a specific AM RF. The top of the sign will have a yellow background and the words "URGENT MESSAGE WHEN FLASHING" in black letters. This message refers to the two flashing beacons that will be located on top of the sign.
4. The two beacons shall require their own power, control and cabinet components. All beacons shall be DC-powered. The DC-powered beacons shall have PV solar arrays and a battery subsystem as described in Subsection 907-655.02.20.
5. The beacons shall be turned on or off remotely with pager-based controller components. A control cabinet shall house the beacon control and power components.
6. HAR flashing beacons shall be constructed in accordance with the Plans for HAR static signs and flashing beacons.
7. The beacon component shall include two (2) beacon housings of polycarbonate construction.
8. The LED beacon lens/heads located on highways/freeways shall be one (1) foot in diameter.
9. The beacons shall have a flash rate as specified in the Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices (MUTCD).
10. The flashing beacon shall be activated via PC dial-out (TAP) over pager network. The pager-based controller shall be used to remotely control the flashing beacons.
11. The flashing beacon system shall include an adjustable automatic shutoff timer that will automatically turn off the flashers in a predetermined amount of time if when done through the paging system.
12. All beacon control and power components, except batteries, shall be housed in a minimum NEMA 3R type aluminum cabinet/enclosure. The cabinet/enclosure shall be constructed from 0.125-inch thick aluminum alloy type 5052-H32. The cabinet/enclosure door shall be lockable and provisions for cabinet door handle padlocks shall be included.
13. HAR system operators shall be able to simply call a designated pager number and enter touch-tone control functions, turning the device off or on.
14. Provide the capability to group signs and then click an icon to issue an on or off command to the group.
15. The flashing beacon, pager-based controller shall provide the following capabilities:

a. Pager based controller shall operate at the 900 MHz frequency range.
b. Support minimum baud rate of 1200.
c. Support Post Office Code Standardization Advisory Group (POCSAG) line (numeric service).
d. Single pager number shall control multiple devices, if supported by local paging service.
e. Operate with a solar power subsystem described herein.
f. Internal relay shall provide contact closure for control of flashing beacons.
g. The pager controller shall be housed in the beacon control and power cabinet.
h. The flashing beacon controller shall be compatible with and controlled by the HAR central control software.

16. The Contractor may propose an alternative pager based control system for review and approval by the Department.

907-655.02.20--Solar Power for Flashing Beacons. The Contractor shall provide required solar power equipment to provide power to the flashing beacons as per the following guidelines. The photovoltaic power supply shall include but not limited to battery, photovoltaic modules and all required peripherals. A performance design study shall be conducted and submitted for approval for the proposed solar power system. The solar power generated should be able to optimally operate the Flashing Beacons as intended. The solar power system shall meet the following minimum requirements:

1. The solar power system shall be designed based on the performance design study described above. However, the solar system shall, at a minimum, operate the flashing beacons continuously at full power for at least three (3) days with no sunlight. This must be accomplished without an auxiliary generator or AC power connection.
2. The performance design study shall include, but is not limited to:
    a. The daily Solar Insulation data averaged on a monthly basis.
    b. The correct Tilt Angle for the solar array.
    c. The daily Array Output, in Amp-Hours, averaged on a monthly basis.
    d. The total Daily Load requirement, in Amp Hours, averaged on a monthly basis.
    e. A monthly Loss of Load Probability (LOLP) of the designed power supply.
    f. The number of Battery Reserve Days, averaged on a monthly basis.
    g. The monthly Average Battery State of Charge.
    h. The statistical Interval to Loss of Load, in years.
3. Shall include a solar controller with automatic battery temperature compensation and automatic charging circuitry to prevent overcharging.
4. Shall include metering for voltage and charging current.
5. Solar panels shall be Jet Propulsion Laboratory Block-5 tested and approved.
6. Solar panels shall be compliant with IEC 61215 and IEEE 1262.
7. Solar panels shall be break-resistant and sealed, with a power rating of 80 watts.
8. Battery shall be maintenance-free, sealed, gel-cell.
9. The solar power system shall include a separate aluminum NEMA 3R enclosure to house the battery. This enclosure shall be designed to provide protection from rain, sleet, snow and corrosion.

a. The enclosure shall be constructed from 0.125-inch thick aluminum alloy type 5052-H32.
b. The enclosure shall be lockable.
c. The enclosure door shall include an EDPM rubber or equivalent closed-cell gasket.

907-655.02.21--HAR Sign Materials and Sign Supports. The HAR Sign layout (size, font, lettering, etc.) shall be as shown in the plans. All sign materials shall conform to the requirements of Subsection 630.02 and Section 721 of the Standard Specifications. The sign supports shall be designed by the Contractor for each location and submitted to the Department for approval. Sign supports shall meet requirements of Subsection 630.02 and Section 721 of the Standard Specifications.

907-655.03--Construction Requirements. All equipment shall be installed according to the manufacturer's recommendations, the Plans, and as follows:

1. Materials and associated accessories/adapters shall not be applied contrary to the manufacturer's recommendations and standard practices.
2. The equipment shall be designed to prevent reversed assembly or improper installation of connectors, fasteners, etc. Each item of equipment shall be designed and installed to protect personnel from exposure to high voltage during equipment operation, adjustments, and maintenance.
3. The Contractor shall furnish and install all supports, clamps, cables, connections and other materials to secure the HAR transmitter and antenna at the selected locations. The type of mounting poles to be supplied and the location of their installation shall be as specified herein and depicted in the Plans.
4. The Contractor shall be responsible for locating possible utility conflicts prior to excavating and installing the ground-plane system. In case of space limitations or structural modification constraints, the Department shall be informed prior to site construction.
5. The Contractor shall perform detailed pre-installation site surveys and frequency tests to determine the adequacy of each HAR transmitter site (e.g., power, grounding, communications, etc.) for the intended purpose and performance criteria and shall submit recommendations to the Department for alternative site(s) if a selected site is unsuitable. The Contractor shall locate and configure the HAR System to maximize the broadcast and overall performance for each HAR location.
6. Do not install electrical service or electronic devices in the HAR transmitter cabinet or connect to the cabinet until cabinet and antenna grounding systems have been successfully completed and accepted, and the cabinet ground connection has been installed.
7. Do not install electronic devices in the cabinet until electrical service has been installed and activated, and the cabinet ventilation fan is operational.
8. Installation of HAR signs shall conform to construction requirements set forth in Subsection 630.03 of the Standard Specifications.

9. The solar power panels for the flashing beacons shall be properly oriented to maximize exposure to the sun during the shortest days of the year at the latitude and longitude of the site.
10. The HAR Signs shall be covered at all times until the HAR system begins full operation from the TMC. The covering shall be a rugged, non-transparent material that is attached to the sign in a secure manner. The material and attachment methods shall be submitted to MDOT for approval prior to purchase and use.

907-655.03.1--Conformance / Testing. Each HAR component shall undergo testing to verify conformance to special provision as follows. 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.

907-655.03.1.1--General Requirements. The Contractor is responsible for planning, coordinating, conducting and documenting all aspects of the Project Testing Program. The Project Engineer and/or the Project Engineer's representatives are only responsible for attending and observing each test, and reviewing and approving the Contractor's test results documentation. The Project Engineer and/or the Project Engineer's representatives reserve the right to attend and observe all tests.

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 specifications or the project plans. Test procedures shall contain documentation regarding the equipment configurations and programming.

No testing shall be scheduled until approval of all project submittals and approval of the test procedures for the given test.

The Contractor shall provide all ancillary equipment and materials as required in the approved test procedures.

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.

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.
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. 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 Manager.

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.

907-655.03.1.2--HAR Pre-Installation Test (PIT). The Contractor shall perform PIT on the HAR as they arrive from the factory. The goal of the HAR PIT is to verify that the HAR were not damaged during shipping and that all components are working.

907-655.03.1.3--HAR Stand Alone Test (SAT). The Contractor's comprehensive SATs for the HAR System shall be sufficient to demonstrate compliance with all requirements specified herein and include the following minimum test requirements:

1. The test equipment should include a power/VSWR meter suitable for AM broadcast band (530 ~ 1,700 kHz), a 50-ohm dummy load and a Hi-Z hand held frequency counter with telescopic antenna.
2. The Contractor must demonstrate full coverage clear reception throughout the project limits as shown on the Plans. The testing process shall include, but not be limited to, the following types of tests:
    a. Remote HAR field tests,
    b. Remote flashing beacon field tests,
    c. Central HAR control tests including GPS synchronization tests for frequency and audio,
    d. Central flashing beacon pager-control tests,
    e. Remote HAR to central communications tests, and
3. The Contractor shall verify that the transmitter operates at 10 watts or less and that the field strength does not exceed the 2mV/m at 0.93 miles.
4. Verify that the HAR transmitter RF power output, as well as VSWR; are within acceptable specified limits as specified herein.
5. Verify proper non-modulated Carrier frequency alignment.
6. Verify modulated carrier does not exceed 6k Hz. Bandwidth (with Side Bands) as per FCC Part 97.
7. Verify proper audio level adjustment as per manufacturer recommendations when performing local recordings with provided microphone via XLR, ¼-inch Phono jack or mini-plug as well as remote recordings dial-upbased network.

907-655.03.1.4--Conditional System Acceptance Test (CSAT). The Contractor shall perform a complete conditional system acceptance test on all equipment and materials in the project. The Contractor shall not request the conditional system acceptance test for a phase until the SATs have been satisfactorily completed, all as-built documentation has been submitted and approved, and all other project work has been completed to the satisfaction of the Engineer. Prior to a Conditional System Acceptance Test, the Contractor shall provide advance notice of and written

test results documentation that the Contractor has performed a dry-run of the conditional system acceptance test, and the Engineer reserves the right to require attendance of a dry-run test session.

The Contractor shall test all project systems simultaneously from the TMC in a manner equivalent to the normal day-to-day operations of the system. The Conditional System Acceptance Test shall demonstrate that all equipment and materials in the network are in full compliance with all project requirements and fully functional as installed and in final configuration, communicating with and being controlled through the control center at the TMC. Upon completion and full approval of the Conditional System Acceptance Test for all equipment, Conditional System Acceptance will be given and the Burn-in Period will begin.

907-655.03.1.5--HAR Final Inspection. Upon successful completion of the burn-in period, the project shall be eligible for a HAR final inspection. The HAR final inspection will be conducted provided the burn-in period has demonstrated the entire system is operating successfully. The HAR final inspection shall include but is not limited to;

- monitoring of all system functions at the TMC to demonstrate the overall system is operational
- a field visit to each site to ensure all field components are in their correct final configuration
- verification that all burn-in punch list items have been completed
- verification that all final cleanup requirements have been completed
- approval of final as-built documentation

Prior to conducting the HAR final inspection, the burn-in period shall demonstrate that all requirements defined in this Special Provision have been met.

The Contractor shall request in writing the Engineer's approval to start the HAR final inspection a minimum of 14 days prior to the requested start date. The Engineer reserves the right to reschedule the start date if needed. The start date for the HAR final inspection cannot be prior to the successful completion of the overall burn-in period.

An unsuccessful or incomplete HAR final inspection shall require a new HAR final inspection after the Contractor has made the necessary corrections. Up to 14 days shall be allowed for the Engineer to conduct a HAR final inspection.

The Engineer reserves the right to require, at no additional expense to the State, the attendance of a qualified technical representative of the equipment and/or software manufacturers to attend a portion of a HAR final inspection.

The Contractor shall be responsible for the full maintenance of all project equipment and materials during the entire time period from the successful completion of the burn-in period until Final Acceptance is granted.

907-655.03.1.6--Final Acceptance Upon successful completion of the HAR final inspection, the Engineer will conduct a project final inspection in accordance with Subsection 105.16.2 of the Standard Specifications.

907-655.03.2--Warranty. The HAR shall be warranted to be free of manufacturer defects in materials and workmanship for a period of one year from the date of Final Acceptance. Equipment covered by the manufacturer's warranties shall have the registration of that component placed in MDOT's name prior to Final Inspection. The Contractor is responsible for ensuring that the vendors and/or manufacturers supplying the components and providing the equipment warranties recognize MDOT as the original purchaser and owner/end user of the components from new. During the warranty period, the supplier 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 supplier's factory or authorized warranty site. Products repaired or replaced under warranty by the supplier shall be returned prepaid by the supplier. During the warranty period, technical support shall be available from the supplier via telephone within four hours of the time a call is made by the Department, and this support shall be available from factory certified personnel. During the warranty period, updates and corrections to control unit software shall be made available to the Department by the supplier at no additional cost.

907-655.03.3--MDOT Employee Training. The Contractor shall submit to the Project Engineer for approval a detailed Training Plan including course agendas, detailed description of functions to be demonstrated and a schedule. The Contractor must also submit the Trainer's qualifications to the Project Engineer for approval prior to scheduling any training. The training must include both classroom style training and hands-on training in the field of the maintenance and troubleshooting procedures required for each component. The training should also consist of a hands-on demonstration of all software configuration and functionality where applicable.

The supplier of the HAR shall, at a minimum, provide a eight-hour operations and maintenance training class with suitable documentation for up to eight (8) persons selected by the Department. The operations and maintenance class shall be scheduled at a mutually acceptable time and location.

907-655.03.4--Maintenance and Technical Support. The supplier shall maintain an adequate inventory of parts to support maintenance and repair of the HAR. Spare parts shall be available for delivery within 30 days of placement of an acceptable order at the supplier's then current pricing and terms of sale of said spare parts.

The suppliers shall maintain an ongoing program of technical support for the video detection system. This technical support shall be available via telephone or via personnel sent to the installation site upon placement of an acceptable order at the supplier's then current pricing and terms of sale of said technical support services.

907-655.04--Method of Measurement. Highway Advisory Radio will be measured in units of each.

Highway Advisory Radio shall be measured for payment as follows:

1) 30% of the contract unit price upon approval of Bench Test Component, Bench Test System and Pre-Installation test results.
2) Additional 40% of the contract unit price upon approval of Stand Alone Site Test results.
3) Additional 20% of the contract unit price upon approval of Conditional System Acceptance test results.
4) Final 10% of the contract unit price upon Final Acceptance.

The HAR Sign with Flashing Beacons will be paid per each as follows:

1) 30% of the contract unit price upon approval of Bench Test Component, Bench Test System and Pre-Installation test results.
2) Additional 40% of the contract unit price upon approval of Stand Alone Site Test results.
3) Additional 20% of the contract unit price upon approval of Conditional System Acceptance test results.
4) Final 10% of the contract unit price upon Final Acceptance.

The HAR Software and Servers will be measured and paid as a lump sum item as follows:

1) 30% of the contract unit price upon approval of Bench Test System.
2) Additional 60% of the contract unit price upon approval of Conditional System Acceptance test results.
3) Final 10% of the contract unit price upon Final Acceptance.

907-655.05--Basis of Payment. The Highway Advisory Radio System will be measured in units of each and paid at the contract price per each. The price bid shall include furnishing, installing, FCC licensing application, coordination and acquisition, pager service activation and monthly billing costs (only during testing), HAR antenna/grounding design submittal, system integration, and testing of a complete HAR Subsystem and software including the HAR equipment/components as specified herein including the AM radio transmitter, digital recorder/player, global positioning system synchronizer, NOAA weather receiver, antenna mounting pole, antenna and grounding, power distribution/supply, battery backup system with recharging subsystem, surge protection, the cabinet, all cabling, connections to support structures (includes all incidental components, attachment hardware, mounting brackets, bolts, straps, or any other items to mount the HAR equipment / components as intended), all required software, satisfactory completion of testing and training requirements and all work, equipment and appurtenances as required to effect the full operation including remote and local control of HAR sites complete in place and ready to use. The price bid shall also include system documentation including: shop drawings, operations and maintenance manuals, wiring diagrams, block diagrams and other materials necessary to document the operation of the HAR System. This price shall be full compensation for all labor, tools, materials, equipment and incidentals necessary to complete the work.

The HAR Sign with Flashing Beacons will be measured in unit of each and paid at the contract price per each. The price bid shall include designing, furnishing, installing, system integration,

and testing of a complete HAR Sign with Flashing Beacons including the sign materials, sign supports, support foundations, flashing beacons, solar power system, controller, pager controller and battery cabinets, cabling, connections and satisfactory completion of testing and training requirements and all work, equipment and appurtenances as required to effect the full operation including remote and local control of HAR Sign with Flashing Beacons sites complete in place and ready to use. The price bid shall also include system documentation including: shop drawings, operations and maintenance manuals, wiring diagrams, block diagrams and other materials necessary to document the operation of the HAR with Flashing Beacons. This price shall be full compensation for all labor, tools, materials, equipment and incidentals necessary to complete the work.

The HAR System Software and Servers will me paid as a lump sum item. The price bid shall include furnishing, installing, system integration and testing of the software and servers, including all required client and server licenses to provide duplicate configurations at both the Regional TMC and the Statewide TMC. The price bid shall also include the servers at both locations. This price shall be full compensation for all labor, tools, materials, equipment and incidentals necessary to complete the work.

