REQUEST FOR PROPOSALS

A DESIGN-BUILD PROJECT

Improvements to Interstate 55
Hinds County, Mississippi

Project Number
DB/IM-0055-02(244)/106023-305000

March 5, 2015

REQUEST FOR PROPOSALS DOCUMENT

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Mississippi Department of Transportation

Introduction

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REQUEST FOR PROPOSALS INTRODUCTION

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I. INTRODUCTION

Purpose

The Mississippi Transportation Commission (Commission) intends to select a Proposer to design and provide construction services necessary for the reconstruction and widening of I-55 from Byram to McDowell Road in Hinds County, Mississippi. The proposed design and construction services to I-55 from Byram to McDowell Road will hereinafter be referred to as the "Project." "Proposer," as used herein, includes a firm or firms, partnership, joint venture, or other legal entity, which is a "Short-listed Responder" and has been requested by the Commission to submit Proposals in response to this RFP. The term "Contractor," as used here, is defined as the selected Short-listed Responder with whom the contract is executed.

The submittal of Proposals in response to this RFP, with all required signatures, shall constitute the Proposer's agreement to enter into a contract with the Commission for the completion of the Project under the terms set forth in the contract. The terms of the contract are non-negotiable.

The Commission is requesting a Contract Price, Best-Value Proposal. It is not the intention of the Commission to receive complete detailed project analysis and design prior to the selection of a Proposer. Rather, the response to this RFP shall provide sufficient information to be evaluated in accordance with the specified process and criteria.

Project Goals

The following are the Commission's goals for the Project:

- Construct the Project, so that it is successful in implementing sound organizational approaches with managers who are responsive to the Commission, MDOT, and the traveling public,
- Design and construct a Project of the highest quality, that is readily maintainable, durable, and easily inspected, with a long-lasting facility,
- Design a Project that is sensitive to the environment, and the community,
- Develop and construct the Project, so that it is safe for all parties involved and the public it serves, and
- Complete the Project as soon as possible but no later than the Substantial Completion and Final Completion Dates as listed in Section X, Milestone Schedule.

Project Background

The Project was originally awarded by the Commission on March 19, 2013, utilizing the Design-Bid-Build method of procurement. The Contractor was issued a Notice to Proceed on May 13, 2013, and began working on the Project in accordance with the original set of plans and specifications. On January 5, 2015, the Commission voted to terminate the contract for convenience. The Commission then voted to re-advertise the Project utilizing the Design-Build method of project delivery to allow the Proposers the opportunity to utilize innovative approaches in order to expedite the Project while taking ownership of all design documents.

General Description of the Work

The Contractor is advised to consider that a previous project was under construction when terminated for convenience by MDOT. The Contractor may incorporate all items of work, as feasible, from the previous project up to the time of the previous project's termination, unless specifically stated otherwise in this RFP. Regardless of the status or condition of all items of work from the previous project, whether installed or MDOT furnished, the Contractor shall be solely responsible for designing and constructing the Project, including all items of work incorporated/provided as applicable from the previous project, to meet all standards, specifications, and requirements in accordance with the RFP and State and federal regulations. The Contractor shall develop all applicable plans, signed and sealed by the Contractor's appropriate team member(s), in accordance with the RFP. MDOT furnished items shall become the property of the Contractor as indicated in Section 904 - Notice to Proposers No. 5312 DB. Any design reports, plans, and specifications shall be signed and sealed by a Professional Engineer licensed in the State of Mississippi.

This Project shall include all work necessary to complete the reconstruction and widening of I-55 from Byram to McDowell Road as further described in the Environmental Assessment/Finding of No Significant Impact (FONSI) document prepared by MDOT for this Project. The Project also includes reconstruction of certain sections of the frontage road. In addition, all other areas of the frontage roads and local roads will require a mill and overlay within the State maintained limits. The Project will be approximately 7.6 miles with five (5) interchanges and a minimum of nine (9) retaining walls. The Contractor shall complete all work as indicated in Section 904 – Notice to Proposers No. 2618 DB (Project Scope), in accordance with the standards and specifications indicated in this RFP, and no later than the Substantial Completion Date and Final Completion Date indicated on the Contractor's Schedule Certificate.

The Contractor shall develop bridge repair, retaining wall, roadway, lighting, signal, intelligent transportation systems, erosion control, traffic control, and other applicable plans, signed and sealed by the Contractor's appropriate team member(s), in accordance with this RFP. Design shall meet all appropriate specifications including, but not limited to, MDOT Roadway Design Manual, AASHTO *Policy on Geometric Design of Highways and Streets* (latest edition), AASHTO *LRFD Bridge Design Specifications* (latest edition), AASHTO *Standard Specifications for Highway Bridges* (17th edition), *Manual on Uniform Traffic Control Devices* (MUTCD) (latest edition), the Floodplain Management Regulations for the State of Mississippi, AASHTO *Drainage Manual*, and MDOT design criteria as modified by the RFP. CADD files prepared for MDOT's use shall be compatible to Microstation and Geopak. The survey shall be

performed in accordance with the current MDOT Survey Manual, unless specifically stated otherwise, and with any additional instructions or requests as specified by the MDOT.

Construction shall comply with all appropriate specifications including, but not limited to, the MDOT *Standard Specifications for Road and Bridge Construction 2004 Edition* as modified by the RFP to accommodate specific Design-Build requirements, *Manual on Uniform Traffic Control Devices* (MUTCD) (latest edition), MDOT Standard Drawings, any Special Provisions, Notice to Proposers, current MDOT publications and test methods including, but not limited to, the Construction Manual, the Materials Division Inspection, Testing and Certification Manual, and existing AASHTO or ASTM publications and test methods.

Limits of Construction

The limits of construction shall be in accordance with those limits identified in Section 904 – Notice to Proposers No. 2618 DB (Project Scope).

Informational Documents

All Proposers are hereby notified that MDOT will provide as-built information from the previous project, mobile LiDAR and image surveys, and additional information as "Informational Documents" as defined in Special Provision subsection 907-102.05 of this RFP.

Proposers will be able to access most Informational Documents via a ProjectWise link located on the Design-Build and Special Projects website (mdot.ms.gov – under Contracts and Letting, Design-Build and Special Projects). Proposers will be prompted for their ProjectWise username and password prior to accessing this information. If the Proposer encounters any problems accessing this information via the link, they must e-mail the specific problem encountered to the following address:

I55HindsDesignBuild@mdot.ms.gov.

Testing Requirements

MDOT will be responsible for the Construction Inspection and Job Acceptance Testing; however, the Contractor's Design Engineering Firm will be responsible for Design Quality Control. The Contractor will be responsible for the Quality Control Testing of asphalt and concrete mixtures. The Contractor will also be responsible for providing the Pile Dynamic Analysis (PDA) and pile driving criteria for all structures, and as a result, provide recommended pile lengths to be approved by MDOT. The Quality Control Manager shall be responsible for assuring that the design, all workmanship, and materials are in compliance with the contract requirements.

Environmental Documentation and Other Permits

The Commission has secured an approved Environmental Assessment/Finding of No Significant Impact (FONSI) for the construction of the Project, as well as a Wetlands/Waters United States Army Corps of Engineers (USACE) 404 Permit, and a Storm Water General Permit (LCNOI).

Except for the documents related to the NEPA process, any additional permits and/or permit modifications required will be the responsibility of the Contractor and must be in compliance with all relevant state specifications and federal regulations. A copy of the Environmental Assessment/FONSI, the Wetlands/Waters USACE 404 Permit, and the Storm Water General Permit (LCNOI) are available at the MDOT Design-Build and Special Projects website (mdot.ms.gov - under Contracts and Letting, Design-Build and Special Projects).

Incentive/Disincentive

Proposers are hereby advised that an incentive/disincentive will be incorporated based on Substantial Completion of the Project in accordance with Section 904 – Notice to Proposers No. 5310 DB (Substantial Completion).

Partnering

The Commission values a partnering approach on projects, and as such, this Project will require quarterly formal partnering sessions and weekly informal partnering sessions.

Proposal Stipend

Provided that the Proposer has submitted a responsive Volume 1 - Technical Proposal and a responsive Volume 2 – Contract Price Proposal, a stipend of $75,000.00 will be available to the Proposer(s) to whom the contract is not awarded. The Proposer should include a request for payment of the stipend with their submittal of the Volume 2 - Contract Price Proposal should they not be awarded the Best-Value Proposal.

DBE Goal

The contract for this Project contains a Disadvantaged Business Enterprise (DBE) goal of ten percent (10%) of the contract price. The Proposer shall submit an OCR-485 (located in Section 905 – Proposal) with their submittal of the Volume 2 - Contract Price Proposal.

II. GENERAL INSTRUCTIONS

Pre-Proposal Meeting

A Pre-Proposal meeting will not be held for this Project.

Optional Field Visits

Proposers are advised that three optional field visits will be scheduled. The purpose of the optional field visits is to allow the opportunity to visually inspect the current conditions of the Project. In addition, these field visits will include visiting any State furnished materials sites made available per the RFP. **Proposers are hereby advised that these three optional field visits will be the only opportunities they are allowed to tour the site. No Proposers will be allowed on-site other than the opportunities outlined in this section (other than as members of the traveling public).**

MDOT will issue a letter to each Proposer's Project Director, notifying them of the three field visit dates and providing instructions on when and where to meet in order to participate in each field visit. MDOT will shuttle Proposer representatives to the site. Proposers will be required to accompany the designated MDOT individual(s) while on each field visit. Each Proposer's team is limited to no more than three (3) representatives for each visit scheduled. MDOT will require that Proposer representatives sign a waiver releasing the MDOT and/or others from liability. All representatives visiting the site shall wear hard hats and ANSI approved reflective vests of any color. Any Proposer representative who is not in compliance with these requirements will not be allowed on-site. Proposer representatives may be allowed to take pictures on the field visits. While requests to visit specific areas on the field visits may be allowed, questions will not be addressed.

Questions (RFP) & Addenda

All questions must be e-mailed by the Proposer's Project Director to the following e-mail address:

I55HindsDesignBuild@mdot.ms.gov.

Questions e-mailed in accordance with the above method will be accepted according to the date and time established in the Milestone Schedule.

Questions received and MDOT's written responses to these questions, as well as any applicable addenda, will be posted on the MDOT Design-Build and Special Projects website. Proposers are encouraged to check the website often for posting of new information. Proposers shall be solely responsible for checking the website for updates and addenda.

Proposers shall not rely on any responses about the RFP except written responses to any questions submitted in accordance with the RFP. No requests for additional information or clarification to any other MDOT office, consultant, or employee will be considered. The Commission will not be responsible for and the Proposer shall not rely on any oral or other exchange of information that occurs outside of the official process for questions or addenda as specified herein.

Pre-Proposal Alternate Technical Concept Submittals

In order to facilitate a communicative process with MDOT and to provide a forum for Alternate Technical Concepts (ATCs), MDOT encourages the Proposer to suggest technical alternatives to the Project provided as part of the RFP. All proposed ATCs will be required to meet the current requirements and standards as noted in the RFP. This forum is to aide in uncovering opportunities for Proposers to reduce project costs while providing an equal or better project. All technical questions must be submitted and will be responded to in accordance with the procedure explained below.

Specific requests for each ATC must be submitted by the Project Director and received by MDOT by the date and time indicated in the Milestone Schedule utilizing the Form for Alternate Technical Concept provided with this RFP.

MDOT intends to provide responses to each request by the date indicated in the Milestone Schedule. Each Proposer will be limited to the submission of a **maximum of three (3) requests** for consideration by MDOT. Each request shall contain only a single modification.

Submission of the request for each ATC must include the following:

1. A narrative description of the proposed modification.

2. The location(s) where the proposed modification will be used on the Project.

3. A conceptual drawing of the proposed modification should the ATC impact design.

4. An explanation of why the proposed modification improves the quality of the Project.

5. A description of potential impacts or changes.

6. Each ATC shall be proposed in such a way as to facilitate a simple "yes" or "no" response from MDOT.

The Proposer shall submit electronic copies of its desired ATC(s) utilizing the form provided to the following e-mail address:

I55HindsDesignBuild@mdot.ms.gov.

MDOT will not post the Proposer's completed form or the request to the project website. MDOT will only post the response to each request for an ATC that MDOT determines to be validly submitted. Each ATC for which MDOT intends to post a response will be assigned a number by MDOT, and MDOT will convey that number to the Proposer's Project Director.

III. PROPOSAL INFORMATION

Proposal Development

The Commission is requesting a Contract Price, Best-Value Proposal that includes a project schedule commitment for the work proposed. The price and schedule shall be guaranteed by the Proposer for a minimum of sixty (60) days after the date of opening the Volume 2 - Contract Price Proposal.

The Proposer is solely responsible for submitting Proposals that meet the requirements of the RFP. Assumptions that are not in compliance with the RFP will not relieve the Contractor of the requirements of the RFP. The submitted Proposals are evaluated for general conformance with the RFP requirements for the purpose of selecting the Best-Value Proposal. While those items listed in Section 902 – Contract and Exhibits become part of the contract documents, the Release for Construction (RFC) plans and designs must meet all the RFP Technical Requirements.

In order to evaluate the Proposals efficiently, the Proposals shall be prepared in separate volumes and should be in the following sequence, tabbed and organized as indicated below:

Volume 1 – Technical Proposal

The recommended length of this Proposal is no more than fifty (50) pages, double-spaced, eight and a half (8.5)-inch by eleven (11)-inch pages with margins of at least one (1) inch on all four (4) sides, typed on one (1) side only, excluding appendices. All text information in the recommended fifty (50)-page limit should be shown in a readable font, size twelve (12) points or larger. Pages may be eleven (11) inches by seventeen (17) inches, but they shall count as two (2) sheets each against the recommended fifty (50)-page maximum. Headers, footers, charts, and other graphics may be provided in a different font type and size providing they are legible. Section dividers are not counted as part of the recommended fifty (50)-page maximum. A cover letter, the table of contents, organizational chart, Contractor's Schedule Certificate, and any plan sheets will not be counted as part of the recommended fifty (50)-page maximum. The organizational chart as indicated below in Part 7, Key Individuals, should be provided in the front of the appendix. All plan submittals should be in a separate appendix to the Volume 1 - Technical Proposal. Volume 1 – Technical Proposals should use cross-referencing to reduce repetition in explaining the proposed Project. MDOT reserves the right to reject any Proposal that is deemed illegible. These recommendations and other formatting instructions indicated in this RFP will be considered when evaluating the quality of the Proposer's Volume 1 – Technical Proposal.

Those Volume 1 – Technical Proposals which exceed the recommended proposal length or fail to provide the information in the appropriate location indicated below may adversely affect the Proposer's score. **Proposers should address each of the following categories in the same order as listed below and number those categories in a manner consistent with this RFP as indicated in Section VI.**

Submit a Volume 1 - Technical Proposal containing the following preferred and mandatory information in the order indicated below:

1. **Schedule Certificates and Introductions**

    a. **Contractor's Schedule Certificate** found on page 22 of this RFP. The Proposer **shall include a completed, signed, and responsive** Contractor's Schedule Certificate. This form should be placed at the beginning of the Volume 1 – Technical Proposal. This form will not be counted toward the recommended page limit.

    b. **Introductions** –The Proposer should provide a cover letter that provides introductory information for the Proposal. The cover letter should be limited to no more than two (2) pages. The Proposer should then provide a one (1)-page summary of the overall Volume 1 – Technical Proposal summarizing the benefits provided in the Proposal. The cover letter and summary will not count toward the recommended page limit.

2. **Approach to Design** – Describe the technical principles, solutions, and innovations proposed to design the roadway including the retaining walls, other structures, and the slide repair. Proposers should submit plan sheets (eleven (11)-inch by seventeen (17)-inch in size) for the roadway. The plan sheets should include typical sections, plan-profile, temporary traffic control, and other details as necessary. All plan sheets should be included in a separate appendix to the Volume 1 - Technical Proposal. The eleven (11)-inch by seventeen (17)-inch plan sheets will not count toward the recommended page limit. If a design ATC has been submitted or approved, please include the appropriate ATC form and reference the appropriate ATC number for the related proposed modification. The Proposer should provide specific detail describing how their ATC design will impact the Project.

3. **Approach to Construction** – The Proposer should provide a detailed construction plan for the Project which outlines how the Proposer plans to construct the Project within the requirements stated herein. The Proposer should also describe the proposed project phasing, innovations, and traffic control. In addition, the Proposer should specifically detail how they plan to address the opening of ramps that are currently closed as a priority. Discuss how impacts to roadway users were considered in development of the phasing plan. The Proposer should describe how they will avoid conflicts with utilities, as well. If a construction ATC has been submitted or approved, please include the appropriate ATC form and reference the appropriate ATC number for the related proposed modification. The Proposer should provide specific detail describing how their construction ATC will impact the Project.

4. **Management Approach** – Describe an overall Project Management Plan for the Project. This plan should consist of, but not necessarily be limited to, a description of sound, proven organizational techniques for design management, construction management, and the integration of both for this Design-Build Project. The Proposer should identify anticipated major risks and present a plan to manage those risks. A plan to manage document control should be provided in this section. The Proposer should describe the week-to-week management of the Project and identify the members of the Proposer team who will attend any weekly and monthly coordination meetings. The Proposer should also describe how their plan will result in responsiveness to MDOT's management team.

5. **Quality Management Plan** – The Proposer should define any project controls for design and construction that have been established to ensure overall project quality and describe how these controls will be effective. Describe how the Proposer will monitor for conformance to the plans and specifications in order to verify project quality. The Proposer should also provide a specific description of the process that will be used to promptly and effectively document and resolve issues of non-conformance with the design and construction.

6. **Schedule Summary and Work Plan** – The Proposer should submit a schedule summary and narrative demonstrating a plan to meet the Proposer's Substantial Completion and Final Completion Dates on the Contractor's Schedule Certificate.

At a minimum, the schedule summary should include a written narrative and a chart that includes dates for planned start and finish of design, procurement of major items, mobilization, retaining wall construction, bridge repair, opening of currently closed ramps, slide repair, and the total number of calendar days from the Notice to Proceed to the Proposer's Substantial Completion and Final Completion Dates. The schedule summary and narrative should address phasing outlined in the approach to traffic control. Describe in the narrative how the schedule will reflect the requirements for the maintenance of traffic for roadway users.

The schedule should include a preliminary construction work plan including all work to be performed, detailing the anticipated number of crews, shifts, and length of work week for the work proposed to be completed. The proposed number(s) of calendar days for the Proposer's Substantial Completion and Final Completion Dates should be the same as shown on the Contractor's Schedule Certificate. Should there be a conflict between the proposed number of calendar days in the schedule summary and the number of days on the Contractor's Schedule Certificate for either the Proposer's Substantial Completion Date or the Proposer's Final Completion Date, the number(s) on the Contractor's Schedule Certificate shall govern. In addition, any inconsistencies in the proposed number(s) of calendar days will affect the Proposer's technical score. The Contractor's Schedule Certificate shall be used as the basis for the assessment of liquidated damages and/or disincentives included in the contract.

7. **Key Individuals** – Proposer should include a copy of the organizational chart in the Volume 1 – Technical Proposal as provided in the Statement of Qualifications. **The Proposer shall identify any modifications to Key Individuals, as approved by MDOT, than what were originally presented in the Statement of Qualifications.** If personnel changes are anticipated, then the Proposer shall resubmit all Key Individual information as defined in the Request for Qualifications (RFQ) and shall present a justification for the change. Any modification will require MDOT approval. **A copy of the organizational chart should be provided in the front of the Volume 1 - Technical Proposal appendices**.

   Modifications to the Proposer's Key Individuals listed in the Proposer's Statement of Qualifications are discouraged and may adversely affect the Proposer's technical score. MDOT will not approve requests for modification without justification. Examples of justification include death of a team member, changes in employment status, bankruptcy, inability to perform, organizational conflict of interest, or other such significant cause. In order to secure MDOT's approval prior to the award of the contract, a written request shall be sent to the following e-mail address:

   I55HindsDesignBuild@mdot.ms.gov.

   The request shall include:

   a) The nature of the desired change,

b) The reason for the desired change, and

c) A statement of how the desired change will meet the required qualifications for the position/responsibility.

No such modification will be made without prior MDOT approval.

8. **Organizational Conflict of Interest -** The Proposer's attention is directed to 23 CFR Section 636 Subpart A and in particular to Subsection 636.116 regarding organizational conflicts of interest. Section 636.103 defines "organizational conflict of interest" as follows:

> "Organizational conflict of interest means that because of other activities or relationships with other persons, a person is unable or potentially unable to render impartial assistance or advice to the owner, or the person's objectivity in performing the contract work is or might be otherwise impaired, or a person has an unfair competitive advantage."

Proposers shall provide information concerning potential organizational conflicts of interest and disclose all relevant facts concerning any past, present, or currently planned interests which may present an organizational conflict of interest. Proposer shall state how its interests or those of its chief executives, directors, Key Individuals for this Project, or any proposed consultant, contractor, or subcontractor may result in, or could be viewed as, an organizational conflict of interest.

Proposers are prohibited from receiving any advice or discussing any aspect relating to the Project or procurement of the Project with any person or entity with an organizational conflict of interest, including, but not limited to Michael Baker International and any of their affiliates. Such persons and entities are prohibited from participating on a Proposer team relating to this Project.

The Proposer agrees that, if an organizational conflict of interest is discovered, the Proposer must make an immediate and full disclosure to MDOT that includes a description of the action that the Proposer has taken or proposes to take to avoid or mitigate such conflict. If after award of the contract, an organizational conflict of interest is determined to exist, MDOT may at its discretion cancel the Design-Build contract for the Project at no additional cost. If the Proposer was aware of an organizational conflict of interest prior to the award of the contract and did not disclose the conflict to MDOT, then MDOT may terminate the contract for default.

If no potential conflict of interest exists, the Proposer should indicate so in their Volume 1 - Technical Proposal in this section.

Volume 2 – Contract Price Proposal (Marked and Sealed per Special Provision 907-102-1 DB)

This Volume 2 - Contract Price Proposal shall contain the following information:

1. All pages of Section 905 including acknowledgment of addenda and bid sheets completed and signed.

2. A certified check, cashier's check, or Proposer's bid bond payable to the State of Mississippi in the principal amount of five percent (5%) of the bid that includes the Project Number, executed by the Proposer and signed or countersigned by a qualified Mississippi agent or qualified nonresident agent for the Surety with Power of Attorney attached.

3. An executed Equal Opportunity Clause Certification as indicated in Section 905.

4. A signed list of all firms submitting quotes (OCR-485) as indicated in Section 905.

5. The Certification regarding Non-Collusion, Debarment and Suspension, executed in duplicate as indicated in Section 905.

6. Notice to Proposers No. 4566 DB: DUNS Requirement for Federal Funded Projects.

Please note that the Volume 2 – Contract Price Proposal must be signed and information provided as specified in Special Provision subsection 907-102.06.

Additional Proposal Submittal Instructions

All information obtained under this RFP shall become the exclusive property of the Commission without restriction or limitation on its use. The Commission shall have unrestricted authority to publish, disclose, distribute, or otherwise use in whole or in part any reports, data, or other materials prepared under this RFP. The Commission shall retain ownership of all plans, specifications, and related documents.

The Proposer should also include with their submittal of the Volume 2 - Contract Price Proposal a request for payment of the stipend should they not be awarded the Best-Value Proposal.

All Volume 1 – Technical Proposals and Volume 2 – Contract Price Proposals **must** be received by the date and time specified in Section X, Milestone Schedule. All Proposals, as detailed below, must be submitted to the following:

Mr. Billy Owen, P.E.
Contract Administration Engineer
Mississippi Department of Transportation
401 North West Street
P.O. Box 1850

Jackson, Mississippi 39215-1850
Phone: (601) 359-7730
Fax: (601) 359-7732

Volume 1 – Deliver nine (9) copies sequentially numbered on the lower right hand cover sheet from 1 to 9, and one (1) CD containing the proposal files in no more than five (5) PDF files.

Volume 2 – One (1) Contract Price Proposal (no PDF submittal required).

IV. ESCROW PROPOSAL DOCUMENTS

The Proposer is required to escrow all Proposal documents in accordance with Special Provision 907-103 within ten (10) business days of Notification of Award. Failure to escrow documents in the allotted time may result in rescission of the award and/or forfeiture of the Proposer's bid bond.

V. EVALUATION OF PROPOSALS

A Proposal Review Committee (Committee) will be appointed to evaluate the Volume 1 - Technical Proposals on behalf of the Commission. The Committee will be comprised of MDOT employees. In addition, MDOT will assemble a group of advisory members that may include the Federal Highway Administration (FHWA) and others with various areas of expertise.

VI. CRITERIA FOR SCORING

The Commission has developed criteria for use in evaluating and scoring the Volume 1 – Technical Proposals and Volume 2 – Contract Price Proposals to determine the Best Value. The Committee will use these criteria to develop a numerical score for each Volume 1 – Technical Proposal. Scoring will be based on a point system. The Committee will evaluate the Volume 1 – Technical Proposals based on meeting the technical evaluation criteria as shown below.

The maximum amount of points for the evaluation criteria will be as follows:

Compliance with the RFP Requirements	5
Approach to Design	25
Approach to Construction	30
Management Approach	10
Quality Management Plan	10
Schedule	20

The Committee will consider the following criteria:

Compliance with the RFP Requirements

1.1 Overall Presentation – How well is the Proposal presented, and how well did the Proposer follow the RFP requirements and formatting instructions?

Approach to Design

2.1 How well has the Proposer presented the approach to the project and how logical, innovative, and detailed is the approach to design the roadway, retaining walls, and other structures?
2.2 How logical, innovative, and detailed is the approach to design the slide repair?
2.3 How well has the Proposer complied with the design criteria established in the RFP?

Approach to Construction

3.1 How well has the Proposer described the construction means and methods, and how logical, innovative, and implementable are these for the Project?
3.2 How well has the Proposer addressed project phasing, and how effective is the phasing plan in reducing impacts to roadway users?
3.3 How effective is the Proposer's plan to open up the currently closed ramps as a priority?
3.4 How well has the Proposer described the plan to avoid conflicts with utilities?

Management Approach

4.1 How well does the Proposer describe the overall Project Management Plan, and how effective is the plan?
4.2 How well does the Proposer identify major risks, and how logical and effective is the plan to manage those risks?
4.3 How well does the Proposer demonstrate a plan to manage document control, and how effective is the plan?
4.4 How well does the Proposer describe the week-to-week management of the Project, and how responsive will the team members be to MDOT?

Quality Management Plan

5.1 How well does the Proposer define project controls for design and construction, and how effective are the controls?
5.2 How well does the Proposer demonstrate a plan to monitor for conformance with the RFP and the design plans, and how effective is the plan?
5.3 How well does the Proposer describe a process that will be used to promptly and effectively document and resolve issues of non-conformance with the design and construction?

Schedule

6.1 How clear, logical, and effective is the Proposer's schedule for design and construction of the Project?

6.2 How well does the Proposer demonstrate the necessary resources to accomplish the work in accordance with his schedule summary?

6.3 How well does the Proposer outline the schedule for procurement and delivery of major items and materials necessary to achieve the schedule summary?

6.4 How effectively does the schedule reflect the requirements for maintenance of traffic for roadway users?

The individual technical score by each reviewer will be the summation of the technical scores achieved for each of the above selection criteria. The Proposer's total technical score (maximum of 100 points) will be the summation of the individual technical scores from each reviewer divided by the number of reviewers.

VII. SELECTION PROCESS

The Proposal Review Committee will score the Volume 1 – Technical Proposals according to the evaluation criteria. Upon approval by the MDOT Executive Director, MDOT will disclose the technical scores for each Proposer prior to opening the Volume 2 - Contract Price Proposals, all in accordance with the Milestone Schedule.

Best Value Proposal = (Part A + Part B) / [1 + (Technical Score / 100)]

Where:

Part A = Contract Price Proposal.

Part B = (Number of calendar days from the Notice to Proceed up to and including Substantial Completion set forth by the Proposer) x $100,000.

In the event of a tie for the Best Value Proposal as determined by the above formula, the Proposer with the lowest Contract Price Proposal will be selected.

The Commission intends to award and offer a contract to the Proposer submitting the Best Value Proposal with the lowest score as determined above. However, if the parties are unable to execute a contract, MDOT may offer a contract to the Proposer that submitted the Best Value Proposal with the next lowest score, and so on, until an agreement is reached.

VIII. CONFIDENTIALITY

The Proposer should mark any and all pages of their Volume 1 – Technical Proposal considered to be proprietary information which may remain confidential in accordance with Mississippi Code Annotated 25-61-9 and 79-23-1 (1972, as amended). Each page of the Volume 1 – Technical Proposal that the Proposer considers trade secrets or confidential commercial or financial information should be on a different color of paper than non-confidential pages and be

marked in the upper right hand corner with the word "CONFIDENTIAL." Failure to clearly identify trade secrets or confidential commercial or financial information will result in that information being released subject to a public records request.

IX. GENERAL INFORMATION

The Commission reserves the right to terminate evaluation of one or more of the Proposals if it is determined to be in its best interest.

The Commission reserves the right, at its sole discretion, to proceed no further with this RFP process and/or to re-advertise in another public solicitation.

The Commission reserves the right to reject any and all Proposals and/or to discontinue contract execution with any party at any time prior to final contract execution.

The Commission reserves the right to request or obtain additional information about any and all Proposals.

Except for the stipend defined in this RFP, the Commission assumes no liability and will not reimburse costs incurred by Proposers, whether selected or not, in developing Proposals or in contract execution.

After award, in order to secure MDOT approval of modifications to Key Individuals, the procedures as defined in the Technical Requirements Section 2.4 shall be followed.

Any team selected for contract award and execution may be subject to a performance evaluation once the contract has been completed.

The Best Value Proposer shall submit an additional twenty (20) sets of Volume 1 - Technical Proposals within ten (10) days after contract award.

The successful Proposer will be required to furnish the documents referenced in Special Provision subsection 907-103.07 within the specified time frame.

All debriefing requests shall be submitted by e-mail to the attention of Mr. Scot Ehrgott, P.E., at sehrgott@mdot.ms.gov and shall copy Ms. Gina Lombard at glombard@mdot.ms.gov within one (1) week of the Commission approval of award. The debriefing shall be limited to the merits of the individual Proposer's response to the RFP.

X. MILESTONE SCHEDULE

Provide RFP to Short-listed Responders	March 5, 2015
Deadline for Proposers to Submit Written Questions or ATCs	March 24, 2015 4:00 p.m. Central Time
Target Date for MDOT to Post Final Answers, Addenda, and ATC Responses	March 27, 2015
Submittal of Volume 1 – Technical Proposals	April 13, 2015 12:00 p.m. Central Time
Submittal of Volume 2 – Contract Price Proposals	April 17, 2015 10:00 a.m. Central Time
Notification of Award	April 17, 2015 (Anticipated)
Notice to Proceed	April 28, 2015 (Anticipated)
Not to Exceed Substantial Completion Date	December 31, 2016
Not to Exceed Final Completion Date	July 1, 2017

Form for Alternate Technical Concept No. _____

A submission to request an Alternate Technical Concept is hereby submitted to MDOT for consideration (all criteria must be addressed):

Submittal Information
1. A narrative description of the proposed modification:
2. The location(s) where the proposed modification will be used on the Project (insert or attach sketch, or refer to location (span, bent, or beam)):
3. A conceptual drawing of the proposed modification should the ATC impact design (attach or insert sketch):
4. An explanation of why the proposed modification improves the quality of the Project:
5. A description of potential impacts or changes:

MDOT Response (to be posted on the Project Website)

CONTRACTOR'S SCHEDULE CERTIFICATE

State of Mississippi

County of Hinds

_____, hereinafter denoted as CONTRACTOR, does hereby certify that it has or will obtain, the labor, material and equipment resources needed and shall perform the Work described in the Project Scope on or before the dates specified below:

Substantial Completion Date: Calendar Days _____ from Notice to Proceed.

The Substantial Completion Date shall be no later than December 31, 2016, or the Proposal will be non-responsive. (The number of calendar days specified shall not exceed **614**.)

Final Completion Date: Calendar Days _____ from Notice to Proceed.

The Final Completion Date shall be no later than July 1, 2017, or the Proposal will be non-responsive. (The number of calendar days specified shall not exceed **796**).

Further, CONTRACTOR hereby agrees that attainment or non-attainment of the Substantial and/or Final Completion Dates stated above shall be the measure of performance for the assessment of the disincentive and/or liquidated damages.

Witness our signature this the _____ day of _____, 201__.

_____

Contractor

Mississippi Department of Transportation

Section 904
Notice to Proposers

Improvements to Interstate 55
Hinds County, Mississippi

Project Number
DB/IM-0055-02(244)/106023-305000

March 5, 2015

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
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MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 1 DB **CODE: (SP)**

DATE: **06/25/2014**

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 RFP contains 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 PROPOSERS NO. 3 DB **CODE: (SP)**

DATE: **06/25/2014**

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 PROPOSERS NO. 640 DB **CODE: (SP)**

DATE: **06/25/2014**

SUBJECT: **Fiber Reinforced Concrete**

Proposers 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.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 927 DB **CODE: (SP)**

DATE: **01/07/2015**

SUBJECT: **Use of Fly Ash in Stone Matrix Asphalt (SMA)**

Proposers are hereby advised that it is not the intent of the Department to disallow the use of fly ash in Stone Matrix Asphalt (SMA). Therefore, the last sentence of Subsection 703.06.1.2 on page 614 in the 2004 Mississippi Standard Specifications that reads “Fly ash shall not be used in hot mix asphalt pavements” is not applicable for Stone Matrix Asphalt (SMA).