Payment will be made under:

907-655-A: Highway Advisory Radio System	- per each
907-655-B: HAR Sign with Flashing Beacons	- per each
907-655-C: HAR System Software and Servers	- lump sum

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-656-3 **CODE: (SP)**

DATE: 04/30/2009

SUBJECT: Dynamic Message Sign

PROJECT: ITS-0210-00(017) / 105469301 & 302-- Forrest and Lamar Counties

Section 907-656, Dynamic Message Sign, 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 907-656--DYNAMIC MESSAGE SIGN

907-656.01--Description. This Special provision describes furnishing, installing and integrating a stationary electronic Dynamic Message Sign (DMS) assembly. The Contractor shall supply a complete operating Light Emitting Diode (LED) sign including the sign housing, sign controller unit (SCU), roadside DMS controller cabinet, all cabling, conduits, electrical service, surge suppression and all hardware associated with a complete installation as required by these Special Provisions.

The DMS assemblies will provide MDOT personnel with a means to visually communicate with motorists regarding incidents, accidents, special events, travel times, etc., that may impact travel on the roadway network.

907-656.02--Materials.

907-656.02.1--Types of DMS. Each DMS shall be one of the following types:

1) DMS Type 1 shall meet the following requirements:
   a) Shall be full matrix sign with a minimum of 125-pixel column and 27-pixel rows.
   b) Pixel spacing shall be such that three lines of text (7x5 font characters) shall each have a nominal height of 18 inches.
   c) The signs housing shall be a walk-in enclosure.
2) DMS Type 2 shall meet the following requirements:
   a) Shall be full matrix sign with a minimum of 125-pixel column and 27-pixel rows.
   b) Pixel spacing shall be such that three lines of text (7x5 font characters) shall each have a nominal height of 18 inches.
   c) The signs housing shall be either a front access or rear access enclosure. A walk-in enclosure is not required for a Type 2 DMS but is allowed if preferred by the vendor.
3) DMS Type 3 shall meet the following requirements:
   a) Shall be full matrix sign with a minimum of 75-pixel columns and 18-pixel rows.
   b) Pixel spacing shall be such that three lines of text (7x5 font characters) shall each have a nominal height of 12 inches.
   c) The signs housing shall be either a front access or rear access enclosure. A walk-in

enclosure is not required for a Type 3 DMS but is allowed if preferred by the vendor.

907-656.02.2--DMS Components. Each DMS shall include the following main components:

1) Sign Housing (walk-in or front access).
2) LED Modules.
3) LED Drivers.
4) Power Supplies
5) Roadside DMS Cabinet.
6) Sign Controller
7) Transient Voltage Surge Suppression (TVSS)

907-656.02.3--References. This special provision incorporates nonnative references to other standards as listed below. If a conflict between the standards referenced and this Special Provision, this Special Provision shall govern.

1) NEMA TS-4: NEMA TS4-2004, Hardware Standards for Dynamic Message Signs (DMS) with NTCIP Requirements. For this special provision only NEMA TS-4 requirements that apply to fixed signs locations shall be used.
2) NTCIP

907-656.02.4--Glossary of DMS Terms. The definitions of the terms used within this special provision are those terms defined in NEMA TS-4.

907-656.02.5--Environmental Requirements. Each DMS shall meet all of the performance and testing requirements as outlined in Section 2 of NEMA TS-4 standard in addition to the following requirements:

1) TVSS shall be installed at each of the following locations:
   a) AC power service entrance into the DMS Cabinet before the main cabinet breaker.
   b) AC power out to the DMS housing after the branch breaker.
   c) AC power entrance into the DMS Housing before the main housing breaker.
2) The TVSS shall be designed meet IEEE C62.41 C3 conditions.
3) Each TVSS as a complete unit shall meet the following minimum electrical requirements:
   a) Maximum Single Pulse Surge Current (8x20µs): 150kA (L-N), 150kA (L-G), 150kA (N-G)
   b) UL 1449 SVR: 400v pk L-N and N-G.

907-656.02.6--Mechanical Construction. Each DMS shall meet all of the performance and testing requirements as outlined in Section 3 of NEMA TS-4 standard in addition to the following requirements:

907-656.02.6.1--Vents and Filters. Each DMS vent and air filters shall meet the following requirements:

1) Air filters shall be installed between the intake vent and the fan.

2) Air filters must be replaceable, industrial grade, and pleated.
3) Shall completely cover the vent opening area.
4) Shall be manufactured per ASHRAE Standard 52.2P or Standard 52.1.
5) Shall be of fire retardant and water resistant construction, able to withstand temperatures up to 300°F.
6) Filter replacement is to be accomplished without tools with easy access.

907-656.02.6.2--Ventilation System. Each DMS shall incorporate a ventilation system meeting the following requirements:

1) The electric fans shall be designed for continuous duty.
2) Sign housing venting fan(s) shall have a minimum combined capacity to keep the signs housing internal temperature to a maximum of thirty (30) degrees Fahrenheit above external ambient temperature under the following conditions:
   a) All pixels are on at maximum illumination level.
   b) Maximum solar loading for the State of Mississippi.
   c) Worse case humidity for the State of Mississippi.
3) LED cooling fans shall be provided to vent the air between the display module and the sign face cover.
4) Sufficient LED cooling fans shall be provided to keep the air surrounding the LEDs to a maximum temperature not exceeding the rated temperature for the LEDs.
5) Provide sign housing ventilation calculations and LED cooling calculations to show sufficient air circulation is provided to meet the special provision requirements.
6) The fan(s) shall be mounted within the housing.
7) The fan(s) shall be down stream from the air filters.
8) The sign housing venting fan(s) shall blow the air into the sign housing.
9) The DMS manufacturer shall determine the number, placement, and size of the electric fans to meet the requirements listed in this subsection.
10) The fans shall be thermostatically controlled.
11) The thermostat shall have a minimum adjustable range between 77° to 122°F.

907-656.02.6.3--Sign Face Material. The sign face material shall be replaceable.

907-656.02.6.4--Sign Housing Construction. The DMS housing shall meet the following requirements:

1) Engineer shall approve sign housing dimensions.
2) The sign housing shall present a clean, unbroken, neat appearance.
3) The sign housing shall not have any visible text or logos on it.
4) The angular alignment of the sign housing shall be adjusted in the vertical direction down by three (3) degrees.
5) The sign housing shall be constructed of aluminum sheeting to be 5052-H32 and structural members to be 6061-T6, per ASTM Specifications.
6) Aluminum sheeting shall be not less than 1/8 inch thick with all seams continuously welded by MIG (metal inert gas) welding or other approved method of similar strength.
7) The front of the sign housing shall have a flat black matte finish.

8) All other surfaces shall have a bare aluminum mill finish.
9) Weep holes shall be provided to allow moisture to escape.
10) The sign housing shall have an interior, non-skid walkway where the walkway shall extend the entire length of the sign housing.

907-656.02.6.5--Access Door. Walk in DMS housing shall include an access door meeting the following requirements:

1) Access to the interior of the sign case shall be via a gasketed door.
2) Gasketing shall be provided on all door openings and shall meet the following requirements:
   a) Be dust-tight.
   b) Meet NEMA 3R requirements
   c) Permanently bonded to the door metal.
   d) Shall not stick to the mating metal surface.
3) A gasket top channel shall be provided to support the top gasket on the door (in order to prevent gasket gravitational fatigue).
4) When the door is closed and latched, the door shall be locked. The lock shall meet the following requirements:
   a) The lock and lock support shall be rigidly mounted on the door.
   b) In the locked position, the bolt throw shall extend a nominal 0.25-inch into the latch cam area.
   c) A lid or seal shall be provided to prevent dust or water entry through the lock opening.
   d) The locks shall be Corbin # type and shall match the master number of the existing signs.
   e) Two keys shall be supplied with each lock.
   f) The keys shall be removable in the locked position only.
   g) The locks shall have rectangular, spring loaded bolts.
5) For DMS installed on an overhead structure with catwalk, the access door shall be located on side of DMS housing that is immediately adjacent to catwalk.
6) For DMS installed on a roadside structure, the access door shall be located on side of DMS housing that is immediately adjacent to roadside, and facing traveled way.

907-656.02.7--Controller to Sign Interface. Each DMS shall meet all of the performance and testing requirements as outlined in Section 4 of NEMA TS-4 standard.

907-656.02.8--Display Properties. Each DMS shall meet all of the performance and testing requirements as outlined in Section 5 of NEMA TS-4 standard for outdoor sign using light emitting yellow color pixels in addition to the following requirements:

Pixels. Each pixel shall meet the following requirements:

1) DMS pixel shall be manufacture using Light Emitting Diodes (LED).
2) Pixels shall be replaceable either individually or in groupings. Groupings with three or more pixels shall be permitted only if bench level repairs and replacements to individual pixels are possible.

3) The failure of an LED in one string within a pixel shall not affect the operation of any other string or pixel.
4) Pixel power shall not exceed 1.5 watts per pixel, including the driving circuitry.

907-656.02.9--Optical Components. Each DMS shall meet all of the performance and testing requirements as outlined in Section 6 of NEMA TS-4 standard in addition to the following requirements:

LED Technology. LEDs used to form each pixel shall meet the following minimum requirements:

1) The discrete, LED shall be a untinted, non-diffused, solid-state lamp that uses Aluminum Indium Gallium Phosphide (AlInGap) technology or functional equivalent, manufactured by Avago Technologies (formerly Agilent Technologies), Toshiba Corporation, or Nichia Corporation or a manufacturer submitted and approved in writing from the Department 2) LED lenses shall be UV light resistant.
3) Each LED pixel shall be water resistant.
4) The manufacturer shall be the same for all LED's in all signs.
5) The LED's shall display an amber color at a wavelength of 590 nm (±7 nm).
6) The LED shall have a 15° viewing angle 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.
7) All LEDs used in all DMS provided for this contract shall be from the same manufacturer and of the same part number, except for the variations in the part number due to the intensity and color bins.
8) LED life shall be nominally rated for 100,000 hours of operation under field conditions, which shall include operating temperatures between -22° and + 185°F. LED life shall be defined as time it takes for the LED light output to degrade to half of the LED's initial light output.

907-656.02.10--DMS Controller Cabinet. Each DMS shall meet all of the performance and testing requirements as outlined in Section 7 of NEMA TS-4 standard.

907-656.02.11--Electronics and Electrical. Each DMS shall meet all of the performance and testing requirements as outlined in Section 8 of NEMA TS-4 standard in addition to the following requirements:

907-656.02.11.1--Brightness Controls. The DMS light sensing and dimming control shall meet the following minimum requirements:

1) Sixteen (16) user selectable brightness levels shall be provided.

2) The controller shall monitor ambient light levels through a photo sensor assembly that senses the ambient illumination level using three (3) photodiodes oriented as follows:
   a) Cell 1 - Monitors the change from "day" to "night".

b) Cell 2 - Facing towards oncoming traffic; monitors prevailing ambient light levels in the upstream traffic.
c) Cell 3 - Facing passed traffic; monitors prevailing ambient light levels in the downstream traffic.

907-656.02.11.2--Communication Interfaces. The DMS controller shall support two Central Communication Ports (CCPs). One CCP shall be an Ethernet port, and the second CCP shall be a serial RS232 port.

907-656.02.11.2.1—Network Security Appliance. Each DMS controller utilizing the Ethernet port shall be interfaced with a network security appliance installed and interfaced as follows:

1) Shall be configured to be monitored from a security appliance server located in the Traffic Management Center.
2) Shall provide network intrusion detection, location, and notification at the Traffic Management Center (TMC)
3) Shall provide bi-directional security access from the cabinet: TMC-to-Cabinet and Cabinet-to-TMC
4) Shall provide Device-based access control to restrict access to ONLY authorized PCs.
5) Capable of performing Self-test on power-up
6) Shall include LED indicators for power, communications, and link activity status
7) Have a minimum 1 WAN and 4 LAN ports (RJ-45 Ports)
8) Appliance WAN port shall be connected to network switch.
9) DMS CCP shall connect to one of the appliance's LAN ports.
10) Shall operate at:
    a. 24 VDC
    b. -29 F to +165ºF
    c. 0 to 95% relative humidity

907-656.02.11.3--NTCIP Protocol and Command Sets. As a minimum, the DMS hardware and software shall support the following NTCIP objects:

1) 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
2) Profile Implementation Conformance Specifications (PICS) for each NTCIP standard required shall be submitted for review and approval to the Department.

907-656.02.11.3.1--Ethernet Interface. Communication interfaces using Ethernet shall conform at a minimum with all mandatory objects of all mandatory Conformance Groups of the following standards:

1) 1101 -NTCIP Simple Transportation Management Framework (STMF)
2) 1203 -NTCIP Object Definition for Dynamic Message Signs
3) 2301 -NTCIP AP-STMF

4) 2202 -NTCIP TP-Internet
5) 2104 -NTCIP SP-Ethernet

907-656.02.11.3.2--RS-232 Interface. Communication interfaces using RS-232 shall conform at a minimum with all standards:

1) 1101 -NTCIP Simple Transportation Management Framework (STMF)
2) 1203 -NTCIP Object Definition for Dynamic Message Signs
3) 2301 -NTCIP AP-STMF
4) 2201 -NTCIP TP-Transportation Transport Profile
5) 2104 -NTCIP SP-PMPP/RS232

907-656.02.11.3.3--Subnet Level. For each communication interface, the Subnet Level shall meet the following minimum requirements:

1) NTCIP Components may support additional Subnet Profiles at the manufacturer's option.
2) At anyone time, only one Subnet Profile shall be active on a given communication interface.
3) The NTCIP Component shall be configurable to allow the field technician to activate the desired Subnet Profile.

907-656.02.11.3.4--Transport Level. For each communication interface, the Transport Level shall meet the following minimum requirements:

1) Communication interfaces may support additional Transport Profiles at the manufacturer's option.
2) Response datagrams shall use the same Transport Profile used in the request.
3) Each communication interface shall support the receipt of diagrams conforming to any of the identified Transport Profiles at any time.

907-656.02.11.3.5--Application Level. For each communication interface, the Application Level shall meet the following minimum requirements:

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

907-656.02.11.3.6--Information Level. All communication interfaces Information level protocol shall meet the following minimum requirements:

1) All communication interfaces shall provide Full, Standardized Object Range Support of

all objects required by these procurement specifications unless otherwise indicated below.

2) The maximum Response Time for any object or group of objects shall be 200 milliseconds.
3) All communication interfaces shall implement all mandatory objects of all mandatory Conformance Groups as defined in NTCIP 1203 and their respective Amendments.
4) Table 1 indicates the modified object requirements for these mandatory objects.
5) Table 2 shows the required minimum support of messages that are to be stored in permanent memory.
6) The sign shall blank if a command to display a message contains an invalid Message CRC value for the desired message.
7) Table 3 specifies the support of the required MULTI tags and their ranges.
8) Shall also implement all mandatory objects of the following optional conformance groups of NTCIP 1201.
   a) Time Management Conformal Group
   b) Report Conformal Group. Table 4 indicates the modified object requirements.
9) 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.
10) Implement all objects of the DMS Configuration Conformance Group, as defined in NTCIP 1203.
11) 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.
12) Implement all objects of the Multi Error Configuration, as defined in NTCIP 1203.
13) Implement all objects of the Illumination/Brightness.
14) Sign Status, as defined in NTCIP 1203.
15) Status Error, as defined in NTCIP 1203.
16) Pixel Error Status, as defined in NTCIP 1203.
17) 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.
18) 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
DmsNumPermanentMsg	NTCIP 1203 Clause 2.6.1.1.1.1	Shall be at least 1*
DmsMaxChangeableMsg	NTCIP 1203 Clause 2.6.1.1.1.3	Shall be at least 60. Each message shall support at least 3 pages per message.
DmsFreeChangeableMemory	NTCIP 1203 Clause 2.6.1.1.1.4	Shall be at least 20 when no messages are stored.
DmsMessageMultiString	NTCIP 1203 Clause 2.6.1.1.1.8.3	The DMS shall support any valid MULTI string containing any subset of those MULTI tags listed in Table 4.
DmsControlMode	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 dmsMessageType 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
Mv	moving text
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 4*
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" font. The second font shall be a double- stroke 18" font. The third font shall be a 28" font. The fourth font shall be empty.

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

a) "A" thru "2" - All upper case letters.
b) "a" thru "z" - All lower case letters.
c) "0" thru "9" - All decimal digits.
d) Space (i.e., ASCII code 0x20).
e) Punctuation marks shown in brackets [. , ! ? - ‘ ’ “ ” / ( )]
f) 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 DMS shall support the following background colors: ▪ black
defaultForegroundColor	NTCIP 1203 Clause 2.5.1.1.1.2	The DMS shall support the following foreground colors: ▪ amber
defaultJustificationLine	NTCIP 1203 Clause 2.5.1.1.1.6	The DMS shall support the following line justification: ▪ Left ▪ Center ▪ Right ▪ Full
defaultJustificationPage	NTCIP 1203 Clause 2.5.1.1.1.7	The DMS shall support the following forms of page justification: ▪ Top ▪ Middle ▪ Bottom
defaultPageOnTime	NTCIP 1203 Clause 2.5.1.1.1.8	The DMS 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 DMS 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 DMS 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 DMS 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 DMS shall support the full range of these objects with step sizes no larger than 0.5 seconds
dmsSWReset	NTCIP 1203 Clause 2.7.1.1.1.2	
dmsMessageTimeRemaining	NTCIP 1203 Clause 2.7.1.1.1.4	
dmsShortPowerRecoveryMessage	NTCIP 1203 Clause 2.7.1.1.1.8	
dmsLongPowerRecoveryMessage	NTCIP 1203 Clause 2.7.1.1.1.9	
dmsShortPowerLossTime	NTCIP 1203 Clause 2.7.1.1.1.10	
dmsResetMessage	NTCIP 1203 Clause 2.7.1.1.1.11	
DmsCommunicationsLossMessage	NTCIP 1203 Clause 2.7.1.1.1.12	
dmsTimeCommLoss	NTCIP 1203 Clause 2.7.1.1.1.13	
dmsEndDurationMessage	NTCIP 1203 Clause 2.7.1.1.1.15	
dmsMemoryMgmt	NTCIP 1203 Clause 2.7.1.1.1.16	The DMS shall support the following Memory management Modes: ▪ normal

		▪ clearChangeableMessage ▪ clearVolatileMessages
dmsMultiOtherErrorDescription	NTCIP 1203 Clause 2.7.1.1.1.20	If the vendor implements any vendor-specific MULTI tags, the DMS shall be provided with documentation that includes meaningful error messages within this object whenever one of these tags generates an error.
dmsIllumLightOutputStatus	NTCIP 1203 Clause 2.8.1.1.1.9	
watchdogFailureCount	NTCIP 1203 Clause 2.11.1.1.1.5	
dmsStatDoorOpen	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	

907-656.02.11.4--NTCIP Compliance Documentation. Software shall be supplied with full documentation on a CD-ROM containing ASCII versions of the following Management Information Base (Mill) files in Abstract Syntax Notation 1 (ASN.1) format:

1) The relevant version of each official standard Mill Module referenced by the device functionality.
2) If the device does not support the full range of any given object within a Standard Mill Module, a manufacturer specific version of the official Standard Mill Module with the supported range indicated in ASN.1 format in the SYNTAX and/or DESCRIPTION fields of the associated OBJECT TYPE macro. The filename of this file shall be identical to the standard MIB Module, except that it will have the extension ".man".
3) 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.

4) A MIB containing any other objects supported by the device.
5) 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.
6) 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.

907-656.02.12--Performance Monitoring. Each DMS shall meet all of the performance and testing requirements as outlined in Section 9 of NEMA TS-4 standard.

907-656.02.13--Power Requirements. Each DMS shall meet all of the performance and testing requirements as outlined in Section 10 of NEMA TS-4 standard.

907-656.03--Construction Requirements.

907-656.03.1--Certified Installation. Installation of the Dynamic Message Signs shall be performed by the supplier or a Contractor trained and certified by the supplier. If a certified Contractor performs the installation and configuration, supplier factory representative shall supervise and assist a Contractor during installation and configuration

907-656.03.2--Conformance / Testing. Each DMS shall undergo testing to verify conformance to special provision as follows. 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.

907-656.03.2.1--General Requirements.

a) The Contractor is responsible for planning, coordinating, conducting and documenting all aspects of the Project Testing Program. The Project Engineer and/or the Project Engineer's representatives are only responsible for attending and observing each test, and reviewing and approving the Contractor's test results documentation. The Project Engineer and/or the Project Engineer's representatives reserve the right to attend and observe all tests.
b) Each test shall fully demonstrate that the equipment being tested is clearly and definitely in full compliance with all project requirements.
c) 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 specifications or the project plans. Test procedures shall contain documentation regarding the equipment configurations and programming.
d) No testing shall be scheduled until approval of all project submittals and approval of the test procedures for the given test.
e) The Contractor shall provide all ancillary equipment and materials as required in the

approved test procedures.

f) 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.

g) 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.

h) 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. 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 Manager.

i) 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.

907-656.03.2.2--DMS Factory Acceptance Test (FAT). The Contractor shall perform FAT on the DMS prior to shipping from the factory. The goal of the DMS FAT is to verify that the DMS meets the requirements of this special provision.

Factory Acceptance Tests shall be conducted at the Manufacturer or Contractor facility or at a facility acceptable to all parties. All equipment to be utilized for this project shall be subject to tests that demonstrate the suitability of the design and compliance with the contract requirements, unless an exception for an equipment item is granted by the Project Engineer. The tests shall be performed on production units identified to be delivered under this contract.

The FAT procedure shall demonstrate all requirements defined in these specifications are met, including, but not limited to: functional/system performance requirements, electrical requirements, data transmission/communication requirements, safety/password requirements, environmental requirements, and interface requirements with other components of the project system.

The Project Engineer reserves the right to waive FATs which are deemed to be unnecessary and reserves the right to witness all FATs that are determined to be critical to the project. At a minimum, the Project Engineer and/or the Project Engineer's representative, will be in attendance at the FAT for the first three (3) units tested. The FAT for the first three (3) units shall be conducted during the same period. The Project Engineer shall be notified a minimum of forty- five (45) calendar days in advance of such tests. Salary and travel expenses of the Project Engineer and the Project Engineer representatives will be the responsibility of MDOT. In case of equipment or other failures that make a retest necessary, travel expenses of the Project Engineer and the Project Engineer's representatives shall be the responsibility of the Contractor. This shall include all costs including, but not limited to, airfare, automobile rental, lodging, and

per diem. These costs, excluding airfare shall not exceed $500.00, per representative, per day. These costs shall be deducted from payment due or charged to the withholding account of the Contractor when the project is terminated.

The vendor must complete the FAT on all remaining units on their own and submit documentation to the Project Engineer that the FATs were completed. The Project Engineer reserves the right to randomly attend those FAT tests.

No equipment for which a FAT is required shall be shipped to the project site without successful completion of factory acceptance testing as approved by the Project Engineer and the Engineer's approval to ship.

907-656.03.2.3--DMS Pre-Installation Test (PIT). The Contractor shall perform PIT on the DMS as they arrive from the factory. The goal of the DMS PIT is to verify that the DMS were not damaged during shipping. The PIT shall test or inspect the following DMS components:

1) External or internal visible damage
2) DMS display damage
3) Verify all pixels are operational
4) Verify the ventilation system works
5) Verify all equipment is secured
6) Verify sign configurations

907-656.03.2.4--DMS Stand Alone Test (SAT). The Contractor shall perform SAT on the DMS as they arrive from the factory. The goal of the SAT is to verify that the DMS has been properly installed and commissioned according to the manufacturer requirements. The SAT shall include at minimum the following tests and inspections:

1) Verify the signs have been attached properly to the structure.
2) Verify the sign case and roadside cabinet have been grounded.
3) Verify the sign has been properly to the power.
4) Verify the sign case has no structural damage of deformities.
5) Verify all pixels are operational
6) Verify local sign control through the serial port
7) Verify local sign control through the Ethernet port.

907-656.03.2.5--DMS Sub-System Test (SST). The Contractor shall perform SST on the DMS to very that the sign is operational from central. The goal of the SST is to verify that all remote DMS functions and alarms are operational.

907-656.03.2.6--Conditional System Acceptance Test (CSAT). The Contractor shall perform a complete conditional system acceptance test on all equipment and materials in the project. The Contractor shall not request the conditional system acceptance test for a phase until the SATs have been satisfactorily completed, all as-built documentation has been submitted and approved, and all other project work has been completed to the satisfaction of the Engineer. Prior to a Conditional System Acceptance Test, the Contractor shall provide advance notice of and written

test results documentation that the Contractor has performed a dry-run of the conditional system acceptance test, and the Engineer reserves the right to require attendance of a dry-run test session.

The Contractor shall test all project systems simultaneously from the TMC in a manner equivalent to the normal day-to-day operations of the system. The Conditional System Acceptance Test shall demonstrate that all equipment and materials in the network are in full compliance with all project requirements and fully functional as installed and in final configuration, communicating with and being controlled through the control center at the TMC. Upon completion and full approval of the Conditional System Acceptance Test for all equipment, Conditional System Acceptance will be given and the Burn-in Period will begin.

907-656.03.2.7--Burn-In Period. Following the Engineer's written notice of successful completion of the Conditional System Acceptance Test, the entire newly installed system must operate successfully for a six (6) month burn-in period. During this burn-in period the Contractor shall be responsible for the full maintenance of the newly installed equipment. However, no separate payment will be made for the burn-in period activities and shall be included in the cost of other items. Successful completion of the burn-in period will occur at the end of six complete months of operation without a major system failure attributable to hardware, software or communications components. Each system failure during the burn-in period will require an additional month of successful operation prior to being eligible for Final Acceptance. (i.e., if there are two system failures during the initial six month period, the burn-in period would be increased to 8 months.)

Burn-In General Requirements.

- Determination of a system failure shall be at the sole discretion of the Engineer. System failure is defined as a condition under which the system is unable to function as a whole or in significant part to provide the services as designed. While a single component failure will not constitute a system failure, chronic failure of that component or component type may be sufficient to be considered a system failure. Chronic failure of a component or component type is defined as three (3) or more failures for the same component during the burn-in period.
- Components are defined as contract items or major material elements in a contract item. For electrical and electronic contract items, components are defined as the complete assembly of materials that makes up the contract item.
- Specifically exempted as system failures are failures caused by accident, acts of God, or other external forces that are beyond the control of the Contractor. However, failure of the contractor to respond to the repair request for that failure within 24 hours may be considered a system failure.
- The Department will advise the Contractor in writing when it considers that a system failure has occurred or chronic failure exists.
- If multiple system and/or chronic failures continue to occur throughout the burn-in period due to a single component type, the Contractor may be required to replace all units of that component type with a different model or manufacturer.
- The Contractor shall document all failures and subsequent diagnosis and repair. The repair documentation shall include as a minimum:

  - Description of the problem
  - Troubleshooting and diagnosis steps
  - Repairs made
  - List of all equipment and materials changed including serial numbers.
  - Update of the equipment inventory where needed.
- The Contractor shall provide the repair documentation to the Engineer within 2 days of completing the repair; failure to provide acceptable documentation as required shall be reason to not approve the repair as complete. The Engineer will provide acceptance or rejection of the repair and documentation within seven (7) days.
- The Engineer reserves the right to require, at no additional expense to the State, the presence of a qualified technical representative of the equipment and/or software manufacturers as related to the diagnosis and/or repair of any system failure.
- During the burn-in period the Contractor shall perform incidental work such as touching up, cleaning of exposed surfaces, leveling and repair of sites, sodding/grassing and other maintenance work as may be deemed necessary by the Engineer to insure the effectiveness and neat appearance of the work sites.
- During the burn-in period the Engineer shall maintain a "burn-in period punch list" that contains required Contractor actions but that the Engineer does not define as a system failure. Each burn-in period punch list action item shall be completed by the Contractor to the Engineer's satisfaction within seven (7) days of Contractor notification of the action item.
- During the burn-in period the Contractor is required to meet the following response times once notified there is a problem. A response is defined as being on-site to begin diagnosing the problem.
  - Monday thru Friday: The Contractor shall respond no later than 9:00 a.m. the following morning after being notified.
  - Weekends: If the Contractor is notified on Friday afternoon or during the weekend, the Contractor shall respond by 9:00 a.m. on Monday morning.
- During the burn-in period the Contractor shall provide all labor, materials, equipment and replacement parts to completely maintain, troubleshoot and repair all items installed under this contract. No separate payment will be made for any labor, materials, equipment or replacement parts needed during the burn-in period.
- The overall burn-in period will be considered complete upon the successful completion of the burn-in time periods, the Engineer's acceptance of all repairs and repair documentation, completion of all burn-in period punch list actions and a final inspection as described below.

907-656.03.2.8--DMS Final Inspection. Upon successful completion of the burn-in period, the project shall be eligible for the DMS final inspection. The DMS final inspection will be conducted provided the burn-in period has demonstrated the entire system is operating successfully. The DMS final inspection shall include but is not limited to:

- monitoring of all system functions at the TMC to demonstrate the overall system is operational
- a field visit to each site to ensure all field components are in their correct final configuration

- verification that all burn-in punch list items have been completed
- verification that all final cleanup requirements have been completed
- approval of final as-built documentation

Prior to conducting the DMS final inspection, the burn-in period shall demonstrate that all requirements defined in this Special Provision have been met.

The Contractor shall request in writing the Engineer's approval to start the DMS final inspection a minimum of 14 days prior to the requested start date. The Engineer reserves the right to reschedule the start date if needed. The start date for the DMS final inspection cannot be prior to the successful completion of the overall burn-in period.

An unsuccessful or incomplete DMS final inspection shall require a new DMS final inspection after the Contractor has made the necessary corrections. Up to 14 days shall be allowed for the Engineer to conduct a DMS final inspection.

The Engineer reserves the right to require, at no additional expense to the State, the attendance of a qualified technical representative of the equipment and/or software manufacturers to attend a portion of a DMS final inspection.

The Contractor shall be responsible for the full maintenance of all project equipment and materials during the entire time period from the successful completion of the burn-in period until Final System Acceptance is granted.

907-656.03.2.9--Final System Acceptance Upon successful completion of the DMS final inspection, the Engineer will conduct a project final inspection in accordance with Subsection 105.16.2 of the Standard Specifications.

907-656.03.3--Documentation. DMS documentation shall meet all of the performance and testing requirements as outlined in Section 12 of NEMA TS-4 standard.

907-656.03.4--Warranty. The DMS shall be warranted to be free of manufacturer defects in materials and workmanship for a period of one year from the date of Final Acceptance. Equipment covered by the manufacturer's warranties shall have the registration of that component placed in MDOT's name prior to Final Inspection. The Contractor is responsible for ensuring that the vendors and/or manufacturers supplying the components and providing the equipment warranties recognize MDOT as the original purchaser and owner/end user of the components from new. During the warranty period, the supplier 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 supplier's factory or authorized warranty site. Products repaired or replaced under warranty by the supplier shall be returned prepaid by the supplier. During the warranty period, technical support shall be available from the supplier via telephone within four hours of the time a call is made by the Department, and this support shall be available from factory certified personnel. During the warranty period, updates and corrections to control unit software shall be made available to the Department by the supplier at no additional cost.

907-656.03.5--MDOT Employee Training. The Contractor shall submit to the Project Engineer for approval a detailed Training Plan including course agendas, detailed description of functions to be demonstrated and a schedule. The Contractor must also submit the Trainer's qualifications to the Project Engineer for approval prior to scheduling any training. The training must include both classroom style training and hands-on training in the field of the maintenance and troubleshooting procedures required for each component. The training should also consist of a hands-on demonstration of all software configuration and functionality where applicable.

The supplier of the DMS shall, at a minimum, provide a sixteen-hour operations and maintenance training class with suitable documentation for up to eight (8) persons selected by the Department. The operations and maintenance class shall be scheduled at a mutually acceptable time and location.

907-656.03.6--Maintenance and Technical Support. The supplier shall maintain an adequate inventory of parts to support maintenance and repair of the DMS. Spare parts shall be available for delivery within 30 days of placement of an acceptable order at the supplier's then current pricing and terms of sale of said spare parts.

907-656.04--Method of Measurement. Dynamic Message Sign will be measured in units of each.

Dynamic message sign shall be measured for payment as follows:

1) 20% of the contract unit price upon completion of the Factory Acceptance Test and Pre-Installation Test.
2) 40% of the contract price upon delivery to the site. Delivery cannot be more than 60 days before anticipated installations.
3) 90% of the contract unit price upon complete installation and stand alone testing of the dynamic message sign.
4) 100% of the contract unit price upon Final System Acceptance.

Dynamic Message Sign Training will be measured as a lump sum unit.

907-656.05--Basis of Payment. Dynamic Message Sign, measured as prescribed above, will be paid for at the contract unit price per each, which shall include furnishing, installing, system integration and testing of the complete dynamic message sign including the sign case, light sources, display apparatus, wiring, controller, roadside DMS cabinet, communications interface, wiring between the sign case and DMS cabinet, structure mounted conduit, fittings, and junction boxes, sign case support connections to the sign support structure, satisfactory completion of testing and training requirements and all work, equipment and appurtenances as required to effect the full operation including remote and local control of the sign complete in place and ready for use. The price bid 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 DMS. This price shall be full compensation for all labor, tools, materials, equipment, and incidentals necessary to complete the work for a

complete and functional DMS.

Dynamic Message Sign Training, measured as prescribed above, will be paid as a lump sum unit, which price shall be full compensation for all costs necessary to perform the training.

This work does not include the sign support structure.

Payment will be made under:

907-656-A: Dynamic Message Sign * - per each

907-656-B: Dynamic Message Sign Training - lump sum

* Type may be specified

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-657-4 **CODE: (SP)**

DATE: 04/22/2009

SUBJECT: Fiber Optic Cable (OSP)

PROJECT: ITS-0210-00(017) / 105469301 & 302-- Forrest and Lamar Counties

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, ST 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 >-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 yam 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 ST compatible connectors for all fiber optic infrastructures.

The Contractor shall provide only factory-installed connectors of a type other than ST when required by the Network Switches.

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 ST 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 yam 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/kin @ 1550.

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--Construction Requirements.

907-657.03.1--General. The Contractor shall install all fiber optic infrastructures according to the manufacturer's recommended procedures and specifications.