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 1405 DB **CODE: (SP)**

DATE: **06/25/2014**

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 PROPOSERS NO. 1928 DB **CODE: (SP)**

DATE: **04/14/2008**

SUBJECT: **Federal Bridge Formula**

Proposers 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 PROPOSERS NO. 2382 DB **CODE: (SP)**

DATE: **06/25/2014**

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 Proposer 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.

Mark C. McConnell
Deputy Executive Director/
Chief Engineer

Charles R. Carr
Director
Office of Intermodal Planning

Melinda L. McGrath
Executive Director

Lisa M. Hancock
Deputy Executive Director/
Administration

Willie Huff
Director
Office of Enforcement

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
P. O. Box 1850 / Jackson, Mississippi 39215-1850 / Telephone (601) 359-7001 / FAX (601) 359-7110 / www.GoMDOT.com

March 4, 2015

Mr. Andrew Hughes
Division Administrator
FHWA-Mississippi Division
100 West Capitol Street, Suite 1062
Jackson, MS 39269

RE: DB/IM-0055-02(244)
106023-305000
I-55
Hinds County

AMENDED
RIGHT-OF-WAY CERTIFICATION

Dear Mr. Hughes:

This amends the right of way certificate dated January 20, 2015 and March 2, 2015.

This project will be constructed on existing highway right of way delineated on plans for previous State and Federal Aid Projects on file in offices of the Department of Transportation in Jackson. Since no additional right of way is required, there are no relocatees, improvements or Potentially Contaminated Sites involved in this project.

This project is a design-build and therefore the utilities that would be affected as listed. Impacts to utilities are not known at this time. The design build contractor shall be responsible for any adjustments to the utility lines that become impacted by the design and construction of this project.

Attached:
Status of Right of Way
Encroachment Certification
Utility Certification
Status of Hazardous Waste Site
Status of Buildings

Very truly yours,

RIGHT OF WAY DIVISION

Trudi Loflin
Division Administrator

TL: ar

Pc: Chief Engineer (65-01)
Contract Administration (74-01)
Construction Engineer (73-01)
District Five (25-01)
Project Engineer (25-01 PE)
Facility & Records Management (89-20)

STATUS OF RIGHT-OF-WAY

DB/IM-0055-02(244)

106023-305000

Hinds County

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

None.

Mark C. McConnell
Deputy Executive Director/
Chief Engineer

Lisa M. Hancock
Deputy Executive Director/
Administration

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

Melinda L. McGrath
Executive Director

Dick Hall
Central District Commissioner

J. Kevin Magee
District 3 Engineer

David Foster
District 5 Engineer

P. O. Box 90 / Newton, MS 39345-0090 / Telephone (601) 683-3341 / FAX (601) 683-7030 / GoMDOT.com

January 26, 2015
Revised
March 2, 2015

MEMORANDUM

TO: ROW DIVISION
Ms. Ann Russell

FROM: CONSTRUCTION ASSISTANT
David Addy DA/lw

RE: NH-0055-02(218) 106023-305000
I-55 from Byram to McDowell Rd.
Hinds County

To the best of my knowledge, here is the list of all known utilities on this project.

Comcast	Gulf South Pipeline
Entergy	CenterPoint Energy
AT & T	Contact Network, Inc (InLine)
Atmos Energy	Telepak Network, Inc (Cspire)
360 Networks	Zayo Group, LLC
Sprint Nextel	City of Jackson water and sewer

This list represents all known utility crossings within the project limits.

573+12+/- - AT & T
573+61+/- – 4" Gas
573+82 +/- – 4" Gas
598+50 +/- – Power
600+00 +/- – F.O.T crossing 55 on north side of Siwell Rd
601+00 +/- – F.O.T crossing 55 on south side of Siwell Rd
604+40 +/- – Power

613+17 +/- - Comcast
647+24 +/- - AT& T
648+25 +/- - AT & T
651+40 +/- – 4" Gas
705+00 +/- – Atmos 2" steel
715+40 +/- – Power
758+50 +/- – 10" Gas
758+50 +/- – Atmos 4" gas
766+80 +/- – Power and F.O.T
834+60 +/- – F.O. T
840+40+/- - FOC
841+80 +/- - Comcast
850+88 +/- – Telephone
867+92 +/- - Comcast
873+37 +/- – 2" steel Atoms gas
Crossing I-55 on north side of McDowell Rd– Power, water, 18", 24"sewer, (water and sewer should be City of Jackson)
948+93 +/- - (Inline) Contact Network
950+15 +/- – 6" gas line Gas

MDOT and ITS
B.O.P to E.O.P – MDOT underground power and F.O. telephone , consultant plans

DRA: lch

PC: Construction Division
Ms. Trudy Loflin, Director of ROW
Mr. John Murray – ROW Division
Mr. Kent Reeves, Asst. Dist.Const.Engr. – Preconstruction
District Construction File
District Utility File

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

Inter-Departmental Memorandum

TO: Ann R. Russell
R.O.W. Division

DATE: January 20, 2015

FROM: Brian D. Ratliff BDR
Resident Engineer

SUBJECT OR PROJECT NO: DB/IM-0055-02(244)/
106023/305000
I-55 From Byram to
McDowell Road

INFORMATION COPY TO:

COUNTY : Hinds

PC: Kent Reeves (District Five)
Frank Lovell (District Five)
Hogan and Glenn (Construction)
Trudi Loflin (ROW)
Project Files

Please be advised, I certify that the above captioned project was inspected on January 19, 2015, and the following encroachments were found:

NONE

If more information is needed, please advise.

ASBESTOS CONTAMINATION STATUS OF BUILDINGS
TO BE REMOVED BY THE CONTRACTOR
DB/IM-0055-02(244)
106023-305000
Hinds County
January 20, 2015

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

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

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

STATUS OF POTENTIALLY CONTAMINATED SITES
DB/IM-0055-02(244)
106023-305000
Hinds County
January 20, 2015

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 2618 DB

DATE: **1/20/2015**

SUBJECT: **Project Scope**

PROJECT: **Design and Construction for I-55 Reconstruction and Widening in Hinds County**
Project No. DB/IM-0055-02(244) / 106023-305000

The Contractor shall provide all design and construction services necessary to complete the reconstruction and widening of I-55 from Byram to McDowell Road in Hinds County, Mississippi, as further described in the Environmental Assessment/Finding of No Significant Impact (FONSI) document prepared by MDOT for this Project. The Project also includes reconstruction of certain sections of the frontage road. In addition, all other areas of the frontage roads and local roads will require a mill and overlay within the State maintained limits. The Project will be approximately 7.6 miles with five (5) interchanges and a minimum of nine (9) retaining walls.

The Contractor is advised to consider that a previous project was under construction when terminated for convenience by MDOT. The Contractor may incorporate all items of work, as feasible, from the previous project up to the time of the previous project's termination, unless specifically stated otherwise in this RFP. Regardless of the status or condition of all items of work from the previous project, whether installed or MDOT furnished, the Contractor shall be solely responsible for designing and constructing the Project, including all items of work incorporated/provided as applicable from the previous project, to meet all standards, specifications, and requirements in accordance with the RFP and State and federal regulations. MDOT furnished items shall become the property of the Contractor as indicated in Section 904 - Notice to Proposers No. 5312 DB. The Contractor shall develop all applicable plans, signed and sealed by the Contractor's appropriate team member(s), in accordance with the RFP. Any design reports, plans, and specifications shall be signed and sealed by a Professional Engineer licensed in the State of Mississippi.

Principal elements of the scope include, but are not necessarily limited to the following items:

1. Reconstruction and widening from four (4) to six (6) lanes of I-55 from Station 562+00 (BOP) to Station 947+81.83 (EOP). Overlay limits shall extend from Station 547+78 to Station 963+50.

2. Construction services for frontage and local roads within the State maintained right of way as state in Notice to Proposers No. 5417 DB.

3. Joint repairs, bridge end wall repairs, and bridge end pavement replacement at the I-55 over McDowell Road bridges. Joint repairs will also be required on the Elton

Road Bridge.

4. Retaining walls are required at the following locations:

    a. STA 564+00 TO 569+00 SB
    b. STA 614+00 TO 621+75 SB
    c. STA 627+50 TO 631+50 SB
    d. STA 633+50 TO 638+80 NB
    e. STA 752+48 TO 759+53 SB
    g. STA 778+45 TO 783+68 NB
    h. STA 791+50 TO 796+50 SB
    i. STA 850+46 TO 851+22 SB
    j. STA 870+50 TO 882+50 SB

5. A new mast arm traffic signal is required at the intersections of East Frontage Road and I-55 North Ramp on Siwell Road.

6. Review and optimize the basic timing settings and develop new coordinated timing plans for the three (3) traffic signals located on Siwell Road from East Frontage Road to Terry Road.

7. The following traffic design and Intelligent Transportation Systems (ITS) are required:

    a. Two Internet Protocol (IP)-PTZ traffic cameras are required at each interchange, providing full coverage of the roadway, co-located on the existing high-mast light poles. Also, a minimum of three (3) additional traffic cameras are required between interchanges on 50' metal poles with IP-PTZ cameras.

    b. Radar vehicle detection devices with Bluetooth capability are required at locations approximately 2,500 feet south of each major interchange, consisting of two side-fire radar devices on separate metal poles, to cover the entire highway alignment, both directions.

    c. Dynamic Message Signs (DMS) are required at two (2) locations including a PTZ camera facing each DMS to verify the operation of the sign. DMSs shall be "Full Color Matrix;" locations include two (2) truss-mounted DMS signs, one for each direction of traffic south of the McDowell Road interchange.

    d. A complete fiber optic communication network with Open Transport Network (OTN) technology is required from a DMS sign located

approximately five thousand feet (5,000') south of Siwell Road (to be installed by others) to the North project limits, including all related equipment and appurtenances.

8. The following permanent sign plans are required:

   Permanent sign plans shall include guide signs along the interstate and at each interchange, interstate mile markers at 0.25 mile intervals, and all applicable regulatory and warning signs.

   Permanent sign plans shall also include traffic control signs, guide signs, route assemblies, other regulatory signs, and applicable warning signs for all intersections, including interchange ramp intersections and local road intersections.

   The following overhead guide signs are required (20 Total):

   a. EXIT 85 Byram — Northbound: One (1) OH Truss (Exit Directional)
      Southbound: Three (3) OH Trusses (Advance Primary, Supplemental, Exit Directional)

   b. EXIT 88 Elton Rd. — Northbound: Three (3) OH Trusses (Advance Primary, Supplemental, Exit Directional)
      Southbound: Three (3) OH Trusses (Advance Primary, Supplemental, Exit Directional)

   c. EXIT 90A Savannah — Northbound: Three (3) OH Trusses (Advance Primary, Supplemental, Exit Directional)
      Southbound: Three (3) OH Trusses (Advance Primary, Supplemental, Exit Directional)

   d. EXIT 90B Daniel Lk — Southbound: Signing combined with Savannah (2 locations) (No signs required)

   e. EXIT 92A McDowell — Northbound: Three (3) OH Trusses (Advance Primary, Supplemental, Exit Directional)

   f. EXIT 92B&C I-20 — Northbound: One (1) OH Truss (Exit Directional)

9. Provide a "permanent fix" for the embankment slide area along the East Frontage Road as described in Section 904 - Notice to Proposers No. 5316 DB.

10. The placement of cable barrier, including vegetation control pad, from Station

543+90 to Station 566+30.

The Design scope of work for this Project may include, but not be limited to, the following work items:

- Erosion control plans
- Final structural design and plan preparation
- Final roadway design and plan preparation
- Intelligent transportation systems design
- Hydraulic analysis
- Quality control for design
- Full design surveying/staking
- Geotechnical investigation, design, testing, and report preparation
- Traffic control plans
- Utility coordination
- Roadway drainage design
- Traffic signals
- Signing
- Pavement markings
- Lighting

Design shall meet all appropriate specifications including, but not limited to, MDOT Roadway Design Manual, AASHTO *Policy on Geometric Design of Highways and Streets* (latest edition), AASHTO *LRFD Bridge Design Specifications* (latest edition), AASHTO *Standard Specifications for Highway Bridges* (17th edition), *Manual on Uniform Traffic Control Devices* (MUTCD) (latest edition), the Floodplain Management Regulations for the State of Mississippi, AASHTO *Drainage Manual*, and MDOT design criteria as specified in the RFP. CADD files prepared for MDOT's use shall be compatible to Microstation and Geopak. The survey shall be performed in accordance with the current MDOT Survey Manual, unless specifically stated otherwise, and with any additional instructions or requests as specified by the MDOT.

The Construction scope of work for this Project will include, but not be limited to, the following work items:

- Clearing and grubbing with debris removal and disposal
- All necessary roadway and structural work in accordance with construction plans
- Surveying/construction staking
- Drainage
- Intelligent transportation systems installation
- Traffic signals installation
- Lighting installation
- Erosion and sediment control work items
- Quality control testing of asphalt and concrete mixtures
- Traffic control
- Utility coordination
- Project management
- Construction management

- Construction quality control

Construction shall comply with all appropriate specifications including, but not limited to, the MDOT *Standard Specifications for Road and Bridge Construction 2004 Edition* as modified by the RFP to accommodate specific Design-Build requirements, *Manual on Uniform Traffic Control Devices* (MUTCD) (latest edition), MDOT Standard Drawings, any Special Provisions, Notice to Proposers, current MDOT publications and test methods including, but not limited to, the Construction Manual, the Materials Division Inspection, Testing and Certification Manual, and existing AASHTO or ASTM publications and test methods.

Testing Requirements

MDOT will be responsible for the Construction Inspection and Job Acceptance Testing; however, the Contractor's Design Engineering Firm will be responsible for Design Quality Control. The Contractor will be responsible for the Quality Control Testing of asphalt and concrete mixtures. The Contractor will also be responsible for providing the Pile Dynamic Analysis (PDA) and pile driving criteria for all structures, and as a result, provide recommended pile lengths to be approved by MDOT. The Quality Control Manager shall be responsible for assuring that the design, all workmanship, and materials are in compliance with the contract requirements.

Design and Construction Responsibilities

The Contractor warrants that it will perform all services in accordance with the standards of care and diligence normally practiced by recognized engineering and construction firms in performing services and obligations of a similar nature. The Contractor warrants that the Project shall be fit for its intended purpose and that all materials and equipment furnished shall be of good quality and new unless otherwise authorized by the Commission and that the construction shall conform to the Contract requirements.

The Contractor shall be fully and solely responsible for the accuracy of the design and compliance with specifications, standards and design criteria. The Contractor shall construct the Project in accordance with all applicable federal, state and local laws, and the Contract.

The Contractor shall perform quality control services as defined in the Technical Requirements, Section 3.2 Contractor Construction Testing Requirements.

Contractor shall perform all construction activities efficiently and with the requisite expertise, skill and competence to satisfy the requirements of the Contract. Contractor at all times shall exercise control over the means, methods, sequences and techniques of construction. Contractor's operations and construction methods shall comply with all applicable federal, state and local regulations including but not limited to worker safety, protection and health and protection of the environment and applicable permit requirements.

Control of Work

The Contractor shall be solely responsible for determining the appropriate means, methods and scheduling necessary to complete the Work in a timely manner and in accordance with all Contract requirements. MDOT and FHWA will have the right to review and inspect the Work at any time.

1. Contract Interpretations

The Engineer will decide all questions which may arise as to the quality and acceptability of materials, the Work and the progress of the Work, all questions which may arise as to the interpretation of the specifications, and all questions as to the fulfillment of the Contract.

The Engineer will have the authority, but not the responsibility to suspend the Work, wholly or in part, because of the Contractor's failure to correct conditions unsafe for workers or the general public, for failure to carry out provisions of the Contract, or for failure to carry out orders. The Engineer may also suspend Work for periods deemed necessary due to unsuitable weather conditions, for any conditions considered unsuitable for the prosecution of the Work, or for any other condition or reason deemed to be in the public interest. The Engineer may authorize, in writing, the continued prosecution of Work activities past their specified seasonal limits when it is determined that the quality of the Work will not be reduced and the public interest will be best served. The Engineer will have authority to enforce and make effective all decisions and orders relating to the Contract.

2. Governmental Approvals and Permits

The Contractor is responsible for obtaining all governmental approvals and permits, except those specifically designated as MDOT obtained permits, necessary to construct the Project. Copies of all correspondence and permits shall be forwarded to MDOT within seven (7) days after the correspondence is received. The Contractor shall integrate design practices to avoid and/or minimize potential Work impacts to wetlands and waters of the US. The Contractor shall bear the cost and responsibility of resolving any deviations among the Project Right-of-Way limits, drawings or other information included in the permits that would violate the intent or spirit of the permits. Any proposed changes within the permitted areas shall be coordinated with MDOT and the appropriate agency, and performed to MDOT's satisfaction.

3. Plans for Construction

Prior to the start of construction of any phase or portion of Work, the Contractor shall have plans stamped by MDOT as "Released for Construction" for that phase or portion of Work.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 2818 DB **CODE: (SP)**

DATE: **06/25/2014**

SUBJECT: **Non-Quality Control / Quality Assurance Concrete**

Proposers 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	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 PROPOSERS NO. 2937 DB **CODE: (SP)**

DATE: **06/25/2014**

SUBJECT: **Reduced Speed Limit Signs**

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 3131 DB **CODE: (SP)**

DATE: **06/25/2014**

SUBJECT: **Temporary Traffic Paint**

Proposers are hereby advised that the temporary traffic paint for this project can be waterborne paint as specified in the 2004 Mississippi Standard Specifications For Road and Bridge Construction or fast dry solvent traffic paint meeting the requirements set out in 907-710-1 (Fast Dry Solvent Traffic Paint).

Payment for all temporary traffic paint shall be paid under the appropriate 619 pay items.

When using fast dry solvent traffic stripe, no paint can be sprayed or placed on the ground during set-up or clean-up.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 3581 DB **CODE: (SP)**

DATE: **06/25/2014**

SUBJECT: **Storm Water Discharge Associated with Construction Activity (≥ 5 Acres)**

PROJECT: **DB/IM-0055-02(244) / 106023305**

A Construction Storm Water General NPDES Permit to discharge storm water associated with construction activity is required.

The Department has acquired Certificate of Permit Coverage MSR-106301 under the Mississippi Department of Environmental Quality's (MDEQ) Storm Water Large Construction General Permit. Projects issued a certificate of permit coverage are granted permission to discharge treated storm water associated with construction activity into State waters. Copies of said permit, completed Large Construction Notice of Intent (LCNOI), and Storm Water Pollution Prevention Plan (SWPPP) are on file with the Department.

Prior to the execution of the contract, the successful Proposer shall execute and deliver to the Executive Director an original signed copy of the completed Prime Contractor Certification Forms.

Failure of the Proposer to execute and file the completed Prime Contractor Certification Forms shall be just cause for the cancellation of the award.

The executed Prime Contractor Certification Forms shall be prima facie evidence that the Proposer has examined the permit, is satisfied as to the terms and conditions contained therein, and that the Proposer has the primary responsibility for meeting all permit terms including, but not limited to, the inspection and reporting requirements. For this project, the Contractor shall furnish, set up and read, as needed, an on-site rain gauge.

The Contractor shall make inspections in accordance with condition No. S-4, page 22, and shall furnish the Project Engineer with the results of each weekly inspection as soon as possible following the date of inspection. A copy of the inspection form is provided with the packet. The weekly inspections must be documented monthly on the Inspection and Certification Form. The Contractor's representative and the Project Engineer shall jointly review and discuss the results of the inspections so that corrective action can be taken. The Project Engineer shall retain copies of the inspection reports.

The Engineer will have the authority to suspend all work and/or withhold payments for failure of the Contractor to carry out provisions of MDEQ's Storm Water Construction General Permit, the erosion control plan, updates to the erosion control plan, and/or proper maintenance of the BMPs.

Upon successful completion of all permanent erosion and sediment controls, accepted and documented by the full maintenance release, the Construction Division shall submit a completed Request for Termination (RFT) of Coverage to the Office of Pollution Control.

Securing a permit (s) for storm water discharge associated with the Contractor's activity on any other regulated area the Contractor occupies, shall be the responsibility of the Contractor.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 3704 DB **CODE: (SP)**

DATE: **01/07/2015**

SUBJECT: **Use of Precast Drainage Units**

Proposers attention is brought to the content of Subsection 601.02.3 regarding precast units. MDOT Drawing Sheet Nos. PCU-1 and PCU-2 address MDOT approved precast drainage units. The Contractor must make a request to the Project Engineer for approval to use precast units other than the ones shown on Drawing Sheet No. PCU-1 or PCU-2.

Proposers are advised that precast drainage unit tops are only allowed on units shown on Drawing Sheet No. PCU-1. Cast-In-Place drainage unit tops are required on units shown on Drawing Sheet No. PCU-2.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 4214 DB **CODE: (SP)**

DATE: **06/25/2014**

SUBJECT: **Safety Apparel**

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

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

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 4488 DB **CODE: (SP)**

DATE: **05/01/2013**

SUBJECT: **DBE Forms, Participation and Payment**

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

Form OCR-482 has been developed to comply with this requirement. Proposers 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. Proposers 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.

Proposers are also advised that Form OCR-485 will be completed by **ALL PROPOSERS** submitting a Volume 2 – Contract Price Proposal and **must be signed and included in the Volume 2 – Contract Price Proposal package.** If at least one copy of this form is not signed and included as part of the Volume 2 – Contract Price Proposal, your Volume 2 – Contract Price Proposal will be deemed irregular.

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 4566 DB **CODE: (SP)**

DATE: **06/25/2014**

SUBJECT: **DUNS Requirement for Federal Funded Projects**

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

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

DUNS: _____

Company Name: _____

Company e-mail address: _____

By: _____

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 4661 DB **CODE: (SP)**

DATE: **06/25/2014**

SUBJECT: **Payroll Requirements**

Proposers 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 IV 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 or 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.

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO NOTICE TO PROPOSERS NO. 5266 DB

DATE: 01/07/2015

SUBJECT: DISADVANTAGED BUSINESS ENTERPRISES IN FEDERAL-AID HIGHWAY CONSTRUCTION

The goal is 10 percent for the Disadvantaged Business Enterprise. The low bidder is required to submit Form OCR-481 for all DBEs. Proposers are advised to check the bid tabulation link for this project on the MDOT website at:

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5266 DB **CODE: (SP)**

DATE: **01/07/2015**

SUBJECT: **DISADVANTAGED BUSINESS ENTERPRISES IN FEDERAL-AID HIGHWAY CONSTRUCTION**

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

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

Copies of the program may be obtained from:

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

POLICY

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

ASSURANCES THAT CONTRACTORS MUST TAKE

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

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

DEFINITIONS

For purposes of this provision the following definitions will apply:

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

CONTRACTOR'S OBLIGATION

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

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

CONTRACT GOAL

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

The percentage of the contract that is proposed for DBEs (1% or greater) shall be so stated on the last bid sheet of the Volume 2 – Contract Price Proposal.

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

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

FORMS ARE AVAILABLE FROM THE OFFICE OF CIVIL RIGHTS

The OCR-481 Form must contain the following information:

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

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

If the DBE Commitment shown on the last sheet of the Volume 2 – Contract Price Proposal does not equal or exceed the contract goal, the Proposer must submit, with the Volume 2 – Contract Price Proposal, information to satisfy the Department that adequate good faith efforts have been made to meet the contract goal.

Failure of the Proposer to furnish acceptable proof of good faith efforts, submitted with the Volume 2 – Contract Price Proposal, shall be just cause for rejection of the Volume 2 – Contract Price Proposal. Award may then be made to the next lowest responsive Proposer or the work may be readvertised.

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

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

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

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

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

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

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

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

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

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

The Proposer's execution of the signature portion of the Volume 2 – Contract Price Proposal shall constitute execution of the following assurance:

> The proposer hereby gives assurance pursuant to the applicable requirements of "Moving Ahead for Progress in the 21st Century Act (MAP-21)" and applicable requirements of "Part 26, Title 49, Code of Federal Regulations" that the proposer has made a good faith effort to meet the contract goal for DBE participation for which this Volume 2 – Contract Price Proposal is submitted.

DIRECTORY

A list of "Certified DBE Contractors" which have been certified as such by the Mississippi Department of Transportation and other Unified Certification Partners (UPC) can be found on the Mississippi Department of Transportation website at www.gomdot.com. The DBE firm must be certified at the time the project is let and approved by MDOT to count towards meeting the DBE goal.

REPLACEMENT

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

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

When a Contractor proposes to substitute/replace/terminate a DBE that was originally named on the OCR-481, the Contractor must obtain a release, in writing, from the named DBE explaining why the DBE Subcontractor cannot perform the work. A copy of the original DBE's release must be attached to the Contractor's written request to substitute/replace/terminate along with

appropriate Subcontract Forms for the substitute/replacement/terminated Subcontractor, all of which must be submitted to the DBE Coordinator and approved, in advance, by MDOT.

GOOD FAITH EFFORTS

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

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

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

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

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

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

(6) The Contractor may count 100% of the expenditures for materials and supplies obtained from certified DBE suppliers and manufacturers that produce goods from raw materials or substantially alters them for resale provided the suppliers and manufacturers assume the actual and contractual responsibility for the provision of the materials and supplies. The Contractor may count sixty percent (60%) of the expenditures to suppliers that are not manufacturers, provided the supplier performs a commercially useful function in the supply process. Within 30 days after receipt of the materials, the Contractor shall furnish to the DBE Coordinator invoices from the certified supplier to verify the DBE goal.

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

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

Failure of the Contractor to demonstrate good faith efforts to replace a DBE Subcontractor that cannot perform as intended with another DBE Subcontractor, when required, shall be a breach of

contract and may be just cause to be disqualified from further bidding for a period of up to 12 months after notification by certified mail.

PARTICIPATION / DBE CREDIT

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

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

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

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

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

(5) The Contractor may count 100% of the expenditures for materials and supplies obtained from certified DBE suppliers and manufacturers that produce goods from raw materials or substantially alters them for resale provided the suppliers and manufacturers assume the actual and contractual responsibility for the provision of the materials and supplies. The Contractor may count sixty percent (60%) of the expenditures to suppliers that are not manufacturers, provided the supplier performs a commercially useful function in the supply process. Within 30 days after receipt of the materials, the Contractor shall furnish to the DBE Coordinator invoices from the certified supplier to verify the DBE goal.

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

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

AWARD

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

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

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

(3) Proposer must submit an OCR-485 listing all firms that submitted quotes for material supplies or items to be subcontracted. Please make and add copies of this form when needed or attach additional sheets containing the information required by the form and add these sheets to the Volume 2 – Contract Price Proposal. Form OCR-485 must be signed and submitted with the Volume 2 – Contract Price Proposal. If at least one copy of this form is not signed and included as part of the Volume 2 – Contract Price Proposal, your bid will be deemed irregular.

Prior to the start of any work, the proposer 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 RFP of 1% or greater 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 Proposers 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. This OCR-484 will be attached to the monthly estimate for further processing. Failure of the Contractor to submit the OCR-484 will result in the estimate not being processed and paid.

(5) OCR-485: Proposer must submit **signed form with the Volume 2 – Contract Price Proposal** of all firms that submitted quotes for material supplies or items to be subcontracted. Please make and add copies of this form when needed or attach additional sheets containing the information required by the form and add these sheets to the Volume 2 – Contract Price Proposal. If at least one copy of this form is not signed and included as part of the Volume 2 – Contract Price Proposal, your bid will be deemed irregular.

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

SANCTIONS

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

(1) Disallow credit towards the DBE goal

(2) Withhold progress estimate payments

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

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5300 DB **CODE: (SP)**

DATE: **02/18/2015**

SUBJECT: **Lane Closure Restrictions**

PROJECT: **DB/IM-0055-02(244) / 106023305 -- Hinds County**

Proposers are hereby advised of the following lane closure restrictions for the project:

Interstate

1. Lane closures will not be allowed anytime during head to head phasing (traffic separated by a single line of median barrier), unless specifically ordered by the Engineer.
2. While traffic is in a four-lane configuration, and not head to head, lane closures will not be allowed Monday through Thursday between the hours of 6:00 AM and 7:00 PM, and on Friday between the hours of 6:00 AM and 8:00 PM.
3. When traffic is open to six lanes, a single lane closure will be allowed Monday through Friday except between the hours of 6:00 AM to 9:00 AM and from 4:00 PM to 7:00 PM.
4. When traffic is open to six lanes, a two lane closure will be allowed Monday through Thursday except between the hours of 6:00 AM and 7:00 PM, and on Friday except between the hours of 6:00 AM and 8:00 PM.
5. The maximum length of lane closure shall not exceed 3 miles. Multiple lane closures in the same lane shall be at least 1 mile apart.
6. The Contractor shall schedule their work, so that the maximum time a ramp/exit is closed is thirty (30) days.

Frontage Roads

1. Lane closures will not be allowed Monday through Friday between the hours of 6:00 AM and 9:00 AM and from 4:00 PM to 7:00 PM.
2. While traffic is in head to head phasing on the interstate, lane closures will be allowed on the frontage road anytime other than listed above; however, if an accident occurs on the interstate the Engineer will have the authority to order the Contractor to remove the lane closure to help handle the traffic.
3. The maximum length of lane closure shall not exceed 1 mile. Multiple lane closures in the same lane shall be at least 1 mile apart.

No exceptions to the above requirements will be allowed, unless specifically allowed by the Engineer. Also, no lane closures will be permitted on the following holidays or the day preceding them: New Year's Day, Easter, Independence Day, Labor Day, Thanksgiving Day or Christmas Day. In the event that one of the previously mentioned holidays falls during the

weekend or on a Monday, no lane closures will allowed during that weekend of the Friday immediately preceding that holiday. If any of the lane closure restrictions listed above is violated, no excuses will accepted by the Department and the Contractor will be charged a fee of $2,500.00 for each full or partial five minute period until the roadway is back in compliance with the lane closure restrictions listed above.

For the purposes of this contract, official time shall be the announced time available at the Jackson area telephone number (601) 355-9311.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5301 DB **CODE (SP)**

DATE: **01/07/2015**

SUBJECT: **Placement of Fill Material in Federally Regulated Areas**

PROJECT: **DB/IM-0055-02(244) / 106023305 – Hinds County**

A Permit (404, General, Nationwide, etc.) for placing fill material federally regulated sites is required.

The Department has acquired the following permits for permanently filling at regulated sites that are identified during project development:

Nationwide Permit No. 23 (Waters of the US) -- All Sites
(ID No. MVK 2012-1100)

Copies of said permit(s) are on file with the Department.

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5302 DB **CODE: (SP)**

DATE: **02/18/2015**

SUBJECT: **Work Restrictions**

PROJECT: **DB/IM-0055-02(244) / 106023305 -- Hinds County**

Proposers are hereby advised of the following work restrictions:

1. The contractor will be allowed to work 24 hours a day / 7 days a week as long as it does not violate the conditions set forth in the Lane Closure Restriction Notice to Proposers.

2. Traffic will not be allowed to run on milled surfaces.

3. The contractor shall not close any two consecutive interchanges at any given time.

4. The contractor shall cover signs that are in conflict with current traffic patterns.

5. The Contractor shall provide traffic control for surveying and inspection by the Department if requested by the Engineer.

6. The Contractor shall notify the Engineer at least 48 hours prior to altering traffic patterns, closing of loops, closing of exits, closing of ramps, etc.

7. At Siwell Road, the NE ramp and SE loops cannot be closed simultaneously. Also, the NW Ramp can only be closed from 8:00 PM on Saturday until 6:00 AM on Monday.

8. Proposers are hereby advised that the driving of piling, including sheet piling, shall be limited to the hours of 7:00 a.m. to 8:00 p.m.

9. When traffic is in a head to head configuration, glare paddles will be required on median barriers.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5303 DB **CODE: (SP)**

DATE: **01/07/2015**

SUBJECT: **Erosion Control Requirements**

PROJECT: **DB/IM-0055-02(244) / 106023305 – Hinds County**

Proposers are hereby advised of the following requirements that relate to erosion control activities on the Project:

Proposers are hereby advised that the requirement to maintain a maximum of 19 acres of exposed surface area of erodible material as established in Special Provision 907-107-14 shall not apply to this project.

Clearing and Grubbing: Prior to beginning any clearing and grubbing operations on the project, controls shall be in place to address areas such as drainage structures, wetlands, streams, steep slopes and any other sensitive areas as directed by the Engineer. Clearing and grubbing should be limited to the minimum area necessary to construct the project. Grubbing operations should be minimized in areas outside the construction limits and stumps should be cut off flush with the existing ground elevations. A buffer area of at least fifteen (15) feet shall be in place adjacent to the right-of-way line and at least five (5) feet adjacent to stream banks. The buffer area can either be the existing vegetation that is left undisturbed or re-established by planting new vegetation if clearing and grubbing was required.

Unclassified Excavation: Cut sections shall be graded in accordance with the typical sections and plan grades. Permanent erosion control BMP's should be placed as soon as possible after the cut material has been moved. Fill sections that are completed shall have permanent erosion control BMP's placed. Fill sections that are not completed will be either permanently or temporarily grassed until additional material is made available to complete these sections. The contractor may have to stockpile unclassified excavation. No additional compensation will be made for stockpiling operations.

Disturbed areas that remain inactive for a period of more than fourteen (14) days shall be temporary grassed and mulched. Temporary grassing and mulching shall only be paid one time for a given area.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5307 DB **CODE: (SP)**

DATE: **01/07/2015**

SUBJECT: **Traffic Management Center (TMC) Modifications**

PROJECT: **DB/IM-0055-02(244) / 106023305 – Hinds County**

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

MDOT TMC Modifications SITE #1

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

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

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

The Contractor is required to fully configure the existing ATMS 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 ATMS software for the DMS.
- Configure the ATMS speed map of the project area and RDS locations. The base map shall be reviewed and approved prior to the 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 ATMS client software within the TMC to be able to fully utilize the changes noted above.

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

Testing:

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5308 DB **CODE: (SP)**

DATE: **02/11/2015**

SUBJECT: **Location & Configuration of OTN Nodes**

PROJECT: **DB/IM-0055-02(244) / 106023305 – Hinds County**

Proposers are hereby advised of the following OTN Node Locations and Interface Card configuration for each OTN Node.

I-55 Communications Node (I-55 at Siwell Road)

MDOT State-Wide TMC Node (2567 N. West, Jackson MS)

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

OTN Node Locations & Configurations				
Item Description	**Part No.**	**Total #**	**MDOT State Wide TMC**	**I-55 @ HWY 463**
NODE CHASSIS & POWER SUPPLIES				
N42C Node Chassis	S30826-B30-X	**2**	1	1
OTN-N42 Steel Chassis	S30826-B17-X			
Power Supply 90-264 VAC and 125 VDC	V30812-A5020-A42	**4**	2	2
Power Cord 230 VAC for OTN Nodes	BET:AT306051A	**4**	2	2
COMMON LOGIC CARDS & OPTICAL TRANSCEIVERS				
BORA2500-X3M-ETX for N42	S30824-Q124-X103	**2**	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	**2**	1	1
BORA2500-ETX for N24	S30824-Q106-X101			

M-optic module (MM, 850nm)	V30813-S1-A1			
S2-optic module (1550nm)	V30813-S3-A1	**4**	2	2

INTERFACE CARDS				
RS485	BE2:FB052429A	**2**	1	1
RS485/422	FB-52429-A			
ET-100DAE (10 + 2 S-LAN ports)	S30824-Q123-X101	**2**	1	1
Optical GbE SFP 850nm mm	V30813-S19-A1	**2**	1	1
MPEG (4 ports with TTX)	S30824-Q107-X101	**3**	2	1
H.264/AVC Video Card (16 analog ports, inputs and outputs), including streaming	S30824-Q131-X501	**3**	2	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		**2**	1	1
RS485 Drop Cable	S30827-C18-A30	**2**	1	1

PANEL				
19" BNC terminal panel 1HU (16 positions)	V30812-A3010-A147	**2**	1	1

NETWORK MANAGEMENT / MAINTENANCE SOFTWARE				
OMS License for one N42	OTN:LIC-N42-2500	**2**	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.

A Communication HUT building exists at the I-55 / Siwell Road intersection as shown in the Informational Documents. This Communications Hut building is empty and DOES NOT have the required equipment inside. The Communications Hut building is approximately 10' x 8' x 8'6" for the outside dimensions and layout shall be provided as shown in Diagram 1. 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 racks 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.
- Include rechargeable battery backup.
- Alarm notification via e-mail messages and text messages.
- Built-in IP device monitoring

Communication Node Installation, Configuration

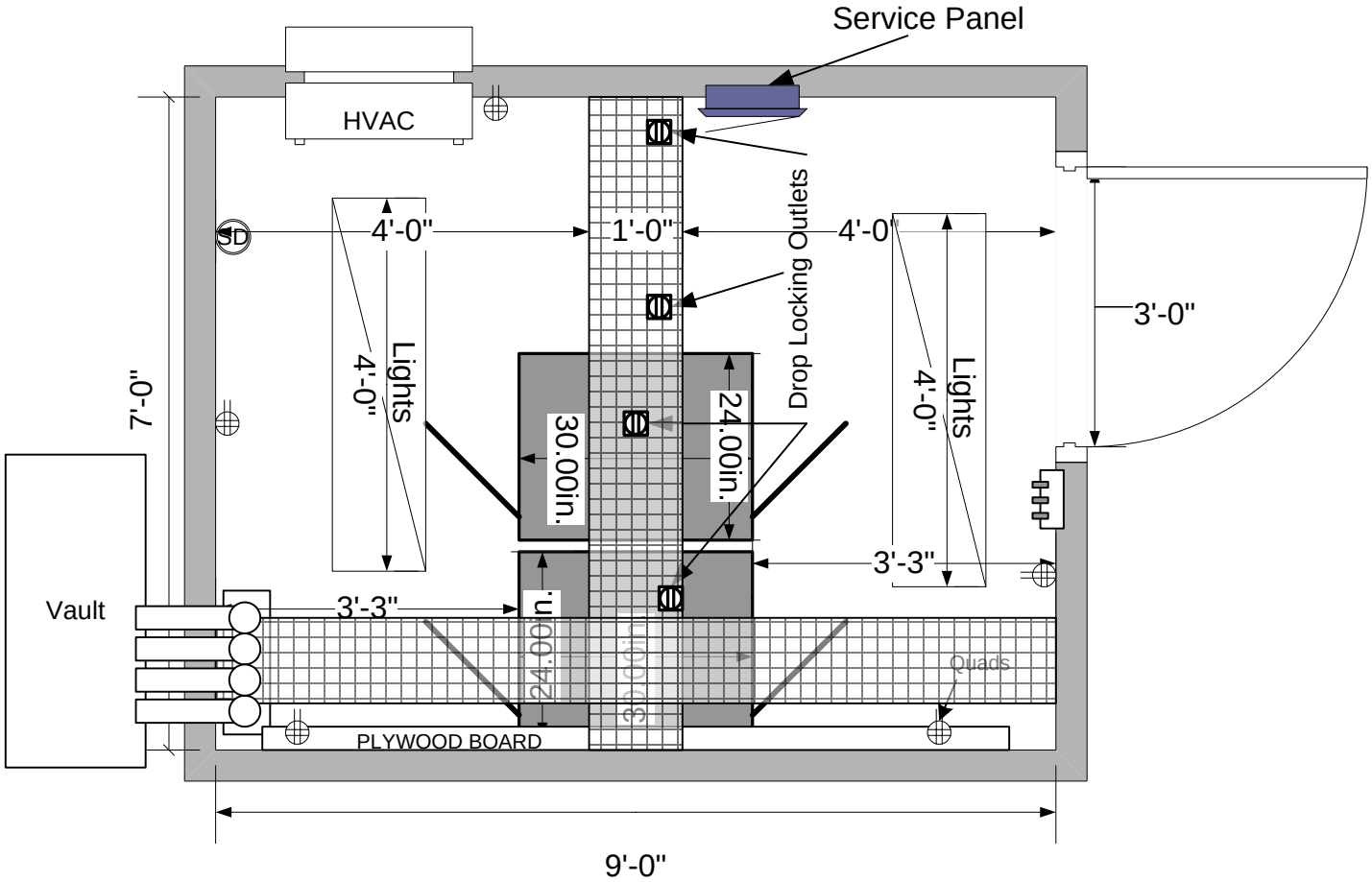
- All installation and configuration of the OTN nodes, switch, ITS equipment located in the Communication hut buildings, and cabling will be required.
- The Contractor shall be responsible for installing the OTN interface cards identified in the table above and configuring them to be integrated to the 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 will be connected in the OTN Hut as follows:
    - The contractor is responsible to mount the Type C network switch in the existing 19 inch rack at each Communications Node Hut.
    - If existing equipment must be moved, the contractor will coordinate with the ITS Engineer for movement of equipment.
    - The contractor is responsible for any re-cabling if existing equipment is moved to make room for the switch in the rack. (Valley St will likely require the UPS and two video distribution panels to be lowered to accommodate the new Type C switch.)
    - 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 shall be connected to Type C Network Switch via network cables.

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.

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

Diagram 1:



MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5309 DB **CODE: (SP)**

DATE: **01/07/2015**

SUBJECT: **Traffic Recorder Classification Permanent System**

PROJECT: **DB/IM-0055-02(244) / 106023305 – Hinds County**

Proposers are hereby advised that this contract requires a new Traffic Recorder Classification Permanent System at Station 824+54 in the left and right lanes of I-55.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5310 DB **CODE: (SP)**

DATE: **02/18/2015**

SUBJECT: **Substantial Completion**

PROJECT: **DB/IM-0055-02(244) / 106023305 -- Hinds County**

Proposers are hereby advised that a Substantial Completion Date will be required on this Project in order to minimize the impacts on the traveling public. Should the Contractor complete the required items of work for Substantial Completion before **December 31, 2016**, the Contractor will receive a bonus of **$100,000.00 a day** for each calendar day in advance of December 31, 2016, up to a maximum of **$5,000,000.00**. However, a disincentive of **$100,000.00 a day** will be assessed for each calendar day after the Proposer's Substantial Completion Date and shall continue without limitation until the items of work for Substantial Completion have been completed.

Substantial Completion will be achieved when the following have been completed to the satisfaction of the Engineer:

1. Traffic is in its permanent location, three (3) lanes northbound and three (3) lanes southbound.
2. All asphalt, except for the top lift of SMA and the OGFC, has been completed. This includes the shoulders and ramps. This does not include the Frontage Roads.
3. All retaining walls are complete.
4. All traffic regulatory items, including temporary raised pavement markers, necessary for opening to 6-lane traffic are in place. This does not include DMS signs.
5. Permanent signing is complete.
6. All Exit/Entrance ramps are open and functioning.
7. Slide repair addressed in Notice to Proposers No. 5316 DB has been completed.
8. All bridge repairs are complete.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 – NOTICE TO PROPOSERS NO. 5312 DB **CODE: (SP)**

DATE: **03/04/2015**

SUBJECT: **MDOT Furnished Materials**

PROJECT: **DB/IM-0055-02(244) / 106023305000 – Hinds County**

Proposers are hereby advised that the Department is furnishing the following materials to the Contractor. The Contractor shall take ownership and remove the following materials at these locations by the dates shown. Should the Proposer/Contractor fail to remove the items by the dates shown, the next monthly estimate will be held until they are removed. Pictures of these materials will be available on ProjectWise for information only. Three optional field visits will be scheduled for viewing of these materials per the RFP.

A. Ford Pit Stockpile (located adjacent to the West Frontage Rd, just past the Byram Interchange in Byram, MS). Remove materials by August 1, 2015. See Attachment A for listing of materials.

B. Mississippi Surplus Property Bldg. (located at Pearl, MS). Remove materials by August 1, 2015. See Attachment B for listing of materials.

C. MDOT Whitfield Project Office (located at Hwy 468, Pearl, MS). Remove materials by December 31, 2016. See Attachment C for listing of materials.

D. Project Site: Remove materials by end of Project. A maintenance release will not be issued until all of the materials are removed. See Attachment D for listing of materials.

E. Gulf Coast Prestress (located in Pass Christian, MS). Remove materials by June 1, 2015. See Attachment E for listing of materials. (No Charge delivery upon request)

F. Asphalt Aggregate Stockpile (located at US 51 & Gallatin). Remove materials by August 1, 2015. See attachment F for listing of materials.

G. Traffic Control Items in Use on Project: Remove materials by end of Project. A maintenance release will not be issued until all of the items are removed. See attachment G for listing of items.

Attachment A

Ford Pit Stockpiles

Sheet Pile

Description	Number of Pairs - (36" total width)	LF per Pair	Total SF
PZ 27	979	30	88110

Reinforcement

Structure	Weight (lbs)
Retaining Wall D	49594

Pipe

Description	Sections	LF per section	Total LF
18" Corrugated Plastic Pipe	28	20	560

Emergency Detour Traffic Control Items

Description	Sign Number	Unit	Quantity
Emergency Detour Signs w/stand	M4-9	Each	8
8' Single Faced Barricade		Each	8

Attachment B			
Items stored at State Surplus Office in Pearl, MS			
Description	Unit	Quantity	Remarks
Lighting Assembly, Light	EACH	146	Line Item 1990 Pay Item 683-B108
Lighting Assembly, Arm	EACH	146	Line Item 1990 Pay Item 683-B108
Lighting Assembly, Hardware (covers, bolts, nuts,caps)	EACH	Varies	Line Item 1990 Pay Item 683-B108
Lighting Assembly, Underpass Fixture	EACH	6	Line Item 2000 Pay Item 683-C010
Lighting Assembly, Underpass Bulb	EACH	6	Line Item 2000 Pay Item 683-C010
Structure Mounted Junction Box	EACH	1	Line Item 1985 Pay Item 682-E002
Fiber Optic Cable	LNFT	48294	Line Item 3470 Pay Item 907-657-A001
Fiber Optic Closure Kits	EACH	17	Line Item 3470 Pay Item 907-657-A001
Fiber Optic Splice	EACH	19	Line Item 3470 Pay Item 907-657-A001
#8 Stranded Copper Wire	LNFT	15000	Line Item 1750 Pay Item 666-B032
#6 Stranded Copper Wire	LNFT	6000	Line item 1880 Pay Item 682-A001 and Line Item 1740 Pay item 666-028
#6 Stranded Copper Wire	LNFT		
#4 Stranded Copper Wire	LNFT	93	Line Item 1760 Pay Item 666-B038 and Line Item 1870 Pay Item 682-A025
#4 Stranded Copper Wire	LNFT		
#2 Stranded Copper Wire	LNFT	22000	Line Item 1850 Pay Item 682-A015 and Line Item 1920 Pay Item 682-B016
#2 Stranded Copper Wire	LNFT		
#1/0 Stranded Copper Wire	LNFT	1600	Line Item 1840 Pay Item 682-A004 and Line Item 1910 Pay Item 682-B005
#1/0 Stranded Copper Wire	LNFT		
#2/0 Stranded Copper Wire	LNFT	4299	Line Item 1860 Pay Item 682-A020
Vehicle Impact Attenuator, 60 mph	EACH	30	Line Item 1420 Pay Item 629-A002
Traffic Cameras	EACH	3	Previously MDOT property removed from previous project to be reinstalled on project

Attachment B continued			
Description	Unit	Quantity	Remarks
Gomaco Median Footer Mold	EACH	1	Slip form footer mold for median barrier wall
Gomaco Shoulder Footer Mold	EACH	1	Slip form footer mold for shoulder barrier wall
Gomaco Shoulder Wall Mold	EACH	1	slip form wall mold for shoulder barrier wall
Gomaco Median Barrier Side Mount Assembly	EACH	1	mount for all slip form molds for barrier wall
Power Curber/Smeco Trimmer	EACH	1	trimmer for soil cement to trim out moment slab key for shoulder barrier walls
Power Curber/Smeco Trimmer Head for Barrier Wall	EACH	1	extra head for trimmer
Power Curber/Smeco Trimmer motor	EACH	1	extra motor for trimmer
Carbide Teeth for Trimmer	EACH	60	extra teeth for trimmer
Bullet Teeth for Trimmer	EACH	24	extra teeth for trimmer
14" Concrete Pile Cushions	EACH	347	
Metal Drain Forms for Shoulder Barrier Wall	LS	1	
2" Stand Chairs for Barrier Wall	LNFT	6975	for retaining walls
3" Stand Chairs for Barrier Wall	LNFT	3775	for retaining walls
2" Slab Bolsters Upper for Barrier Wall	LNFT	9850	for retaining walls
3" Slab Bolsters Upper for Barrier Wall	LNFT	2545	for retaining walls
4.25" Slab Bolster Upper for Barrier Wall	LNFT	7295	for retaining walls
1" Fiber Expansion Material	EACH	200	200 full sheets
Concrete Maturity Loggers	EACH	300	
Concrete Maturity Readers	EACH	3	
36"x48" Ramp 35 MPH sign	EACH	2	
48"x60" Ramp 40 MPH sign	EACH	4	
36"x36" Speed Reduction 60 MPH	EACH	1	
36"x48" Speed Limit 60 MPH	EACH	1	
24"x24" Interstate Shield I-55	EACH	3	
24"x12" South for Interstate	EACH	3	
Minor Hardware (Overhead Sign Assemblies)	See Information Only for screws and bolts listed that are supplied)		

Attachment C		
Items Stored at the Whitfield Project Office		
Description	Unit	Quantity
Knowles Materials Reinforcing Steel Overhead Structure No. 20 Drilled Shaft	LBS	3220
Sign Assembly No. 1 Pieces	EACH	1
Sign Assembly No. 2 Pieces	EACH	1
Sign Assembly No. 3 Pieces	EACH	1
Sign Assembly No. 4 Pieces	EACH	1
Sign Assembly No. 5 Pieces	EACH	1
Sign Assembly No. 6 Pieces	EACH	1
Sign Assembly No. 7 Pieces	EACH	1
Sign Assembly No. 8 Pieces	EACH	1
Sign Assembly No. 9 Pieces	EACH	1
Sign Assembly No. 10 Pieces	EACH	1
Sign Assembly No. 11 Pieces	EACH	1
Sign Assembly No. 12 Pieces	EACH	1
Sign Assembly No. 13 Pieces	EACH	1
Sign Assembly No. 14 Pieces	EACH	1
Sign Assembly No. 15 Pieces	EACH	1
Sign Assembly No. 16 Pieces	EACH	1
Sign Assembly No. 17 Pieces	EACH	1
Sign Assembly No. 18 Pieces	EACH	1
Sign Assembly No. 19 Pieces	EACH	1
Sign Assembly No. 20 Pieces	EACH	1
Sign Assembly No. 21 Pieces	EACH	1
Sign Assembly No. 22 Pieces	EACH	1

Attachment D			
Items Located on ROW			
Description	Unit	Quantity	Remarks
Traffic Signal Eq. pole	EACH	1	Line Item 3360 Pay Item 907-639-A009 at Siwell Interchange SE
Traffic Signal Eq. pole	EACH	1	Line Item 3350 Pay Item 907-639-A007 Located at Siwell Interchange SE
Traffic Signal Eq. pole	EACH	1	Line item 3340 Pay Item 907-639-A006 Located at Siwell Interchange SE
Traffic Signal Eq. pole	EACH	2	Line Item 3320 Pay Item 907-639-A002 Located at Siwell Interchange SE
Lighting Assembly, pole	EACH	146	Line Item 1990 Pay Item 683-B108 Located at Siwell Interchange SE
Pullbox, Type 1	EACH	3	Line Item 1670 Pay Item 647-A001 Located at Siwell Interchange SE
Pullbox, Type 2	EACH	15	Line Item 1710 Pay Item 647-A005 Located at Siwell Interchange SE
Pullbox,Type 3	EACH	1	Line Item 1680 Pay Item 647-A002 Located at Siwell Interchange SE
Pullbox, Type4	EACH	3	Line Item 1690 Pay Item 647-A003 Located at Siwell Interchange SE
Camera Pole (Removed from McDowell Rd.)	EACH	1	Located at Siwell Rd. (should be relocated to McDowell Rd.)
100# Riprap	TONS	10 (Estimated)	Located at Siwell Rd.
300# Riprap	TONS	10 (Estimated)	Located at Siwell Rd.
18" RCP	LF	56	Located at Siwell Rd.
18" FES	EACH	1	Located at Siwell Rd.
15" RCP	LF	120	Located at Siwell Rd.
22"x13" Arch Pipe	LF	232	Located at Siwell Rd.
22"x13" FES	EACH	3	Located at Siwell Rd.
29"x18" Arch Pipe	LF	88	Located at Siwell Rd.
29"x18" FES	EACH	1	Located at Siwell Rd.
30" RCP	LF	16	Located at Siwell Rd.
30" FES	EACH	1	Located at Siwell Rd.
36"x23" Arch Pipe	LF	80	Located at Siwell Rd.
36"x23" FES	EACH	1	Located at Siwell Rd.
Underdrain Accessory (90)	EACH	10	Located at Siwell Rd.

Attachment D continued			
Description	Unit	Quantity	Remarks
Underdrain Accessory (CPLG)	EACH	100	Located at Siwell Rd.
Granular Material 9C	CY	3570	Located at Siwell Rd.
14"x14" Prestressed Concrete Piling (36') w/Dowels	LF	864	In roadway at Retaining Wall E
14"x14" Prestressed Concrete Piling (38') w/Dowels	LF	1140	In Roadway at Retaining Wall E
Masonry Sand	TONS	10 (Estimated)	Located at Elton Rd.
100# Riprap	TONS	7 (Estimated)	Located at Elton Rd.
14"x14" Prestressed Concrete Piling (36') w/Dowels	LF	2196	In roadway at Retaining Wall J
RAP	CY	Unknown	Located in a stockpile at Elton Rd.
Filter Cloth	SY	5000	Located at Elton Rd.
Reinforcement for Retaining Wall J	LBS	108127	In Roadway at Retaining Wall J
6" Perforated Sewer Pipe	LF	3500	Located at Siwell Rd.
6" Non-Perforated Sewer Pipe	LF	500	Located at Siwell Rd.
10 3/4" Retaining Wall Standees for Wall J	EACH	620	Located at Retaining Wall J

Attachment E			
Items Stored at Gulf Coast Pre-stress yard in Pass Christian, MS			
Description		Unit	Quantity
14"x14" Prestressed Concrete Piling (36') w/dowels		LF	16056
14"x14" Prestressed Concrete Piling (38') w/dowels		LF	3876

Attachment F		
Asphalt Aggregate Stockpile US 51 and Gallatin		
Material	Unit	Quantity
3/8" Rock	TONS	4659.35
1/2" Rock	TONS	9378.92
3/4" Rock	TONS	7878.07
Sand	TONS	3071.63

Attachment G			
Traffic Control Items In Use on the Project			
Sign Number	Description	Unit	Quantity
	Precast Concrete Median Barrier (10')	LF	40830
	Precast Concrete Median Barrier (12')	LF	16702
	Glare Paddles	LF	38998
	Arrow Panel	EACH	1
	Temporary Impact Attenuators	EACH	20
	Thrie-Beam Guardrail (Median Barrier Connectors)	EACH	37
	Temporary Message Boars	EACH	18
W13-1	20 mph	EACH	1
W13-2	30 mph exit- Post	EACH	1
W13-3	30 mph ramp - Post	EACH	1
W13-1	40 mph	EACH	3
R2-1	50 mph speed limit - Wall Mount	EACH	12
W3-5	50 mph speed limit ahead- Post	EACH	5
DBL Faced Barricade	6'	EACH	82
Single Faced Barricade	6'	EACH	14
R2-1	70 mph speed limit - Post	EACH	1
Single Faced Barricade	8'	EACH	103
M6-2R	Arrow	EACH	1
	Arrow board	EACH	1
	B light	EACH	4
W1-8R	Chevron - Post	EACH	10
W1-8R	Chevron - Wall Mount	EACH	4
C7	Daniel Lake Blvd, exit 90 B, directional	EACH	1
W1-4BL	Double lane shift left - Post	EACH	3
	Drums	EACH	536
C4 C11	Elton Rd 1 mile, exit 88	EACH	1
C3 C12	Elton Rd exit 88, directional	EACH	1
SP-W20-A	Emergency pull off - Wall Mount	EACH	1
SP-W20-A-1000	Emergency pull off 1000 ft. - Wall Mount	EACH	1
SP-W20-A-500	Emergency pull off 500 ft. - Wall Mount	EACH	1
G20-2A	End road work - Post	EACH	48
E5-1	Exit closed - Wall Mount	EACH	1
SP1-W20-A-500	Exit closed 500 ft. - Wall Mount	EACH	1
SP1-W20-A	Exit closed ahead - Wall Mount	EACH	2

Attachment G continued			
Sign Number	Description	Unit	Quantity
E5-1	Exit right - Post	EACH	4
E5-1	Exit right - Wall Mount	EACH	2
M1-1	I-20 - Stand	EACH	1
W9-2L	Lane ends merge left - Stand	EACH	1
W4-1L	Lane merge left - Post	EACH	12
W4-1R	Lane merge right - Post	EACH	1
W1-6L	Left arrow	EACH	1
M5-4	Left Lane - Stand	EACH	2
C8	McDowell Rd, exit 92 A, directional	EACH	1
R3-2	No left turn - Post	EACH	2
R8-3A	No Parking - Post	EACH	7
R8-3A	No Parking - Wall Mount	EACH	6
R3-1	No right turn - Post	EACH	1
M3-1	North - Stand	EACH	1
	Orange plaque	EACH	2
	Ramp closed - Stand	EACH	1
	Ramp closed 350 ft. - Stand	EACH	2
	Ramp closed 700 ft. - Stand	EACH	2
	Ramp closed ahead - Stand	EACH	2
W4-3R	Ramp merge onto I-55 S - Post	EACH	1
SP-03	Remain with disabled vehicle - Wall Mount	EACH	1
R3-7R	Right lane must turn right - Post	EACH	1
W1-1	right turn	EACH	1
R11-2	Road closed	EACH	35
W20-1	Road work 1 mile - Post	EACH	8
W20-1	Road work 1/2 mile - Post	EACH	7
W20-1	Road work 1000 ft. - Post	EACH	7
W20-1	Road work ahead - Post	EACH	49
G20-1	Road work next 8 miles - Post	EACH	7
C6	Savanna St, exit 90 A, 1/2 mile	EACH	1
C5 C14	Savanna St, exit 90 A, directional	EACH	1
C2	Siwell Rd / Byram, exit 85, directional	EACH	1
R16-3	Speeding fines doubled - Post	EACH	14
R16-3	Speeding fines doubled - Wall Mount	EACH	2
R1-1	Stop	EACH	24
M1-4	U.S. 49 - Stand	EACH	1
M3-1	West - Stand	EACH	1
G20-5AP	Work zone	EACH	10
R1-2	Yield - Stand	EACH	2
W3-2A	Yield ahead - Stand	EACH	2

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5313 DB **CODE: (SP)**

DATE: **02/10/2015**

SUBJECT: **Failed Soil Cement Sections**

PROJECT: **DB/IM-0055-02(244) / 106023305 -- Hinds County**

Proposers are hereby advised of the following information regarding previously placed soil cement treated sections that did not meet MDOT requirements.

The following previously placed soil cement treatment sections did not meet the density requirements of the Standard Specifications.

- Station 730+12 to Station 742+00 in the Right Lane from 12 feet right of centerline to the outside shoulder

- Station 742+00 to Station 754+00 in the Right Lane from 12 feet right of centerline to the outside shoulder

The soil was originally mixed as one 12-inch layer of Class 9, Group C, Granular material.

Acceptable treatment of the above mentioned soil cement sections shall be resolved by one of the following procedures:

1. Remove and replace the full soil cement lift with a new 12-inch layer of cement treated Class 9, Group C, Granular material in one or two lifts.

2. Remix the full soil cement lift, fully pulverizing the material. Once pulverized, the in-place material shall be remixed with a sufficient amount of cement and water to meet the design requirements of Mississippi Test Method MT-25 for a base material.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5315 DB **CODE: (SP)**

DATE: **02/10/2015**

SUBJECT: **Mowing**

PROJECT: **DB/IM-0055-02(244) / 106023305 -- Hinds County**

Proposers are hereby advised that the Contractor shall perform mowing of noxious vegetation or excess growth at least twice a year. Mowing shall be performed once in the spring months and once in the fall months. Steep slopes and areas not accessible by mowers, shall be cut by any means deemed appropriate to the satisfaction of the Engineer.

Prior to mowing, the Contractor shall pick up and properly dispose of all trash and debris within the area to be mowed and along any adjacent roadway shoulders. Trash and debris picked up and piled or bagged on the roadside must be removed from the right-of-way by the close of the work day. Piles or bags will not be allowed to remain on the roadside overnight. All trash and debris is defined as all trash, debris, litter, junk, rubbish, paper, cardboard, glass, cans, styrofoam cups, discarded items, garbage, old tires, treads, etc. The Contractor will not be required to pick up such items as cigarette butts, tiny chips of glass or other small items not readily visible to the traveling public.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5316 DB **CODE: (SP)**

DATE: **02/10/2015**

SUBJECT: **Slide Repair**

PROJECT: **DB/IM-0055-02(244) / 106023305 -- Hinds County**

Proposers are hereby advised that a former slide repair area is located between Station 565+30± and Station 567+20± along the East Frontage Road. This area was previously repaired by removing the embankment material from the edge of pavement on the East Frontage Road to the toe of the slope and back filled with rip rap. Proposers shall include in their price a "permanent fix" for this embankment area which shall accommodate a six lane typical section meeting applicable design criteria established by this RFP. The "permanent fix" shall consist of removing the existing rip rap as applicable and provide a stabilized slope through the use of retaining walls, piling or other acceptable means. Design of this work shall be prepared, submitted and approved prior to work commencing. All work shall be performed within existing right of way. East Frontage Road traffic shall be maintained at all times with ingress/egress at adjacent business/residence being provided. Existing Interstate 55 northbound traffic will not be allowed to be re-located until this work is performed.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5405 DB **CODE: (SP)**

DATE: **02/11/2015**

SUBJECT: **Traffic Control Devices**

Proposers are advised of the following two changes regarding traffic control devices.

Flashing Arrow Panels

In Subsection 619.02.5 of the Standard Specifications, it states that flashing arrow panels shall meet the requirements of Section 6F.53 of the MUTCD. The new MUTCD has changed this reference to Section 6F.61. Flashing arrow panels on this project must meet the requirements of Section 6F.61 of the latest MUTCD.

Type III Barricade Rails

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

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

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

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

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

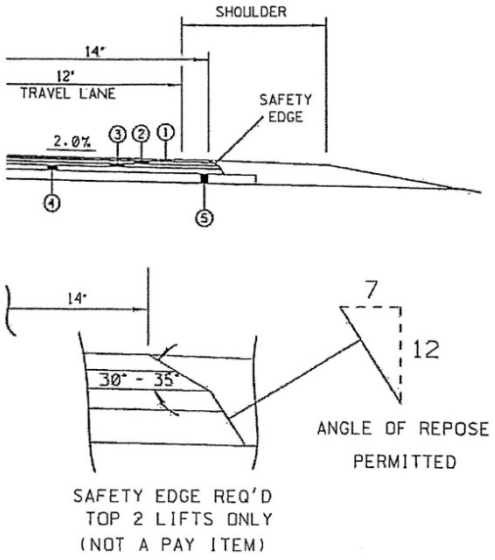
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5411 DB **CODE: (SP)**

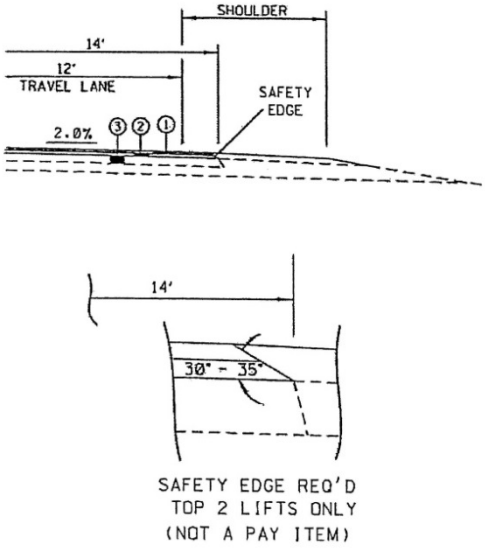
DATE: **02/17/2015**

SUBJECT: **Safety Edge**

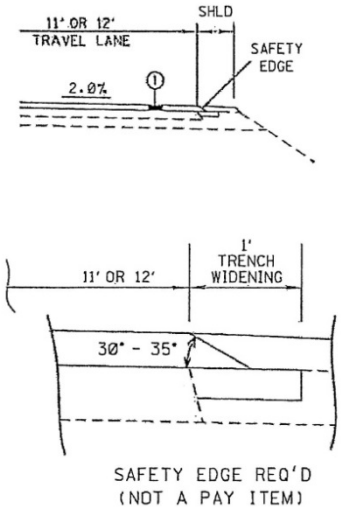
Proposers are hereby advised that the Shoulder Wedge (Safety Edge) specified in Special Provision 907-401-7, Asphalt Pavements, shall only apply to the top two (2) lifts of asphalt. Open Graded Friction Courses (OGFC) are not to be considered a lift as it pertains to safety edge. Attached is a drawing showing the safety edge.



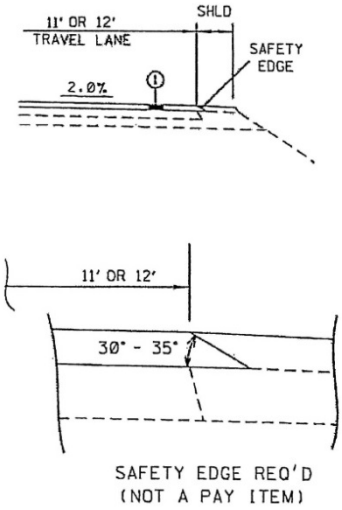
NEW CONSTRUCTION



OVERLAY
14' PAVEMENT



OVERLAY
11' OR 12' PAVEMENT
WITH TRENCH WIDENING



OVERLAY
11' OR 12' PAVEMENT
WITHOUT TRENCH WIDENING

SAFETY EDGE DETAILS **4/8/2011**

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5412 DB **CODE: (SP)**

DATE: **02/18/2015**

SUBJECT: **Maintenance of Existing Slopes**

PROJECT: **DB/IM-0055-02(244) / 106023305 -- Hinds County**

Proposers are hereby advised that the contractor will be required to maintain all existing slopes on the project. Special consideration shall be given to the method of construction used to construct the project and how that might affect the slopes. If the Engineer determines that repair of the existing slopes is required and is the result of poor workmanship on behalf of the Contractor, all costs associated with the repairs shall be solely the responsibility of the Contractor. If the Engineer determines that the repair of the slope is required and is a result of no fault of the Contractor, the Department will compensate the Contractor for the extra work. The Contractor shall submit a method of repair to the Engineer for approval. A temporary repair may be needed before a permanent repair can get approved. It shall be understood that the repair of the existing slopes as mentioned above shall not be a reason to extend the Proposer's Substantial Completion Date.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5413 DB **CODE: (SP)**

DATE: **02/27/2015**

SUBJECT: **Fuel and Material Adjustments**

Proposers are advised that **NO FUEL OR MATERIAL ADJUSTMENT**, as addressed in Subsection 109.07 of the Standard Specifications, will be allowed on this project.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5414 DB **CODE: (SP)**

DATE: **02/27/2015**

SUBJECT: **Opening of Existing Ramps/Exits**

PROJECT: **DB/IM-0055-02(244) / 106023305 – Hinds County**

Proposers are hereby advised that the Department desires to expedite the opening of the exits/ramps that are currently closed within the project limits. The proposer shall indicate via construction phasing sheets and traffic control sheets their plan and proposed time frame for accomplishing this work. This work shall be considered a priority for the proposer. If this work is not being given full attention to the satisfaction of the Engineer, all other work on the project will be stopped.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5415 DB **CODE: (SP)**

DATE: **02/27/2015**

SUBJECT: **Field Office**

PROJECT: **DB/IM-0055-02(244) / 106023305 – Hinds County**

Proposers are hereby advised that the Department currently has a lease on an Engineering Field Office Building located at 121 Southpointe Drive in Byram that is paid for through October 31, 2015. The Contractor will be required to pay for all other costs associated with this Engineering Field Office Building as set out in Special Provision 907-622-7 DB and Section 622 of the Mississippi Standard Specifications for Road and Construction from the date of the Notice To Proceed through October 31, 2015.