The Contractor shall provide all necessary interconnections, services and adjustments required for a complete and operable data transmission system.

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.

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.

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.

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.

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.

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.

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.

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).

During installation, even if the tension specifications for the cable are not exceeded, the first ten feet shall be discarded.

Warning tape shall be placed 12 inches above the cable not to deviate $\pm$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.

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.

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 ST/ST 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 Requirements.

907-657.03.10.1--General. 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.

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--Training and Equipment. 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.

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.

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.

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. 907-658-3 **CODE: (SP)**

DATE: 04/22/2009

SUBJECT: Networking Equipment

PROJECT: ITS-0210-00(017) / 105469301 & 302-- Forrest and Lamar Counties

Section 658, Hardened 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 and Type B 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, Terminal Servers and associated cabling will be placed in the field device cabinets and shall meet the following requirements:

907-658.02.1--Type A Network Switch.

1) Minimum of six 10/100 Base-TX ports. Each port shall connect via RJ-45 connector.
2) Minimum of two 1000 Base Long Reach optical ports with the following optical requirements:
3) The minimum optical budget between transmit and received ports shall be 19dB.
4) Shall include ST SC and LC connector options.
5) Optical receiver maximum input power level shall not be exceeded.
6) 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.

7) 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.
8) Operate between -34 to +74 degree Celsius, including power supply.
9) Operate from 100 VAC to 200 VAC.
10) Operate from 10% to 90% non-condensing humidity.
11) Meet the IEEE 802.3 (10Mbps Ethernet) standard.
12) Meet the IEEE 802.3u (Fast Ethernet 100 Mbps) standard.
13) Meet the IEEE 802.3x (Full Duplex with Flow Control) standard.
14) Meet the IEEE 802. ip (Priority Queuing) standard.
15) Meet the IEEE 802.1 Q (VLAN) standard per port for up to four VLAN' s.
16) The switch shall meet the IEEE 802.1 D (Spanning Tree Protocol) and IEEE 802.1w (Rapid Spanning Tree Protocol) standards.
17) Meet the IEEE 802.3 ad (Port Trunking) standard for a minimum of two groups of four ports.
18) Capable of mirroring any port to any other port within the switch.
19) Password manageable through:
    a. SNMP
    b. Telnet/CLI
    c. HTTP (Embedded Web Server) with Secure Sockets Layer (SSL)
20) Full implementation of SNMPv1 and SNMPv2c.
21) Full implementation of RMON I and RMON II.
22) Full implementation of GVRP (Generic VLAN Registration Protocol).
23) Full implementation of IGMP and IGMP snooping.
24) Minimum MTBF of 100,000 hrs using Bellcore TS-332 standard.
25) Full implementation of RFC 783 (TFTP) to allow remote firmware upgrades.
26) UL approved.
27) 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.
28) 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.
29) Unused ports (copper and optical) shall be covered with rubber or plastic dust caps/cover.

907-658.02.2--Type B Network Switch.

1) Minimum of twelve 10/100 Base-TX ports. Each port shall connect via RJ-45 connector.
2) Minimum of two 1000 Base Long Reach optical ports with the following optical requirements:
3) The minimum optical budget between transmit and received ports shall be 19dB.
4) Shall include ST SC and LC connector options
5) Optical receiver maximum input power level shall not be exceeded.
6) 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.

7) 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.
8) Operate between -34 to +74ºC, including power supply.
9) Operate from 100 VAC to 200 VAC.
10) Operate from 10% to 90% non-condensing humidity.
11) Meet the IEEE 802.3 (10Mbps Ethernet) standard.
12) Meet the IEEE 802.3u (Fast Ethernet 100 Mbps) standard.
13) Meet the IEEE 802.3x (Full Duplex with Flow Control) standard.
14) Meet the IEEE 802.1p (Priority Queuing) standard.
15) Meet the IEEE 802.1Q (VLAN) standard per port for up to four VLAN's.
16) The switch shall meet the IEEE 802.1D (Spanning Tree Protocol) and IEEE 802.1w (Rapid Spanning Tree Protocol) standards.
17) Meet the IEEE 802.3ad (Port Trunking) standard for a minimum of two groups of four ports.
18) Capable of mirroring any port to any other port within the switch.
19) Password manageable through:
20) SNMP
21) Telnet/CLI
22) HTTP (Embedded Web Server) with Secure Sockets Layer (SSL)
23) Full implementation of SNMPv1 and SNMPv2c.
24) Full implementation of RMON I and RMON II.
25) Full implementation of GVRP (Generic VLAN Registration Protocol).
26) Full implementation of IGMP and IGMP snooping.
27) Minimum MTBF of 100,000 hrs using Bellcore TS-332 standard.
28) Full implementation of RFC 783 (TFTP) to allow remote firmware upgrades.
29) UL approved.
30) 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.
31) 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.
32) Unused ports (copper and optical) shall be covered with rubber or plastic dust caps/cover.

907-258-02.3--Type C Network Switch Requirements. The Type C Network Switch will be installed in the Communication Hubs and shall meet the following requirements:

1) 19" rack mountable.
2) Operate from 5 to 40ºC.
3) Operate from 100 VAC to 120 VAC.
4) NEBS Level 3 compliant.
5) UL Registered.
6) Operate from 5 to 80 non-condensing humidity
7) Designed as a chassis with easy to remove modules.

8) Chassis backplane shall be passive.
9) All modules shall be hot-swappable.
10) Meet the IEEE 802.3u (Fast Ethernet 100 Mbps) standard.
11) Meet the IEEE 802.3x (Full Duplex with Flow Control) standard.
12) Meet the IEEE 802.1p (Priority Queuing) standard.
13) Meet the IEEE 802.1q (VLAN) standard per port for up to 255 VLAN's.
14) Meet the IEEE 802.1w (Rapid Spanning Tree Protocol) standard.
15) Meet the IEEE 802.1d (Virtual Bridge) standard.
16) Meet the IEEE 802. lx (authentication) standard.
17) Meet the IEEE 802.3ad (Port Trunking) standard for a minimum of two groups of four ports.
18) Meet the IEEE 802.3x (Flow Control) standard.
19) Full implementation of RIP protocol as outlined by RFCs: 1058, 1723, 1812
20) Full implementation of OSPF protocol as outlined by RFCs: 2178, 1583, 1587, 1745, 1765, 1850, 2154, 2328, 1850, 1997, 2385, 2439, 2842, 2918, 2370.
21) Capable of mirroring any port to any other port within the switch.
22) Password manageable through:
    a. SNMP
    b. Telnet/CLI
    c. HTTP (Embedded Web Server)
    d. SSHv2 (Secure Shell)
23) Full implementation of SNMPv1 and SNMPv2c.
24) Full implementation of GMRP (Generic Multicast Registration Protocol).
25) Full implementation of GVRP (Generic VLAN Registration Protocol).
26) Full implementation of IGMP, IGMPv2 and IGMP snooping.
27) Full implementation of PIM-SM and PIM-DM.
28) Full implementation of DVMRPv3.
29) Full implementation of VRRP.
30) Minimum MTBF of 100,000 hrs using Bellcore TS-332 standard.
31) Comply with FCC 47 CRF Part 15 Class A emissions.
32) Bandwidth flow rate limiting policing support per port.
33) Full security implementation of
    a. Support SSH2, 802.lx (rel 2)
    b. Access Control Lists (ACL's)
    c. RADIUS
    d. TACACS
34) Full implementation RFC 783 (TFTP) to allow remote firmware upgrades.
35) Have redundant power supplies installed.
36) The power supply units shall be hot swappable.
37) Switch chassis shall have a minimum of 6 module slots.
38) 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 services
        ii. 64Gbps/48Mpps module bandwidth
        iii. Minimum of 2GE 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. In one (or more) SFP-based module(s): a minimum of 48 ports of l000Base-X (SFP-based) compatible.

b. 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 switches
   iv. Same optical transmitter power as Type A switches

c. In one (or more) modules: 24 Ethernet 10/100/1000 ports

39) 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
40) Blank covers for all remaining slots
41) Unused ports (copper and optical) shall be covered with rubber or plastic dust caps/cover

907-658.02.4--Terminal Server.

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/l00Base-TX protocol, Full/Half-Duplex, Auto Sense (802.3), RJ-45).

907-658.02.5--Category 6 Cable.

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 (-4ºF to 140ºF)
9) Bend Radius 10 x Cable OD or smaller
10) Recommended for 1000 Base-T applications for a distance of 300 feet.

907-658.02.6--Cat 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 (whichever is used).
5) Certified by the manufacturer for Category 6 performance criteria.
6) Length as needed. Excessive slack is not permitted.

907-658.02.7--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--Construction Requirements. The Contractor shall adhere to the following installation requirements:

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.

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) 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.
4) The Switches shall be configured to perform multicasting of video.
5) The Contractor may submit an alternate switch configuration to the Engineer for review and approval. The 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.

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 in electronic format.

907-658.03,3--Training and Equipment. 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 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. Terminal Server will be measured per each. Category 6 cable installed in conduit will be measured horizontally per linear feet.

907-658.04--Basis of Payment. Network Switches, measured as prescribed above, will be paid for at the contract price per each, which price shall include 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. The price bid 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. This 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 price per each, which price bid shall include 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. This price shall be full compensation for all labor, tools, materials, equipment and incidentals necessary to complete the work.

Category 6 cable, measured as prescribed above, will be paid for by the linear foot measured horizontally and shall include the conduit. This price shall be full compensation for all labor, tools, materials, equipment and incidentals necessary to complete the work

Payment will be made under:

907-658-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. 907-659-2 **CODE: (SP)**

DATE: 06/01/2007

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 Central 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)
Southaven Combined TMC – 8791 Northwest Drive, Southaven, Mississippi (Police Department)
City of Ridgeland TMC – 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 Coast TMC – 16499 Hwy 49, Saucier, Mississippi (MDOT Lyman Project Office)

Additional Traffic Management Centers may be added as needed.

907-659.02--Materials.

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, 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.

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.

907-659.03.3--TMC Modifications – Installation & Training. 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. 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.

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 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. 907-660-2 **CODE: (SP)**

DATE: 04/22/2009

SUBJECT: Communications Node

PROJECT: ITS-0210-00(017) / 105469301 & 302-- Forrest and Lamar Counties

Section 907-660, Communications Node, is hereby added to and becomes part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-660--COMMUNICATIONS NODE

907-660.01--Description. A communication node is a collection of communication equipment including OTN nodes and an environmental controlled prefabricated building used to interface ITS devices in the field to Traffic Management Center systems and computers over fiber, wireless, and leased line communication systems. Work also includes making modifications to existing Communication Nodes in accordance with the plans, specials provisions, Notice to Bidders, and contract documents.

907-660.02--Materials.

907-660.02.1--OTN Node. Open Transport Network (OTN) is a network transmission system based on the latest fiber optics technology. It is characterized by the dual ring approach, resulting in high network availability, self-healing fault tolerance/recovery, and the integration of different types of services in one network. OTN supports almost all standard and/or customized transmission requirements for voice, data, LAN and video.

OTN nodes can be configured with a range of interface cards which allows them to be used for diverse applications. This diversity of interface cards saves on all kinds of transmission equipment such as protocol converters and conversion equipment. Interface cards available for OTN nodes are:

- Video applications (video distribution and monitoring, CCTV, MPEG4, H.264, M-JPEG)
- Data transport (e.g. RS232, RS422, and RS485)
- Telephony purposes (e.g. analog and digital 2-wire and 4-wire voice links, E1, T1)
- Local Area Networks (10/100/1000 Mbs)

OTN nodes will be installed in Traffic Management Centers (TMC) and climate controlled Communication Huts. A list of OTN node installation locations and specific interface card configurations shall be shown in the Notice To Bidders.

The OTN node will be a modular 19-inch rack mountable chassis with two redundant power supply units and a hot-swappable common logic card. Each OTN chassis must have eight

universal interface slots for interface modules in any combination. Provide 784 Mbps capacity per Ethernet interface card and 100% user bandwidth utilization with a total add-drop capacity of 2.5 Gbps. Two extra slots are required for auxiliary cards. Each node must have three intelligent (temperature switched and fail detect) fan modules to regulate the temperature inside the node. The dual power supply units shall be a minimum 270-Watt System, 10 TE width, with a supply voltage of 90 to 264 VAC (including 125 VDC) or 18 to 60 VDC, or any combination of both.

907-660.02.2--Communication Hut. The equipment building shall be of a modular, prefabricated type construction. The walls, roof, and floor shall be concrete with reinforcing steel, polypropylene fiber reinforced, 4,000 PSI minimum at 28 days compressive strength. The minimum design loads shall be:

- Seismic load performance category "C", Exposure Group III
- Standard Live Roof Load – 60 PSF
- Standard Floor Load – 250 PSF
- Standard Wind Loading – 130 MPH

The roof panel shall slope 1" from center to sides. The roof shall extend a minimum of 1½" beyond the wall panel on each side.

Roof, floor, and wall panels must each be produced as single component monolithic panels. No roof, floor, or vertical wall joints will be allowed except at corners. Wall panels shall set on top of floor panel.

The following shall be included in the building:

- 3'0" x 7'0" x 1¾" galvanized steel door and frame with dead bolt lock, door knob and three (3) keys
- Distribution panel board, 120/240 VAC interior, single phase, three wire, 200 amp main including breakers, (with 40-circuit minimum load panel)
- 2- 4-foot fluorescent ceiling mount fixture with two 40-watt cool white lamps each
- Exterior light with photocell, 120 VAC
- 1 1/2 ton, 17,000 BTU, 5-kw unit, 30 AMP, 120 VAC AC unit
- Minimum of five 120 VAC grounded duplex receptacles and all conduit and wiring with a minimum of one on each wall
- Minimum of four 120 VAC grounded overhead locking receptacles and all conduit and wiring
- ¾-inch thick 4-foot by 8-foot plywood board mounted on one wall
- Overhead cable trays as outlined in the project related Communications Node NTB
- Equipment Racks as outlined in the project related Communications Node NTB
- WEB based rack mounted remote environmental monitoring system with components as outlined in the project related Communications Node NTB
- MPEG IV IP based PTZ camera with built in WEB server for browser viewing and control

- Finished walls and ceiling with insulation and vinyl floor tiles
- Halo ground system
- Exposed aggregate finish or comparable finish as directed by Engineer
- 10" x 20" opening in the floor for 4 - 4-inch conduits to provide access to the Communication Node Vault. Contractor shall seal the opening around the conduits after conduits are installed.
- A wall mounted CO_2 fire extinguisher rated for electrical fires, to be located inside the hub building adjacent to the hub door opening.
- An uninterruptible power supply, and grounding system detailed in the construction requirements section of this special provision

The building's outer dimensions and any required layout for locations of doors, conduits, racks, cable trays, etc shall be covered in the Notice to Bidders..

907-660.02.3--Communication Hut Vault. A communications conduit vault shall be installed at each Hut location where the communications conduit, fiber and required fiber slack coils will be stored. The vault will be formed from concrete in accordance with specifications in the MDOT Redbook. The vault walls, floors and roof shall be minimum six (6) inches thicknesses. The vault shall be sized and installed as shown on the vault detail in the plans. The vault will be accessed through a minimum 30-inch diameter manhole assembly and cover. The iron manhole cover shall be imprinted with "MDOT COMMUNICATIONS". The concrete roof of the vault shall be installed below ground level with the vault cover ring installed so that the manhole is approximately two to three inches (2" - 3") above ground level. The communications vault will be located approximately five (5) feet from the rear side of the Hut building and in no case more than 10 feet from the building so that the conduit connecting the vault and the Hut can be minimized.

Conduit carrying fiber to and from field locations may enter the vault on any of the three sides of the vault not adjacent to the Hut. Conduit will connect the vault and provide a path for the fiber from the vault to the Hut. This connecting conduit will conform to MDOT standard Type IV (PVC). Four lines of 4-inch conduit will be provided to connect the vault and the Hut. The conduit leaving the vault shall be aligned horizontally, spaced apart from adjacent conduit sufficiently to allow proper grouting and sealing. The conduits shall be aligned and enter the vault level, straight and perpendicular to the vault wall. Minimum cover over the conduit between the vault and the Hut shall be 36 inches. The conduit shall be placed horizontally until it connects with a 90 degree long sweep as it enters the Hut vertically in the floor near the inside of the rear wall of the Hut. The conduit will be trenched and buried in accordance with the trenching detail provided in the plans.

907-660.03--Construction Requirements.

907-660-03.1--OTN Node. OTN nodes will be installed in Traffic Management Centers (TMC) or in climate controlled OTN Communication Huts. OTN nodes in the MSTraffic network shall be interconnected by dual point-to-point optical fiber links as indicated in the Notice to Bidders or directed by the MDOT ITS Engineer. These fibers will form two (2) counter-rotating,

redundant rings. The second ring will serve as a backup and should be able to, either partly or completely, take over all data transport. Installation will include, but is not limited to, expanding the central video management system and interconnecting the appropriate number of video interfaces between networked Traffic Management Centers (TMC) located across the State. Nodes should be installed in 19-inch equipment cabinets and all interface cables must be labeled. Video that is placed on the MDOT OTN Node fiber ring or any city/agency traffic cameras must be available/delivered to a monitoring wall in the TMC. Type C network switches that interface with field devices will connect to the OTN nodes via Gigabit Ethernet over multimode fiber optic cables.

907-660.03.2--Communication Hut. The installation of the modular, prefabricated building shall consist of installing the leveling crushed gravel pad, providing 120/240 power to the building and connecting the distribution panel to the power supply, and testing the equipment for proper working/running condition. The building shall be placed no closer than two feet (2' 0") from an existing structure.

The building shall be set on a 4-inch minimum depth, level, crushed gravel base, with that base being at least one foot longer than the length and width of the building. Conduit for the fiber interconnect system is to be in place before the building is set on the gravel base.

As part of site preparation, the area surrounding the communications building shall be leveled and prepared with a layer of Geotextile (Type III Erosion Control) and then a 5-inch thick layer of Mineral Aggregate (size 57), in addition to a 5' x 3' concrete pad (five inches thick) shall be installed in front of the door. The cost of the items shall be included in the lump sum price bid for the Communications Node.

The Contractor shall anchor the site as appropriate and approved by the Project Engineer to withstand wind loading requirements of the site locations.

907-660.03.2.1--Uninterruptible Power Supply.

- Mount the UPS at the bottom of the equipment rack containing the OTN and network switch.
- Connect the OTN and network switch input and any ancillary equipment power supplies to the UPS.
- Connect the UPS network interface to the network switch.

907-660.03.2.2--Grounding System.

- Install all grounding and bonding materials according to the manufacturer's recommended procedures and specifications.
- All metallic materials interior or exterior to the hub building shall be bonded to the grounding system directly.
- All electrical and electronic equipment shall be bonded to the grounding system through the electrical service feed to the equipment, or shall be bonded directly if the electrical

service feed is not grounded unless otherwise recommended by the equipment manufacturer.

- Grounding and bonding wire shall be bare solid copper (BSC) unless otherwise specified.
- Grounding strap shall be BSC unless otherwise specified.
- Do not splice any grounding or bonding wire or strap.
- All below ground or exterior connections between wire, ground rod, and metallic structures and posts shall be made only by exothermic welding. All exothermic welding shall be performed in the presence of the Engineer.
- All connections to ground strap shall be made by silver soldering/brazing, except when impractical due to size and/or quantity of straps, where approved mechanical strap connectors shall be used with the Engineer's approval.
- Interior connections for bonding jumpers shall be by mechanical fasteners with silver soldered lugs. Copper conductive paste shall be used with mechanical fasteners.
- Minimum bending radius of any exterior grounding wire or strap shall be 24 inches.
- Minimum bending radius of any interior grounding wire #6 or smaller shall be eight (8) inches.
- Minimum bending radius of any interior grounding wire #2 or larger or any grounding strap shall be 12 inches.
- Do not splice any grounding or bonding wire or strap.
- All metallic communications facilities entering the hub building shall be isolated from remote facility ground through isolation or neutralizing transformer technology per IEEE Std. 487-2000.

907-660.03.2.2.1—Interior Grounding System.

- The MGB shall be minimum 0.25-inch x 4-inch x 12-inch. buss bar fabricated from solid copper alloy and shall include insulated mounting standoffs.
- The MGB down conductor shall be #2 BSC that is exothermically welded to the bottom of the bar.
- Install the MGB with standoffs in the lower center of the hub wall as shown in the Plans.
- Connect the MGB down conductor through the PVC ground wire sleeve directly to the chemically-enhanced ground rod in the grounding ring immediately outside of the building.
- Seal around the ground wire in the sleeve entry hole with waterproof outdoor-rated silicone caulk. Do not use expanding foam or caulk products.
- Bond the electrical panel load center and the generator supply transfer switch to the MGB with #2 AWG BSC.
- Bond each individual equipment rack directly to the cable runway with a #2 AWG BSC.
- Inside the hub building, bond the hub door to the door frame six inches (6") from the top of the door frame with a #2 AWG flexible copper wire or braid jumper of sufficient length to not hinder door movement. Bond the door frame directly to the MGB with a #6 AWG BSC.
- Unless otherwise specified, bond all any other metallic materials in the hub interior to the MGB with minimum #10 AWG stranded copper wire. Do not daisy-chain or splice bonding wires.

907-660.03.2.2.2—Exterior Grounding System.

- Ground rods shall be copper-clad 5/8-inch diameter, 8-foot long steel electrical ground rods.
- Ground ring shall be formed with 3-inch wide #20 AWG BSC strap.
- Ground rod inspection handholes shall be plastic or polymer round enclosures minimum 12 inches in diameter and 18 inches deep.
- Chemically-enhanced ground rods shall be 10-foot long hollow copper tubes chemically-charged grounding electrode with an access handlhole, and shall include ground enhancement backfill material.
- Sacrificial anodes for corrosion protection of the exterior grounding system shall be a minimum of 32 pound magnesium material.
- Install the hub ring ground rods and ground strap at a depth of 18 inches. Install the ground strap in one continuous length; do not splice.
- Install ground ring inspection handholes at the four ground rods outside the corners of the building. Ensure the top of the ground rod is exposed for inspection.
- Install chemically-enhanced ground rods at the Hub Single Point Ground (HPSG) immediately outside of the hub building below the MGB position.
- Install a ground ring with a minimum of seven ground rods and one chemically-enhanced ground rod at the HSPG.
- Provide ground enhancement material as required to comply with the maximum ground impedance requirements. As a minimum, provide ground enhancement material for the complete length of the hub grounding ring strap.
- Install corrosion protection sacrificial anodes in accordance with the manufacturer's recommendations. Install a minimum of one for each ground ring.

907-660.03.3--Communication Node Installation, Configuration, & Training. 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. 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.

Installation and configuration of Communication Node is inclusive of all devices, OTN Nodes, and Network switches that are located in the Communications Node HUT or included with as part of any Communications Node Notice to Bidders. This work shall include modifications to existing equipment, OTN nodes, and network switches to provide system communications to the TMC and Integration to the TMC systems.

Training shall be provided covering the system architecture, operations, and maintenance of the OTN Nodes and MSTraffic network. If training requirements include travel on the part of training participants then the cost of travel shall be included.

907-660.04--Method of Measurement. OTN Node, OTN Node Communication Hut, and Communication Node Modification, complete in place, will be measured per each, inclusive of

the communications hut vault, all wiring, hardware, and incidentals, necessary to complete the work.

Communication Node modifications, complete in place, tested, and accepted, will be measured as unit quantities per each for a complete and operable unit in accordance with the contract provisions.

OTN Training will be measured per lump sum.

907-660.05--Basis of Payment. OTN Node, OTN Node Communication Hut, and Communication Node Modification, measured as prescribed above, will be paid for at the contract unit price per each, which price shall be full compensation for furnishing all materials, construction installation, connecting, testing, for all equipment, tools, labor, and incidentals required to complete the work.

The OTN Node Training, measured as prescribed above, will be paid for at the contract lump sum price, which price shall be full compensation for all materials and software for all equipment, travel expenses, software and incidentals necessary to complete the work.

Payment will be made under:

907-660-A:	OTN Node	- per each
907-660-B:	Communications Node Hut	- per each
907-660-C:	OTN Node Training	- lump sum
907-660-D:	Communications Node Modifications	- per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-662-3 **CODE: (SP)**

DATE: 04/02/2009

SUBJECT: Video Communication Equipment

PROJECT: ITS-0210-00(017) / 105469301 & 302-- Forrest and Lamar Counties

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. 907-668-1 **CODE: (SP)**

DATE: 04/01/2009

SUBJECT: Traffic Signal Conduit

PROJECT: ITS-0210-00(017) / 105469301 & 302-- Forrest and Lamar Counties

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-701-3

DATE: 10/01/2008

SUBJECT: Hydraulic Cement

In Subsection 907-701.02.2.1 on page 3, delete the line in Table 1 addressing Severe Soluble Sulfate Conditions, and substitute the following:

Severe	0.20 - 2.00	1,500 - 10,000	Type I cement with a replacement by weight of 50% GGBFS, or Type II ** cement with one of the following replacements of cement by weight: 25% Class F fly ash, 50% GGBFS, 10% metakaolin, or 8% silica fume

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-701-3 **CODE: (IS)**

DATE: 11/30/2007

SUBJECT: Hydraulic Cement

Section 701, Hydraulic Cement, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

Delete Subsection 701.01 on pages 595 & 596, and substitute the following:

907-701.01--General. The following requirements shall be applicable to hydraulic cement:

Only hydraulic cements conforming to Section 701 shall be used. Hydraulic cements shall not be listed or designated as meeting more than one AASHTO or Department type.

Different brands of hydraulic cement, or the same brand of hydraulic cement from different mills, shall not be mixed or used alternately in any one class of construction or structure, without written permission from the Engineer; except that this requirement will not be applicable to hydraulic cement treatment of design soils, or bases.

The Contractor shall provide suitable means for storing and protecting the hydraulic cement against dampness. Hydraulic cement, which for any reason, has become partially set or which contains lumps of caked hydraulic cement will be rejected. Hydraulic cement salvaged from discarded or used bags shall not be used.

The temperature of bulk hydraulic cement shall not be greater than l65°F at the time of incorporation in the mix.

Acceptance of hydraulic cement will be based on the certification program as described in the Department's Materials Division Inspection, Testing, and Certification Manual and job control sampling and testing as established by Department SOP.

Retests of hydraulic cement may be made for soundness and expansion within 28 days of test failure and, if the hydraulic cement passes, it may be accepted. Hydraulic cement shall not be rejected due to failure to meet the fineness requirements if upon retests after drying at 212°F for one hour, it meets such requirements.

Delete Subsection 701.02 on page 596, and substitute the following:

907-701.02--Portland Cement.

907-701.02.1--General.

907-701.02.1.1--Types of Portland Cement. Portland cement (cement) shall be either Type I or Type II conforming to AASHTO Designation: M85 or Type I(MS), as defined by the description below Table 1. Type III cement conforming to AASHTO Designation: M85 or Type III(MS), as defined by the description below Table 1, may be used for the production of precast or precast-prestressed concrete members.

907-701.02.1.2--Alkali Content. All cement types in this Subsection shall meet the Equivalent alkali content requirement for low-alkali cements listed in AASHTO Designation: M85, Table 2.

907-701.02.2--Replacement by Other Cementitious Materials. The maximum replacement of cement by weight is 25% for fly ash or 50% for ground granulated blast furnace slag (GGBFS). The minimum tolerance for replacement shall be 5% below the maximum replacement content. Replacement contents below this minimum tolerance by fly ash or GGBFS may be used, but shall not be given any special considerations, like the maximum acceptance temperature for Portland cement concrete containing pozzolans. Special considerations shall only apply for replacement of cement by fly ash or GGBFS.

907-701.02.2.1--Portland Cement Concrete Exposed to Soluble Sulfate Conditions or Seawater. When Portland cement concrete is exposed to moderate or severe soluble sulfate conditions, or to seawater, cement types and replacement of cement by Class F fly ash, GGBFS, metakaolin, or silica fume shall be as follows in Table 1.

Table 1- Cementitious Materials for Soluble Sulfate Conditions

Sulfate Exposure	Water-soluble sulfate (SO_4) in soil, % by mass	Sulfate (SO_4)in water, ppm	Cementitious material required*
Moderate and Seawater	0.10 - 0.20	150 - 1,500	Type II **, ***, **** cement, or Type I cement with one of the following replacements of cement by weight: 25% Class F fly ash, 50% GGBFS, 10% metakaolin, or 8% silica fume
Severe	0.20 - 2.00	1,500 - 10,000	Type II ** cement with one of the following replacements of cement by weight: 25% Class F fly ash, 50% GGBFS, 10% metakaolin, or 8% silica fume

* The values listed in this table for replacement of Portland cement by the cementitious materials listed are maximums and shall not be exceeded. The minimum tolerance for replacement shall be 0.5% below the maximum replacement content. Replacement contents below this minimum tolerance by the cementitious materials listed in this table do not meet the requirements for the exposure conditions listed and shall not be allowed.

** Type I cement conforming to AASHTO Designation: M85 with a maximum 8% tricalcium aluminate (C_3A) may be used in lieu of Type II cement; this cement is given the designation "Type I(MS)". Type III cement conforming to AASHTO Designation: M85 with a maximum 8% tricalcium aluminate (C_3A) may be used in lieu of Type II cement as allowed in Subsection 907-701.02.1; this cement is given the designation "Type III(MS)".

*** Blended cement meeting the sulfate resistance requirements of Subsection 907-701.04 may be used in lieu of Type II as allowed in Subsection 907-701.04. No additional cementitious materials shall be added to or as a replacement for blended cement.

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

Class C fly ash shall not be used as a replacement for cement in any of the sulfate exposure conditions listed above.

907-701.02.2.2--Cement for Soil Stabilization Exposed to Soluble Sulfate Conditions or Seawater. When Portland cement for use in soil stabilization is exposed to moderate or severe soluble sulfate conditions, or to seawater, cement types and replacement of cement by Class F fly ash or GGBFS shall meet the requirements of Subsection 907-701.02.2.1. Neither metakaolin nor silica fume shall be used to bring the cementitious materials into compliance with the requirements of Table 1.

Delete Subsection 701.03 on page 596, and substitute the following:

907-701.03--Masonry Cement. Masonry cement shall conform to ASTM Designation: C 91 and shall only be used in masonry applications.

Delete Subsection 701.04 on page 596, and substitute the following:

907-701.04--Blended Hydraulic Cement.

907-701.04.1--General.

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

Type I(SM) – Slag-modified Portland cement
Type IS – Portland blast-furnace slag cement
Type I(PM) – Pozzolan-modified Portland cement
Type IP – Portland-pozzolan cement

Blended cement for use in Portland cement concrete or soil stabilization exposed to the moderate soluble sulfate condition or exposure to seawater as defined in Table 1 shall meet the Sulfate resistance requirement listed in AASHTO Designation: M 240, Table 2 and the "(MS)" suffix shall be added to the type designation.

907-701.04.1.2--Alkali Content. All blended cement types in this Subsection shall meet the Mortar expansion requirements listed in AASHTO Designation: M 240, Table 2.

907-701.04.2--Replacement by Other Cementitious Materials. No additional cementitious materials, such as Portland cement, performance hydraulic cement, fly ash, GGBFS, metakaolin, or others, shall be added to or as a replacement for blended cement.

907-701.04.3--Exposure to Soluble Sulfate Conditions or Seawater. When Portland cement concrete or blended cement for soil stabilization is exposed to moderate soluble sulfate conditions or to seawater, where the moderate soluble sulfate condition is defined in Table 1, the

blended cement shall meet the sulfate resistance requirement listed in AASHTO Designation: M 240, Table 2.

When Portland cement concrete or blended cement for soil stabilization is exposed to severe soluble sulfate conditions, where the severe soluble sulfate condition is defined in Table 1, blended cements shall not be used.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-703-8 **CODE: (IS)**

DATE: 06/01/2009

SUBJECT: Aggregates

Section 703, Aggregates, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-703.03.2.4--Gradation. Delete the last sentence of the last paragraph of Subsection 703.03.2.4 on page 611.

907-703.04--Aggregate for Crushed Stone Courses.

907-703.04.1--Coarse Aggregate. Delete the first sentence of the first paragraph of Subsection 703..04.1 on page 611, and substitute the following:

Coarse aggregate, defined as material retained on No. 8 sieve, shall be either crushed stone, slag, granite, shell, gravel, concrete, or combination thereof.

907-703.04.2--Fine Aggregate. Delete the first sentence of the first paragraph of Subsection 703..04.2 on page 611, and substitute the following:

Fine aggregate, defined as material passing no. 8 sieve, shall be material resulting from the crushing of stone, slag, gravel, concrete, or combination thereof.

907-703.04.3--Gradation. Add the following to the "TABLE OF SIZES AND GRADATION OF CRUSHED STONE AGGREGATE" in Subsection 703.04.3 on page 613.

Sieve Size	Percent Passing By Weight	
	Size No. 825	**Crushed Stone**
2 inch	100	
1 1/2 inch	90 - 100	100
1 inch	75 - 98	90 - 100
3/4 inch		
1/2 inch	60 - 85	62 - 90
3/8 inch		
No. 4	40 - 65	30 - 65
No. 8	28 - 54	
No. 10		15 - 40
No. 16	19 - 42	
No. 40		
No. 50	9 - 27	
No. 200	4 - 18	3 - 16

After the "TABLE OF SIZES AND GRADATION OF CRUSHED STONE AGGREGATE" in Subsection 703.04.3 on page 613, add the following:

907-703.04.4--Crushed Concrete. Crushed reclaimed concrete shall also be allowed as a crushed aggregate course provided it meets the requirements of Subsection 703.04 and the following.