After October 31, 2015, the Contractor shall provide an Engineering Field Office Building, Type 3, meeting all of the requirements of Special Provision 907-622-7 DB and and Section 622 of the Mississippi Standard Specifications for Road and Bridge Construction.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5416 DB **CODE: (SP)**

DATE: **03/02/2015**

SUBJECT: **Contract Requirements**

PROJECT: **DB/IM-0055-02(244) / 106023305 – Hinds County**

The Contractor is hereby advised to consider that a previous project was under construction when terminated for convenience by MDOT. The Contractor may incorporate all items of work, as feasible, from the previous project up to the time of the previous project's termination, unless specifically stated otherwise in this RFP. Regardless of the status or condition of all items of work from the previous project, whether installed or MDOT furnished, the Contractor shall be solely responsible for designing and constructing the Project, including all items of work incorporated/provided as applicable from the previous project, to meet all standards, specifications, warranties and requirements in accordance with the RFP and State and federal regulations. The Contractor shall develop all applicable plans, signed and sealed by the Contractor's appropriate team member(s), in accordance with the RFP. MDOT furnished items shall become the property of the Contractor as indicated in Section 904 - Notice to Proposers No. 5312 DB. Any design reports, plans, and specifications shall be signed and sealed by a Professional Engineer licensed in the State of Mississippi.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 – NOTICE TO PROPOSERS NO. 5417 DB **CODE: (SP)**

DATE: **03/05/2015**

SUBJECT: **Frontage Roads and Local Roads within State Maintained ROW**

PROJECT: **DB/IM-0055-02(244) / 106023305000 – Hinds County**

Proposers are hereby advised that all Frontage Roads and Local Roads (to the end of State Maintenance) will require a 1 ½" Mill and Overlay. Prior to the Mill and Overlay, the Frontage Roads will require repair of failed/settled areas with asphalt/subgrade removal and asphalt leveling within the repair area to regain an acceptable cross slope.

Milling will not be required on the West Frontage Road between the following stations (692+00 to 761+25). Additional milling will be required at bridge ends, tie ends, curb and gutter, etc.

Reconstruction of the West Frontage Road will be required from Station 775+00 to 788+00. The frontage road, within this area, may be closed for a maximum of 14 calendar days to complete this work. After 14 calendar days, the Engineer will have the authority to stop all other work on the project until this work is complete and the frontage road re-opened to traffic. During this reconstruction work, ramp closures will not be allowed at Elton Road or Savannah Street.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5418 DB **CODE: (SP)**

DATE: **03/02/2015**

SUBJECT: **Extended Warranty Information**

PROJECT: **DB/IM-0055-02(244) / 106023305 – Hinds County**

Proposers are hereby advised of the following information provided regarding extended warranties for lighting items.

Additional warranty information will be posted to ProjectWise.

See the following attached documents:

valmont
STRUCTURES

February 25, 2015

Wes Dean
MSDOT
PO Box 1850
Jackson, MS 39215-1850

RE: MDOT-Hinds County Project I-55 McDowell Road to Siwell Road

Dear Mr. Dean:

As a follow-up to your request for an extended warranty for the material provided on the subject project on Valmont Order #212051-P1. As you know our standard Valmont warranty is one year from date of shipment. It is my understanding that the poles provided on this order were shipped over a year ago and have yet to be installed. We are being told the poles were stored inside and not exposed to any elements which could be detrimental to the pole including its galvanized finish.

Out of market consideration to MDOT Valmont will agree to extend our standard manufacturing warranty for another 12 months from the date of this letter. Obviously the warranty would not cover any damage due improper handling of neglect. Those damages should be the responsibility of the contractor who originally purchased the material. Also, should there be missing hardware or components Valmont will provide those in a timely manner and at a reasonable price.

Best Regards,

Hank Vaughn
Lead-Regional Manager
U.S. Lighting and Traffic
Valmont Industries, Inc.

Cc: Travis Kraemer
Alison McGill

Lighting, Traffic and Communication Structures
Valmont Industries, Inc. 28800 Ida Street P.O. Box 358 Valley, Nebraska 68064-0358 USA
402-359-2201 800-825-6668 Fax 402-359-6221 valmont.com valmontstructures.com

Acuity Brands Lighting, Inc.
One Lithonia Way
Conyers, GA 30012
Tel: 770-922-9000

March 2, 2015

Response to Request for Extension of Limited Warranty

Project Name:	MDOT - Hinds County
Quote Number:	2311-13-10047-2
Fixture (s):	W415AHP48UG
	HMSC400HP48C7FD2

To Whom It May Concern:

Acuity Brands Lighting, Inc. will extend the standard limited warranty located at: www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx to the above-referenced project/quote number and fixture(s) for an additional period of 1 years. The resulting warranty period will total 6 years from the date of shipment. All other Acuity Brands Lighting, Inc. standard warranty terms and conditions apply.

Regards,

Dave Deck
Director, Infrastructure Specialty
Acuity Brands

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5419 DB **CODE: (SP)**

DATE: **03/04/2015**

SUBJECT: **Message Boards**

PROJECT: **DB/IM-0055-02(244) / 106023305 – Hinds County**

Proposers are hereby advised that at the conclusion of the Project, eight (8) of the changeable message boards will become the property of MDOT. The message boards are marked with the "MDOT" logo and/or are equipped with MDOT owned SIM cards.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO PROPOSERS NO. 5420 DB **CODE: (SP)**

DATE: **03/04/2015**

SUBJECT: **Sheet Piles**

PROJECT: **DB/IM-0055-02(244) / 106023305 – Hinds County**

Proposers are hereby advised that all existing sheet piling in place shall be removed when the permanent structure is completely in place. The removed sheet piling will become the property of the Contractor.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904- NOTICE TO PROPOSERS NO. 5421 DB **CODE: (SP)**

DATE: **03/04/2015**

SUBJECT: **Smoothness Tolerances**

Proposers are hereby advised that the smoothness tolerances for this Project shall meet the requirements of a Category A project for work on I-55 and a Category C for Frontage Roads according to Subsection 907-403.03.2.1. Proposers are responsible for the collection of a preliminary smoothness profile prior to any work being performed.

Mississippi Department of Transportation

Section 906
Required Contract Provisions

Improvements to Interstate 55
Hinds County, Mississippi

Project Number
DB/IM-0055-02(244)/106023-305000

March 5, 2015

SUPPLEMENT TO FORM FHWA-1273

DATE: **10/23/2013**

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 upon request 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
II. Nondiscrimination
III. Nonsegregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Compliance with Governmentwide Suspension and Debarment Requirements
XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

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

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

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

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

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

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

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

II. NONDISCRIMINATION

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

6. Training and Promotion:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

III. NONSEGREGATED FACILITIES

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

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

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

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

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

1. Minimum wages

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

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

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

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

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

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

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

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

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

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

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

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

2. Withholding

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

3. Payrolls and basic records

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

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

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

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

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

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

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

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

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

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

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

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

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

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

b. Trainees (programs of the USDOL).

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

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

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

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

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

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

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

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

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

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

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

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

10. Certification of eligibility.

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

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

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

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

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

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

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

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

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

VI. SUBLETTING OR ASSIGNING THE CONTRACT

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

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

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

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;
(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

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

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

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

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

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

VII. SAFETY: ACCIDENT PREVENTION

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

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

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

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

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

* * * * *

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

* * * * *

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

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

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

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(06/28/2012)

General Decision Number: MS150238 01/30/2015 MS238

Superseded General Decision Number: MS20140238

State: Mississippi

Construction Type: Highway

County: Hinds County in Mississippi.

HIGHWAY CONSTRUCTION PROJECTS

Note: Executive Order (EO) 13658 establishes an hourly minimum wage of $10.10 for 2015 that applies to all contracts subject to the Davis-Bacon Act for which the solicitation is issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.10 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/02/2015
1	01/30/2015

* ELEC0480-010 01/01/2015

	Rates	Fringes
TRAFFIC SIGNALIZATION		
Electrician	$ 24.10	8.15

SUMS2010-057 08/04/2014

	Rates	Fringes
CARPENTER (Form Work Only)	$ 13.73	0.00
CEMENT MASON/CONCRETE FINISHER	$ 13.93	0.00
ELECTRICIAN	$ 24.04	5.87
HIGHWAY/PARKING LOT STRIPING: Truck Driver (Line Striping Truck)	$ 11.81	0.00
INSTALLER - GUARDRAIL	$ 12.07	0.00
INSTALLER - SIGN	$ 12.13	0.00
IRONWORKER, REINFORCING	$ 15.47	0.00
LABORER: Common or General, Including Asphalt Raking, Shoveling, Spreading; and		

Grade Checking.....$ 10.32 0.00

LABORER: Flagger.....$ 9.69 0.00

LABORER: Luteman.....$ 12.88 0.00

LABORER: Mason Tender -
Cement/Concrete.....$ 12.11 0.00

LABORER: Pipelayer.....$ 13.44 0.00

LABORER: Laborer-Cones/
Barricades/Barrels -
Setter/Mover/Sweeper.....$ 10.39 0.00

OPERATOR: Asphalt Spreader.....$ 14.71 0.00

OPERATOR:
Backhoe/Excavator/Trackhoe.....$ 16.01 0.00

OPERATOR: Bobcat/Skid
Steer/Skid Loader.....$ 11.64 0.00

OPERATOR: Broom/Sweeper.....$ 9.75 0.00

OPERATOR: Bulldozer.....$ 13.87 0.00

OPERATOR: Concrete Saw.....$ 14.38 0.00

OPERATOR: Crane.....$ 21.33 0.00

OPERATOR: Distributor.....$ 10.25 0.00

OPERATOR: Grader/Blade.....$ 14.31 0.00

OPERATOR: Grinding/Grooving
Machine.....$ 15.90 0.00

OPERATOR: Loader.....$ 11.96 0.00

OPERATOR: Mechanic.....$ 15.20 0.00

OPERATOR: Milling Machine.....$ 14.68 0.00

OPERATOR: Mixer.....$ 14.25 0.00

OPERATOR: Oiler.....$ 12.13 0.00

OPERATOR: Paver (Asphalt,
Aggregate, and Concrete).....$ 11.59 0.00

OPERATOR: Roller (All Types)....$ 11.53 0.00

OPERATOR: Scraper.....$ 12.25 0.00

OPERATOR: Tractor.....$ 11.81 0.00

TRUCK DRIVER: Flatbed Truck.....$ 14.06 0.00

TRUCK DRIVER: Lowboy Truck.....$ 12.56 0.00

TRUCK DRIVER: Mechanic.....$ 13.00 0.00

TRUCK DRIVER: Water Truck.....$ 10.00 0.00

TRUCK DRIVER: Dump Truck (All Types).....$ 11.39 0.00

TRUCK DRIVER: Semi/Trailer Truck.....$ 14.60 0.00

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

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

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

Union Rate Identifiers

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

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

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and

the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

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

Union Average Rate Identifiers

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

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

WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

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

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

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

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

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

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

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END OF GENERAL DECISION

Mississippi Department of Transportation

Section 907
Special Provisions

Improvements to Interstate 55
Hinds County, Mississippi

Project Number
DB/IM-0055-02(244)/106023-305000

March 5, 2015

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISIONS

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MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-101-1 DB **CODE: (SP)**

DATE: **02/10/2015**

SUBJECT: **Definitions and Terms**

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

907-101.01--Abbreviations. Add the following to the list of abbreviations in Subsection 101.01 starting on page 1:

BV	Best Value
CPM	Critical Path Method
MCIA	Mississippi Concrete Industries Association
PPS	Project Payment Schedule
QA	Quality Assurance
QC	Quality Control
RCSR	Review Comment Summary and Resolution
RFC	Release for Construction
RFI	Request for Information
RFQ	Request for Qualifications
RFR	Request for Revision
SOQ	Statement of Qualifications
SOV	Statement of Values
VE	Value Engineering

907-101.02--Definitions. Add the following, or amend the following, to the list of definitions in Subsection 101.02 starting on page 3:

Best Value Proposal -- means the Proposal provided by a Proposer that the Commission determines is (a) responsive to the RFP and (b) presents the best value for the Commission and MDOT as determined by the **Criteria for Scoring** of the RFP.

Bid -- Bid is understood to mean Proposal throughout all documents.

Bidder -- Bidder is understood to mean Proposer throughout all documents.

Daily Diaries -- Daily reports, generated by MDOT required for reporting on weather, manpower, equipment, material deliveries, work activities, progress, problems, and whatever else is required by the Contract.

Contract -- The written agreement between MDOT and the Contractor setting forth the obligations of the parties thereunder, including but not limited to, the performance of the Work,

and the basis of payment. The Contract shall be composed of those documents described in Section 902, I. (Contract Documents).

Engineer -- The Chief Engineer of MDOT, acting directly or through a duly authorized representative(s).

Engineer of Record -- Shall be a member of the Contractor's design team and shall be a Mississippi-licensed Professional Engineer who has responsibility for a specific area of design and shall sign and seal plan sets that have been developed under his/her direct supervision. Engineer of Record shall be responsible for addressing the Contractor's Request for Information (RFI's) as per Section 2.2.6 of the Technical Specifications.

Final Completion Date -- The date on which all Work specified in the Contract is complete, which is derived from adding the calendar days bid by the Contractor to the date of the Notice to Proceed.

Governmental Approval -- Any authorization, consent, approval, action, license, lease, permit, certification, exemption, filing or registration by or with any Governmental Person.

Governmental Person -- Any federal, state, local or foreign government, any political subdivision or any governmental, quasi-governmental, judicial, public or statutory instrumentality, administrative agency, authority, body or entity, excluding MDOT unless the context requires otherwise.

Inspector -- MDOT's authorized representative assigned to make detailed inspections of Contract performance.

Laboratory -- The testing laboratory of MDOT or any other testing laboratory which may be designated by MDOT.

MDOT duly authorized representative -- Those individuals or firms with specific authority to act for and on behalf of MDOT.

Milestone -- An activity that represents a significant point in time, and may be used to indicate the start or end of a series of related activities and/or Contract accomplishment. A milestone has zero original and remaining duration, and does not increase the Contract time.

Project Documents -- All written instruments associated with the Project including SOQ, RFP, Proposal, Agreement, Exhibits, referenced materials, design, and all documents produced to administer the Project including, but not limited to, all correspondence, changes, RFRs, RCSR, Request for Information, and Submittals.

Project Management Services -- All planning, monitoring, controlling and reporting for Project activities and design including but not limited to, personnel, facilities, materials, computer systems and training for management of the Project as determined adequate by MDOT.

Project Payment Schedule -- See Subsection 907-108.03.1.4.1 of the Special Provisions.

Project Scope - All responsibilities and tasks included in the RFP necessary to complete the Project and satisfy all requirements in the Contract including all associated work developed from the design, minor MDOT revisions, changed conditions, and contingencies that may be necessary for the Contractor to complete the Work not mentioned or included in the RFP.

Proposal -- The offer of a Proposer, on the prescribed form, to perform the Work at the price and time quoted.

Proposal Date -- Is the date designated in the RFP for submission of the Volume 1 –Technical Proposal and/or Volume 2 – Contract Price Proposal to MDOT.

Proposal Form -- The approved form on which the Department requires Proposals to be prepared and submitted for the Work.

Proposal Guaranty -- A certified check, cashier's check, or Proposal bond furnished with the Proposal to guarantee that the Proposer will enter into a Contract for the Work and furnish acceptable bond if the Contractor's Proposal is accepted.

Proposer -- Includes a firm or firms, consortia, partnerships, joint ventures and other legal entity, which has been requested by the Mississippi Department of Transportation to submit a Proposal.

Review Comment Summary and Resolution (RCSR) -- A written instrument to facilitate the disposition of reviewer comments of Contractor submittals.

Release for Construction -- The written act of MDOT advising the Contractor it is allowed to proceed with construction, installation, manufacture or procurement according to the documents so released by MDOT, provided, however, Contractor shall nonetheless meet all requirements of this Contract.

Request for Information (RFI) -- An RFI or information request is submitted by the Contractor to MDOT or duly appointed representative when information is needed concerning the Work. RFIs are answered by the appropriate party and returned to the Contractor with a response.

Request for Revision (RFR) -- A written instrument for the Contractor to request a change to the Project scope identified in the RFP or the design developed during each Phase of the Project by the Contractor.

Resident or Project Engineer -- The Engineer assigned by the Chief Engineer and bonded to the State to have the responsibility and authority for on-the-job administration.

Site -- Shall mean any area within the Right-of-Way of the project limits and additional areas that may be designated in the Contract.

Stipend -- Allowance paid for unsuccessful responsive Proposers.

Work --All design, engineering, quality control, procurement, construction, labor, supervision, testing for asphalt and concrete, training and other services, equipment and materials provided or to be furnished and provided by Contractor necessary to achieve Final Acceptance of the Project in regard to which Notice To Proceed has been issued and performed in accordance with all requirements of this Contract.

Working Drawings -- Stress sheets, shop drawings, erection plans, falsework plans, framework plans, cofferdam plans, bending diagrams for reinforcing steel, or any other supplementary plans or similar data which the Contractor is required to submit.

Value Engineering -- Proposed change to the Project Scope or design by MDOT or the Contractor that will reduce cost, increase quality and/or expedite the schedule.

907-101.03--Presumption. Delete Subsection 101.03 on page 13 and substitute the following.

907-101.03--Blank.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-102-1 DB **CODE: (SP)**

DATE: 09/13/2011

SUBJECT: Bidding Requirements and Conditions

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

SECTION 907-102 - BIDDING REQUIREMENTS AND CONDITIONS

907-102.01--Prequalification of Proposers. Prospective Proposers will be required to file with the Department a list of persons authorized to bind the company in all matters. Other information may be required from time to time before issuing Proposals.

The attention of prospective Proposers is directed to all fees and taxes required for the privilege of doing business within the State of Mississippi.

When two or more persons, firms or corporations are submitting a joint venture, each of the persons, firms or corporations may be required to comply with the above prequalification requirements.

907-102.02--Contents of RFP. The RFP will identify the Project, state the location, describe the Work, and state the time in which the Work must be completed. The RFP will also include special provisions and requirements which are not contained in the Standard Specifications or required modifications thereto.

All papers bound with, attached to, or designated for addition or substitution in the RFP are considered a part thereof and must not be detached or altered when the Proposal is submitted. All documents designated in the RFP shall be considered a part as if attached to and included in the Proposal.

907-102.03--Issuance of Proposal. [Deleted]

907-102.04--Interpretation of Quantities. Determination of the quantities for the Work entailed by the Project Scope is the responsibility of the Contractor. Quantities are needed monthly to determine the frequency of materials sampling and testing for quality control referenced in Special Provision 907-109.01. All subsections within the MDOT Standard Specifications that establish the Method of Measurement and Basis of Payment for work performed is deleted. The single lump sum Contract Price submitted by the Contractor in response to the RFP shall constitute full and complete compensation for all Work.

907-102.05--Examination of Specifications, Special Provisions, Notices to Proposers and

Site of Work. The Proposer is allowed to examine carefully the site of the proposed Work during the three optional field visits in accordance with the Request for Proposal (RFP), the RFP, Specifications, Special Provisions, Notices to Proposers and contract forms before submitting a Volume 1 – Technical Proposal and Volume 2 – Contract Price Proposal.

MDOT has made available or provided to the Contractor information that MDOT acquired prior to the date of this Contract in the course of planning for the construction of the Project, which information is hereinafter collectively called "Informational Documents."

MDOT hereby specifically disclaims any implication that it has made any such representation or warranty either express or implied, as to any matter whatsoever, by virtue of the fact that it is making the Informational Documents available to Contractor. Further, MDOT is not representing that the Informational Documents are exhaustive, complete, accurate or sufficient for design or construction of the Project. Contractor agrees that it has full responsibility for the design and construction of the Project and Contractor specifically acknowledges and agrees that the Informational Documents are preliminary and conceptual in nature.

The submission of a Volume 1 – Technical Proposal and Volume 2 – Contract Price Proposal shall be considered prima facie evidence that the Proposer has made such an examination and is satisfied as to the conditions to be encountered in performing the Work at the Project site and as to the requirements of the Informational Documents, standard specifications, Request for Proposal, special provisions, Contract, and the Federal, State, and local laws which will in any way affect the execution of the Work. All Contracts are subject to the provisions of Sections 65-1-89 and 65-1-91, Miss. Code Ann. (1972).

907-102.06--Preparation of Proposal. Volume 1 – Technical Proposals and Volume 2 – Contract Price Proposals are to be prepared in accordance with the requirements set forth in the RFP issued by the Department. All the figures shall be in ink or typed. It is the responsibility of every Proposer to check for any addendum or modification to the Contract document(s). It shall be the Proposer's responsibility to be sure they are in receipt of all addenda and/or questions and answers, if any are issued.

Each RFP issued will contain duplicate Certification regarding debarment, suspension, and other responsibility matters to be completed by the Proposer. The Certification must be sworn to and shall be under penalty of perjury and Proposers are cautioned to read and understand its contents in entirety before execution. The Contractor shall provide immediate written notice to the Contract Administration Engineer at any time, prior to or after award, that it is known a certification was erroneous when executed or has become erroneous by reason of changed circumstances.

Failure on the part of the Proposer to execute the Certification will result in the Volume 2 – Contract Price Proposal being considered nonresponsive.

The Proposer's Volume 2 – Contract Price Proposal must be signed with ink by the individual, by one or more members of the partnership, by one or more members or officers of each firm representing a joint venture, or by one or more officers of a corporation; or by an agent of the

Contractor legally qualified to bind the Contractor and acceptable to the State. If the Volume 2 – Contract Price Proposal is made by an individual, the individual's name and address must be shown; by a partnership, the name and address of each partnership member must be shown; as a joint venture, the name and address of each member or officer of the firms represented by the joint venture must be shown; by a corporation, the name of the corporation and the business address of its corporate officials must be shown.

The address stated on the Volume 2 – Contract Price Proposal shall be the Proposer's permanent address until changed by written notice to the Executive Director. All notices provided for in the Contract shall be considered as delivered to the Contractor when mailed or delivered to such address.

907-102.07--Irregular Proposals. Volume 2 – Contract Price Proposals will be considered irregular and may be rejected for any of the following reasons:

(a) If the Volume 2 – Contract Price Proposal is on a form other than that furnished by the Department, or if the form is altered or any part thereof is detached, except as allowed in Subsection 907-102.06.

(b) If there are unauthorized additions, conditional or alternate Volume 2 – Contract Price Proposals or irregularities of any kind which may tend to make the Volume 2 – Contract Price Proposal incomplete, indefinite, or ambiguous as to its meaning.

(c) If the Proposer adds any provisions reserving the right to accept or reject an award, or to enter into a Contract pursuant to an award.

(d) If the Volume 2 – Contract Price Proposal, does not contain acknowledgement of receipt and addition to the Volume 2 – Contract Price Proposal and Contract documents of all addenda issued prior to opening of Volume 2 – Contract Price Proposals.

(e) Failure to execute required affidavits, certificates, etc., and furnish Proposal guaranty.

(f) The Mississippi Transportation Commission reserves the right to reject any or all Volume 1 – Technical Proposals and/or Volume 2 – Contract Price Proposals, to waive technicalities or irregularities, or to advertise for new Volume 1 – Technical Proposals and Volume 2 – Contract Price Proposals, and the decision of the Commission to reject any Volume 1 – Technical Proposal or Volume 2 – Contract Price Proposal shall not be cause for any liability or damage against the Commission, the Department, any of its officers, duly appointed representatives or employees.

907-102.08--Proposal Guaranty. No Volume 2 – Contract Price Proposal will be considered unless accompanied by certified check, cashier's check or bond, made payable to the State of Mississippi, in an amount of not less than five percent of the total amount of the contract price offered. Proposal bond shall not be conditioned in any way to modify the minimum five percent (5%) required. Volume 2 – Contract Price Proposals that fail to include a Proposal Guaranty shall be deemed nonresponsive and will be rejected by MDOT. The guaranty shall be evidence

of good faith that, if awarded the Contract, the Proposer will execute the Contract and give Contract bond as stipulated in Subsection 907-103.05 and as required by law. The Proposal Guaranty amount should not include the dollar amount determined for the Contract Time (Part B).

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

907-102.08.1--Bonding. The successful Proposer shall provide MDOT with the following bond within ten (10) calendar days of being awarded the Project:

(a) A Performance Bond, or bonds in a sum equal to the full amount of the Contract. In the event of award of a joint Volume 2 – Contract Price Proposal, each individual, partnership, firm or corporation shall assume jointly the full obligations under the Contract and Contract bond. The form of the bond(s) shall be that provided by or acceptable to the Department. The bond(s) shall be negotiated for, procured from and the premium paid to a qualified Mississippi agent or qualified nonresident agent of the Surety. The bond shall be signed or countersigned by a Mississippi agent or qualified nonresident agent and also bear the signature of an "attorney-in-fact" of the surety. Reference is made to Section 31-5-51 et seq of the Mississippi Code of 1972, Annotated, and other State statutes applicable thereto.

Bond(s) must be issued by a Surety with the Best's rating of at least "A" or better and Financial Size Category of VIII or better by A.M. Best Co. The Surety shall be registered with the Mississippi State Insurance Commissioner.

907-102.09--Delivery of Proposals. Unless otherwise specified, Volume 2 – Contract Price Proposals shall be submitted sealed in a special envelope furnished by the Department. The blank spaces on the envelope shall be filled in correctly to clearly indicate its contents. When an envelope other than the special one furnished by the Department is used, it shall be of the same general size and shape and be similarly marked to clearly indicate its contents. Volume 2 – Contract Price Proposal Forms are nontransferable and no name or names of interested parties may be shown other than those to whom the RFP was issued. When sent by mail, the sealed Volume 2 – Contract Price Proposals shall be mailed to the Department at the address and in care of the official in whose office the Volume 2 – Contract Price Proposals are to be received. All Volume 2 – Contract Price Proposals shall be submitted prior to the time and place specified in the Request for Proposals (RFP). Volume 2 – Contract Price Proposals received after the time set forth in the RFP will be returned to the Proposer unopened.

907-102.10--Blank.

907-102.11--Blank.

907-102.12--Blank.

907-102.13--Disqualification of Proposers. In addition to those matters set forth in Section 102.07 regarding Irregular Proposals, either of the following reasons may be considered as being sufficient for the disqualification of a Proposer and the rejection of the Proposer's submitted Volume 1 – Technical Proposal or Volume 2 – Contract Price Proposal or Proposals:

(a) More than one Volume 1 – Technical Proposal or Volume 2 – Contract Price Proposal for the same work from an individual, partnership, firm or corporation under the same or different name(s).

(b) Evidence of collusion among Proposers. Participants in such collusion will receive no recognition as Proposers for any future work of the Department until reinstated as a qualified Proposer.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-103-1 DB **CODE: (SP)**

DATE: **09/13/2011**

SUBJECT: **Award and Execution of Contract**

Section 103, Award and Execution of Contract, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby deleted in toto and replaced as follows.

SECTION 907-103 -- AWARD AND EXECUTION OF CONTRACT

907-103.01--Consideration of Proposals. After the Volume 2 – Contract Price Proposals are opened and read, they will be compared on the basis of the criteria set for in the Request for Proposals (RFP).

907-103.02--Award of Contract. The award of a Contract, if awarded, will be made within 60 calendar days after the opening of Volume 2 – Contract Price Proposals to the Proposer with the Best Value Proposal and whose Volume 2 – Contract Price Proposal complies with all the requirements prescribed. The award of contracts involving the expenditure of Federal funds is contingent upon concurrence of the FHWA. The successful Proposer will be notified of the award by letter mailed to the address shown on the Volume 2 – Contract Price Proposal.

907-103.03--Cancellation of Award. The Department reserves the right to cancel the award of a contract any time prior to the execution by all parties without liability against the Commission, Department, or any of its officers or employees.

907-103.04--Return of Proposal Guaranty. The retained Proposal Guaranty of the Proposers will be returned in accordance with the following:

i. If a contract is executed with the Best Value Proposer, then the remaining Proposers will receive their Proposal Guaranty within 10 days.
ii. If the Best Value Proposer fails to execute a contract, then the Proposal Guaranty will be forfeited in accordance with Section 103.08.
iii. If the Commission elects to negotiate a contract with the next responsive Best Value Proposer(s), then the same procedure as defined above will be followed.

In the event no award is made within 30 days after the opening of the Volume 2 – Contract Price Proposals, the Executive Director may permit the Proposer to replace the certified check or cashier's check with a satisfactory Proposer's bond.

Should no award be made within 60 calendar days, all Volume 2 – Contract Price Proposals will be rejected and all guaranties returned unless the Best Value Proposer, at the request of the Commission, agrees in writing to a longer delay.

907-103.05--Contract Bonds.

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

907-103.05.2--Form of Bonds. The form of bond(s) shall be that provided by or acceptable to the Department. These bonds shall be executed by a Mississippi agent or qualified nonresident agent and shall be accompanied by a certification as to authorization of the attorney-in-fact to commit the Surety company. A power of attorney exhibiting the Surety's original seal supporting the Mississippi agent or the qualified nonresident agent's signature shall be furnished with each bond. The Surety company shall be currently authorized and licensed in good standing to conduct business in the State of Mississippi with a minimum rating by A.M. Best of(A-) in the latest printing "Best's Key Rating Guide" to write individual bonds up to ten percent of the policy holders' surplus or listed on the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published by the United States Department of the Treasury, Financial Management Service, Circular 570 (latest revision as published and supplemented on the Financial Management Service Web site and in the Federal Register) within the underwriting limits listed for that Surety. All required signatures on the bond(s) and certifications shall be original signatures, in ink, and not mechanical reproductions or facsimiles. The Mississippi agent or qualified nonresident agent shall be in good standing and currently licensed by the Insurance Commissioner of the State of Mississippi to represent the Surety company(ies) executing the bonds.

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

907-103.06--Escrow Proposal Documents. The purpose of this specification is to preserve the Proposer's Volume 2 – Contract Price Proposal documents for the use by MDOT in the resolution of any claim or dispute between MDOT and the Contractor either during or after construction. Within ten (10) business days following submittal of the Volume 2 – Contract Price Proposal documents, the Contractor shall have delivered into escrow the original of all documents used in preparation of its Volume 2 – Contract Price Proposal for the Project (the

"Escrowed Proposal Documents" or "EPD").

Upon execution of the Contract, the unsuccessful Proposers will be notified by the Commission in writing that the escrowing of Volume 2 – Contract Price Proposal documents will no longer be required.

The EPD of the successful Proposer will be held in escrow until all of the following have occurred: (a) 180 days have elapsed from the date of the final Contract voucher certification, (b) all disputes regarding this Contract have been settled, and (c) final payment on this Contract has been made by MDOT and accepted by the Contractor.

The EPD shall be available during business hours for joint review by representatives of the Contractor, FHWA and MDOT in connection with the resolution of disputes. The EPD are, and shall always remain, the property of the Contractor, subject to MDOT's right to review the EPD as provided herein. Copies of the EPD shall be provided to the courts of the State of Mississippi and other dispute resolvers upon request of MDOT. The Contractor shall have the right to seek a protective order governing the disclosure of the EPD to parties other than MDOT. The Contractor represents and warrants that the EPD delivered into escrow prior to execution hereof constitute all of the information used in preparation of its Volume 2 – Contract Price Proposal and agrees that no other Volume 2 – Contract Price Proposal preparation information will be considered in resolving disputes or claims related thereto, including in any judicial proceeding to resolve such disputes or claims. The Contractor also agrees that the EPD are not part of this Contract and that nothing in the EPD shall change or modify this Contract.

The Contractor represents and warrants that:

(a) the EPD clearly itemize the estimated costs of performing the Work required by the Contract provisions, all work is separated into sub-items as required to present a complete and detailed estimate of all costs, crews, equipment, quantities, and rates of production are detailed;
(b) estimates of costs are divided into Contractor's usual cost categories such as direct labor, repair labor, equipment ownership and operation, expendable materials, permanent materials and subcontract costs as appropriate, plant and equipment and indirect costs are detailed in the Contractor's usual format, and the Contractor's allocation of plant equipment, indirect costs, contingencies, markup and other items such as overhead and profit to each direct cost item shall be clearly identified;
(c) the EPD include all assumptions, quantity takeoffs, rates of production and progress calculations, quotes for Subcontractors and suppliers, memoranda, narratives and all other information used by the Contractor to arrive at the Contract Price.