Crushed Concrete

Sieve Size	Percent Passing By Weight
2 inch	
1 1/2 inch	100
1 inch	90 - 100
3/4 inch	
1/2 inch	60 - 85
3/8 inch	
No. 4	40 - 65
No. 8	28 - 54
No. 10	
No. 16	19 - 42
No. 40	
No. 50	9 - 27
No. 200	2 - 18

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-711-3 **CODE: (IS)**

DATE: 09/26/2005

SUBJECT: Synthetic Structural Fiber Reinforcement

Section 711, Reinforcement and Wire Rope, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

After Subsection 711.03.4.3 on page 665, add the following:

907-711.04--Synthetic Structural Fiber. Synthetic structural fibers shall meet the requirements of ASTM Designation: C 1116, Section 4.1.3, Note 3. The fibers shall be monofilament made of polypropylene or polypropylene/polyethylene blend meeting the following conditions:

Property	Results
Length, minimum	1.5 inches
Aspect Ratio (length / equivalent diameter)	90
Breaking tenacity, minimum *	530 mN/tex
(Tensile Strength, minimum	70 ksi)
Chord modulus, minimum *	980 cN/tex
(Modulus of Elasticity, minimum	1,300 ksi)

* When tested in accordance with ASTM Designation: D 3822

The dosage rate for the fibers shall be a minimum of three pounds per cubic yard (3 lb / yd^3). The dosage rate for the fibers when used in pile encasements shall be a minimum of four pounds per cubic yard (4 lb / yd^3).

The manufacturer shall furnish the Engineer three copies of the certified test report(s) showing results of all required tests, and certification that the material meets the specifications.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-713-1 **CODE: (IS)**

DATE: 12/11/2007

SUBJECT: Admixtures for Concrete

Section 713, Concrete Curing Materials and Admixtures, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

After the second paragraph of Subsection 713.01.2 on page 676, add the following.

Type 1-D compound may be used on bridge rails, median barriers, and other structures requiring a spray finish. When Type 1-D compound is used, it will be the Contractor's responsibility to assure that the compound has dissipated from the structure prior to applying the spray finish and that the spray finish adheres soundly to the structure.

Delete Subsection 713.02 on pages 676 & 677, and substitute the following:

907-713.02--Admixtures for Portland Cement Concrete. Admixtures shall only be approved by the Department for classification as a single type following the applicable types from AASTHO Designation: M 154 or M 194, or the definition of a mid-range water reducer listed below with the following exception: when requested by the manufacturer the Department will consider classifying an admixture as both a Type A and a Type D. Admixtures shall only be used in accordance with the manufacturer's recommended dosage range for that type. Where an admixture is classified as both a Type A and Type D, the dosage range for use as a Type A shall not overlap the dosage range for use as a Type D.

Air-entraining admixtures shall comply with AASHTO Designation: M 154. Set-retarding, accelerating, and/or water-reducing admixtures shall comply with AASHTO Designation: M 194. Mid-range water-reducers are classified as water-reducing admixtures that reduce the mix water a minimum of 8% when compared to a control mix with no admixtures when tested in accordance with the requirements in AASHTO Designation: M 194. The type designation for admixtures approved by the Department and classified as meeting the requirements of a mid-range water-reducer shall be "MR".

907-713.02.1--Source Approval. In order to obtain approval of an admixture, the Producer/Suppliers shall submit to the State Materials Engineer the following for review: certified test reports, made by an acceptable independent laboratory regularly inspected by the Cement and Concrete Reference Laboratory of the National Institutes of Standards and Technology, which show that the admixture meets all the requirements of the applicable AASHTO or Department Specification for the specific type and the dosage range for the specific type of admixture.

907-713.02.2--Specific Requirements. Admixtures containing chlorides will not be permitted.

907-713.02.3--Acceptance. The Department reserves the right to sample, for check tests, any shipment or lot of admixture delivered to a project.

The Department reserves the right to require tests of the material to be furnished, using the specific cement and aggregates proposed for use on the project, as suggested in AASHTO Designation: M 154 and outlined in AASHTO Designation: M 194.

Failure to maintain compliance with any requirement of these specifications shall be cause for rejection of any previously approved source or brand of admixture.

With each new lot of material shipped the Contractor shall submit to the State Materials Engineer, a notarized certification from the manufacturer showing that the material complies with the requirements of the applicable AASHTO or Department Specification.

When an admixture is used, it shall be the responsibility of the Contractor to produce satisfactory results.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-714-5

DATE: 04/21/2009

SUBJECT: Miscellaneous Materials

Delete the second exception under the first paragraph in Subsection 907-714.05.2 regarding the strength activity index.

Delete Subsection 907-714.11.6 on page 5, and substitute the following:

Delete Subsection 714.11.6 on pages 690 and 691, and substitute the following:

907-714.11.6--Rapid Setting Cementitious Patching Compounds for Concrete Repair. Rapid setting concrete patching compounds must be approved for listing in the Department's "Approved Sources of Materials" prior to use. Upon approval, a product must be recertified every four (4) years to remain on the "Approved Sources of Materials" list. Each product shall be pre-measured and packaged dry by the manufacturer. All liquid solutions included by the manufacturer as components of the packaged material shall be packaged in a watertight container. The manufacturer may include aggregates in the packaged material or recommend the addition of Contractor furnished aggregates.

The type, size and quantity of aggregates, if any, to be added at the job site shall be in accordance with the manufacturer's recommendations and shall meet the requirements of Subsection 703.02 for fine aggregate and Subsection 703.03 for coarse aggregate. Required mixing water to be added at the job site shall meet the requirements of Subsection 714.01.2.

Only those bonding agents, if any, recommended by the manufacturer of the grout or patching compounds may be used for increasing the bond to old concrete or mortar surfaces.

Patching compounds containing soluble chlorides will not be permitted when in contact with steel.

Site preparation, proportioning of materials, mixing, placing and curing shall be performed in accordance with the manufacturer's recommendation for the specific type of application, and the Contractor shall furnish a copy of these recommendations to the Engineer.

Rapid setting cementitious concrete patching compounds, including components to be added at the job site, shall conform to the following physical requirements:

Non-shrink cementitious grouts shall not be permitted for use.

Compressive strength shall equal or exceed 3000 psi in 24 hours in accordance with ASTM C 928 for Type R2 concrete or mortar.

Bond strength shall equal or exceed 1000 psi in 24 hours in accordance with ASTM C 928 for Type R2 concrete or mortar.

The material shall have a maximum length change of ±0.15% in accordance with ASTM C 928 for Type R2 concrete or mortar.

The Contractor shall furnish to the Engineer three copies of the manufacturer's certified test report(s) showing results of all required tests and certification that the material meets the specifications when mixed and place in accordance with the manufacturer's instructions. When the mixture is to be placed in contact with steel, the certification shall further state that the packaged material contains no chlorides. Certified test report(s) and certification shall be furnished for each lot in a shipment.

The proportioning of materials must be approved by the State Materials Engineer and any subsequent change in proportioning must also be approved. A sample of each component shall be submitted to the Engineer along with the quantity or percentage of each to be blended. At least 45 days must be allowed for initial approval.

The proportioning of materials for subsequent lots may be approved by the State Materials Engineer upon receipt of certification from the manufacturer that the new lot of material is the same composition as that originally approved by the Department and that the material has not been changed or altered in any way.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-714-5 **CODE: (IS)**

DATE: 06/18/2008

SUBJECT: Miscellaneous Materials

Section 714, Miscellaneous Materials, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-714.05--Fly Ash. Delete Subsections 714.05.1 & 714.05.2 on pages 680 & 681, and substitute the following:

907-714.05.1--General. The fly ash source must be approved for listing in the Department's "Approved Sources of Materials" prior to use. The acceptance of fly ash shall be based on certified test reports, certification of shipment from the supplier, and tests performed on samples obtained after delivery in accordance with the Department's Materials Division Inspection, Testing, and Certification Manual and Department SOP.

Different classes of fly ash or different sources of the same class shall not be mixed or used in the construction of a structure or unit of a structure without written permission from the Engineer.

The Contractor shall provide suitable means for storing and protecting the fly ash from dampness. Separate storage silos, bins, or containers shall be provided for fly ash. Fly ash which has become partially set or contains lumps of caked fly ash shall not be used.

The temperature of the bulk fly ash shall not be greater than 165°F at the time of incorporation into the work.

All classes of fly ash shall meet the supplementary option chemical requirement for available alkalies listed in AASHTO Designation: M 295, Table 2. Class F fly ash shall have a calcium oxide (CaO) content of less than 6.0%. Class C fly ash shall have a CaO content of greater than or equal to 6.0%.

The replacement of Portland cement with fly ash shall be in accordance with the applicable replacement content specified in Subsection 907-701.02.2.

In addition to these requirements, fly ash shall meet the following specific requirements for the intended use.

907-714.05.2--Fly Ash for Use in Concrete. When used with Portland cement in the production of concrete or grout, the fly ash shall meet the requirements of AASHTO Designation: M 295, Class C or F, with the following exceptions:

The loss on ignition shall not exceed 6.0 percent.

The strength activity index with Portland cement shall be at least 55 percent of the control mix at seven days.

No additional cementitious materials, such as blended hydraulic cement, GGBFS, metakaolin, or others, shall be added to or as a replacement for Portland cement when used with fly ash.

907-714.06--Ground Granulated Blast Furnace Slag (GGBFS). Delete Subsection 714.06.1 on page 681, and substitute the following:

907-714.06.1--General. The GGBFS source must be approved for listing in the Department's "Approved Sources of Materials" prior to use. The acceptance of GGBFS shall be based on certified test reports, certification of shipment from the supplier, and tests performed on samples obtained after delivery in accordance with the Department's Materials Division Inspection, Testing, and Certification Manual and Department SOP.

The Contractor shall provide suitable means for storing and protecting the GGBFS against dampness and contamination. Separate storage silos, bins, or containers shall be provided for GGBFS. GGBFS which has become partially set, caked or contains lumps shall not be used.

The State Materials Engineer shall be notified in writing of the nature, amount and identity of any processing or other additions made to the GGBFS during production.

GGBFS from different mills shall not be mixed or used alternately in any one class of construction or structure without written permission from the Engineer; except that this requirement will not be applicable to cement treatment of design soils or bases.

No additional cementitious materials, such as blended hydraulic cement, fly ash, metakaolin, or others, shall be added to or as a replacement for Portland cement when used with GGBFS in the production of concrete. The replacement of Portland cement with GGBFS shall be in accordance with the applicable replacement content specified in Subsection 907-701.02.2.

Delete Subsection 714.07 on page 682, and substitute the following:

907-714.07--Additional Cementitious Materials.

907-714.07.1--Metakaolin.

907-714.07.1.1--General. Metakaolin shall only be used as a supplementary cementitious material in Portland cement concrete for compliance with the requirements for cementitious materials exposed to soluble sulfate conditions. Metakaolin from different sources shall not be mixed or used alternately in any one class of construction or structure without written permission from the Engineer. No additional cementitious materials, such as blended hydraulic cement, fly ash, GGBFS, or others, shall be added to or as a replacement for Portland cement when used with metakaolin in the production of concrete.

The State Materials Engineer shall be notified in writing of the nature, amount and identity of any processing, or other additions made to the metakaolin during production.

907-714.07.1.2--Source Approval. The approval of each metakaolin source shall be on a case by case basis as determined by the State Materials Engineer. In order to obtain approval of a metakaolin source, the Producer/Suppliers shall submit to the State Materials Engineer the following for review: certified test reports, made by an acceptable, independent laboratory regularly inspected by the Cement and Concrete Reference Laboratory of the National Institutes of Standards and Technology, which show that the metakaolin meets all the requirements of AASHTO Designation: M295, including the Effectiveness in contributing to sulfate resistance, Procedure A, listed in AASHTO Designation: M295, Table 4 for Supplementary Optional Physical Requirements, and other requirements listed herein.

In order to demonstrate effectiveness in contributing to sulfate resistance, included in this test data shall be results of metakaolin from the proposed source tested in accordance with ASTM Designation: C 1012. There shall be two sets of test specimens per the following:

a. One set of test specimens shall be prepared using a Type I Portland cement meeting the requirements of AASHTO Designation: M85 and having a tricalcium aluminate (C_3A) content of more than 8.0%,

b. One set of test specimens shall be prepared using a Type II Portland cement meeting the requirements of AASHTO Designation: M85.

c. The proposed metakaolin shall be incorporated at the rate of 10% cement replacement in each set of test specimens and shall meet both of the acceptance criteria listed below for source approval.

The requirement for acceptance of the test sample using Type I Portland cement is an expansion of 0.10% or less at the end of six months. The requirement for acceptance of the test sample using Type II Portland cement is an expansion of 0.05% or less at the end of six months.

907-714.07.1.3--Storage. The Contractor shall provide suitable means for storing and protecting the metakaolin against dampness and contamination. Metakaolin which has become partially set, caked, or contains lumps shall not be used.

907-714.07.1.4--Specific Requirements. Metakaolin shall meet the requirements of AASHTO Designation: M 295, Class N with the following modifications:

1. The sum of $SiO_2 + Al_2O_3 + Fe_2O_3$ shall be at least 85%. The Material Safety Data Sheet shall indicate that the amount of crystalline silica, as measured by National Institute of Occupation Safety and Health (NIOSH) 7500 method, after removal of the mica interference, is less than 1.0%.
2. The loss on ignition shall be less than 3.0%.
3. The available alkalies, as equivalent Na_2O, shall not exceed 1.0%.
4. The amount of material retained on a No. 325 mesh sieve shall not exceed 1.0%.
5. The strength activity index at seven (7) days shall be at least 85%.

907-714.07.1.5--Acceptance. With each new lot of material shipped the Contractor shall submit to the State Materials Engineer a certified test report from the manufacturer showing that the material meets the requirements AASHTO Designation: M295, Class N and the requirements of this Subsection.

The Department reserves the right to sample, for check tests, any shipment or lot of metakaolin delivered to a project.

907-714.07.2--Silica Fume.

907-714.07.2.1--General. Silica fume shall only be used as a supplementary cementitious material in Portland cement concrete for compliance with the requirements for cementitious materials exposed to soluble sulfate conditions. Silica fume from different sources shall not be mixed or used alternately in any one class of construction or structure without written permission from the Engineer. No additional cementitious materials, such as blended hydraulic cement, performance hydraulic cement, fly ash, GGBFS, or others, shall be added to or as a replacement for Portland cement when used with silica fume in the production of concrete.

The State Materials Engineer shall be notified in writing of the nature, amount and identity of any processing, or other additions made to the silica fume during production.

907-714.07.2.2--Source Approval. The approval of each silica fume source shall be on a case by case basis as determined by the State Materials Engineer. In order to obtain approval of a silica fume source, the Producer/Suppliers shall submit to the State Materials Engineer the following for review: certified test reports, made by an acceptable, independent laboratory regularly inspected by the Cement and Concrete Reference Laboratory of the National Institutes of Standards and Technology, which show that the silica fume meets all the requirements of AASHTO Designation: M307, Table 3, including the Sulfate resistance expansion, listed in the table for Optional Physical Requirements, and other requirements listed herein.

In order to demonstrate effectiveness in contributing to sulfate resistance, included in this test data shall be results of silica fume from the proposed source tested in accordance with ASTM Designation: C 1012. There shall be two sets of test specimens per the following:

a. One set of test specimens shall be prepared using a Type I Portland cement meeting the requirements of AASHTO Designation: M85 and having a tricalcium aluminate (C_3A) content of more than 8.0%,

b. One set of test specimens shall be prepared using a Type II Portland cement meeting the requirements of AASHTO Designation: M85.

c. The proposed silica fume shall be incorporated at the rate of 8% cement replacement in each set of test specimens and shall meet both of the acceptance criteria listed below for source approval.

The requirement for acceptance of the test sample using Type I Portland cement is an expansion of 0.10% or less at the end of six months. The requirement for acceptance of the test sample using Type II Portland cement is an expansion of 0.05% or less at the end of six months.

907-714.07.2.3--Storage. The Contractor shall provide suitable means for storing and protecting the silica fume against dampness and contamination. Silica fume which has become partially set, caked, or contains lumps shall not be used.

907-714.07.2.4--Acceptance. With each new lot of material shipped, the Contractor shall submit to the State Materials Engineer a certified test report from the manufacturer showing that the material meets the Chemical and Physical Requirements of AASHTO Designation: M307.

The Department reserves the right to sample, for check tests, any shipment or lot of silica fume delivered to a project.

907-714.11.6--Rapid Setting Commercial Grouts and Concrete Patching Compounds. Delete the first sentence of the first paragraph of Subsection 714.11.6 on page 690 and substitute the following:

Rapid setting commercial grouts and concrete patching compounds must be approved for listing in the Department's "Approved Sources of Materials" prior to use. Upon approval, a product must be recertified every four (4) years to remain on the "Approved Sources of Materials" list. Each product shall be pre-measured and packaged dry by the manufacturer.

907-714.11.7--Commercial Grout for Anchoring Doweled Tie Bars in Concrete. Before Subsection 714.11.7.1 on page 691, add the following:

Approved Non-"Fast Set" Epoxy anchor systems as specified below may be used for the repair of concrete pavements that do not involve permanent sustained tension applications or overhead applications.

"***Fast Set Epoxy***" may not be used for any Adhesive Anchor Applications. Adhesive Anchor Systems (Fast Set epoxy or otherwise) shall not be used for permanent sustained tension applications or overhead applications. "Fast Set Epoxy" refers to an epoxy produced by the Sika Corporation called Sikadur AnchorFix-3 and repackaged for sale under a variety of names/companies listed at the Federal Highway Administration web site at the following link:

http://www.fhwa.dot.gov/Bridge/adhesives.cfm

907-714.11.7.4--Acceptance Procedure. After the last sentence of the first paragraph of Subsection 714.11.4 on page 691, add the following:

Upon approval, a product must be recertified every four (4) years to remain on the "Approved Sources of Materials" list.

907-714.11.8--Epoxy Joint Repair System.

907-714.11.8.1--General. After the last sentence of the first paragraph of Subsection 714.11.8.1 on page 692, add the following:

Upon approval, a product must be recertified every four (4) years to remain on the "Approved Sources of Materials" list.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-715-3 **CODE: (IS)**

DATE: 01/25/2008

SUBJECT: Roadside Development Materials

Section 715, Roadside Development Materials, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-715-02.2.1--Agricultural Limestone. Delete the first sentence of Subsection 715-02.2.1 on page 704 and substitute the following.

Agricultural limestone shall be either a hard-rock limestone material or a marl or chalk agricultural liming material as addressed in the latest amendment to the Mississippi Agricultural Liming Material Act of 1993, published by the Mississippi Department of Agriculture and Commerce.

907-715.02.2.1.1--Screening Requirements. Delete the first sentence of Subsection 715.02.2.1.1 on page 704.

Delete Subsection 715.02.2.1.2 on page 704 and substitute the following:

907-715-02.2.1.2--Calcium Carbonate Equivalent. Marl or chalk liming material shall not have less than 70% calcium and magnesium carbonate calculated as calcium carbonate equivalent when expressed on a dry weight basis.

907-715-02.2.1.3--Neutralizing Values. Hard-rock limestone material shall have a minimum Relative Neutralizing Value (RNV) of 63.0%, which is determined as follows:

% RNV = CCE x (% passing #10 mesh + % passing #50 mesh)/2

Where: CCE = Calcium Carbonate Equivalent

907-715.03--Seed.

907-715.03.2--Germination and Purity Requirements. Add the following to Table B on page 705.

Name (Kind)	Name (Variety)	Percent Germination	Percent Purity
GRASSES			
Rye Grass	Annual	80	98

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-804-8

DATE: 06/09/2008

SUBJECT: Concrete Bridges and Structures

Before the first sentence of 907-804.02.1 on page 1, add the following:

Delete the third and fourth sentences of the first paragraph of Subsection 804.02.1 on page 846, and substitute the following:

For projects with 1000 cubic yards and more, quality control and acceptance shall be achieved through statistical evaluation of test results. For projects of more than 200 but less than 1000 cubic yards, quality control and acceptance shall be achieved by individual test results.

Before the first sentence of Subsection 907-804.02.10 on page 2, add the following:

Delete the first sentence of the first paragraph of Subsection 804.02.10 on page 850 and substitute the following:

At least 30 days prior to production of concrete, the Contractor shall submit to the Engineer proposed concrete mix designs complying with the Department's *Concrete Field Manual*.

Delete the second paragraph of Subsection 907-804.02.11 on page 3 and substitute the following:

For projects with 1000 cubic yards and more, the concrete batch plant shall meet the requirements for an automatic system capable of recording batch weights. It shall also have automatic moisture compensation for the fine aggregate. For projects of more than 200 but less than 1000 cubic yards the plant can be equipped for manual batching with a fine aggregate moisture meter visible to the plant operator.

Delete Subsection 907-804.02.13 on page 4 and substitute the following:

907-804.02.13--Quality Assurance Sampling and Testing. Delete subparagraph c) in Subsection 804.02.13 on page 858 and substitute the following:

c) For concrete, the Contractor's QC and Department's QA testing of concrete compressive strengths compare when using the data comparison computer program with an alpha value of 0.01 for projects with 1000 cubic yards and more; or, strength comparisons are within 990 psi for projects of more than 200 but less than 1000 cubic yards.

In Table 5 of Subsection 804.02.13 on page 858, delete "and FM" from the requirements on line A.3.

After Subsection 907-804.02.13.1.4 on page 4, add the following:

907-804.02.13.1.5--Compressive Strength. Delete the heading of the second paragraph of Subsection 804.02.13.1.5 on page 860 and substitute the following:

Projects with 1000 Cubic Yards and More.

Delete the second heading in Subsection 804.02.13.1.5 on page 860 and substitute the following:

Projects of More Than 200 but Less Than 1000 Cubic Yards.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-804-8 **CODE: (IS)**

DATE: **02/05/2008**

SUBJECT: Concrete Bridges And Structures

Section 804, Concrete Bridges And Structures, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-804.02-- Materials.

907-804.02.1--General. Add the following materials to the list of materials in Subsection 804.02.1 on page 847.

Blended Cement ..... 907-701.01 and 907-701.04
Ground Granulated Blast Furnace Slag (GGBFS) 907-714.06
Metakaolin 907-714.07
Silica Fume 907-714.07.2

907-804.02.8--Laboratory Accreditation. In Table 1 of Subsection 804.02.8 on page 849, substitute AASHTO: R 39 - Making and Curing Concrete Test Specimens in the Laboratory for AASHTO: T 126 - Making and Curing Concrete Test Specimens in the Laboratory.

907-804.02.9--Testing Personnel. Delete Table 2 in this subsection and replace it with the following.

Table 2

Concrete Technician's Tasks	Test Method Required	Certification Required**
Sampling or Testing of Plastic Concrete	AASHTO Designation:T 23, T 119, T 121, T 141, T 152, T 196, and ASTM Designation: C 1064	MDOT Class I certification
Compressive Strength Testing of Concrete Cylinders	AASHTO Designation: T 22 and T 231	MDOT Concrete Strength Testing Technician certification
Sampling of Aggregates	AASHTO Designation: T 2	Work under the supervision of an MDOT Class II certified technician
Testing of Aggregates	AASHTO Designation: T 19, T 27, T 84, T 85, T 248, and T 255	MDOT Class II certification
Proportioning of Concrete Mixtures*	AASHTO Designation: M 157 and R 39	MDOT Class III
Interpretation and Application of Maturity Meter Readings	AASHTO Designation: T 325 and ASTM Designation: C 1074	MDOT Class III or Two hours maturity method training

* Technicians making concrete test specimens for meeting the requirements of Subsection 804.02.10.1.2 shall be MDOT Class I certified and under the direct supervision of an MDOT Class III certified technician.

** MDOT Class I certification encompasses the same test procedures and specifications as ACI Concrete Field Testing Technician Grade I. MDOT Class II certification encompasses the same test procedures and specifications as ACI Aggregate Testing Technician - Level 1. MDOT Concrete Strength Testing Technician encompasses the same test procedures and specifications as ACI Concrete Strength Testing certification.

For specifics about the requirements for each level of certification, please refer to the latest edition of the Department's *Concrete Field Manual*. Technicians holding current MDOT Class I, MDOT Class II and/or MDOT Class III certifications shall be acceptable until those certifications expire. Upon a current certification expiration, recertification with the certifications listed in Table 2 shall be required. Technicians currently performing either specific gravity testing of aggregates or compressive strength tests shall be required to either:

- have the required MDOT certification listed in Table 2, or
- have a current MDOT Class III certification or work under the direct supervision of current MDOT Class III technician, and have demonstrated the specific gravity and/or compressive strength test during the inspection of laboratory equipment by the Materials Division, Concrete Section.

907-804.02.10--Portland Cement Concrete Mix Design. Delete the Notes under Table 3 of Subsection 804.02.10 on pages 850 & 851, and substitute the following:

* Maximum size aggregate shall conform to the concrete mix design for the specified aggregate.

** The replacement limits of Portland cement by weight by other cementitious materials (such as fly ash, GGBFS, metakaolin, silica fume, or others) shall be in accordance with the values in Subsection 907-701.02. Other hydraulic cements may be used in accordance with the specifications listed in Section 701.

*** The slump may be increased up to six (6) inches with an approved mid-range water reducer or up to eight (8) inches with an approved type F or G high range water reducer, in accordance with 907-713.02. Minus slump requirements shall meet those set forth in Table 3 of AASHTO M157 specifications.

**** Entrained air is not required except for concrete exposed to seawater. For concrete exposed to seawater, the total air content shall be 3.0 % to 6.0%. For concrete not exposed to seawater, the total air content shall not exceed 6.0%.

***** Class DS Concrete for drilled shafts shall have an 8±1-inch slump.

Delete the last paragraph of Subsection 804.02.10 on page 851 and substitute the following:

Either Type A, D, F, G or mid-range chemical admixture, shall be used in all classes of concrete. Any combinations of water reducing admixtures shall be approved by the Engineer before their use.

907-804.02.10.1.1--Proportioning on the Basis of Previous Field Experience of Trial Mixtures. Delete the first sentence of the first paragraph of Subsection 804.02.10.1.1 on page 851, and substitute the following:

Where a concrete production facility has a record, based on at least 10 consecutive strength tests from at least 10 different batches within the past 12 months from a mixture not previously used on Department projects, the standard deviation shall be calculated.

907-804.02.10.3--Field Verification of Concrete Mix Design. Delete the third sentence of the third paragraph of Subsection 804.02.10.3 on page 853, and substitute the following:

If the requirements of yield, slump, or total air content are not met within three (3) production days after the first placement, subsequent field verification testing shall not be permitted on department projects, and the mix design shall not be used until the requirements listed above are met

907-804.02.10.4--Adjustments of Mixture Proportions. Delete the paragraph in Subsection 804.02.10.4 on page 854, and substitute the following:

The mixture may be adjusted by the Class III Certified Technician representing the Contractor in accordance with the allowable revisions listed in the Department's Concrete Field Manual, paragraph 5.7. Written notification shall be submitted to the Engineer a minimum of seven (7) days prior to any source or brand of material change, aggregate size change, allowable material type change, or decrease in any cementitious material content. Any adjustments of the concrete mixture design shall necessitate repeat of field verification procedure as described in Subsection 804.02.10.3 and approval by the Engineer.

907-804.02.11--Concrete Batch Plants. Delete the first three paragraphs of Subsection 804.02.11 on page 854, and substitute the following:

The concrete batch plant shall meet the requirements of the National Ready Mixed Concrete Association *Quality Control Manual, Section 3, Plant Certification Checklist* as outlined in the latest edition of the Department's *Concrete Field Manual*. The Contractor shall submit a copy of the approved checklist along with proof of calibration of batching equipment, i.e., scales, water meter, and admixture dispenser, to the Engineer 30 days prior to the production of concrete.

For large volume projects the concrete batch plant shall meet the requirements for an automatic system capable of recording batch weights. It shall also have automatic moisture compensation for the fine aggregate. For small volume projects, the concrete batch plant can be equipped for manual batching with a fine aggregate moisture meter visible to the plant operator.

The concrete batch plant shall have available adequate facilities to cool concrete during hot weather.

Mixer trucks to be used on the project are to be listed in the checklist and shall meet the requirements of the checklist.

907-804.02.12--Contractor's Quality Control. Delete the fourth paragraph of Subsection 804.02.12 on page 854 & 855, and substitute the following:

The Contractor's Quality Control program shall encompass the requirements of AASHTO Designation: M 157 into concrete production and control, equipment requirements, testing, and batch ticket information. The requirement of AASHTO Designation: M 157, Section 11.7 shall

be followed except, on arrival to the job site, a maximum of 1½ gallons per cubic yard is allowed to be added. Water shall not be added at a later time. If the maximum permitted slump is exceeded after the addition of water at the job site, the concrete shall be rejected.

907-804.02.12.3--Documentation. After the second sentence of the second paragraph of Subsection 804.02.12.3 on page 856, add the following:

Batch tickets and gradation data shall be documented in accordance with Department requirements. Batch tickets shall contain all the information in AASHTO Designation: M157, Section 16 including the additional information in Subsection 16.2 with the following exception: the information listed in paragraphs 16.2.7 and 16.2.8 is not required. Batch tickets shall also contain the concrete producer's permanent unique mix number assigned to the concrete mix design.

907-804.02.12.5--Non-Conforming Materials. In Table 4 of Subsection 804.02.12.5 on page 857, delete "/ FM" from the requirements on line B.3.a.

907-804.02.13--Quality Assurance Sampling and Testing. In Table 5 of Subsection 804.02.13 on page 858, delete "and FM" from the requirements on line A.3.

907-804.02.13.1.4--Temperature. Delete the first paragraph of Subsection 804.02.13.1.4 on pages 859 & 860, and substitute the following:

Cold weather concreting shall follow the requirements of Subsection 907-804.03.16.1. Hot weather concreting shall follow the requirements of Subsection 804.03.16.2 with a maximum temperature of 95°F for Class DS concrete or for concrete mixes containing cementitious materials meeting the requirements of Subsection 907-701.02.2 as a replacement of Portland cement. For other concrete mixes, the maximum concrete temperature shall be 90°F. Concrete with a temperature more than the maximum allowable temperature shall be rejected and not used in Department work.

907-804.03--Construction Requirements.

907-804.03.15--Removal of Falsework, Forms, and Housing. Delete the first sentence of the second paragraph of Subsection 804.03.15 on page 871, and substitute the following:

Concrete in the last pour of a continuous superstructure shall have attained a compressive strength of 2,400 psi, as determined by cylinder tests or maturity meter probe, prior to striking any falsework.

Delete the first sentence of the third paragraph of Subsection 804.03.15 on page 871, and substitute the following:

At the Contractor's option and with the approval of the Engineer, the time for removal of forms may be determined by cylinder tests, in accordance with the requirements listed in Table 6, in which case the Contractor shall furnish facilities for testing the cylinders.

Delete the fourth and fifth paragraphs of Subsection 804.03.15 on pages 871 & 872, and substitute the following:

The cylinders shall be cured under conditions which are not more favorable than those existing for the portions of the structure which they represent.

Delete the table in Subsection 804.03.15 on page 872, and substitute the following:

Table 6
Minimum Compressive Strength Requirements for Form Removal

Forms:	
Columns	1000 psi
Side of Beams	1000 psi
Walls not under pressure	1000 psi
Floor Slabs, overhead	2000 psi
Floor Slabs, between beams	2000 psi
Slab Spans	2400 psi
Other Parts	1000 psi
Centering:	
Under Beams	2400 psi
Under Bent Caps	2000 psi
Limitation for Placing Beams on:	
Pile Bents, pile under beam	2000 psi
Frame Bents, two or more columns	2200 psi
Frame Bents, single column	2400 psi

In lieu of using concrete strength cylinders to determine when falsework, forms, and housings can be removed, an approved maturity meter may be used to determine concrete strengths by inserting probes into concrete placed in a structure. The minimum number of maturity meter probes required for each structural component shall be in accordance with Table 7. Falsework, forms, and housings may be removed when maturity meter readings indicate that the required concrete strength is achieved. Procedures for using the maturity meter and developing the strength/maturity relationship shall follow the requirements of AASHTO Designation: T 325 and ASTM Designation: C 1074 specifications. Technicians using the maturity meter or calculating strength/maturity graphs shall be required to have at least two hours of training prior to using the maturity equipment.

Table 7
Requirements for use of Maturity Meter Probes

Structure Component	Quantity of Concrete	No. of Probes
Slabs, beams, walls, & miscellaneous items	0 - 30 yd^3	2
	> 30 to 60 yd^3	3
	> 60 to 90 yd^3	4
	> 90 yd^3	5
Footings, Columns & Caps	0 - 13 yd^3	2
	> 13 yd^3	3
Pavement, Pavement Overlays	1200 yd^2	2
Pavement Repairs	Per repair or 900 yd^2 Whichever is smaller	2

907-804.03.16--Cold or Hot Weather Concreting.

907-804.03.16.1--Cold Weather Concreting. After the third paragraph of Subsection 804.03.16.1 on page 873, add the following:

In lieu of the protection and curing of concrete in cold weather, at the option of the Contractor with the approval of the Engineer, when concrete is placed during cold weather and there is a probability of ambient temperatures lower that 40°F, an approved maturity meter may be used to determine concrete strengths by inserting probes into concrete placed in a structure. The minimum number of maturity meter probes required for each structural component shall be in accordance with Table 7. An approved insulating blanketing material shall be used to protect the work when ambient temperatures are less than 40°F and shall remain in place until the required concrete strength in Table 6 is achieved. Procedures for using the maturity meter and developing the strength/maturity relationship shall follow the requirements of AASHTO Designation: T 325 and ASTM Designation: C 1074 specifications. Technicians using the maturity meter or calculating strength/maturity graphs shall be required to have at least two hours of training prior to using the maturity equipment.

Rename the Table in Subsection 804.03.16.1 on page 874 from "Table 6" to "Table 8".

907-804.03.19--Finishing Concrete Surfaces.

907-804.03.19.7--Finishing Bridge Floors.

907-804.03.19.7.4--Acceptance Procedure for Bridge Deck Smoothness. After the first sentence of the second paragraph of Subsection 804.03.19.7.4 on page 886, add the following:

Auxiliary lanes, tapers, shoulders and other areas that are not checked with the profilograph, shall meet a 1/8 inch in 10-foot straightedge check made transversely and longitudinally across the deck or slab.

907-804.05--Basis of Payment. Add the "907" prefix to the pay items listed on page 898.

SPECIAL PROVISION NO. 906-3

Training Special Provisions

This Training Special Provision supersedes subparagraph 7b of the Special Provision entitled "Specific Equal Employment Opportunity Responsibilities," (Attachment 1), and is in implementation of 23 U.S.C. 140(a).