It is not intended that the Contractor perform any significant extra work in the preparation of the EPD prior to delivery thereof into escrow. However, the Contractor represents and warrants that the EPD provided prior to execution of this Contract were personally examined prior to delivery to escrow by authorized officers of the Contractor and that they meet the requirements of herein and are adequate to enable a complete understanding and interpretation of how the Contractor arrived at its Volume 2 – Contract Price Proposal. In the event that MDOT determines that the

EPD is incomplete, MDOT may request the Contractor to supply data to make the EPD complete. The Contractor shall provide all such date within three (3) business days of the request, and at that time it will be date stamped, labeled to identify it as supplementary EPD information, and added to the EPD. The Contractor shall have no right to add documents to the EPD except upon MDOT's request.

The EPD shall at all times be treated as proprietary and confidential information and shall be used only for purposes described in herein. Failure or refusal to provide Volume 2 – Contract Price Proposal documentation shall delay execution of the Contract or may be cause for forfeit.

The cost of the escrow will be borne by the Contractor. The Contractor will provide escrow instructions to the selected repository of EPD's or banking institution located in Jackson, Mississippi, consistent with this specification.

907-103.07--Execution and Approval of Contract. The Best Value Proposer to whom the Contract has been awarded shall sign and file with the Executive Director, the Contract and all documents required by the Contract within 10 days after the Contract has been awarded. The Contract may require certain documents be submitted at an earlier date, in which case, those documents shall be submitted within the time frame specified. No Contract is in effect until it is executed by all parties.

907-103.08--Failure to Execute Contract. Failure of the Proposer to execute the Contract and file acceptable performance and payment bonds and/or other required documents within 10 days shall be just cause for the cancellation of the award and forfeiture of the Proposal Guaranty which shall become the property of the Department, not as a penalty but in liquidation of damages sustained. Award may then be made to the next responsive Best Value Proposer, or the Work may be re-advertised at the discretion of the Department.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

DATE: **06/25/2014**

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.

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 also be invited to attend as necessary. The contractors and MDOT will also be required to have Regional/District and Corporate/State level managers on the project team.

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

DATE: **06/25/2014**

SUBJECT: **Scope of Work**

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

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

DATE: **06/25/2014**

SUBJECT: **Control of Work**

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

907-105.04--Coordination of Plans, Specifications, Interim Specifications, Special Provisions and Notice to Bidders. Delete the second full paragraph of Subsection 105.04 on page 35, and substitute the following.

In case of a conflict between plan quantities, advertisement quantities, and/or bid sheet quantities, the bid sheet quantities shall prevail.

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

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

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

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

The Contractor will be responsible for the maintenance of existing roadways within the limits of this project starting on the date of the Notice To Proceed / Beginning of Contract Time. Anytime

work is performed in a travel lane, the Contractor shall install portable lane closure signs meeting the requirement of the MDOT Standard Drawing or MUTCD (latest edition).

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

DATE: 06/25/2014

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

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

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

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

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

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

907-107.14--Damage Claims and Insurance.

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

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

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

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

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

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

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

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

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

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

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

Coverage shall include:

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

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

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

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

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

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

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

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

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

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

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

The eligible permanent items shall be limited to traffic signal systems, changeable message signs, roadway signs and sign supports, lighting items, guard rail items, delineators, impact attenuators, median barriers, bridge railing or pavement markings. The eligible temporary items shall be limited to changeable message signs, guard rail items, or median barriers.

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-107-14 DB

DATE: 01/21/2015

SUBJECT: Contractor's Protection Plan

Delete the first and second paragraphs of Subsection 907-107.22.1 on page 1, and substitute the following.

The Contractor shall maintain the existing erosion control plan for a period of up to 90 days after Notice of Award. Within 60 days of the Notice of Award, the Contractor shall submit to the Project Engineer for concurrence a new comprehensive erosion and siltation control plan. The new plan shall utilize temporary measures and permanent erosion control features to provide acceptable controls during all stages of construction.

Delete Subsection 907-107.22.2 on page 2.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-107-14 DB **CODE: (SP)**

DATE: 06/25/2014

SUBJECT: Contractor's Protection Plan

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:

Delete in toto Subsection 107.22.1 on pages 65 and 66, and substitute the following.

907-107.22.1--Contractor's Erosion Control Plan. At the preconstruction conference or prior to starting any work on the project, the Contractor shall submit to the Project Engineer for concurrence a comprehensive erosion and siltation control plan. The plan shall utilize temporary measures and permanent erosion control features to provide acceptable controls during all stages of construction. If an early Notice to Proceed is desired, the Contractor's Erosion Control Plan should be submitted to the Engineer as soon as possible after award since an approved erosion control plan is required for an early Notice to Proceed.

The time between the Notice of Award and Notice to Proceed/Beginning of Contract Time in the proposal, has been allowed for the submittal and concurrence of the Contractor's erosion control plan, MDOT's review of the plan, and any revisions that may be necessary. The original contract time shall not be adjusted unless delays are caused solely by the Department for the submission, review, and concurrence of the Contractor's erosion control plan.

As a minimum, the plan shall include the following:

1. Erosion Control Plan (ECP) sheets or the plan profile sheets, 11" x 17" or larger, of all areas within the rights-of-way from the Beginning of the Project (BOP) to the End of the Project (EOP) showing the location of all temporary erosion control devices. Erosion control devices should be identified by exact type, temporary or permanent, configuration, and placement of each item to prevent erosion and siltation. A narrative of the Contractor's temporary erosion control plan shall be submitted in a format similar to the form attached to this special provision, but must include the heading and sub-heading information. As a minimum, the narrative shall include the following:
   - A detailed description, including locations (station numbers) of the Contractor's proposed sequence of operations including, but not limited to, clearing and grubbing, excavation, drainage, and structures.
   - A detailed description, including locations, and best management practices (BMP) that will be used to prevent siltation and erosion from occurring during the Contractor's proposed sequence of operations.
2. A copy of the certification for the Contractor's Certified Erosion Control Person whose primary duty shall be monitoring and maintaining the effectiveness of the erosion control plan, BMPs, and compliance with the NPDES permit requirements.

3. A plan for the disposal of waste materials on the project right-of-way which shall include but not be limited to the following:
   - containment and disposal of materials resulting from the cleaning (washing out) of concrete trucks that are delivering concrete to the project site.
   - containment and disposal of fuel / petroleum materials at staging areas on the project.

The erosion and siltation control plan shall be maintained on the project site at all times, updated as work progresses to show changes due to revisions in the sequences of construction operations, replacement of inadequate BMPs, and the maintenance of BMPs. Work shall not be started until an erosion control plan has been concurred with by the MDOT. The Engineer will have the authority to suspend all work and/or withhold payments for failure of the Contractor to carry out provisions of MDEQ's Storm Water Construction General Permit, the erosion control plan, updates to the erosion control plan, and /or proper maintenance of the BMPs.

As soon as the ECP has been approved, a copy of the SWPPP (Narrative, ECP with updates) shall be available on the project at all times. The Contractor shall provide and install a weatherproof enclosure, such as a mailbox, on the project at a location that will be readily accessible to the Engineer or others who may want to review the project ECP. The cost of installing and maintaining this enclosure shall be included in the prices bid for the various erosion control pay items and no direct payment will be made for this work.

907-107.22.2--Clearing and Grubbing, Haul Roads, Waste Areas, Plant Sites or Other Areas Occupied by the Contractor. Delete the fourth paragraph of Subsection 107.22.2 on page 66 and substitute the following.

Unless otherwise determined by the Engineer from a study of overall job conditions, the exposed surface area of erodible material at any one time on this project shall not exceed 19 acres without prior approval by the Engineer.

EXAMPLE
MISSISSIPPI DEPARTMENT OF TRANSPORTATION
Storm Water Pollution Prevention Plan (SWPPP)
Narrative

General Permit Coverage No: MSR_____
Project Number: _____
County: _____
Route: _____

SITE INFORMATION

This project consists of grading and installing drainage structures necessary to construct approximately 6 miles of parallel lanes on SR 31 between the Hinds County Line and the Rankin County Line.

SEDIMENT AND EROSION CONTROLS

VEGETATIVE CONTROLS: Clearing and grubbing areas will be minimized to comply with the buffer zones (minimum of 15 feet along the ROW lines and 5 feet along creeks) as per the contract documents. A combination of temporary and permanent grassing will be used to protect slopes as construction progresses. **Should a disturbed area be left undisturbed for 14 days or more, temporary or permanent vegetation will be placed within 7 calendar days.**

STRUCTURAL CONTROLS: Gravel construction entrance/exit will be installed near Stations 145+50, 159+50, 164+50 & 172+50. Riprap ditch checks will be constructed at Stations 144+50, 151+75, 162+00 & 166+25. The Concrete washout area will be at Stations 140+25, 152+00 & 168+50.

HOUSEKEEPING PRACTICES: Structural BPM's will be cleaned out when sediment reaches 1/3 to 1/2 of the height of the BMP. Maintenance and repair of equipment will be performed off-site, material wash out will occur either off-site or within designated wash out areas.

POST-CONSTRUCTION CONTROL MEASURES: As construction is completed, permanent vegetative growth will be established on disturbed soils to improve soil stability and provide a buffer zone for loose material. Paved ditches and flumes will be placed as specified in the ECP to reduce erosion in concentrated flow areas and rip rap will be placed as specified to dissipate flow energy and reduce flow velocity.

IMPLEMENTATION SEQUENCE

Perimeter controls will be installed first. Clearing and grubbing will be performed in 19-acre sections beginning at the BOP and temporary grassing will be installed as needed. Temporary erosion control BMP's will be installed at the drainage structures prior/during construction of the drainage structures. Grading activities will commence at the BOP and proceed towards the EOP, fill slopes will be permanently grassed in stages for fill heights that exceed 5 feet. Base materials will be installed on completed grading sections with the paving to follow.

MAINTENANCE PLAN

All erosion and sediment control practices will be checked for stability and operation following every rainfall but in no case less than once every week. Any needed repairs will be made immediately to maintain all practices as designed. Sediment basins will be cleaned out when the level of sediment reaches 2.0 feet below the top of the riser. Sediment will be removed from behind BMP's when it becomes about 1/3 to 1/2 height of BMP.

_____ _____
Prime Contractor's Signature Date

_____ _____
Printed Name Title

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-108-2 DB **CODE: (SP)**

DATE: 02/19/2015

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. Delete Subsection 108.01.1 beginning on page 72 and substitute the following.

907-108.01.1--General. The total value of all work performed by the Contractor's own organization shall be no less than 40 percent of the Contract Price. The Contractor shall not assign, subcontract, sublet or transfer any or all of its interest in this Contract, except the furnishing of necessary materials, without prior written approval of the Executive Director. Consent by the Executive Director to any subcontract shall not relieve Contractor from any of its obligations hereunder, and Contractor is required to maintain final management responsibility with regard to any such subcontract.

The Contractor's "own organization" shall be construed to include workmen employed and paid directly, owned or rented equipment and trucks that are classed as owner-operator.

The simple expediency of carrying the workmen of one Contractor on the prime Contractor's or approved subcontractor's payroll to avoid subcontracting will not be permitted.

If evidence and investigation establish that a violation of the subcontract requirement is being attempted through subterfuge whereby one Contractor's equipment is leased to the prime Contractor or the workmen of one Contractor are placed on the payroll of the prime Contractor, the Executive Director will take such action as deemed appropriate under the provisions of the Contract. This provision does not include the lease or use of equipment from a corporation or company wholly owned by the prime Contractor.

Subcontracting does not release the Contractor of bond and Contract liability and shall not be construed to imply that a contract exists between the Department and a third party.

The Contractor must pay subcontractor(s) for satisfactory performance of their contracts no later than 15 calendar days from receipt of payment from the Department. Within 15 calendar days after receiving payment from the Department for work satisfactorily performed, the Contractor shall make prompt payment to all subcontractors or material suppliers for all monies due.

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.

Delete Subsection 108.02 beginning on page 74 and substitute the following.

907-108.02--Notice to Proceed. The Contractor shall not begin construction on any feature of the Work before a Notice to Proceed is issued.

If the Department delays the issuance of the Notice to Proceed for reasons beyond the Contractor's control, the beginning of Contract time shall be adjusted equal to the number of calendar days of the delay. Contract time shall NOT be adjusted for delays caused by the Contractor. The Notice to Proceed and the beginning of Contract time shall be the same date.

Delete Subsection 108.03.1 beginning on page 75 and substitute the following.

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

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

- Show a time scale to graphically show the completion of the work within the Contractor determined completion dates (Substantial Completion and Final Completion).
- Show all activities in the order the work is to be performed including submittals, submittal reviews, fabrication and delivery.
- Show all activities that are controlling factors (critical path) in the completion of the work.
- Show the time needed to perform each activity and its relationship in time to other activities.

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

Delete Subsection 108.03.2 on page 76 and substitute the following.

907-108.03.2--Preconstruction Conference. Prior to commencement of the Work, a preconstruction conference shall be held for the purpose of discussing with the Contractor essential matters pertaining to the prosecution and satisfactory completion of the Project. The Contractor, with the assistance of the Engineer, shall schedule the preconstruction conference.

Delete Subsection 108.03.3 on page 76 and substitute the following.

907-108.03.3--Commencement and Execution of Work. The work shall begin as set out in the Contract Documents or the approved progress schedule and shall be prosecuted at a rate necessary to insure its completion within the contract time specified by the Contractor.

All work covered by supplemental agreement shall not commence until the supplemental agreement has been executed by all parties.

Delete Section 108.04 beginning on page 77 and substitute the following.

907-108.04--Blank.

Delete Section 108.06 beginning on page 79 and substitute the following.

907-108.06--Extension of Time. The Contract Time may not be extended unless there is a delay to the Project caused by an event listed below.

(a) Force Majeure as that term is defined in Section 902 Subsection V.

(b) MDOT initiated scope changes, directives or authorized extra work.

(c) Acts or omissions by MDOT or its duly appointed representative that unreasonably interfere with the Contractor's performance and cause delay of Work on the critical path of the Project.

(d) Changes in a legal requirement or regulation that becomes effective subsequent to the date of this Contract.

(e) Discovery of hazardous materials not discoverable from a reasonable investigation and analysis of the site prior to the Volume 2 – Contract Price Proposal Date.

(f) Discovery of archaeological or paleontological sites not previously identified as set forth in Subsection 5.5 of the Technical Requirements not discoverable from a reasonable investigation and analysis of the site prior to the Volume 2 – Contract Price Proposal Date.

Requests for time extensions shall be made in writing to MDOT within 20 calendar days of the event causing the delay. Requests shall include a schedule analysis fragnet demonstrating the delay is the critical path.

Delete Subsection 108.07 on page 85 and substitute the following.

907-108.07--Failure to Complete the Work on Time. The assessment of liquidated damages shall not be considered a penalty; any damages assessed shall be a reasonable estimate of fair compensation for the damage of delay that may reasonably be anticipated from the Contractor's

failure to complete the Project within the Contractor specified time constraints.

If the Contractor fails to complete all items of Work by the Contractor's specified Final Completion Date, the Commission will assess liquidated damages of **$50,000.00 per calendar day** until the date all items of Work are completed.

The assessments of liquidated damages shall be deducted by the Commission from monies due the Contractor, if sufficient monies are available. Otherwise, the Contractor shall pay to the Commission the liquidated damage assessments within fifteen (15) business days of notice that payment is due.

907-108.08--Default and Termination of Contract. At the end of Subsection 108.08 on page 87, add the following.

Upon termination for default, all Project Documents, as defined in Section 902 Subsection VIII, shall be surrendered forthwith by Contractor to MDOT. MDOT will be authorized to use the Project Documents for the sole purpose of promoting, completing, using, maintaining, upgrading or adding to the Project. This authorization includes allowing design professionals to make changes, corrections, or additions to the Project Documents for these purposes.

Delete Subsection 108.09 beginning on page 87 and substitute the following.

907-108.09--Termination of Contract for Reasons Other Than Default. MDOT reserves the right to cancel the Work upon ten (10) calendar days written notice to Contractor. Should the Work be so canceled by MDOT for convenience, the Contractor shall be paid for the value of the Work, based upon the Project Payment Schedule, performed to the date of cancellation and demobilization together with any cancellation charges by vendors and subcontractors. The Contractor shall also be entitled to the cost of securing the Work, provided such cost is approved by MDOT. In no event, however, shall the total payment to Contractor pursuant to such a cancellation exceed the Contract Price.

Termination of all or a portion of the Contract shall not relieve Contractor of any responsibility it would otherwise have for the Work completed, or any claims arising from that work.

Upon such termination, all Project Documents, as defined in the RFP, shall be surrendered forthwith by Contractor to MDOT. MDOT will be authorized to use the Project Documents for the sole purpose of promoting, completing, using, maintaining, upgrading or adding to the Project. This authorization includes allowing design professionals to make changes, corrections, or additions to the Project Documents for these purposes.

Delete Subsection 108.10 on page 88 and substitute the following.

907-108.10--Termination of Contractor's Responsibility. The construction phase of this Contract will be considered complete when all Work has been satisfactorily completed, the final inspection made, the Work accepted by the Executive Director and the final estimate paid. When the Executive Director writes the formal letter of acceptance, the Contractor will be

released from further obligation except as set forth under the warranty provisions of the Contract or as provided by law.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-109-2 DB **CODE: (SP)**

DATE: 01/21/2015

SUBJECT: Measurement and Payment

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

Delete Subsection 109.01 beginning on page 88 and substitute the following.

907-109.01--Measurement of Quantities. Measurement and calculations of quantities are for testing frequencies only and for this reason the units of measurement and method of measurement shall be consistent with units of measurements and methods of measurements noted in the Standard Specifications.

Delete the second paragraph of Subsection 109.02 on page 91.

Delete Subsection 109.03 on page 91 and substitute the following.

907-109.03--Blank.

Delete Subsection 109.04 beginning on page 91 and substitute the following.

907-109.04--Extra and Force Account Work. When extra work results for any reason and is not handled as prescribed elsewhere herein, the Engineer and the Contractor will attempt to agree on equitable prices. When such prices are agreed upon, a Supplemental Agreement will be issued by the Engineer.

When the Supplemental Agreement process is initiated, the Contractor will be required to submit to the Engineer a detailed breakdown for Material, Labor, Equipment, Profit and Overhead. The total allowable markup (which includes Prime Contractor and Subcontractor work, if applicable) for Supplemental Agreement work shall not exceed 20%.

The requirement for detailed cost breakdowns may be waived when a Department's Bid Item History exists for the proposed item(s), and the Contractor's requested price, including mark-up, is within 20% of the Department's Bid History cost for that item(s). In any case, the Department reserves the right to request detailed cost breakdowns from the Contractor on any Supplemental Agreement request.

When equitable prices cannot be agreed upon mutually by the Engineer and the Contractor, the Engineer will issue a written order that work will be completed on a force account basis to be compensated in the following manner:

Allowable Contract adjustments in accordance with the requirements and provisions of Subsection 907-104.03 will be paid for at the unit prices or lump sum price stipulated in the agreement authorizing the Work, or the Executive Director may require the Contractor to do such work on a force account basis to be compensated in the following manner:

(a) **Labor.** The Contractor will receive the rate of wage or scale agreed upon in writing for each hour that the foreman in direct charge of the specific operations and labor are actually engaged in such work. An amount will be added equal to 19 percent of the sum thereof.

(b) **Bond, Insurance and Tax.** For property damage, liability, and workmen's compensation insurance premiums, unemployment insurance contributions and social security taxes on the force account work, the Contractor will be reimbursed actual cost only. The Contractor shall furnish satisfactory evidence of the rate or rates paid for the bond, insurance and tax.

(c) **Materials.** The Contractor will receive the actual cost of the materials, including transportation charges if paid by the Contractor, exclusive of machinery rentals as hereinafter set forth, plus 19 percent.

(d) **Equipment.** For any machinery or special equipment, other than small tools, authorized by the Engineer, the Contractor will use the rates shown in 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, unless otherwise allowed by the Engineer. This book shall be used to determine equipment ownership and operating expense rates. These rates do not include allowances for operating labor, mobilization or demobilization costs, overhead or profit, and do not represent rental charges for those in the business of renting equipment. Operating labor and overhead cost will be allowed. Subject to advance approval of the Engineer, actual transportation cost for a distance of not more than 200 miles will be reimbursed for equipment not already on the project. The cost of transportation after completion of the force account work will be reimbursed except it cannot exceed the allowance for moving the equipment to the work.

The hourly use rates are computed on the basis of a 40-hour workweek. When the Contractor works more than 40 hours per week, the cost for "Cost of Facilities Capital" (CFC) will be excluded from the hourly rate for those hours in excess of 40 hours per week.

No more than eight hours of standby will be paid during a 24-hour day, nor more than 40 hours per week. Standby time will not be allowed unless the equipment has been in idle status in excess of 16 hours during a 24-hour day. Likewise, standby will not be allowed during periods when the equipment would have otherwise been in idle status or when equipment could reasonably have been used on other parts of the Project. Actual operating time during a week will be credited against the 40 hours maximum standby allowance.

All equipment shall be subject to approval from day to day in accordance with the requirements of Subsection 907-108.05.

(e) **Miscellaneous**. No allowance will be made for general superintendence, the use of small tools, or other costs for which no specific allowance is herein provided.

(f) **Compensation.** No extra work on a force account basis will be paid unless unit prices for labor, materials and equipment rentals have been agreed upon in writing, or as otherwise provided for equipment in paragraph (d), before work is started. The unit prices paid shall not exceed the quoted unit price for each item stipulated in the agreement.

The Contractor, or the Contractor's authorized representative, and the Engineer shall compare records of extra work done on a force account basis at the end of each day. Copies of these records shall be made upon the form provided for this purpose and shall be certified to by the Contractor and the Engineer. The Contractor shall furnish to the Engineer itemized statements of the cost of all force account work. The statements shall include a true copy of the payroll and the original receipt of bills and invoices for the material used and the freight charges paid. Where materials used are not specifically purchased for use on extra work but taken from the Contractor's stock, the Contractor may submit an affidavit of the quantity, price and freight on these materials.

Statements covering force account work for each specific agreement shall be submitted promptly at the end of the month in which the work was actually completed. Failure to timely submit such information shall constitute a waiver if any claim for monetary damage.

Delete Subsection 109.05 on page 93 and substitute the following.

907-109.05--Eliminated Items. The Department shall have the right to eliminate portions of the Contract relating to any of the engineering services or any of the construction services set forth therein. When the Contractor is notified of the elimination of portions of the Contract work, the Department will reimburse the Contractor for actual work done and all costs incurred prior to the notification.

When a major item is eliminated, the Contractor will be reimbursed for substantiated unrecovered overhead costs but not to exceed five percent of the original contract value of the item as shown in the Escrow Proposal Documents. The Contractor shall not be entitled to nor shall the Commission, the Department, or any of its officers or employees be subjected to any liability or damages.

The Contractor upon request will be paid substantiated actual costs for materials, which are in excess of those used and paid for in the completed work that were mobilized prior to notification of elimination or reduction of a major item. Materials which otherwise would have been required prior to such notification and which are on the order that cannot be cancelled may be included in the material to be paid for by the Department. No payment will be allowed for

materials in excess of the quantity required under the Contract

Points of delivery for the reimbursed materials shall be agreeable to the Department. The Contractor shall make delivery at such a point and the additional transportation cost, if any, will be reimbursed by the Department.

Mobilization of material as indicated in this provision shall be understood to be materials which qualify for partial payment under the provisions of Subsection 907-109.06 and cannot be reasonably used by the Contractor in other work under contract.

At the option of the Department, living or perishable plant material, seeds, other materials and warehouse items mobilized for the work may be purchased by the Department.

All mobilized materials for which payment is made shall become the property of the Department, and the Contractor shall furnish the Engineer satisfactory title or approved evidence of ownership.

907-109.06--Partial Payments. Delete Subsection 907-109.06.1 beginning on page 93 and substitute the following.

907-109.06.1--General. The Contractor shall submit a Project Payment Schedule (PPS) for the contracted Work a minimum of 30 days prior to its initial application for partial payment. This schedule will provide a breakdown of values for the contracted Work aggregating the Contract price, and will be the basis for partial payments. The breakdown will demonstrate reasonable, identifiable, and measurable components of the Work. The sum of all values listed for each element shall be equal to the Contract price proposed for that element as set forth in the Contractor's Project Payment Schedule. The Work shall be subdivided into component parts in sufficient detail to serve as the basis for progress payments and price adjustments, positive and negative. Prices will include a pro rata amount of overhead and profit applicable to each item. The Department may reject the Project Payment Schedule if it fails to provide reasonable detail, any prices are excessively unbalanced, or fails to account for the entire Contract fixed price.

The Contractor shall submit to the Engineer an application for each payment (monthly estimate), the cut-off date for receiving submittal shall be the 20th of each month, unless changed by MDOT. A Construction Certificate (Attachment to SP 907-109.06.1) must be attached to each payment application. The Contractor shall include, in each application for payment, a schedule of the percentages of the various parts of the Work completed that, the quantities placed during the current pay period, a running total of all quantities placed to date, OCR-484 and all Contractor Payrolls. The Contractor shall also submit test reports and/or Manufacturer Certificates for materials not tested by the Department with each payment request. Applications for payment shall not be submitted more frequently than once per month. The applications for payment shall be submitted in a format acceptable to MDOT.

The Engineer shall approve all payments based upon the Contractor's compliance with the Project Payment Schedule, the Contract, Construction Certificate and the documented progress of Work. MDOT will make partial payments on the Contract monthly as Work progresses. In

the event a submitted application for payment is completed incorrectly, contains defects or improprieties, or there is a good faith dispute, MDOT will so notify the Contractor within three (3) business days stating the reason or reasons the application for payment is defective or improper or the reasons for the dispute. The Contractor shall have two (2) business days in which to submit the corrected application for payment. If the corrected application is not submitted within two (2) business days, payment will be made on the following month's application for payment.

Delete Subsection 109.07 beginning on page 95 and substitute the following.

907-109.07--Blank.

Delete Subsection 109.11 beginning on page 98 and substitute the following.

907-109.11--Acceptance and Final Payment. When the Executive Director has notified the Contractor of final acceptance pursuant to Subsection 907-105.16.2, a final application for payment showing the value of the work will be prepared by the Contractor. The amount of this payment, less all previous payments and deductions required under the Contract, will be paid to the Contractor as soon as practicable. Final payment will not be made until written consent of the Contractor and the Surety has been delivered to the Contract Administration Engineer of the Department. It shall be the Contractor's responsibility to have the Surety provide the consent. Delays in final payment because of non-receipt of Surety's consent shall not be cause for the payment of interest under the provisions of Section 31-5-27 of the Mississippi Code, 1972, Annotated, for the period of time occasioned by such delay.

Acceptance by the Contractor of final payment shall operate as and shall be a release to the Commission from all claims or liability under the Contract and any act or neglect of the Commission relating to or connected with the Contract.

CONSTRUCTION CERTIFICATE

TO: MISSISSIPPI DEPARTMENT OF TRANSPORTATION

FROM: _____

INVOICE REFERENCE NUMBER: _____

PAY PERIOD COVERED BY REFERENCED INVOICE: _____

PROJECT NUMBER: _____

This Construction Certificate is made by ("Contractor"), in accordance with the Design/Build Contract, by and between the Contractor and the Mississippi Transportation Commission and in compliance with the requirements of that Contract.

Capitalized terms used in this Construction Certificate shall have the meanings and definitions given them in the Contract.

This Construction Certificate is submitted in connection with Contractor's invoice referenced above and in order to induce Commission to make to Contractor a progress payment, pursuant to Subsection 907-109.06.1 of the Contract Special Provisions. To this end, Contractor hereby certifies, represents, warrants and covenants as follows:

1. Other than as set forth in writing and attached hereto and marked "Exhibit 1", Contractor is aware of no claim, dispute, circumstance or fact which Contractor asserts gives rise to a Supplemental Agreement for extension of time or addition to or increase in the Contract Price. If there are no such claims, disputes, circumstances or facts of which the Contractor is aware, Exhibit 1 shall state "None". If no such claims, disputes, circumstances or facts are set forth on Exhibit 1, any such claim, dispute, circumstance or fact of which Contractor is aware is hereby waived by Contractor.

2. Pursuant to Subsection 109.06.2--Advancement on Materials, of the Standard Specifications, attached hereto and marked "Exhibit 2" is a description, in detail sufficient for independent verification, of all newly stored, Stored Materials and all adjustments for Stored Materials incorporated into the Project in the then immediately preceding progress payment.

4. Pursuant to Subsection 109.06.2--Advancement on Materials, of the Standard Specifications, the Contractor certifies that all such Stored Materials to which Contractor holds title and which are described in Exhibit 2 hereto were either obtained and properly stored or removed from storage and incorporated into the Work in the immediately preceding payment period; Exhibit 2 states which such Stored Materials were obtained and properly stored and which such Stored Materials were removed form storage and incorporated into the Work.

5. Pursuant to Section 3 Quality Control/Quality Assurance (QC/QA) of the Technical Requirements in the Contract, the Contractor certifies that the Work invoiced in connection with this Design and Construction Certificate and all Work invoiced to date has been performed in a prudent manner and in compliance with the requirements of the Contract, including the Performance Criteria that all amounts have been paid by the Contractor for Work for which Previous Certificates for Payment were issued and payments received from the Owner.

6. Contractor certifies that Contractor has complied with the requirements of Section III.C.1, Periodic Progress Payment Application, of the Contract, and that all necessary materials to perform the Work have been provided by Contractor or its Subcontractors or Vendors in accordance with the provisions of the Contract, and that Contractor holds title to all such materials included in the invoice in accordance with Section III.C.1 of the Contract.

7. The undersigned is duly authorized and empowered by Contractor to execute this Construction Certificate.

By: _____ Date: _____
[Type or print name of authorized agent]

Its: _____
[Type or print name of authorized agent]

Signature of authorized agent: _____

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

DATE: **06/25/2014**

SUBJECT: **Wage Rates**

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

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

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-225-4 DB **CODE: (SP)**

DATE: 01/07/2015

SUBJECT: Grassing

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

Delete Section 225 on pages 158 thru 163, and substitute the following.

SECTION 907-225--GRASSING

907-225-01--Description. This work consists of furnishing, transporting, placing, plant establishment, and all work, including ground preparation, fertilizing, seeding, and mulching, necessary to produce a satisfactory and acceptable growth of grass.

At the Contractor's option, seeds and mulch may be incorporated using a hydraulically applied method under certain limitations. Under no circumstances shall fertilizer be incorporated hydraulically.

907-225.02--Materials.

907-225.02.1--Fertilizers. Fertilizers for purposes of this specification shall be understood to include standard manufactured products consisting of single or combination ingredients and agricultural limestone.

All fertilizer shall comply with the State fertilizer laws, Subsection 715.02, and the requirements of this specification.

907-225.02.2--Seeds. Seeds shall meet the requirements of Subsection 715.03, subject to the provisions of this subsection. The Contractor shall acquire seed from persons registered with the Mississippi Department of Agriculture and Commerce.

Except for the germination requirements, bags of seeds properly labeled or tagged according to law and indicating characteristics meeting or exceeding the requirements of Subsection 715.03 will be acceptable for planting.

The Contractor should provide adequate dry storage facilities for seeds, and shall furnish access to the storage for sampling stored seed.

907-225.02.3--Mulch.

907-225.02.3.1--Vegetative Mulch. The vegetative materials for mulch shall meet the

requirements of Subsection 215.02.

907-225.02.3.2--Hydraulically Applied Mulch (Hydromulch). Fibers for hydromulch shall be produced from wood, straw, cellulose, natural fibers, or recycled fibers which are free of non-biodegradable substances. The fiber shall disperse into a uniform slurry when mixed with water. Fibers shall be colored green, or other approved contrasting color, and shall not stain concrete or other surfaces. The use of tackifiers or activators will be allowed.

Hydromulch shall be listed on the Department's "Approved Sources of Materials".

907-225.02.3.2.1--Wood Fiber Mulch. Wood fiber mulch shall be made from wood chip particles manufactured particularly for discharging uniformly on the ground surface when dispersed by a hydraulic water sprayer. It shall remain in uniform suspension in water under agitation and blend with grass seed and fertilizer to form a homogeneous slurry. The fibers shall intertwine physically to form a strong moisture-holding mat on the ground surface and allow rainfall to percolate the underlying soil. The fiber material shall be heat processed so as to contain no germination or growth-inhibiting factors. The mulch shall be dyed an appropriate color to facilitate the application of material using non-toxic dye.

907-225.02.3.2.2--Cellulose Fiber Mulch. Cellulose fiber mulch consist of recycled paper stock products which are shredded into small pieces particular for application by hydraulic seeding equipment. It shall mix readily and uniformly under agitation with water and blend with grass seed and fertilizer to form a homogeneous slurry. When applied to the ground surface, the material shall form a strong moisture-holding mat, allow rainfall to percolate the underlying soil, and remain in place until the grass root system is established. The material shall contain no growth inhibiting characteristic or organisms. The mulch shall be dyed an appropriate color to facilitate the application of material using non-toxic dye.

907-225.02.3.2.3--Wood/Cellulose Fiber Mulch. Wood/cellulose fiber mix hydroseeding mulch shall consist of a combination of the above wood and cellulose fibers at a ratio recommended by the manufacturer of the products.

907-225.02.3.2.4--Straw Mulch. Straw mulch shall consist of a natural straw fiber. This material shall be a minimum 90% straw and essentially free from plastic materials or other non-bio degradable substances. The material shall be disperse into a uniform mulch slurry when mixed with water.

907-225.02.3.2.5--Tackifier. The tackifier will serve the purpose of an adhesive to form a bond between the soil, fiber, and seed particles. It will also allow the soil to retain moisture. The tackifier shall be of the organic or synthetic variety.

907-225.03--Construction Requirements.

907-225.03.1--Ground Preparation. Ground preparation, light or standard, consists of plowing, loosening, and pulverizing the soil to form suitable beds for erosion control items in reasonably close conformity with the established lines and grades without appreciable humps or depressions.

When grassing an area that has been previously planted with temporary grassing, a standard ground preparation will be required. The previously planted grasses shall be disked, tilled, plowed, etc. to assure that the existing temporary grasses are thoroughly mixed into the soil.

Any equipment used for ground preparation shall be approved units suitable to perform the work and subject to the requirements of Subsection 108.05.

The Contractor shall take full advantage of weather and soil conditions, and no attempt shall be made to prepare soil when it is wet or in a condition which will not allow the soil to be properly tilled.

Light ground preparation should be used on areas where seeding is required to improve the coverage of partially vegetated areas.

Standard ground preparation should be used on areas designated to be solid sodded and unvegetated areas designated to be seeded.

Aerating, moistening, or otherwise bringing the soil to a suitable condition for ground preparation shall be considered as incidental to the work and will not be measured for separate payment.

907-225.03.1.1--Light Ground Preparation. Light ground preparation consists of scratching the surface with a close-tooth harrow, disk-harrow, or similar equipment. The depth of scratching should be at least three-quarters inch but not deep enough to damage existing grasses of the type being planted.

907-225.03.1.2--Standard Ground Preparation. Standard ground preparation consists of plowing or disk-harrowing and thoroughly pulverizing the areas immediately before the application of erosion control (vegetative) items. Unless otherwise specified, the pulverized and prepared seedbed should be at least four inches deep and shall be reasonably free of large clods, earthballs, boulders, stumps, roots and other objectionable matter. Incorporation of fertilizer and ground preparation may be performed simultaneously.

907-225.03.2--Fertilizing. Fertilizing consists of furnishing, transporting, spreading, and incorporating fertilizers. The Contractor shall furnish all equipment necessary to properly handle, store, uniformly spread, and incorporate the specified application of fertilizer.

The Contractor shall incorporate 13-13-13 commercial fertilizer at the rate indicated in the vegetation schedule in the plans. The equivalent rate of other type fertilizers will be allowed if the equivalent percentages of Nitrogen, Phosphorus and Potassium are obtained. The Contractor shall incorporate agricultural limestone at the rate indicated in the vegetation schedule in the plans. Fertilization shall be applied uniformly on the areas to be planted or seeded and uniformly incorporated into the soil.

Fertilizers should be applied on individual areas of not more than three (3) acres.

All fertilizer should be incorporated within 24 hours following spreading.

907-225.03.3--Seeding. Seeding consists of furnishing and planting seeds in a prepared seedbed, covering the seeds, and providing plant establishment on all areas seeded.

Prior to planting the seeds, ground preparation and fertilizing shall be satisfactorily performed.

The required type of seeds, minimum rates of application, and planting dates of seeds are shown in the vegetation schedule in the plans.

It is the Contractor's responsibility to apply an ample amount of each type of seed to produce a satisfactory growth of grass and of the seed type required. At the completion of the project, a satisfactory growth of grass will be required. Reference Section 210 for satisfactory growth and coverage of dormant seed.

Seeding should not be done during windy weather or when the ground is frozen, extremely wet, or in a condition which will not allow the soil to be properly tilled.

907-225.03.3.1--Conventional Application. Legume seeds should be treated in accordance with Subsection 715.03.4 immediately before sowing. Seeds should be uniformly sown over the entire area with mechanical seeders. Seeds of different sizes may necessitate separate sowing. When legume seeds become dry, they should be re-inoculated.

All seeds should be covered lightly with soil by raking, rolling, or other approved methods, and the area compacted with a cultipacker.

Mulching should be performed as soon as practicable after seeding.

907-225.03.3.2--Hydroseeding Application. Seeds may be applied using the hydroseeding method except during the months of June, July, August, and September. During these months, the seeding shall be incorporated in accordance with the above Conventional Application method.

The seed(s) shall be combined into a distribution tank with all required ingredients on the project site. The application of the seed(s) and all ingredients shall be performed in one operation.

Mulching should be performed simultaneously with or as soon as practicable after seeding.

907-225.03.3.3--Plant Establishment. The Contractor should provide plant establishment on all areas seeded until release of maintenance. At the completion of the project, a satisfactory growth of grass will be required. The Contractor should reference Subsection 210 for satisfactory growth and coverage of dormant seed.

Plant establishment should be provided for a minimum period of 45 calendar days after completion of seeding. In the event satisfactory growth and coverage has not been attained by the end of the 45-day period, plant establishment should be continued until a satisfactory growth

and coverage is provided for at least one kind of plant as referenced in Section 210. The Contractor shall perform plant establishment on all areas of temporary seeding until the Engineer determines that the temporary seeding has served its purpose.

Plant establishment shall consist of preserving, protecting, watering, reseeding, mowing, and other work necessary to keep the seeded areas in satisfactory condition.

Areas requiring reseeding should be prepared and seeded and all other work performed as if the reseeding was the initial seeding. The types and application rates of fertilizer will be at the discretion of the Contractor.

907-225.03.3.4--Growth and Coverage. It shall be the Contractor's responsibility to provide satisfactory growth and coverage of grasses, legumes, or combination produced from the specified seeding.

Growth and coverage on seeded areas will be considered to be in reasonably close conformity with the intent of the contract when the type of vegetation specified, exclusive of that from seeds not expected to have germinated and shows growth at that time, has reached a point of maturity where stems or runners overlap adjacent similar growth in each direction over the entire area.

907-225.03.4--Mulching. Mulching consists of furnishing, transporting, and placing mulch on slopes, shoulders, medians, and other designated areas. Unless otherwise noted in the contract or directed by the Engineer, the Contractor has the option to place mulch by the conventional method or by the hydraulic method.

907-225.03.4.1--Vegetative Mulch.

907-225.03.4.1.1--Equipment. Mulching equipment should be capable of maintaining a constant air stream which will blow or eject controlled quantities of mulch in a uniform pattern.

Mulch stabilizers should consist of dull blades or disks without camber and approximately 20 inches in diameter. The disks should be notched, should be spaced at approximately 8-inch intervals, and should be equipped with scrapers. The stabilizer should weigh approximately 1000 to 1200 pounds, should have a working width of no more than eight feet, and should be equipped with a ballast compartment, so that weight can be increased.

907-225.03.4.1.2--Placement of Vegetative Mulch. Mulching should be placed uniformly on designated areas within 24 hours following seeding unless weather conditions are such that mulching cannot be performed. Placement should begin on the windward side of areas and from tops of slopes. In its final position, the mulch should be loose enough to allow air to circulate but compact enough to partially shade the ground and reduce erosion.

The baled material should be loosened and broken thoroughly before it is fed into the machine to avoid placement of unbroken clumps.

907-225.03.4.1.3--Anchoring Mulch. The mulch should be anchored by using a mulch

stabilizer when not hydraulically applied. If a mulch stabilizer is used, the mulch should be punched into the soil for a minimum depth of one inch.

When mulch stabilizers are used, anchoring the mulch should be performed along the contour of the ground surface.

907-225.03.4.2--Hydromulch. Hydromulch shall be applied in accordance with the installation instructions and recommendations of the manufacturer. Hydromulch shall be uniformly applied at the manufacturer's recommended application rate. In no case shall the application rate be less than one (1) ton per acre.

907-225.03.4.3--Protection and Maintenance. The Contractor should maintain and protect mulched areas until the Release of Maintenance of the project. The Contractor should take every precaution to prevent unnecessary foot and vehicular traffic.

The Contractor should mow, remove or destroy any undesirable growth on all areas mulched as soon as any undesirable growth appears. This will prevent competition with the desired plants and to prevent reseeding of undesirable growth.

907-225.03.5--Hydro Equipment. The equipment for hydraulically applying seed and mulch shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend, and homogeneously mix slurry of the specified amount of fiber, seed, and water. The slurry distribution lines shall be large enough to prevent stoppage. The discharge line shall be equipped with a set of hydraulic spray nozzles, which will provide even distribution of the slurry on the various areas to be seeded.

The mixture shall all be combined into the slurry tank for distribution of all ingredients in one operation as specified herein. The materials shall be combined in a manner recommended by the manufacturer. The slurry mixture shall be so regulated that the amounts and rates of application shall result in a uniform application of all materials at rates not less than the amounts specified. Using the color of the mulch as a guide, the equipment operator shall spray the prepared seedbed with a uniform visible coat. The slurry shall be applied in a sweeping motion, in an arched stream, so as to fall like rain, allowing the mulch to build upon each other until an even coat is achieved.

907-225.03.6--Vegetation Schedule. When a vegetation schedule is not shown in the plans or when the contract does not have an official set of plans, the following application rates shall be used, unless otherwise noted or approved by the Engineer.

Agricultural Limestone	1,000 pounds per acre	March 1 to September 1
13-13-13 Commercial Fertilizer	250 pounds per acre	March 1 to September 1
Vegetative Materials	2 tons per acre	
Bermudagrass	80 pounds per acre	March 1 to September 1
	20 pounds per acre	September 1 to March 1 *
Bahiagrass	80 pounds per acre	March 1 to September 1
	25 pounds per acre	September 1 to March 1

Tall Fescue	25 pounds per acre	---	March 1 to September 1
	100 pounds per acre	---	October 1 to March 1 **
Sericea Lespedeza	25 pounds per acre	---	March 1 to September 1
	25 pounds per acre	---	September 1 to March 1
Crimson Clover	20 pounds per acre	---	August 1 to April 1

* 80 pounds per acre in District 3 Delta
** 25 pounds per acre in District 3 Delta

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-226-3 DB **CODE: (SP)**

DATE: 01/07/2015

SUBJECT: Temporary Grassing

Section 907-226, Temporary Grassing, is hereby added to and made part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-226 -- TEMPORARY GRASSING

907-226.0l--Description. This work consists of furnishing, transporting, placing, plant establishment and all work necessary to produce rapid-growing grasses, grains or legumes to provide an initial, temporary cover of grass. This work includes ground preparation, fertilizing, seeding and mulching necessary to establish a satisfactory growth of temporary grass. The Contractor may elect to place temporary grassing using the hydroseeding method as set out in Special Provision No. 907-227, as modified by this special provision.

The Engineer or the plans will designate areas to be temporarily grassed. Any other areas the Contractor desires to grass will be measured for payment only if agreed upon by the Engineer.

907-226.02--Materials.

907-226.02.1--Fertilizers. Fertilizers for purposes of these specifications shall be understood to include standard manufactured products consisting of a combination of ingredients.

All fertilizer shall comply with the State fertilizer laws and Subsection 715.02.

Agricultural limestone will not be requirement for temporary grassing.

907-226.02.2--Seeds. Seeds shall meet the requirements of Subsection 715.03, subject to the provisions of this subsection. The Contractor shall acquire seed from persons registered with the Mississippi Department of Agriculture and Commerce.

Except for the germination requirements, bags of seeds properly labeled or tagged according to law and indicating characteristics meeting or exceeding the requirements of Subsection 715.03 will be acceptable for planting.

The Contractor should provide adequate dry storage facilities for seeds, and shall furnish access to the storage for sampling stored seed.

907-226.02.3--Mulching. The vegetative materials for mulch shall meet the requirements of Subsection 715.05.

When used, bituminous material for mulch shall be Emulsified Asphalt, Grade SS-1, meeting the requirement of Subsection 702.07.

907-226.03--Construction Requirements. The rates of application shall not exceed the rates shown on the temporary vegetation schedule, unless otherwise approved by the Engineer. Any unauthorized overage due to increased application rates will not be measured for payment.

907-226.03.1--Ground Preparation. Any equipment used for ground preparation shall be approved units suitable to perform the work and subject to the requirements of Subsection 108.05.

Light ground preparation should be used on areas where seeding is required.

Light ground preparation consists of scratching the surface with a close-tooth harrow, disk-harrow, or similar equipment. The depth of scratching should be at least three-quarters inch but not deep enough to damage existing grasses of the type being planted.

Aerating, moistening, or otherwise bringing the soil to a suitable condition for ground preparation shall be considered as incidental to the work and will not be measured for separate payment.

907-226.03.2--Fertilizing. The Contractor shall furnish all equipment necessary to properly handle, store, uniformly spread, and incorporate the specified application of fertilizer.

The Contractor shall incorporate 13-13-13 commercial fertilizer at the rate shown in the vegetation schedule in the plans. The equivalent rate of other type fertilizers will be allowed if the equivalent percentages of Nitrogen, Phosphorus and Potassium are obtained. Fertilization shall be applied uniformly on the areas to be seeded and uniformly incorporated into the soil.

Fertilizer should be applied on individual areas of not more than three acres.

All fertilizer should be incorporated within 24 hours following spreading.

907-226.03.3--Seeding.

907-226.03.3.1--General. Prior to planting the seeds, ground preparation and fertilizing should have been satisfactorily performed.

The required type of seeds, recommended rates of application and recommended planting dates of seeds are shown in the vegetation schedule in the plans.

It is the Contractor's responsibility to apply an ample amount of each type of seed to produce a satisfactory growth of grass and of the seed type required.

Legume seeds should be treated in accordance with Subsection 715.03.4 immediately before sowing. Seeds should be uniformly sown over the entire area with mechanical seeders. Seeds of different sizes may necessitate separate sowing. When legume seeds become dry, they should be reinoculated.

Seeding should not be done during windy weather or when the ground is frozen, extremely wet, or in an untillable condition.

All seeds should be covered lightly with soil by raking, rolling, or other approved methods, and the area compacted with a cultipacker.

907-226.03.3.2--Plant Establishment. Plant establishment shall consist of preserving, protecting, watering, reseeding, and other work necessary to keep the seeded areas in satisfactory condition.

Areas requiring reseeding should be prepared and seeded and all other work performed as if the reseeding was the initial seeding. The types and application rates of fertilizer will be at the discretion of the Contractor. No additional measurement and payment will be made for re-seeding when payment was made for the initial seeding.

907-226.03.3.3--Growth and Coverage. It shall be the Contractor's responsibility to provide satisfactory growth and coverage of grasses, legumes, or combination produced from the specified seeding.

Growth and coverage on seeded areas will be considered to be in reasonably close conformity with the intent of the contract when the type of vegetation specified, exclusive of that from seeds not expected to have germinated and shows growth at that time, has reached a point of maturity where stems or runners overlap adjacent similar growth in each direction over the entire area.

907-226.03.4--Mulching.

907-226.03.4.1--Equipment. Mulching equipment should be capable of maintaining a constant air stream which will blow or eject controlled quantities of mulch in a uniform pattern. If asphalt is used, a jet or spray nozzle for applying uniform, controlled amounts of asphalt to the vegetative material as it is ejected should be located at or near the discharge spout.

Mulch stabilizers should consist of dull blades or disks without camber and approximately 20 inches in diameter. The disks should be notched, should be spaced at approximately 8-inch intervals, and should be equipped with scrapers. The stabilizer should weigh approximately 1000 to 1200 pounds, should have a working width of no more than eight feet, and should be equipped with a ballast compartment, so that weight can be increased.

907-226.03.4.2--Placement of Vegetative Mulch. If required, mulching should be placed uniformly on designated areas within 24 hours following seeding unless weather conditions are such that mulching cannot be performed. Placement should begin on the windward side of areas

and from tops of slopes. In its final position, the mulch should be loose enough to allow air to circulate but compact enough to partially shade the ground and reduce erosion.

The baled material should be loosened and broken thoroughly before it is fed into the machine to avoid placement of unbroken clumps.

907-226.03.4.3--Rates of Application and Anchoring Mulch. The recommended rate of application of vegetative mulch shall be as shown in the vegetation schedule in the plans. The mulch should be anchored by either the use of a mulch stabilizer or by tacking with bituminous material. If a mulch stabilizer is used, the mulch should be punched into the soil for a minimum depth of one inch. If bituminous material is used, the rate of application should be 150 gallons per acre.

Where steep slopes or other conditions are such that anchoring cannot be performed satisfactory with a mulch stabilizer, the Contractor may elect to use bituminous material applied at the time or immediately following the mulch placement.

When mulch stabilizers are used, anchoring the mulch should be performed along the contour of the ground surface.

907-226.03.4.4--Protection and Maintenance. The Contractor should take every precaution to prevent unnecessary foot and vehicular traffic.

907-226.03.5--Vegetation Schedule. When a temporary vegetation schedule is not shown in the plans or when the contract does not have an official set of plans, the following application rates shall be used, unless otherwise noted or approved by the Engineer.

Spring & Summer
Browntop Millet ---------- 20 pounds per acre ------- April 1 to August 31

Fall & Winter
Rye Grass ---------- 25 pounds per acre ------- September 1 to March 31
Oats ---------- 90 pounds per acre ------- September 1 to December 15

13-13-13 Commercial Fertilizer ----- 250 pounds per acre
Vegetative Mulch ---------- 2 tons per acre

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-227-10 DB **CODE: (SP)**

DATE: 01/21/2015

SUBJECT: Hydroseeding

Section 907-227, Hydroseeding, is hereby added to and made part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-227--HYDROSEEDING

907-227.0l--Description. This work consists of furnishing, transporting, placing, plant establishment and all work necessary to produce a satisfactory and acceptable growth of grass. The seeds, fertilizers, tackifier, and mulch shall be incorporated using the hydroseeding process. These items shall be combined into a mixture and force-applied to the areas to be grassed.

907-227.02--Materials. The Contractor shall, prior to application, furnish the Engineer with invoices of all materials used in the grassing operation.

907-227.02.1--Fertilizers. Fertilizers for purposes of these specifications shall be understood to include standard manufactured products consisting of single or combination ingredients.

All fertilizers shall comply with the State fertilizer laws and Subsection 715.02.

907-227.02.2--Seeds. Seeds shall meet the requirements of Subsection 715.03, subject to the provisions of this subsection. The Contractor shall acquire seed from persons registered with the Mississippi Department of Agriculture and Commerce.

Except for the germination requirements, bags of seeds properly labeled or tagged according to law and indicating characteristics meeting or exceeding the requirements of Subsection 715.03 will be acceptable for planting.

The Contractor should provide adequate dry storage facilities for seeds, and shall furnish access to the storage for sampling stored seed.

907-227.02.3--Mulching. The rate of application of fiber mulch shall be as recommended by the manufacturer of the fibers mulch.

907-227.02.3.1--Wood Fiber Mulch. Wood fiber mulch shall be made from wood chip particles manufactured particularly for discharging uniformly on the ground surface when dispersed by a hydraulic water sprayer. It shall remain in uniform suspension in water under agitation and blend with grass seed and fertilizer to form a homogeneous slurry. The fibers shall intertwine physically to form a strong moisture-holding mat on the ground surface and allow rainfall to percolate the underlying soil. The fiber material shall be heat processed so as to

contain no germination or growth-inhibiting factors. The mulch shall be dyed an appropriate color to facilitate the application of material using non-toxic dye.

907-227.02.3.2--Cellulose Fiber Mulch. Cellulose fiber mulch consist of recycled paper stock products which are shredded into small pieces particular for application by hydraulic seeding equipment. It shall mix readily and uniformly under agitation with water and blend with grass seed and fertilizer to form a homogeneous slurry. When applied to the ground surface, the material shall form a strong moisture-holding mat, allow rainfall to percolate the underlying soil, and remain in place until the grass root system is established. The material shall contain no growth inhibiting characteristic or organisms. The mulch shall be dyed an appropriate color to facilitate the application of material using non-toxic dye.

907-227.02.3.3--Wood/Cellulose Fiber Mulch. Wood/cellulose fiber mix hydroseeding mulch shall consist of a combination of the above wood and cellulose fibers at a ratio recommended by the manufacturer of the products.

907-227.02.3.4--Straw Mulch. Straw mulch shall consist of a natural straw fiber. This material shall be a minimum 90% straw and essentially free from plastic materials or other non-bio degradable substances. The material shall be disperse into a uniform mulch slurry when mixed with water.

907-227.02.3.5--Tackifier. The tackifier will serve the purpose of an adhesive to form a bond between the soil, fiber, and seed particles. It will also allow the soil to retain moisture.

The tackifier shall be of the organic or synthetic variety.

907-227.03--Construction Requirements.

907-227.03.1--Ground Preparation. Light ground preparation consists of plowing, loosening, and pulverizing the soil to form suitable beds for seeding items in reasonably close conformity with the established lines and grades without appreciable humps or depressions. Unless otherwise specified, the pulverized and prepared seedbed should be at least four inches deep and shall be reasonably free of large clods, earth balls, boulders, stumps, roots and other objectionable matter. The Engineer may eliminate or alter the requirements for ground preparation due to site conditions.

907-227.03.2--Fertilizing. The Contractor shall furnish all equipment necessary to properly handle, store, uniformly spread, and incorporate the specified application of fertilizer.

The Contractor shall incorporate bag fertilizer at a rate of 1000 pounds per acre of 13-13-13 commercial fertilizer. The equivalent rate of other type fertilizers will be allowed if the equivalent percentages of Nitrogen, Phosphorus and Potassium are obtained. Any changes in the type or rate of application of the fertilizers shall be approved by the Engineer prior to being incorporated.

Agricultural limestone will be incorporated into the area and paid for in accordance with Section 213 of the Standard Specifications.

907-227.03.3--Seeding.

907-227.03.3.1--General. The Contractor shall use the vegetation schedule in the plan for the correct types of seed and application rates, unless otherwise noted or approved by the Engineer.

When a vegetation schedule for permanent grass is not shown in the plans, the following types of seed and application rates shall be used, unless otherwise approved by the Engineer.

Bermudagrass ---------- 20 pounds per acre
Bahiagrass ---------- 25 pounds per acre
Tall Fescue ---------- 15 pounds per acre
Crimson Clover ---------- 20 pounds per acre

At the completion of the project, a satisfactory growth of grass will be required. The Contractor should reference Subsection 210 for satisfactory growth and coverage of dormant seed.

907-227.03.3.2--Plant Establishment. The Contractor should provide plant establishment on all areas seeded until release of maintenance. Plant establishment shall consist of preserving, protecting, watering, reseeding, mowing, and other work necessary to keep the seeded areas in satisfactory condition.

Plant establishment should be provided for a minimum period of 45 calendar days after completion of seeding. In the event satisfactory growth and coverage has not been attained by the end of the 45-day period, plant establishment should be continued until a satisfactory growth and coverage is provided for at least one kind of plant. The Contractor should reference Section 210 of the Standard Specifications for more information.

907-227.03.3.3--Growth and Coverage. It shall be the Contractor's responsibility to provide satisfactory growth and coverage of grasses, legumes, or combination produced from the specified seeding.

Growth and coverage on seeded areas will be considered to be in reasonably close conformity with the intent of the contract when the type of vegetation specified, exclusive of that from seeds not expected to have germinated and shows growth at that time, has reached a point of maturity where stems or runners overlap adjacent similar growth in each direction over the entire area.

Final acceptance of the project will not be made until a satisfactory growth of grass has been acknowledged by the Engineer.

907-227.03.4--Mulching. At the Contractor’s option, mulch may be wood fiber, cellulose fiber, a mixture of wood and cellulose fibers, or straw fiber. The mulch shall be applied at the rate recommended by the manufacturer in a mixture of water, seed and fertilizer. Any changes in the rate of application of the mulch shall be approved by the Engineer prior to its use.

907-227.03.5--Equipment. Hydraulic equipment shall be used for the application of fertilizers, seeds and slurry of the prepared mulch. This equipment shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend, and homogeneously mix slurry of the specified amount of fiber, fertilizer, seed and water. The slurry distribution lines shall be large enough to prevent stoppage. The discharge line shall be equipped with a set of hydraulic spray nozzles, which will provide even distribution of the slurry on the various areas to be seeded.

The seed, fertilizer, mulch and water shall all be combined into the slurry tank for distribution of all ingredients in one operation as specified herein. The materials shall be combined in a manner recommended by the manufacturer. The slurry mixture shall be so regulated that the amounts and rates of application shall result in a uniform application of all materials at rates not less than the amounts specified. Using the color of the mulch as a guide, the equipment operator shall spray the prepared seedbed with a uniform visible coat. The slurry shall be applied in a sweeping motion, in an arched stream, so as to fall like rain, allowing the mulch to build upon each other until an even coat is achieved.

907-227.03.6--Protection and Maintenance. The Contractor should maintain and protect seeded areas until release of maintenance of the project. The Contractor should take every precaution to prevent unnecessary foot and vehicular traffic.

The Contractor should mow or otherwise remove or destroy any undesirable growth on all areas mulched to prevent competition with the desired plants and to prevent reseeding of undesirable growth.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-228-1 DB **CODE: (SP)**

DATE: **01/07/2015**

SUBJECT: **Erosion Control Blanket**

Section 907-228, Erosion Control Blanket, 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 907-228 - EROSION CONTROL BLANKET

907-228.01--Description. This work consists of furnishing, placing, and maintaining a Erosion Control Blanket (ECB) of the type specified on seeded or other designated areas in accordance with the plans and specifications.

907-228.02--Materials. The erosion control blankets shall be a temporary, organic and/or inorganic re-vegetative blanket with non-organic, photodegradable or biodegradable netting. The netting shall be bonded sufficiently to the parent material to prevent separation of the net from the parent material for the life of the product. For those blankets that have netting attached, the netting and stitching shall be photodegradable and/or biodegradable. The photodegradable stitching shall be of the same material with similar properties as the netting such that the expected degradation periods are the same. The weight of the netting shall not exceed 15% of the total blanket weight.

The Contractor will be permitted to furnish and install a multi-width blanket with seams securely bonded by stapling, staking, stitching, or other methods meeting the approval of the Engineer.

The erosion control blanket must be one from the Department's current "List of Approved Sources" for the type indicated.

907-228.02.1--Blanket Types. There are four types of erosion control blankets.

Type I blankets shall be a processed degradable natural and/or polymer fibers mechanically bound together by a single rapidly degrading, synthetic or natural fiber netting or an open weave textile of processed rapidly degrading natural or polymer yams or twines woven into a continuous matrix.

Type II blankets shall be a processed degradable natural and/or polymer fibers mechanically bound together between two rapidly degrading, synthetic or natural fiber nettings.

Type III blankets shall be an erosion control blanket composed of processed slow degrading natural or polymer fibers mechanically bound together between two slow degrading synthetic or natural fiber nettings to form a continuous matrix or an open weave textile composed of processed slow degrading natural or polymer yams or twines woven into a continuous matrix.

Type IV blankets shall be an erosion control blanket composed of processed slow degrading natural or polymer fibers mechanically bound together between two slow degrading synthetic or natural fiber nettings to form a continuous matrix or an open weave textile composed of processed slow degrading natural or polymer yams or twines woven into a continuous matrix.

In addition to being on the Department's current "List of Approved Sources", the blankets must meet the following general requirements.

TYPES OF BLANKETS

Type	**Maximum Gradient**	**C Factor *, ** **	**Minimum Tensile Strength *** **
I	≤3:l (H:V)	<0.15	50 lbs/ft
II	≤2:1 (H:V)	<0.20	75 lbs/ft
III	≤1.5:1 (H:V)	<0.25	100 lbs/ft
IV	≤1:1 (H:V)	<0.25	125 lbs/ft

* "C" Factor calculated as the ratio of soil loss from the ECB protected slope (tested at specified or greater gradient, h:v) to the ratio of soil loss from unprotected (control) plot in large-scale testing.

** Acceptable large-scale test methods may include ASTM Designation: D 6459, or other independent testing deemed acceptable by the Engineer.

*** Minimum Average Roll Values using ASTM Designation: D 6818.

907-228.02.2--Stakes. Unless otherwise specified by the manufacturer of the erosion control blanket, stakes used to secure the blanket shall be one of the following.

1) a double prong "U" shaped wire staple made from 11-gauge or heavier steel wire with an approximate length of eight inches (8”) after bending,
2) a biodegradable anchoring device meeting the requirements of ASTM Designation: D 5338, or
3) an equal approved by the Engineer.

907-228.02.3--Acceptance Procedure. Prior to use, the Contractor must furnish the Engineer three copies of the manufacturer's certification for each shipment of erosion control blanket material stating the number of rolls furnished and that the material in the shipment conforms to the same composition as that listed on the Department's current "List of Approved Sources".

When wire staples are used, also furnish the Engineer three copies of a certification from the manufacturer or distributor stating the wire size for staples for each shipment.

The certifications by the manufacturer or distributor will be prima facie evidence of the materials meeting the requirements of the specifications.

907-228.03--Construction Requirements. The Contractor shall furnish and install protective covering blankets for erosion control on prepared areas of slopes at locations shown on the plans or designated by the Engineer.

Erosion control blankets shall be installed according to manufacturer recommendation or install according to the detail plan sheet. The design plan sheet is to be used as a guide in lieu of the manufacture recommendations.

907-228.03.1--Site Preparation. The area to receive the erosion control blanket should be fine graded to a smooth profile and relatively free from all weeds, clods, stones, roots, sticks, or other foreign material that may prevent the blanket from bearing completely on the surface. Any voids on the slope shall be filled and properly compacted.

Any seeded areas damaged or destroyed during placement of the erosion blanket shall be re-seeded as specified for the original seeding at no additional costs to the State.

907-228.03.2--Trench Preparation. An anchor trench shall be prepared at the top of the slope by excavating a trench six inches deep by six inches wide. The erosion control blanket shall be anchored into the trench by staking on 1-foot centers. The stakes shall be driven at least flush

with the soil surface. The anchor trench shall be backfilled and compacted with soil. A minimum of three feet shall be allowed from the anchor trench to the crest of the slope.

A similar anchor trench shall be installed at the bottom of the slope to terminate the installation. The trench shall be installed similar to the above except the erosion control blanket shall be rolled 24 inches past the toe of the slope. The terminal end of the erosion control blanket shall be staked on 1-foot centers.

On long slopes, an intermediate anchor trench shall be installed at 50-foot intervals.

907-228.03.3--Placement of Blanket. Starting at the crest of the slope, the erosion control blanket shall be rolled down the slope in a controlled manner. Approximately every 25 feet, the erosion control blanket shall be pulled to take out any excess slack. The goal is to have the erosion control blanket contour and initiate full contact with the soil.

The typical installation will require one stake placed at 3-foot to 5-foot intervals along the vertical length of the erosion control blanket. Stakes shall be staggered 18 to 24 inches horizontally across the erosion control blanket. If the erosion control blanket needs to be spliced in the middle of a slope, the erosion control blanket shall be "shingled" with up-slope erosion control blanket overlapping the down-slope erosion control blanket. There should be a minimum of six inches of overlap in a splice. The joint splice shall be made by placing a row of stakes six inches on center and then placing a second row of stakes six inches on center, staggered from the first row. All overlaps and the edges shall be secured with stakes. All longitudinal and transverse laps shall be a minimum 6-inch joint with the upgrade section on top. All transverse laps shall be staked with two staggered rows of stakes on 6-inch centers. All longitudinal laps shall be stakes with two staggered rows on 3-foot to 5-foot centers. The staking shall firmly anchor the fabric netting to the soil surface.

On the downstream end of blankets adjoining a structure, the anchor trench shall be omitted and the material folded six inches and butted tightly against the structure and one row of stakes installed on six-inch centers. An edge adjacent to a paved ditch shall be butted tightly against the paved ditch and a row of stakes installed on 12-inch centers. All stakes shall be driven flush with the soil surfaces.

907-228.03.2--Protection and Maintenance. The Contractor shall maintain and protect the blankets until release of maintenance or until the Engineer has determined that the blankets have served their useful life, whichever occurs first. Maintenance shall consist of repairs necessitated by erosion, rain, wind, fire, or other cause.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-229-1 DB **CODE: (SP)**

DATE: **01/07/2015**

SUBJECT: **Erosion Mats**

Section 907-229, Erosion Mats, is hereby added to and made part of the 2004 Edition of the Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-229 -- EROSION MATS

907-229.01--Description. This work consists of furnishing and installing erosion mats to protect slopes, ditches, etc. from scour and erosion. The mats shall be installed at locations shown on the plans in reasonably close conformity with the lines, grades and dimensions shown on the plans or as directed by the Engineer.

907-229.02--Materials. Erosion mats shall be UV stabilized mat constructed of plastics, composites, polymers, rubber, precast concrete, or cast-in-place concrete. Erosion mats will be used as an erosion preventer for ditches, slopes, and other locations shown on the plans. Erosion mats shall be one of the following, or an approved equal.

Flexamat
Motz Enterprises, Inc.
11006 Reading Road, Suite 301
Cincinnati, OH 45241
Phone: 513-772-6689
www.flexamat.com

Enviromat (EL and EB) Linings
Synthetex
4151 Ashford Dunwoody Road
Suite 510
Atlanta, Georgia 30319
Phone: 800-225-0023
www.hydrotex.com

The mat shall be visually inspected and approved by the Engineer prior to use. Once approved by the Engineer, the mat may be incorporated into the work.

907-229.03--Construction Requirements. Erosion mats shall be installed in accordance with the plans and manufacturer's guidelines including any underlayment. The anchor system shall be sufficient to anchor the mat to the ground surface.