As part of the Contractor's equal employment opportunity affirmative action program training shall be provided as follows:

> The Contractor shall provide on-the-job training aimed at developing full journeymen in the type of trade or job classification involved.

The number of trainees to be trained under this special provision will be as indicated in the bid schedule of the contract.

In the event that a Contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided, however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also insure that this training special provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing construction, the Contractor shall submit to the State highway agency for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeymen status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a

journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by the State highway agency and the Federal Highway Administration. The State highway agency and the Federal Highway Administration shall approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the engineer, reimbursement will be made for training persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees be on board for the entire length of the contract. A

Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The Contractor shall furnish the trainee a copy of the program he will follow in providing the training. The Contractor shall provide each trainee with a certification showing the type and length of training satisfactorily completed.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

SPECIAL PROVISION NO. 906-6

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
ON-THE-JOB TRAINING PROGRAM

ALTERNATE TRAINING SPECIAL PROVISION

PURPOSE

The purpose of the On-The-Job Training (OJT) Program is to provide training for minority, female and economically disadvantaged individuals in order that they may develop marketable skills and gain journey status in the skilled craft classifications in which they are being trained.

INTRODUCTION

This voluntary OJT Program has been developed through the partnering efforts of the Road Builders of Mississippi, the Federal Highway Administration (FHWA) and the Mississippi Department of Transportation (MDOT).

The OJT Program has been designed for use by participating contractors and subcontractors in meeting their training needs. The objective of the OJT Program is to develop skilled workers in the skilled craft trade areas of highway construction who are sufficiently trained to be productive employees in the highway construction industry work force.

The success of the OJT Program will require that contractors and subcontractors take part in the program and follow uniform procedures in training and in tracking trainee's progress.

FUNDING

MDOT will establish an annual OJT Fund from which, contractors and subcontractors may bill the Department directly for hours worked by trainees. The funding source of this money will be state and federal funds for MDOT's OJT Program.

DISBURSEMENT OF FUNDS

MDOT will pay $3.00 per hour toward the trainee's salary for each hour of training performed by each trainee in an approved training program. Program reimbursements will be made directly to the prime or sub contractor. Requests for payment will be submitted to the Office of Civil Rights for approval.

Contractors must provide a signed invoice providing the following information to be reimbursed.

- Contractor's Name
- Mailing Address
- Trainee Name
- Social Security Number

- Race
- Sex
- Project Number
- Job Classification
- Total Number of Hours Completed

TRAINING PROGRAM APPROVAL

A. To use the OJT Program on highway construction projects, the contractor will notify the Department Office of Civil Rights using the On-the-Job Trainee Schedule Form. The notification must include the following information:

- Trainee Starting Date
- Project number (s) trainee starting on
- Training program (classification) to be used; and
- Number of Training Hours Required

B. If a contractor chooses to use a training program different from those listed in the OJT Program Manual, or desires to train in a different classification, the training program must be submitted in its entirety for approval by the Department and FHWA. The training proposal must include the following:

1. The primary objective of the program: To provide training for minority, female and economically disadvantaged individuals for development to full journey status in the work classifications in which they are being trained.

2. The minimum number of hours and type of training the trainee will receive as it relates to each specific task required to achieve journey status.

3. No less than minimum wage.

4. Trainee certification of completion.

5. Records and reports submitted to the Office of Civil Rights on a monthly basis.

DEPARTMENT RESPONSIBILITY

1. Department project staff will monitor trainees on the project. They will monitor payrolls for payment of correct wage rates and fringe benefits. The Office of Civil Rights will maintain a master list by contractor name, project number, trainee name and trainee social security number to aid project staff in monitoring trainees who work on multiple projects.

2. The Office of Civil Rights may elect to interview trainees periodically during the training period to assess their performance and training program.

CONTRACTOR RESPONSIBILITY

1. Trainees must be identified on payrolls (i.e. dragline trainee).

2. When any trainee completes a program, or is terminated for a reason or reasons other than successful completion, the contractor must include the date of completion or an explanation for the termination and date of termination on the OJT Termination Report.

3. The contractor will assign each trainee to a particular person--either a supervisor or a journeyman/woman who is proficient in the craft the trainee is being trained in, to ensure that timely instructional experience is received by the trainee. This person, cooperating with the appropriate company personnel, will see that proper records and the total intended training hours are completed during the allocated number of hours set up in the classification criteria.

4. The contractor has the prerogative of terminating the training period of the trainee and advancing the trainee to journey status. Approval requests must be submitted to the Office of Civil Rights with an explanation (***refer to 2 above***).

5. Upon notification from the contractor, the Department will issue a skill verification card and certificate of training to the trainee.

6. Trainees may be transferred to state-aid highway construction projects in order to complete the training program. If transfers are made the Office of Civil Rights must be notified on the Monthly Trainee Form. All of the training hours completed by trainees will count toward overall program completion.

7. Program reimbursements will be made directly to the prime or sub contractor.

WAGE RATE

The wage rate for all trainees is the current Minimum Federal Wage Rate, during their OJT training program. Trainees shall be paid full fringe benefit amounts, where applicable. At the completion of the training program, the trainee shall receive the wages of a skilled journey.

RECRUITMENT AND SELECTION PROCEDURES

A. Prerequisites for Trainees

To be qualified for enrollment in the OJT Program, trainees must possess basic physical fitness for the work to be performed, dependability, willingness to learn and ability to follow instructions.

B. Licenses

Truck driver trainees must possess appropriate driver permits or licenses for the operation of Class A, B and C trucks. However, when an instructional permit is used in lieu of a license, the trainee must be accompanied by an operator who:

1. Holds a license corresponding to the vehicle being operated;

2. Has had at least one year of driving experience; and

3. Is occupying the seat next to the driver.

C. Recruitment

1. Notices and posters setting forth the contractor's Equal Employment Opportunity Policy and availability of training programs will be placed in areas readily accessible to employees, applicants for employment and potential employees.

2. The contractor must target minority, female or economically disadvantaged trainees.

3. The contractor will conduct systematic and direct recruitment through public and private employee referral sources. Contractors must submit the trainee's name and completed application form to the Office of Civil Rights for review and approval. Approval must be obtained before the trainee can begin work under the training program.

4. Present employees will be screened for upgrading.

D. Selection

1. The selection and employment of a person by participating contractor shall qualify the person for the OJT Program.

2. Selection will be made without regard to race, color, religion, sex, age or national origin and shall be completely nondiscriminatory.

3. Employment of trainees will be in accordance with the work force requirements of the contractor. Each contractor will hire and train the trainees for uses in their own organization.

4. Written certification of individuals under the category of economically disadvantaged can be provided to the contractor at the time of the interview. This certification must then be provided to the Office of Civil Rights with the other required information as part of the approval process for trainees.

- ***NOTE:*** The OJT Program is to provide training for minority, female and economically disadvantaged individuals in order that they may develop marketable skills and gain journey status in the skilled craft classifications in which they are being trained. However, this program does not exclude trainees that are not members of the above groups.

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.

SECTION 905 -- PROPOSAL (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.

Installation of Intelligent Transportation System (ITS) improvements on US 49, US 98 & I-59 in Hattiesburg, known as Federal Aid Project No. ITS-0210-00(017) / 105469301 & 302, in the Counties of Forrest and Lamar, State of Mississippi.

I (We) agree to complete the entire project within the specified contract time.

***** SPECIAL NOTICE TO BIDDERS *****
BIDS WILL NOT BE CONSIDERED UNLESS BOTH UNIT PRICES AND ITEM TOTALS ARE ENTERED.
BIDS WILL NOT BE CONSIDERED UNLESS THE BID CERTIFICATION LOCATED AT THE END OF THE BID SHEETS IS SIGNED

*****BID SCHEDULE*****

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Item Amount	
						Dollar	Ct	Dollar	Ct
Roadway Items									
0010	201-B001		5	Acre	Clearing and Grubbing				
0020	203-EX018	(E)	1,400	Cubic Yard	Borrow Excavation, AH, LVM, Class B9				
0030	603-CA002	(S)	24	Linear Feet	18" Reinforced Concrete Pipe, Class III				
0040	603-CA003	(S)	24	Linear Feet	24" Reinforced Concrete Pipe, Class III				
0050	603-CB001	(S)	2	Each	18" Reinforced Concrete End Section				
0060	603-CB002	(S)	2	Each	24" Reinforced Concrete End Section				
0070	606-B001		2,025	Linear Feet	Guard Rail, Class A, Type 1				
0080	606-C003		9	Each	Guard Rail, Cable Anchor, Type 1				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0090	606-E001		9	Each	Guard Rail, Terminal End Section				
0100	618-A001		1	Lump Sum	Maintenance of Traffic	XXXXXXXX	XXX		
0110	618-B001		1	Square Feet	Additional Construction Signs	10.	00	10.	00
0120	619-D4001		116	Square Feet	Directional Signs				
0130	619-E1001		2	Each	Flashing Arrow Panel, Type C				
0140	620-A001		1	Lump Sum	Mobilization	XXXXXXXX	XXX		
0150	630-F001		75	Each	Delineators, Guard Rail, White				
0160	630-F002		6	Each	Delineators, Guard Rail, Yellow				
0170	647-A003		57	Each	Pullbox, Type 4				
0180	647-A004		52	Each	Pullbox, Type 5				
0190	647-A005		62	Each	Pullbox, Type 2				
0200	650-A002		16	Each	On Street Video Equipment, Fixed Type				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0210	650-A003		8	Each	On Street Video Equipment, PTZ Type				
0220	666-B037		4,000	Linear Feet	Electric Cable, Underground in Conduit, THHN, AWG 1/0, 4 Conductor				
0230	666-B038		3,590	Linear Feet	Electric Cable, Underground in Conduit, THHN, AWG #4, 3 Conductor				
0240	668-A029		8,260	Linear Feet	Traffic Signal Conduit, Underground, Rolled Pipe, 2"				
0250	668-B024		460	Linear Feet	Traffic Signal Conduit, Underground Drilled or Jacked, Rolled Pipe, 2"				
0260	907-225-A001		10	Acre	Grassing				
0270	907-225-B001		30	Ton	Agricultural Limestone				
0280	907-304-F001	(GT)	150	Ton	Size 825 Crushed Stone Base				
0290	907-403-A015	(BA1)	492	Ton	Hot Mix Asphalt, ST, 9.5-mm mixture				
0300	907-619-E3001		2	Each	Changeable Message Sign				
0310	907-630-I005		1	Lump Sum	Metal Overhead Sign Supports, Assembly No. 5, Contractor Designed	XXXXXXXX	XXX		
0320	907-630-M001		1	Lump Sum	Pedestal Sign Support, Assembly No 1, Contractor Designed	XXXXXXXX	XXX		

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0330	907-630-M002		1	Lump Sum	Pedestal Sign Support, Assembly No 2, Contractor Designed	XXXXXXXX	XXX		
0340	907-630-M006		1	Lump Sum	Pedestal Sign Support, Assembly No 3, Contractor Designed	XXXXXXXX	XXX		
0350	907-630-M007		1	Lump Sum	Pedestal Sign Support, Assembly No 4, Contractor Designed	XXXXXXXX	XXX		
0360	907-630-M008		1	Lump Sum	Pedestal Sign Support, Assembly No 6, Contractor Designed	XXXXXXXX	XXX		
0370	907-630-M009		1	Lump Sum	Pedestal Sign Support, Assembly No 7, Contractor Designed	XXXXXXXX	XXX		
0380	907-637-A001		1	Each	Equipment Cabinet, Type B				
0390	907-637-A002		3	Each	Equipment Cabinet, Type C				
0400	907-639-E001		8	Each	Camera Pole with Foundation, 50' Pole				
0410	907-641-A001		8	Each	Radar Detection System				
0420	907-655-A001		2	Each	Highway Advisory Radio System				
0430	907-655-B001		5	Each	Highway Advisory Radio Flashing Beacon				
0440	907-655-C001		1	Lump Sum	Highway Advisory Radio System Software and Server	XXXXXXXX	XXX		

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0450	907-656-A001		1	Each	Dynamic Message Sign, Type 1				
0460	907-656-A002		6	Each	Dynamic Message Sign, Type 2				
0470	907-656-B001		1	Lump Sum	Dynamic Message Sign Training	XXXXXXXX	XXX		
0480	907-657-A001		91,195	Linear Feet	Fiber Optic Cable, 72 SM				
0490	907-657-B001		1,460	Linear Feet	Fiber Optic Drop Cable, 12 SM				
0500	907-658-A001		10	Each	Hardened Network Switch, Type A				
0510	907-658-A003		3	Each	Hardened Network Switch, Type C				
0520	907-658-B001		8	Each	Terminal Server				
0530	907-659-A001		1	Lump Sum	Traffic Management Center Modifications	XXXXXXXX	XXX		
0540	907-659-C001		1	Lump Sum	Traffic Management Center Modifications - Training	XXXXXXXX	XXX		
0550	907-660-A001		3	Each	OTN Node				
0560	907-660-B001		3	Each	OTN Node Communications Hut				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0570	907-660-C001		1	Lump Sum	OTN Node Training	XXXXXXXX	XXX		
0580	907-662-A001		8	Each	Video Encoder, Type A				
0590	907-668-E002		56,880	Linear Feet	Traffic Signal Conduit Bank, Underground, Rolled Pipe, 2 @ 2"				
0600	907-668-E003		500	Linear Feet	Traffic Signal Conduit Bank, Underground, Rolled Pipe, 3 @ 2"				
0610	907-668-E004		3,400	Linear Feet	Traffic Signal Conduit Bank, Underground, Rolled Pipe, 4 @ 2"				
0620	907-668-F002		28,025	Linear Feet	Traffic Signal Conduit Bank, Underground, Drilled or Jacked,Rolled Pipe, 2 @ 2"				
0630	907-668-F003		650	Linear Feet	Traffic Signal Conduit Bank, Underground, Drilled or Jacked,Rolled Pipe, 3 @ 2"				
0640	907-668-F005		180	Linear Feet	Traffic Signal Conduit Bank, Underground, Drilled or Jacked,Rolled Pipe, 4 @ 2"				

*** BID CERTIFICATION ***

TOTAL BID.....$_____

*** DBE/WBE SECTION ***

Complete item nos. 1, 2, and/or 3 as appropriate. See Notice to Bidders addressing Disadvantaged Business Enterprises in Highway Construction.

1. I/We agree that no less than _____ percent shall be expended with small business concerns owned and controlled by socially and economically disadvantaged individuals (DBE and WBE).

2. Classification of Bidder: Small Business (DBE)_____ Small Business (WBE)_____

3. A joint venture with a Small Business (DBE/WBE): _____

*** SIGNATURE STATEMENT ***

BIDDER ACKNOWLEDGES THAT HE/SHE HAS CHECKED ALL ITEMS IN THIS PROPOSAL FOR ACCURACY AND CERTIFIED THAT THE FIGURES SHOWN THEREIN CONSTITUTE THEIR OFFICIAL BID.

_____

BIDDER'S SIGNATURE

_____

BIDDER'S COMPANY

_____

BIDDER'S FEDERAL TAX ID NUMBER

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.

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. **ITS-0210-00(017) / 105469301 & 302**,

in **Forrest and 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. **ITS-0210-00(017) / 105469301 & 302**,

in **Forrest and 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.

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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.

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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 **ITS-0210-00(017) / 105469301 & 302**

LOCATED IN THE COUNTY(IES) OF **Forrest and 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

CONTRACT BOND FOR: **ITS-0210-00(017) / 105469301 & 302**

LOCATED IN THE COUNTY(IES) OF: **Forrest and Lamar**

STATE OF MISSISSIPPI,

COUNTY OF HINDS

Know all men by these presents: that we, _____

_____ Principal, a _____

residing at _____ in the State of _____

and _____

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)	Mississippi Resident Agent
	_____
	(Signature) Mississippi Resident Agent
	Address _____
	_____
	_____
	(Surety Seal)

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____
Contractor

_____
Address

_____
City, State ZIP

as Principal, hereinafter called the Principal, and _____

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 **Installation of Intelligent Transportation System (ITS) improvements on US 49, US 98 & I-29 in Hattiesburg, known as Federal Aid Project No. ITS-0210-00(017) / 105469301 & 302, in the Counties of Forrest and Lamar, State of Mississippi.**

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 _____ , 2009

_____
(Principal) (Seal)

_____ By: _____
(Witness) (Name) (Title)

_____
(Surety) (Seal)

_____ By: _____
(Witness) (Attorney-in-Fact)

_____
MS Resident Agent

_____
Mississippi Insurance ID Number

Bid bond must be signed or countersigned by a qualified Mississippi resident agent and the bidder as per Section 102.08 of the Mississippi Standard Specifications for Road and Bridge Construction, 2004 edition.

OCR-485
REV. 3/08

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: **ITS-0210-00(017) / 105469301 & 302**

County: **Forrest and Lamar**

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 this form is not **signed** and included as part of the bid packet, your bid will be deemed irregular. For further information about this form, call Mississippi DOT's Office of Civil Rights at (601) 359-7466; FAX (601) 576-4504.
Please make copies of this form when needed and also add those copies to the bid package.