The installation area shall be graded to a level, smooth surface to avoid water concentration and to create an appropriate base for the erosion mat. Seed and fertilizer shall be placed on the

prepared surface prior to the installation of the erosion mat.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-234-5 DB **CODE: (SP)**

DATE: **01/07/2015**

SUBJECT: **Siltation Barriers**

Section 234, Silt Fence, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-234.01--Description. Delete the first paragraph of Subsection 234.01 on page 177 and substitute the following:

This work consists of furnishing, constructing and maintaining a water permeable filter type fence, inlet siltation guard or turbidity barrier for the purpose of removing suspended soil particles from the water passing through it in accordance with the requirements shown on the plans, directed by the Engineer and these specifications. Fence, inlet siltation guards and turbidity barriers measured and paid as temporary shall be removed when no longer needed or permanent devices are installed.

Delete the first sentence of the second paragraph of Subsection 234.01 on page 177 and substitute the following:

It is understood that measurement and payment for silt fence, inlet siltation guards, and turbidity barriers will be made when a pay item is included in the proposal.

907-234.02--Materials. After the first paragraph of Subsection 234.02 on page 177, add the following:

Inlet siltation guards shall be listed on the Department's "Approved Sources of Materials".

Turbidity barriers shall be one of the following, or an approved equal.

1. SiltMax Turbidity Barrier by Dawg, Inc., 1-800-935-3294, www.dawginc.com
2. Turbidity Barrier by IWT Cargo-Guard, Inc., 1-609-971-8810, www.iwtcargoguard.com
3. Turbidity Curtain by Abasco, LLC, 1-281-214-0300, www.abasco.net

Chain link fence and hardware for super silt fence shall meet the requirements of Section 607, as applicable. Geotextile for super silt fence shall meet the requirements of Subsection 714.13 for a Type II Woven fabric.

907-234.03--Construction Requirements. After the last paragraph of Subsection 234.03.1 on page 178, add the following:

Super Silt Fence. Super silt fence shall be constructed in accordance with the plans and these specifications.

All posts shall be installed/driven so that at least 34 inches of the post will protrude above the ground. The chain link wire and geotextile shall be stretched taut and securely fastened to the posts as shown on the plans. The bottom edge of the fence and geotextile shall be buried at least eight inches below ground surface to prevent undermining. When splicing of the geotextile is necessary, the fabric shall be overlapped approximately 18 inches.

907-234.03.1.1--Placement of Inlet Siltation Guards and Turbidity Barriers. The inlet siltation guards and turbidity barriers shall be constructed at the locations shown on the erosion control plans. Inlet siltation guards and turbidity barriers shall be installed in accordance with the erosion control drawings in the plans. A copy of the manufacturer's instructions for placement of inlet siltation guards and turbidity barriers shall be provided to the Engineer prior to construction.

907-234.03.2--Maintenance and Removal. At the end of the first paragraph of Subsection 234.03.2 on page 178, add the following:

The Contractor shall maintain the inlet siltation guards. The geotextile shall be removed and replaced when deteriorated to such extent that it reduces the effectiveness of the guard. Replacement geotextile shall be the same type and manufacture as the original. Excessive accumulations against the guard shall be removed and disposed of at a location approved by the Engineer.

The Contractor shall maintain the turbidity barriers. Excessive accumulations against the turbidity barrier shall be removed and disposed of at a location approved by the Engineer.

Delete the second paragraph of Subsection 234.03.2 on page 178 and substitute the following:

Unless otherwise directed, all temporary silt fences, inlet guards and turbidity barriers shall be removed. Upon removal, the Contractor shall remove and dispose of any excess silt accumulations, shape the area to the line, grade, and cross section shown on the plans and vegetate all bare areas in accordance with the contract requirements. The temporary fence, inlet guard materials and turbidity barriers will remain the property of the Contractor and may be used at other locations provided the materials are acceptable to the Engineer.

After Subsection 234.03.2 on page 178, insert the following:

907-234.03.3--Resetting Inlet Siltation Guards and Turbidity Barriers. When inlet siltation guards and turbidity barriers are no longer needed at one location, they may be removed and reset at other needed locations. The Engineer may allow the resetting of siltation guards and turbidity barriers upon an inspection and determination that the siltation guards (frame and geotextile) and turbidity barriers are adequate for their intended purpose. When they have to be stored until needed at another location, payment for resetting will not be made until they are reset at their needed location.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

DATE: 01/07/2015

SUBJECT: Wattles

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

SECTION 907-237 - WATTLES

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

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

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

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

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

907-237.03--Construction Requirements.

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

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-245-2 DB **CODE: (SP)**

DATE: 01/07/2015

SUBJECT: Triangular Silt Dike

Section 907-245, Triangular Silt Dike, 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 907-245 -- TRIANGULAR SILT DIKE

907-245.01--Description. This work consists of furnishing, installing, maintaining and removing temporary triangular silt dikes. The dike consists of a triangular-shaped inner material made of foam rubber or urethane foam. The outer cover is a woven geotextile fabric placed around the inner material with aprons that extend from both sides of the triangle. The dike aprons are entrenched at the upstream side and anchored to the ground at downstream end using staples. This device can be used on surfaces that do not allow for trenching by securing the aprons with sand or gravel bags. The device can be easily removed for maintenance and is considered to be reusable.

907-245.02--Materials. Triangular silt dikes shall be triangular in shape, having a height of at least ten inches (10”) in the center. The triangular-shaped inner material shall be foam rubber or urethane foam. The outer cover shall be a woven geotextile fabric placed around the inner triangular plane and allowed to extend beyond both sides of the triangle for two feet to form an apron.

907-245.03--Construction Requirements. The flexibility of the materials in triangular silt dikes allows them to conform to various channel configurations.

The dikes shall be attached to the ground with wire staples. The staples shall be No. 11 gauge wire and be at least six inches long. As a minimum, the staples shall be placed as recommended by the manufacture.

The geotextile filter material shall be attached to the triangular frame by using wire ties or staples. The ties shall be placed evenly 12-inch centers.

Prior to placement of the triangular silt dikes, the Contractor shall make sure the surface on which the dike is to be placed is flat. The triangular silt dikes shall be placed in ditch, keeping excess fabric extended up and downstream of the dam. Excess material shall be trenched into the ground on the upstream end and stapled on the downstream end. A minimum 6-inch overlap between end sections shall be required should the width require multiple triangular silt dikes to be installed. The overlapped end sections shall be connected with wire wraps or staples every 12 inches on center.

The Contractor shall be required to remove and dispose of all sediment that is accumulated adjacent to the dike.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-246-3 DB **CODE: (SP)**

DATE: **01/07/2015**

SUBJECT: **Sandbags and Rockbags**

Section 907-246, Sandbags and Rockbags, 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 907-246 -- SANDBAGS AND ROCKBAGS

907-246.01--Description. This item of work shall consist of the furnishing, installing, and maintaining sandbags and rockbags for the purpose of temporary erosion control by intercepting and slowing the flow of sediment-laden runoff water, or for use as a temporary dam.

907-246.02--Materials. The filler material for sandbags shall consist of a fine aggregate meeting the requirements of Subsection 703.02. The filler material for rockbags shall consist of a size 57 aggregate meeting the requirements of Subsection 703.03.

The bag material shall be woven polypropylene, polyethylene or polyamide fabric with a minimum unit weight of four (4) ounces per square yard. The bags shall be a minimum of 21 inches in length, 12 inches in width, and four (4) in thickness when filled.

907-246.03--Construction Requirements. Sandbags and rockbags shall be used to construct a berm/dam which will intercept sediment-laden storm water runoff from disturbed areas, create a retention pond, detain sediment, and release water in sheet flow. Sand or rock shall be placed in the bag so that at least the top six (6) inches of the bag is unfilled to allow for proper tying of the open end. Any subsequent rows of bags shall be offset one-half the length of the preceding row to provide a layered brick-type arrangement.

The sandbag and rockbag berm/dam installation shall be maintained in good condition by the Contractor. All necessary work and materials to maintain the integrity of the installation shall be provided until earthwork construction is complete and permanent erosion-control features are in place. The maintenance of the bags will not be paid for separately and will be included in the cost for sandbags or rockbags.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-249-1 DB **CODE: (SP)**

DATE: **01/07/2015**

SUBJECT: **Riprap for Erosion Control**

Section 907-249, Riprap for Erosion Control, 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 907-249 -- RIPRAP FOR EROSION CONTROL

907-249.01--Description. Riprap for erosion control consists of furnishing and installing riprap for the purpose of temporary erosion control by intercepting and slowing the flow of sediment-laden runoff water, or for use as a temporary dam. It also includes the maintenance and removal of riprap when no longer needed.

Remove and reset riprap consists of the removal and relocation of riprap to other locations shown on the plans, directed by the Engineer, or indicated on the Contractor's Erosion Control Plan.

Riprap shall be installed in accordance with the specifications in reasonably close conformity with the locations and dimensions shown on the plans or established.

907-249.02--Materials. Stones for riprap shall be Size 100 meeting the requirements of Subsection 705.04.

907-249.03--Construction Requirements. Riprap shall be used to construct a berm/dam which will intercept sediment-laden storm water runoff from disturbed areas, create a retention pond, detain sediment, and release water in sheet flow.

The riprap installation shall be maintained in good condition by the Contractor. All necessary work and materials to maintain the integrity of the installation shall be provided until earthwork construction is complete and permanent erosion-control features are in place. The maintenance of the riprap will not be paid for separately and will be included in the cost for riprap for erosion control.

When required, existing riprap may need to be removed and reset at other locations. These locations may be for additional temporary erosion control or may be placed in permanent locations designated by the Engineer.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-304-13 DB **CODE: (SP)**

DATE: **01/07/2015**

SUBJECT: **Granular Courses**

Section 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.

Crushed concrete meeting the requirements of Subsection 907-703.04.3 may be used in lieu of granular courses or crushed stone courses specified in the contract. This applies to base courses, shoulders, or other required construction on a prepared foundation.

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-307-4 DB **CODE: (SP)**

DATE: **01/07/2015**

SUBJECT: **Lime Treated Courses**

Section 307, Lime Treated Courses, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-307.02--Materials.

907-307.02.4--Curing Seals. After "EA-1," in the first sentence of 307.02.4 on page 195, add "EPR-1, AE-P, CSS-1,".

907-307.02.5--Soil-Lime Design. Delete the first paragraph of Subsection 307.02.5 on page 195 and substitute the following:

Quantities and percentages of lime shown on the plans are preliminary. The actual application rate will be established from tests made prior to beginning treatment. The design of soil-lime courses shall be performed by the Central Laboratory. At least 45 days prior to the proposed use of a lime course, the Contractor shall make available materials proposed for use in the mixture for sampling and testing by the Department as the Engineer may consider necessary for the establishment of a mix design.

Changes in source of lime shall not be made without approval. Approval will be based on verification of a mix design.

907-307.03--Construction Requirements.

907-307.03.2--Equipment. Delete the second paragraph of Subsection 307.03.2 on pages 196 & 197.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-308-4 DB **CODE: (SP)**

DATE: 01/07/2015

SUBJECT: Portland Cement Treated Courses

Section 308, Portland Cement Treated Courses, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-308.02--Materials.

907-308.02.4--Curing Seals. After "EA-1," in the first sentence of 308.02.4 on page 204, add "EPR-1, AE-P, CSS-1,".

907-308.03--Construction Requirements.

907-308.03.2--Equipment.

907-308.03.2.1--General. Delete the second paragraph of Subsection 308.03.2.1 on page 206.

Delete Subsection 308.03.7.2 on page 209 and substitute the following.

907-308.03.7.2--Weather Limitations. No cement or cement treated material shall be applied or placed when the temperature is below 40°F nor when the Engineer determines, based on the latest information available from the National Weather Service, that the forecast temperature will fall below 40°F within the next three (3) days in the area in which the project is located. For anticipated mixing operations on a Monday, a Friday forecast that runs through the following Wednesday shall be used to determine if conditions will allow the application of cement on Monday. No cement or cement treated material shall be placed on a frozen foundation or mixed with frozen material.

907-308.03.9.2--Density. Delete the second paragraph of Subsection 308.03.9.2 on page 213 and substitute the following.

Soil Cement Treatment of Subgrade. The lot will be divided into five approximately equal sublots with one density test taken at random in each sublot. The average of the five (5) density tests shall equal or exceed 96.0 percent with no single density test below 94.0 percent. Sublots with a density below 94.0 percent shall be corrected at no additional cost to the State and retested for acceptance.

Each lot of work found not to meet the density requirement of 96.0% of maximum density, may remain in place with a reduction in payment as set out in the following table:

PAYMENT SCHEDULE FOR COMPACTION

Pay Factor	Lot Density * % of Maximum Density
1.00	96.0 and above
0.90	95.0 - 95.9
0.50	94.0 - 94.9

* Any lot with a density less than 94.0% of maximum density shall be corrected at no additional cost to the State.

Soil Cement Treatment of Base. The lot will be divided into five approximately equal sublots with one density test taken at random in each sublot. The average of the five (5) density tests shall equal or exceed 97.0 percent with no single density test below 95.0 percent. Sublots with a density below 95.0 percent shall be corrected at no additional cost to the State and retested for acceptance.

Each lot of work found not to meet the density requirement of 97.0% of maximum density, may remain in place with a reduction in payment as set out in the following table:

PAYMENT SCHEDULE FOR COMPACTION

Pay Factor	Lot Density ** % of Maximum Density
1.02	98.0 and above
1.00	97.0 - 97.9
0.90	96.0 - 96.9
0.50	95.0 - 95.9

** Any lot with a density less than 95.0% of maximum density shall be corrected at no additional cost to the State.

Soil Cement Treatment of Irregular Areas. Density of irregular areas shall be rolled to highest stability. Irregular areas shall be defined as preleveling, wedging [less than fifty percent (50%) of width greater than minimum lift thickness], ramp pads, irregular shoulder areas, median crossovers, turnouts, and other areas where an established rolling pattern cannot be obtained.

907-308.03.10--Protection and Curing. Delete the second paragraph of Subsection 308.03.10 on page 213 and substitute the following.

When the treated course is the subgrade, a subsequent course shall not be placed on the sealed course for at least seven (7) calendar days. During this 7-day period, the treated course shall not be subjected to any type of traffic and equipment.

When the treated course is the base, the Contractor shall use the mix design (7-day or 14-day) as specified on the Mix Design from the Central Laboratory. Depending on the specified mix design, a subsequent course shall not be placed on the sealed course for at least seven (7) or

fourteen (14) calendar days. During this period, the treated course shall not be subjected to any type of traffic and equipment.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-311-3 DB **CODE: (SP)**

DATE: 01/07/2015

SUBJECT: Lime-Fly Ash Treated Courses

Section 311, Lime-Fly Ash Treated Courses, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-311.02--Materials.

907-311.02.2--Curing Seals. After "EA-1," in the first sentence of 311.02.2 on page 223, add "EPR-1, AE-P, CSS-1,".

907-311.03--Construction Requirements. Delete Subsection 311.03.2 on pages 223 & 224, and substitute the following.

907-311.03.2--Equipment. Equipment necessary for the proper prosecution of the work shall meet the applicable requirements of Subsection 907-308.03.2.

Delete Subsection 311.03.7 on page 225, and substitute the following.

907-311.03.7--Shaping, Compacting, and Finishing.

907-311.03.7.1--General. The mixed material shall be shaped as required immediately after mixing, or delivery to the roadbed in the case of central plant mixed material. Initial compaction shall begin immediately, and machining and compacting shall continue until the entire depth and width of the course is compacted to the required density within two hours of the time of beginning mixing. Compaction shall be by equipment and methods which do not result in lamination.

Areas inaccessible to rollers shall be compacted to the required density by other approved methods.

The addition of thin layers of treated material in order to conform to cross sectional or grade requirements will not be permitted.

Compaction by vibration shall not be performed after the lime fly-ash has taken its initial set. Vibratory compaction of a section shall be completed within one hour.

During compaction, a spike-tooth harrow or other suitable equipment shall be used as required to prevent lamination.

The surface shall then be reshaped to the required lines, grades, and cross section, and if necessary shall be lightly scarified to remove imprints left by the compacting or shaping

equipment. The surface shall then be sprinkled as necessary and thoroughly rolled with a pneumatic roller, and if the mixture contains plus No. 4 aggregate, at least one complete coverage of the section shall be made with a steel-wheel tandem roller.

Surface compaction and finishing for the entire section shall be performed in a manner that will produce a smooth, closely knit surface, free from laminations, construction cracks, ridges, or loose material, and conforming to the crown, grade, and lines stipulated within four hours after the beginning of mixing.

Upon completion of compaction, testing will be performed in accordance with Subsections 700.03 and 700.04.

907-311.03.7.2--Density. Determination of acceptance of compaction of treated courses for required density will be performed on a lot to lot basis. Each lot will be each 2,500 linear feet per layer placed. At the discretion of the Engineer, a residual portion of a lot completed during a day's operation may be considered a separate lot or may be included in the previous or subsequent lot, except that any day's operation of less than one full lot will be considered a lot.

The lot will be divided into five approximately equal sublots with one density test taken at random in each sublot. The average of the five (5) density tests shall equal or exceed 98.0 percent with no single density test below 94.0 percent. Sublots with a density below 94.0 percent shall be corrected at no additional cost to the State and retested for acceptance.

For treated materials other than for design soils and bases, the required density will be set out elsewhere in the contract.

907-311.03.7.3--Width, Thickness, and Surface Requirements. For the purpose of determining reasonable conformity with the designated width of a treated course, it shall be understood that the width of a treated course shall not vary from the designated edge lines by more than plus or minus one inch.

For the purpose of determining reasonable conformance with the designated thickness of a treated course, it shall be understood that the depth of the treated course shall not vary from designated thickness by more than minus one-half (1/2) inch or plus one (1) inch.

The finished surface of a treated course shall conform to the requirements shown on the plans, within the tolerances allowable under Section 321.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-401-5 DB **CODE: (SP)**

DATE: 01/07/2015

SUBJECT: Stone Matrix Asphalt (SMA)

Section 401, Plant Mix Pavements-General, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as amended by this special provision is applicable to Stone Matrix Asphalt (SMA) Only.

SECTION 907-401 – STONE MATRIX ASPHALT (SMA)

907-401.01--Description. These specifications include general requirements that are applicable to Stone Matrix Asphalt (SMA).

This work consists of constructing one or more lifts of SMA pavement on a prepared surface in accordance with the requirements of Section 401 for Asphalt Pavement, with the exceptions set forth in this special provision. The SMA shall meet the specific requirements for the mixture to be produced and placed in reasonably close conformity with the lines, grades, thicknesses and typical sections shown on the plans or established by the Engineer.

907-401.02--Materials.

907-401.02.1--Component Materials.

907-401.02.1.2--Aggregates. The source of aggregates shall meet the applicable requirements of Section 703.

907-401.02.1.2.1--Coarse Aggregate Blend. Mechanically fractured faces by weight of the combined mineral aggregate coarser than the No. 4 sieve shall be 95 percent two or more fractured faces for all SMA mixtures.

The maximum percentage by weight of flat and elongated particles, maximum to minimum dimension greater than 3, shall not exceed 20% for SMA mixtures. This shall be determined in accordance with ASTM D 4791, Section 8.4, on the combined mineral aggregate retained on the 3/8” sieve.

907-401.02.1.2.2--Fine Aggregate Blend. All SMA mixture fine aggregate blends shall have a minimum fine aggregate angularity index of 44.0 (ASTM C1252, Method A). The minus No. 40 fraction of the combined aggregate shall be non-plastic when tested according to AASHTO T 90. The clay content for the combined aggregate used in underlying layers shall not exceed 1.0 percent, and when used in top layers shall not exceed 0.5 percent by weight of the total mineral aggregate when tested according to AASHTO T 88.

907-401.02.1.2.3--Combined Aggregate Blend. All gradations will be based on percent passing by volume and not mass. Refer to Mississippi Test Method MT-80 Stone Matrix Asphalt (SMA) Volumetric Mix Design, Section 11 for the procedure to calculate gradations based on volumes. The gradation requirements, by volume, for SMA mixtures are provided in the following table.

Sieve Size	Nominal Maximum Aggregate Size					
	19.0-mm		12.5-mm		9.5-mm	
	Lower Control	Upper Control	Lower Control	Upper Control	Lower Control	Upper Control
1-inch	100	100				
3/4-inch	90	100	100	100		
1/2-inch	50	74	90	100	100	100
3/8-inch	25	60	26	78	90	100
No. 4	20	28	20	28	26	60
No. 8	16	24	16	24	20	28
No. 16	13	21	13	21	13	21
No. 30	12	18	12	18	12	18
No. 50	12	15	12	15	12	15
No. 200	8.0	10.0	8.0	10.0	8.0	10.0

907-401.02.1.3--Bituminous Materials. Bituminous materials shall meet the applicable requirements of Section 702 for the grade specified. A PG 76-22 asphalt binder shall be used for all SMA mixtures. The asphalt content (by weight of total mix) shall be based on the bulk specific gravity of the combined aggregate blend (G_{sb}) to ensure a constant asphalt binder volume in the mix for durability purposes. The relationship between G_{sb} and the minimum asphalt binder content by weight of total mix is provided in the following table.

Based on Minimum Asphalt Content by Volume of 6.0 Percent		
Combined Aggregate Bulk Specific Gravity, G_{sb}	Minimum Asphalt Content (%)	Rounded Minimum Asphalt Content (%)
2.40	6.58	6.6
2.45	6.46	6.5
2.50	6.34	6.3
2.55	6.22	6.2
2.60	6.11	6.1
2.65	6.00	6.0
2.70	5.90	5.9
2.75	5.79	5.8
2.80	5.70	5.7

2.85	5.60	5.6
2.90	5.51	5.5
2.95	5.42	5.4
3.00	5.34	5.3
Minimum AC, % (mass) = $0.724*(G_{sb})^2 - 5.98*G_{sb} + 16.76$		

Tack coat shall be the same neat grade asphalt cement used in the mixture being placed or those materials specified for tack coat in Table 410-A on the last page of Section 410. Emulsified asphalt shall not be diluted without approval of the Engineer.

907-401.02.1.4--Mineral Filler. Mineral filler shall meet the requirements of Subsection 703.16.

907-401.02.1.8--Stabilizing Fiber. Stabilizing fiber shall meet the requirements of Subsection 714.07.

907-401.02.3--Composition of Mixtures.

907-401.02.3.1--General. Unless otherwise specified or permitted, the SMA shall consist of a uniform mixture of asphalt, aggregate, mineral filler, stabilizing fibers, hydrated lime and, when required or necessary to obtain desired properties, antistripping agent and/or other materials.

The total amount of crushed limestone aggregate, in the top lift, shall not exceed 50 percent of the total combined aggregate by weight.

Hydrated lime shall be used in all SMA at the rate of one percent (1%) by weight of the total dry aggregate. The aggregate, prior to the addition of the hydrated lime, shall contain sufficient surface moisture. If necessary, the Contractor shall add moisture to the aggregate according to the procedures set out in Subsection 401.03.2.1.2.

The Contractor shall obtain a shipping ticket for each shipment of hydrated lime. The Contractor shall provide the District Materials Engineer with a copy of each shipping ticket from the supplier, including the date, time and weight of hydrated lime shipped.

Mixtures will require the addition of an antistripping agent when the Tensile Strength Ratio (MT-63) and/or the Boiling Water Test (MT-59) fail to meet the following criteria.

Tensile Strength Ratio (TSR - MT-63)	
Wet Strength / Dry Strength	85 percent minimum
Interior Face Coating	95 percent minimum
Boiling Water Test (MT-59)	
Particle Coating	95 percent minimum

Reclaimed asphalt pavement (RAP) or crushed reclaimed concrete may not be used as an aggregate component in the production of SMA.

907-401.02.3.1.1--Mixture Properties. The mortar is defined as the combination of the percent passing the 0.075 mm sieve, liquid asphalt binder, and the stabilizing fiber. Mix design and approval shall include mortar preparation and testing conducted in accordance with Mississippi Test Method MT-81. The mortar shall have a minimum unaged dynamic shear rheometer (DSR) $G^*/\sin\delta$ of 5.00 kPa, a minimum rolling thin film oven (RTFO) DSR $G^*/\sin\delta$ of 11.00 kPa, and a maximum pressure aging vessel (PAV) bending beam rheometer (BBR) stiffness (S) of 1500 MPa.

All mixes shall be designed according to Mississippi Test Method MT-80. SMA mixes shall be designed with the Superpave gyratory compactor utilizing an N_{design} of 75 gyrations. The design air voids and voids in the mineral aggregate for all SMA mixes are 4.0 and a minimum of 17.0 percent, respectively. The ratio of the voids in the coarse aggregate in the compacted mix (VCA_{mix}) to the voids in the coarse aggregate as determined with the dry rodded unit weight test (VCA_{dr}) shall be less than 1.0.

The designed mixture shall have a draindown of less than 0.3 percent when tested in accordance with Mississippi Test Method MT-82, Draindown Determination for Stone Matrix Asphalt Mixtures.

907-401.02.3.2--Job Mix Formula. The job mix formula shall be established in accordance with Mississippi Test Method MT-80.

At least 10 business days prior to the proposed use of each mixture, the Contractor shall submit in writing to the Engineer a proposed job-mix formula or request the transfer of a verified job-mix formula as set forth in the latest edition of MDOT's Field Manual for HMA and MT-80. The job-mix formula shall be signed by a Certified Mixture Design Technician (CMDT).

The Department will perform the tests necessary for review of a proposed job-mix formula for each required mixture free of charge one time only. A charge will be made for additional job-mix formulas submitted by the Contractor for review.

Review of the proposed job-mix formula will be based on percent maximum specific gravity at N_{Design}, VMA @ N_{Design}, ratio of voids in the Coarse Aggregate (VCA_{mix}/VCA_{dr}), draindown, mortar properties, resistance to stripping, and other criteria specified for the mixture.

The mixture shall conform thereto within the range of tolerances specified for the particular mixture. No change in properties or proportion of any component of the job-mix formula shall be made without permission of the Engineer. The job-mix formula for each mixture shall be in effect until revised in writing by the Engineer.

A job-mix formula may be transferred to other contracts in accordance with conditions set forth in the Department's Field Manual for HMA.

The Contractor shall not place any SMA prior to receiving "tentative" approval and a MDOT design number from the Central Laboratory.

When a change in source of materials, unsatisfactory mixture production results (such as segregation, bleeding, shoving, rutting over 1/8", raveling & cracking) or changed conditions make it necessary, a new job-mix formula will be required. The conditions set out herein for the original job-mix formula are applicable to the new job-mix formula.

907-401.02.5--Contractor's Quality Management Program.

907-401.02.5.3--Testing Requirements. As a minimum, the Contractor's quality management program shall include the following:

(a) Bituminous Material. Provide Engineer with samples in a sealed one quart metal container at the frequency given in MDOT SOP TMD-20-04-00-000.

(b) Mechanically Fractured Face. Determine mechanically fractured face content of aggregates retained on the No. 4 sieve, at a minimum of one test per day of production.

(c) Mixture Gradation. Conduct extraction tests for gradation determination on the mixture. Sample according to the frequency in paragraph (i) and test according to Mississippi Test Method MT-31.

(d) Total Voids and VMA. Determine total voids and voids in mineral aggregate (VMA), at N_{Design}, from the results of bulk specific gravity tests on laboratory compacted specimens. Sample according to the sampling frequency in paragraph (i) and test according to the latest edition of MDOT's Field Manual for HMA.

(e) Asphalt Content. Sample according to the sampling frequency in paragraph (i), and determine the asphalt content using one of the following procedures.

(1) Nuclear gauge. (Mississippi Test Method MT-6)
(2) Incinerator oven. (AASHTO T 308, Method A)

Draindown tests shall also be conducted according to Mississippi Test Method MT-82, at a minimum of one test per day of production..

(f) Stripping Tests. Conduct a minimum of one stripping test at the beginning of each job-mix production and thereafter, at least once per each two weeks of production according to Mississippi Test Method: MT-63 and one stripping test per day of production according to Mississippi Test Method: MT-59. Should either the TSR (MT-63) or the boiling water (MT-59) stripping tests fail, a new antistrip additive or rate shall be established or other changes made immediately that will result in a mixture which conforms to the specifications; otherwise, production shall be suspended until corrections are made.

(g) Density Tests. Conduct density tests as necessary to control and maintain required compaction according to Mississippi Test Method: MT-16, Method C (nuclear gauge), or AASHTO T 166.

(h) Quality Control Charts. Plot the individual test data, the average of the last four tests and the control limits for the following items as a minimum:

Mixture Gradation (Percent Passing) Sieves:
1/2-in, 3/8-in, No. 4, No. 8, No. 30, and No. 200.
Asphalt Content, Percent
Maximum Specific Gravity
Total Voids @ N_{Design}, Percent
VMA @ N_{Design}, Percent

Keep charts up-to-date and posted in a readily observable location. Charts may be kept on a computer, however, the charts shall be printed out a minimum of once each production day and displayed in the laboratory. Note any process changes or adjustments on the Air Voids chart.

(i) Sampling Frequency. Conduct those tests as required above at the following frequency for each mixture produced based on the estimated plant tonnage at the beginning of the day.

Total Estimated Production, tons	Number of Tests
1-700	1
701-1400	2
1401-2100	3
2101+	4

(j) Sample Requirements. Obtain the asphalt mixture samples from trucks at the plant. Obtain aggregate samples from cold feed bins or aggregate stockpile. Save a split portion of all mixture samples at the laboratory site in a dry and protected location for 14 calendar days. At the completion of the project, the remaining samples may be disposed of with the approval of the Engineer.

The above testing frequencies are for the estimated plant production for the day. If production is discontinued or interrupted, the tests will be conducted at the previously established sample tonnage points for the materials that are actually produced. If the production exceeds the estimated tonnage, sampling and testing will continue at the testing increments previously established for the day. A testing increment is defined as the estimated daily tonnage divided by the required number of tests from the table in the above subparagraph (i).

In addition to the above program, aggregate stockpile gradation tests (AASHTO T-11 and T-27) shall be conducted every other production day. Fine aggregate angularity tests (ASTM C 1252, Method A) shall be conducted on the first day of production and once for every eight production samples thereafter, with a minimum of one test per production week.

907-401.02.5.5--Control Limits. The following control limits for the job mix formula (JMF) and warning limits are based on a running average of the last four data points.

Item	JMF Limits	Warning Limits
Sieve - % Passing		
1/2-in	± 5.5	± 4.0
3/8-in	± 5.5	± 4.0
No. 4	± 4.0	± 3.0
No. 8	± 4.0	± 3.0
No. 30	± 4.0	± 3.0
No. 200	± 2.0	± 1.5
Asphalt Content, %	-0.3 to +0.5	-0.2 to +0.4
Total Voids @ N_{Design}, %	± 1.3	± 1.0
VMA @ N_{Design}, %	– 1.5	– 1.0

907-401.02.5.7--Job Mix Formula Adjustments. A request for a JMF adjustment signed by a CAT-II may be made to the Engineer by the Contractor. Sufficient testing data shall be submitted with the request to justify the change. The requested change will be reviewed by the State Materials Engineer for the Department. If current production values meet the mixture design requirements, a revised JMF will be issued. Adjustments to the JMF shall conform to the latest edition of MDOT's Field Manual for HMA. Adjustments to the JMF to conform to actual production shall not exceed the tolerances specified for the JMF limits. Regardless of such tolerances, any adjusted JMF gradation shall be within the range given in Subsection 907-401.02.1.2.3 for the mixture specified. **The JMF asphalt content may only be reduced if the production VMA meets or exceeds the minimum design VMA requirements for the mixture being produced.**

907-401.02.5.9--Trial Section. At the beginning of placement for each lift, the Contractor shall construct a trial section of a maximum of 400 tons of mix, for the purpose of establishing and evaluating consistent mixture properties and the compactibility of the mixture. The Contractor shall determine the production point at which the mix shall be sampled during trial section construction. This sample does not have to be selected by the formal random selection procedures used during actual production, but should be representative of the mix produced.

Density tests shall be performed according to the procedures in Chapter 7 of MDOT's Field Manual for Hot Mix Asphalt (First Day Production). The Contractor (QC) and the Department (QA) will conduct tests for mixture quality. A trial section is considered to be successful if the QC results are within the Warning Limits (the testing indicates a pay factor of 1.0), and the QC tests compare to the QA tests within the allowable differences set forth in Section 907-401.02.6.2. If the criteria for a successful trial section is not achieved, additional trial sections of at least 200 tons but not more than 400 tons shall be constructed until the criteria is achieved, at which time full production may begin. In the event a successful trial section is not accomplished by the completion of the second trial section, the Contractor will be required to construct additional trial sections at an off-site location. The Engineer reserves the right to have any trial section removed and replaced at no additional cost to the State, if the pay factor for any characteristic for a trial section is less than 0.75.

For actual payment purposes, a pay factor of 1.00 will be used for all first and second trial sections allowed to remain in place. Any required off-site trial sections will be constructed at no additional cost to the State.

907-401.02.6--Standards of Acceptance.

907-401.02.6.4--Acceptance Procedure for Density. Each completed lift will be accepted with respect to compaction on a lot to lot basis from density tests performed by the Department. Material produced and placed during the trial section(s), if placed on the roadway, will be designated as separate lots. For normal production days, divide the production into approximately equal lots as shown in the following table. When cores are being used for the compaction evaluation, randomly obtain one core from each lot. When the nuclear density gauge is being used for compaction evaluation, obtain two random readings from each lot and average the results (see Chapter 7 of the latest edition of MDOT's Field Manual for HMA). Additional tests may be required by the Engineer to determine acceptance of work appearing deficient. The Contractor shall furnish and maintain traffic control for all compaction evaluations, including coring, required in satisfying specified density requirements.

Lot Determination

Daily Production - Tons	Number of Lots
0-300	1
301-600	2
601-1000	3
1001-1500	4
1501-2100	5
2101-2800	6
2801+	7

907-401.02.6.4.1--Roadway Density. The density requirement for each completed lift on a lot to lot basis from density tests performed by the Department shall be 93.0 percent of maximum density. When it is determined that the density for a lot is below 93.0 percent but not lower than 91.0 percent of maximum density, the Contractor will have the right to remove and replace the lot(s) not meeting the specified density requirements in lieu of accepting reduced payment for the lot(s).

When it is determined that the density for a lot is above 96.0 percent, the Engineer shall notify the Contractor who will make plant adjustments to resolve the problem.

When it is determined that the density for a lot is below 91.0 percent, the lot(s), or portions thereof, shall be removed and replaced in accordance with Chapter 7 of the latest edition of MDOT's Field Manual for HMA at no additional cost to the State. A corrected lot will be retested for approval. No resampling will be performed when pavement samples are used for determining density.

At any time the average daily compaction (the total of the percent compaction for the lots produced in one day divided by the total number of lots for the day) does not meet 93.0 percent

compaction or more for two consecutive days, the Contractor shall notify the Engineer of proposed changes to the compactive effort. If the average daily compaction does not meet 93.0 percent compaction or more for a third consecutive day, the Contractor shall stop production and construct another trial section to establish proper compaction procedures.

Each lot of work found not to meet the density requirement of 93.0 percent of maximum density may remain in place with a reduction in payment as set out in the following table:

PAYMENT SCHEDULE FOR COMPACTION

Pay Factor	Lot Density ** % of Maximum Density
1.00	93.0 and above
0.90	92.0 - 92.9
0.70	91.0 - 91.9

** Any lot or portion thereof with a density of less than 91.0 percent of maximum density shall be removed and replaced at no additional cost to the State.

The compaction pay factors and mixture quality pay factor will each apply separately (See Subsection 907-401.02.6.3). However, the combined pay factor shall not be less than 0.50 for any mixture allowed to remain in place.

907-401.03--Construction Requirements. Mississippi DOT has adopted the "Hot-Mix Asphalt Paving Handbook" as the guideline for acceptable SMA construction practices.

907-401.03.1--Specific Requirements.

907-401.03.1.1--Weather Limitations. The mixture shall not be placed when weather conditions prevent the proper handling and finishing or the surface on which it is to be placed is wet or frozen. At the time of placement, the air and pavement surface temperature limitations shall be equal to or exceed 55°F.

907-401.03.1.4--Density. The lot density for all SMA 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 93.0 percent of the maximum density based on AASHTO Designation: T 209 for the day's production. If a job-mix formula adjustment is made during the day which affects the maximum specific gravity, calculate a new average maximum density for the lot(s) placed after the change.

Pavement core samples obtained for determining density which have a thickness less than two times the maximum size aggregate permitted by the job-mix formula will not be used as a representative sample.

Preleveling, wedging [less than fifty percent (50%) of width greater than minimum lift thickness], ramp pads, irregular shoulder areas, median crossovers, turnouts, and other areas

where an established rolling pattern cannot be obtained shall be compacted to refusal densification.

907-401.03.2--Bituminous Mixing Plants.

907-401.03.2.1--Plant Requirements.

907-401.03.2.1.4--Stabilizing Fiber Addition. For batch plants, fibers shall be added (manually or automatic) to either the pugmill or the weigh hopper. At least one aggregate source shall be added prior to the fiber addition, if fibers are added to the weigh hopper. Otherwise, fibers shall be added to the pugmill immediately after the addition of all the aggregate and prior to the addition of the asphalt binder.

907-401.03.2.1.4.1--Manual Method. Provided it is demonstrated to the satisfaction of the Engineer that the proper dosage rate of the stabilizing fibers is uniformly distributed into the mix, manual introduction of the fibers is acceptable when a batch plant is used to make the mix. When the fibers are available in prepackaged (weighed) containers, proper dosage may be pre-determined per batch. A device is required to interrupt mixture production and warn the plant operator if the operator manually feeding the fiber fails to introduce it properly.

Manual introduction of fibers shall not be used in drum plants.

907-401.03.2.1.4.2--Automatic Method. The automatic method requires specialized equipment that can accurately proportion and meter, by weight, the proper amount per batch for batch plants, or continuously and in a steady uniform manner for drum plants. Fiber, pelletized or loose, shall not be fed through the cold feed bins or through the RAP bins.

These proportioning devices shall be interlocked with the plant system and controlled to +/-10 percent of the weight of the fibers required so as to maintain the correct proportions for all production rates and batch sizes. During trial section construction, an equipment calibration check shall be performed to the satisfaction of the Engineer that shows the fiber is being accurately metered and uniformly distributed into the mix. These metering devices shall provide in- process high flow ($\geq$10 percent or more) and low flow (<10 percent or less) plant operator notification and interrupt the mix production where the fiber rate is not properly controlled. The fiber metering system shall also provide a record of feed rate (weight or mass per time) and include a section a minimum of two feet long of translucent pipe for visual confirmation of consistent flow rates. Care shall be taken to insure that the fibers are not entrained in the plant's exhaust system. If there is any evidence of fiber in the bag-house or wet-washer fines, the liquid asphalt binder line and/or the fiber line shall be relocated so that the fiber is captured by liquid asphalt binder spray and incorporated into the mix. If there is any evidence of clumps of fibers or pellets at the discharge chute, the contractor shall increase the mixing time and/or intensity. This may entail extending the liquid asphalt binder and fiber feeding lines further into the drum.

Note: Various stabilizing fiber suppliers have developed methodology and equipment for metering bulk loose and pelletized fiber into asphalt plants. Whenever the fiber supplier's recommendations are more stringent than this specification, the fiber supplier's recommendations shall control.

907-401.03.2.4--Surge or Storage Bins. Normally the surge bins shall be emptied at the end of each day's operation. During breakdowns or adverse weather conditions, the material may be stored for a period not to exceed three (3) hours in a well sealed, well insulated, heated bin.

907-401.03.5--Rollers. All rollers shall be self-propelled units capable of maintaining a smooth and uniform forward and reverse speed as required for proper compaction. Pneumatic-tired rollers shall not be permitted for compacting SMA mixes. Rollers shall be equipped with adjustable scrapers, water tanks, mats and a device for wetting the wheels to prevent the mixture from sticking. Adhesion of the mixture to the rollers will not be permitted. The use of diesel fuel or gasoline for cleaning roller wheels, or to aid in preventing the mixture from sticking to the wheels, is prohibited.

907-401.03.9--Material Transfer Equipment. Except for the areas mentioned below, the material transferred from the hauling unit 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: 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.

907-401.03.11--Compaction. After the mixture has been spread and surface irregularities corrected, it shall be thoroughly and uniformly compacted to the required line, grade, cross section and density. It is recommended that compaction of SMA mixtures be completed before the mat temperature drops to 250°F.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-401-7 DB **CODE: (SP)**

DATE: 01/07/2015

SUBJECT: Asphalt Pavements

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

SECTION 907-401 - ASPHALT PAVEMENT -- GENERAL

907-401.01--Description. These specifications include general requirements that are applicable to all types of asphalt whether producing Hot Mix Asphalt (HMA) mixtures or Warm Mix Asphalt (WMA) mixtures. These specifications also include the specific requirements for each particular mixture when deviations from the general requirements are necessary.

This work consists of the construction of one or more lifts of asphalt pavement in accordance with these specifications and the specific requirements for the mixture to be produced and in reasonably close conformity with the lines, grades, thicknesses and typical sections shown on the plans or established by the Engineer.

907-401.01.1--Definitions.

Maximum Sieve Size - Maximum sieve size is the smallest sieve size at which 100 percent of the aggregate passes.

Nominal Maximum Sieve Size - The nominal maximum sieve size is one sieve size larger than the first sieve to retain more than 10 percent of the aggregate.

Maximum Density Line - The maximum density line is a straight line plot on the FHWA 0.45 power gradation chart which extends from the zero origin point of the chart through the plotted point of the combined aggregate gradation curve on the nominal maximum sieve size.

Mechanically Fractured Face - An angular, rough, or broken surface of an aggregate particle created by crushing as determined by ASTM Designation: D 5821.

907-401.02--Materials.

907-401.02.1--Component Materials.

907-401.02.1.1--General. Component materials will be conditionally accepted at the plant subject to later rejection if incorporated in a mixture or in work which fails to meet contract requirements.

907-401.02.1.2--Aggregates. The source of aggregates shall meet the applicable requirements

of Section 703.

907-401.02.1.2.1--Coarse Aggregate Blend. Mechanically fractured faces by weight of the combined mineral aggregate coarser than the No. 4 sieve:

Mixture	Percent Fractured Faces, minimum
25-mm	70, one-face
19-mm *	80, one-face
12.5-mm	90, two-face
9.5-mm	90, two-face
4.75-mm	90, two-face

* When used on routes requiring polymer modified asphalt, the top intermediate lift (19-mm mixture), including travel lane and adjacent lane, shall have at least 90 percent two fractured faces minimum. When placed on an existing Portland Cement Concrete surface, all intermediate lifts (19-mm mixture) shall have at least 90 percent fractured two faces minimum.

The maximum percentage by weight of flat and elongated particles, for all mixes other than 4.75-mm, maximum to minimum dimension greater than 5, shall not exceed 10% for all mixtures. This shall be determined in accordance with ASTM Designation: D 4791, Section 8.4, on the combined mineral aggregate retained on the 3/8” sieve.

907-401.02.1.2.2--Fine Aggregate Blend. Of all the material passing the No. 8 sieve and retained on the No. 200 sieve, not more than 60 percent shall pass the No. 30 sieve.

Uncrushed natural sand shall pass the 3/8” sieve and may be used, excluding the content in RAP, in the percentages of the total mineral aggregate by weight set out in the following table:

Mixture	Maximum Percentage of Natural Sand by Total Weight of Mineral Aggregate		
	HT	MT	ST
25-mm	10	10	20
19-mm	10	10	20
12.5-mm	10	10	20
9.5-mm	10	10	10
4.75-mm	25	30	35

907-401.02.1.2.3--Combined Aggregate Blend.

Design Master Range

Mixture:	25-mm	19-mm	12.5-mm	9.5-mm	4.75-mm
Nominal Maximum Sieve Size:	1 inch	3/4 inch	1/2 inch	3/8 inch	1/4 inch
Sieve Size	Percent Passing				
1½ inch	100				
1 inch	90-100	100			
¾ inch	89 max.	90-100	100		
½ inch	-	89 max.	90-100	100	100
3/8 inch	-	-	89 max.	90-100	95-100
No. 4	-	-	-	89 max.	90-100
No. 8	16-50	18-55	20-60	22-70	-
No. 16	-	-	-	-	30-60
No. 200	4.0-9.0	4.0-9.0	4.0-9.0	4.0-9.0	6.0-12.0

For MT and HT mixtures, the combined aggregate gradation of the job mix formula, when plotted on FHWA 0.45 power chart paper, shall fall entirely below the Maximum Density Line on all sieve sizes smaller than the No. 4 sieve. However, MT and HT mixtures having a minimum fine aggregate angularity index of 44.0, per ASTM Designation: C1252, Method A, may be designed above the maximum density line.

The 9.5-mm mixtures shall have a minimum fine aggregate angularity of 44.0 for HT and MT mixtures and 40.0 for ST mixtures when tested on combined aggregate in accordance with ASTM Designation: C1252 Method A. The 4.75-mm mixtures shall have a minimum fine aggregate angularity of 45.0 for all design levels when tested on combined aggregate in accordance with ASTM Designation: C 1252, Method A.

The minus No. 40 fraction of the combined aggregate shall be non-plastic when tested according to AASHTO Designation: T 90. The clay content for the combined aggregate for underlying layers shall not exceed 1.0 percent, and for the top layer shall not exceed 0.5 percent by weight of the total mineral aggregate when tested according to AASHTO Designation: T 88.

907-401.02.1.3--Bituminous Materials. Bituminous materials shall meet the applicable requirements of Section 702 for the grade specified.

Tack coat shall be the same neat grade asphalt cement used in the mixture being placed or those materials specified for tack coat in Table 410-A on the last page of Section 410. Emulsified asphalt shall not be diluted without approval of the Engineer.

907-401.02.1.4--Blank.

907-401.02.1.5--Hydrated Lime. Hydrated lime shall meet the requirements of Subsection 714.03.2 for lime used in soil stabilization.

907-401.02.1.6--Asphalt Admixtures. Additives for liquid asphalt, when required or permitted, shall meet the requirements of Subsection 702.08.

907-401.02.1.7--Polymers. Polymers for use in polymer modified asphalt pavements shall meet the requirements of Subsection 702.08.3.

907-401.02.2--WMA Products and Processes. The Department will maintain a list of qualified WMA products and processes. No product or process shall be used unless it appears on this list.

The Contractor may propose other products or processes for approval by the Product Evaluation Committee. Documentation shall be provided to demonstrate laboratory performance, field performance, and construction experience.

907-401.02.3--Composition of Mixtures.

907-401.02.3.1--General. Unless otherwise specified or permitted, the asphalt shall consist of a uniform mixture of asphalt, aggregate, hydrated lime and, when required or necessary to obtain desired properties, antistripping agent and/or other materials.

The total amount of crushed limestone aggregate for mixtures, excluding shoulders, when used in the top lift, shall not exceed 50 percent of the total combined aggregate by weight.

Hydrated lime shall be used in all asphalt at the rate of one percent (1%) by weight of the total dry aggregate including aggregate in RAP, if used. The aggregate, prior to the addition of the hydrated lime, shall contain sufficient surface moisture. If necessary, the Contractor shall add moisture to the aggregate according to the procedures set out in Subsection 907-401.03.2.1.2.

The Contractor shall obtain a shipping ticket for each shipment of hydrated lime. The Contractor shall provide the District Materials Engineer with a copy of each shipping ticket from the supplier, including the date, time and weight of hydrated lime shipped and used in hot mix asphalt production. An amount equal to twenty-five percent (25%) of the total value of asphalt items performed during the initial estimate period in which the Contractor fails to submit the hydrated lime shipping tickets to the District Materials Engineer will be withheld from the Contractor's earned work. Non-conformance with this specification for successive estimate period(s) will result in the total value (100%) of asphalt items performed during this period(s) being withheld from the Contractor's earned work. Monies withheld for this non-conformance will be released for payment on the next monthly estimate following the date the submittal of hydrated lime shipping tickets to the District Materials Engineer is brought back into compliance with this specification.

Mixtures will require the addition of an antistripping agent when the Tensile Strength Ratio (MT-63) and/or the Boiling Water Test (MT-59) fail to meet the following criteria.

Tensile Strength Ratio (TSR - MT-63)
Wet Strength / Dry Strength ..... 85 percent minimum

Interior Face Coating ..... 95 percent minimum
Boiling Water Test (MT-59)
Particle Coating ..... 95 percent minimum

Reclaimed asphalt pavement (RAP) materials may be used in the production of asphalt in the percentages of the total mix by weight set out in the following table:

Asphalt Mixture	Maximum Percentage of RAP by total weight of mix
4.75-mm	0
9.5-mm	20 *
12.5-mm Surface Lift	20 *
12.5-mm Underlying Lift	30
19-mm	30
25-mm	30

* At a minimum, RAP shall be processed and/or screened such that the RAP material size does not exceed the nominal maximum sieve size for the mixture specified.

During asphalt production, the RAP shall pass through a maximum 2-inch square sieve located in the asphalt plant after the RAP cold feed bin and prior to the RAP weighing system.

Crushed reclaimed concrete pavement may be used as an aggregate component of all asphalt pavements. When crushed reclaimed concrete pavement is used as an aggregate component, controls shall be implemented to prevent segregation. Crushed reclaimed concrete pavement aggregate shall be separated into coarse and fine aggregate stockpiles using the 3/8-inch or 1/2-inch sieve as a break-point unless otherwise approved by the Engineer in writing.

907-401.02.3.1.1--Mixture Properties.

ALL MIXTURES	Percent of Maximum Specific Gravity (Gmm)
N_{Design}	96.0
$N_{Initial}$	Less than 90.0
$N_{Maximum}$	Less than 98.0

VMA CRITERIA	Minimum percent
25-mm mixture	12.0
19-mm mixture	13.0
12.5-mm mixture	14.0
9.5-mm mixture	15.0
4.75-mm mixture	16.0

Mixtures with VMA more than two percent higher than the minimum may be susceptible to flushing and rutting; therefore, unless satisfactory experience with high VMA mixtures is available, mixtures with VMA greater than two percent above the minimum should be avoided.

The specified VFA range for 4.75-mm nominal maximum size mixtures for design traffic levels >3 million ESAL's (HT Mixtures) shall be 75 to 78 percent, for design traffic levels of 1.0 to 3 million ESAL's (MT mixtures) 65 to 78 percent, and for design traffic levels of <1.0 million ESAL's (ST mixtures) 65 to 78 percent.

DUST/BINDER RATIO for 4.75-mm mixtures
Percent Passing No.200 / Effective Binder Percent ..... 0.9 to 2.0

DUST/BINDER RATIO for 9.5-mm, 12.5-mm, 19-mm & 25-mm mixtures
Percent Passing No.200 / Effective Binder Percent ..... 0.8 to 1.6

907-401.02.3.2--Job Mix Formula. The job mix formula shall be established in accordance with Mississippi Test Method: MT-78, where N represents the number of revolutions of the gyratory compactor.

Compaction Requirements:	$N_{Initial}$	N_{Design}	$N_{Maximum}$
High Type (HT) Mixtures			
19-mm, 12.5-mm, 9.5-mm & 4.75-mm	7	85	130
Medium Type (MT) Mixtures			
19-mm, 12.5-mm, 9.5-mm & 4.75-mm	7	65	100
All Standard Type (ST) Mixtures;			
25-mm HT & MT Mixtures	6	50	75

At least 10 business days prior to the proposed use of each mixture, the Contractor shall submit in writing to the Engineer a proposed job-mix formula or request the transfer of a verified job-mix formula as set forth in the latest edition of MDOT's Field Manual for HMA and SOP TMD-11-78-00-000. The proposed job-mix formula shall indicate whether the mixture will be produced as HMA or WMA. The process or product used to produce WMA should also be noted on the proposed documentation for the job-mix formula. The job-mix formula shall be signed by a Certified Mixture Design Technician (CMDT).

The Department will perform the tests necessary for review of a proposed job-mix formula for each required mixture free of charge one time only. A charge will be made for additional job-mix formulas submitted by the Contractor for review.

Review of the proposed job-mix formula will be based on percent maximum specific gravity at $N_{Initial}$, N_{Design}, and $N_{Maximum}$, VMA @ N_{Design}, resistance to stripping, and other criteria specified for the mixture.

The mixture shall conform thereto within the range of tolerances specified for the particular mixture. No change in properties or proportion of any component of the job-mix formula shall be made without permission of the Engineer. The job-mix formula for each mixture shall be in effect until revised in writing by the Engineer.

A job-mix formula may be transferred to other contracts in accordance with conditions set forth in the Department's Field Manual for HMA.

The Contractor shall not place any asphalt prior to receiving “tentative” approval and a MDOT design number from the Central Laboratory.

When a change in source of materials, unsatisfactory mixture production results (such as segregation, bleeding, shoving, rutting over ⅛”, raveling & cracking) or changed conditions make it necessary, a new job-mix formula will be required. The conditions set out herein for the original job-mix formula are applicable to the new job-mix formula.

In the event the Contractor wishes to change from an approved HMA job-mix formula to WMA or an approved WMA job-mix formula to HMA, the Contractor shall submit the proposed change in writing to the Engineer at least 10 business days prior to the proposed change. If no changes (other than the plant production temperature) are to be made to the job-mix formula, a new MDOT design number will be assigned by the MDOT Central Laboratory.

907-401.02.4--Substitution of Mixture. The substitution of a one (1) size finer mixture for an underlying lift shall require written permission of the State Construction Engineer, except no substitution of a 4.75-mm mixture will be allowed. A 9.5-mm mixture may be substituted for the 12.5-mm mixture designated on the plans as the top lift or pre-leveling. The 19-mm mixture may be substituted for the 25-mm mixture in trench widening work. Any substitution of mixtures shall be of the same type. No other substitutions will be allowed. The quantity of substituted mixture shall be measured and paid for at the contract unit price for the mixture designated on the plans. The substitution of any mixture will be contingent on meeting the required total structure thickness and maintaining the minimum and/or maximum laying thickness for the particular substituted mixture as set out in the following table.

Mixture	Single Lift Laying Thickness Inches	
	Minimum	Maximum
25-mm	3	4
19-mm	2¼	3½
12.5-mm	1½	2½
9.5-mm	1	1½
4.75-mm	½	¾

907-401.02.5--Contractor's Quality Management Program.

907-401.02.5.1--General. The Contractor shall have full responsibility for quality management and maintain a quality control system that will furnish reasonable assurance that the mixtures and all component materials incorporated in the work conform to contract requirements. The Contractor shall have responsibility for the initial determination and all subsequent adjustments in proportioning materials used to produce the specified mixture. Adjustments to plant operation and spreading and compaction procedures shall be made immediately when results indicate that

they are necessary. Mixture produced by the Contractor without the required testing or personnel on the project shall be subject to removal and replacement by the Contractor at no additional cost to the State.

907-401.02.5.2--Personnel Requirements. The Contractor shall provide at least one Certified Asphalt Technician-I (CAT-I) full-time during asphalt production at each plant site used to furnish material to the project. Sampling shall be conducted by a certified technician or by plant personnel under the direct observation of a certified technician. All testing, data analysis and data posting will be performed by the CAT-I or by an assistant under the direct supervision of the CAT-I. The Contractor shall have a Certified Asphalt Technician-II (CAT-II) available to make any necessary process adjustments. Technician certification shall be in accordance with MDOT SOP TMD-22-10-00-000, MDOT HMA Technician Certification Program. An organizational chart, including names, telephone numbers and current certification, of all those responsible for the quality control program shall be posted in the Contractor's laboratory while the asphaltic paving work is in progress.

907-401.02.5.3--Testing Requirements. As a minimum, the Contractor's quality management program shall include the following:

(a) Bituminous Material. Provide Engineer with samples in a sealed one quart metal container at the frequency given in MDOT SOP TMD-20-04-00-000.

(b) Mechanically Fractured Face. Determine mechanically fractured face content of aggregates retained on the No. 4 sieve, at a minimum of one test per day of production.

(c) Mixture Gradation. Conduct extraction tests for gradation determination on the mixture. Sample according to the frequency in paragraph (i) and test according to Mississippi Test Method MT-31.

(d) Total Voids and VMA. Determine total voids and voids in mineral aggregate (VMA), at N_{Design}, from the results of bulk specific gravity tests on laboratory compacted specimens. Sample according to the sampling frequency in paragraph (i) and test according to the latest edition of MDOT's Field Manual for HMA.

(e) Asphalt Content. Sample according to the sampling frequency in paragraph (i). Determine the asphalt content using one of the following procedures.

(1) Nuclear gauge per Mississippi Test Method MT-6.
(2) Incinerator oven per AASHTO Designation: T 308, Method A.

(f) Stripping Tests. Conduct a minimum of one stripping test at the beginning of each job-mix production and thereafter, at least once per each two weeks of production according to Mississippi Test Method: MT-63 and one stripping test per day of production according to Mississippi Test Method: MT-59. Should either the TSR (MT-63) or the boiling water (MT-59) stripping tests fail, a new antistrip additive or rate shall be established or other changes made immediately that will result in a mixture which conforms to the specifications; otherwise, production shall be suspended until corrections

are made.

(g) Density Tests. For 25-mm, 19.5-mm, 12.5-mm & 9.5-mm mixtures, conduct density tests as necessary to control and maintain required compaction according to Mississippi Test Method: MT-16, Method C (nuclear gauge), or AASHTO Designation: T 166. Note - The nuclear gauge may be correlated, at the Contractor's option, with the average of a minimum of five pavement sample densities. For 4.75-mm mixtures, conduct density tests as necessary to control and maintain required compaction according to AASHTO Designation: T 166.

(h) Quality Control Charts. Plot the individual test data, the average of the last four tests and the control limits for the following items as a minimum:

Mixture Gradation (Percent Passing) Sieves:
1/2-inch, 3/8-inch, No. 8, No. 16, No. 30 and No. 200.
Asphalt Content, Percent
Maximum Specific Gravity, G_{mm}
Total Voids @ N_{Design}, Percent
VMA @ N_{Design}, Percent

NOTE: For 4.75-mm mixtures, Quality Control Charts for mixture gradation are not required on the No. 8 and No. 30 sieves. For 4.75-mm mixtures, as a minimum, Quality Control Charts for mixture gradation shall be kept on the 3/8-inch, No. 16 and No. 200 sieves. For all mixtures other than 4.75-mm, Quality Control Charts for mixture gradation are not required on the No. 16 sieve.

Keep charts up-to-date and posted in a readily observable location. Charts may be kept on a computer, however, the charts shall be printed out a minimum of once each production day and displayed in the laboratory. Note any process changes or adjustments on the Air Voids chart.

(i) Sampling Frequency. Conduct those tests as required above at the following frequency for each mixture produced based on the estimated plant tonnage at the beginning of the day.

Total Estimated Production, tons	Number of Tests
50-800	1
801-1700	2
1701-2700	3
2701+	4

NOTE: Material placed in a storage silo from a previous day's production shall be randomly sampled and tested when removed for placement on the roadway. Such sample(s) shall be independent of the day's production sampling frequency and shall be used in calculating the four (4) sample running average.

(j) Sample Requirements. Obtain the asphalt mixture samples from trucks at the plant.

Obtain aggregate samples from cold feed bins or aggregate stockpile. Save a split portion of all mixture samples at the laboratory site in a dry and protected location for 14 calendar days. At the completion of the project, the remaining samples may be disposed of with the approval of the Engineer.

The above testing frequencies are for the estimated plant production for the day. If production is discontinued or interrupted, the tests will be conducted at the previously established sample tonnage points for the materials that are actually produced. If the production exceeds the estimated tonnage, sampling and testing will continue at the testing increments previously established for the day. A testing increment is defined as the estimated daily tonnage divided by the required number of tests from the table in Subsection 907-401.02.5.3 paragraph (i).

In addition to the above program, the following tests shall be conducted on the first day of production and once for every eight production samples thereafter, with a minimum of one test per production week.

Aggregate Stockpile Gradations per AASHTO Designations: T-11 and T-27.

Reclaimed Asphalt Pavement (RAP) Gradation per Mississippi Test Method MT-31.

Fine Aggregate Angularity for all 4.75-mm and 9.5-mm mixtures and all MT and HT mixtures designed above the maximum density line per ASTM Designation: C 1252, Method A.

Testing of the aggregate and RAP stockpiles during production will be waived provided the Contractor provides the Engineer with gradation test results for the materials in the stockpile determined during the building of the stockpiles. The test results provided shall represent a minimum frequency of one per one thousand tons of material in the stockpile. If the Contractor continues to add materials to the stockpile during asphalt production, the requirements for gradation testing during production are not waived.

907-401.02.5.4--Documentation. The Contractor shall document all observations, records of inspection, adjustments to the mixture, and test results on a daily basis. All tests conducted by the Contractor in accordance with Subsection 907-401.02.5.3(h) shall be included in the running average calculations. If single tests are performed as a check on individual asphalt properties, between regular samples, without performing all tests required in Subsection 907-401.02.5.3(h), the results of those individual tests shall not be included in the running average calculations for that particular property. The Contractor shall record the results of observations and records of inspection as they occur in a permanent field record. The Contractor shall record all process adjustments and job mix formula (JMF) changes on the air void charts. The Contractor shall provide copies of all test data sheets and the daily summary reports on the appropriate Mississippi DOT forms to the Engineer on a daily basis. The Contractor shall provide a written description of any process change, including blend proportions, to the Engineer as they occur. Information provided to the Engineer must be received in the Engineer's office by no later than 9:00 AM the day after the asphalt is produced. Fourteen days after the completion of the placement of the asphalt, the Contractor shall provide the Engineer with the original testing records and control charts in a neat and orderly manner.

907-401.02.5.5--Control Limits. The following control limits for the job mix formula (JMF) and warning limits are based on a running average of the last four data points.

Item	JMF Limits	Warning Limits
Sieve - % Passing		
1/2-inch	± 5.5	± 4.0
3/8-inch	± 5.5	± 4.0
No. 8	± 5.0	± 4.0
No. 16, for 4.75-mm mixtures ONLY	± 4.0	± 3.0
No. 30	± 4.0	± 3.0
No. 200	± 1.5	± 1.0
Asphalt Content, %	-0.3 to +0.5	-0.2 to + 0.4
Total Voids @ N_{Design}, %	± 1.3	± 1.0
VMA @ N_{Design}, %	– 1.5	– 1.0

907-401.02.5.6--Warning Bands. Warning bands are defined as the area between the JMF limits and the warning limits.

907-401.02.5.7--Job Mix Formula Adjustments. A request for a JMF adjustment signed by a CAT-II may be made to the Engineer by the Contractor. Submit sufficient testing data with the request to justify the change. The requested change will be reviewed by the State Materials Engineer for the Department. If current production values meet the mixture design requirements, a revised JMF will be issued. Adjustments to the JMF shall conform to the latest edition of MDOT's Field Manual for HMA. Adjustments to the JMF to conform to actual production shall not exceed the tolerances specified for the JMF limits. Regardless of such tolerances, any adjusted JMF gradation shall be within the design master range for the mixture specified. The JMF asphalt content may only be reduced if the production VMA meets or exceeds the minimum design VMA requirements for the mixture being produced.

907-401.02.5.8--Actions and Adjustments. Based on the process control test results for any property in question, the following actions shall be taken or adjustments made when appropriate:

(a) When the running average trends toward the warning limits, the Contractor shall consider taking corrective action. The corrective action, if any, shall be documented. All tests shall be part of the contract files and shall be included in the running average calculations.
(b) The Contractor shall notify the Engineer whenever the running average exceeds the warning limits.
(c) If two consecutive running averages exceed the warning limit, the Contractor shall stop production and make adjustments. Production shall only be restarted after notifying the Engineer of the adjustments made.
(d) If the adjustment made under (c) improves the process such that the running average after four additional tests is within the warning limits, the Contractor may continue production with no reduction in payment.

(e) If the adjustment made under (c) does not improve the process and the running average after four additional tests stays in the warning band, the mixture will be considered unsatisfactory. Reduced payment for unsatisfactory mixtures will be applied starting from the stop point to the point when the running average is back within the warning limits in accordance with Subsection 907-401.02.6.3.

(f) Failure to stop production and make adjustments when required shall subject all mixture produced from the stop point to the point when the running average is back within the warning limits to be considered unsatisfactory. Reduced payment for unsatisfactory mixtures will be applied in accordance with Subsection 907-401.02.6.3.

(g) If the running average exceeds the JMF limits, the Contractor shall stop production and make adjustments. Production shall only be restarted after notifying the Engineer of the adjustments made.

(h) All materials for which the running average exceeds the JMF limits will be considered unacceptable and shall be removed and replaced by the Contractor at no additional cost to the State. The Engineer will determine the quantity of material to be replaced based on a review of the individual testing data which make up the running average in question and an inspection of the completed pavement. If the Engineer decides to leave the mixture in place because of special circumstances, the quantity of mixture, as defined above, will be paid for in accordance with Subsection 907-401.02.6.3.

(i) Single test results shall be compared to 1.7 times the warning and JMF limits. If the test results verified by QA testing (within allowable differences in Subsection 907-401.02.6.2) exceed these limits, the pay factor provided in Subsection 907-401.02.6.3 will apply for the quantity of material represented by the test(s). Single test limits will be used for the acceptance of projects when insufficient tonnage is produced to require four (4) Contractor's tests.

(j) The above corrective action will also apply for a mixture when the Contractor's testing data has been proven incorrect. The Contractor's data will be considered incorrect when; 1) the Contractor's tests and the Engineer's tests do not agree within the allowable differences given in Subsection 907-401.02.6.2 and the difference can not be resolved, or 2) the Engineer's tests indicates that production is outside the JMF limits and the results have been verified by the Materials Division. The Engineer's data will be used in place of the Contractor's data to determine the appropriate pay factor.

907-401.02.6--Standards of Acceptance.

907-401.02.6.1--General. Acceptance for mixture quality (VMA and total voids @ N_{Design}, gradation, and asphalt content) will be based on random samples tested in accordance with the latest edition of MDOT's Field Manual for HMA. Pavement densities and smoothness will be accepted by lots as set out in Subsections 907-401.02.6.4 and 907-401.02.6.5.

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 907-401.02.5.8(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.

907-401.02.6.3--Acceptance Procedure for Mixture Quality. All obviously defective material or mixture will be subject to rejection by the Engineer. Such defective material or mixture shall not be incorporated into the finished work. If the defective material has already been placed in the work, the material shall be removed and replaced at no additional cost to the State.

The Engineer will base final acceptance of the asphalt mixture production on the results of the Contractor's testing for total voids and VMA @ N_{Design}, gradation, and asphalt content as verified by the Engineer in the manner hereinbefore described and the uniformity and condition of the completed pavement. Areas of pavement that exhibit non-uniformity or failures, materials or construction related, such as but not limited to segregation, bleeding, shoving, rutting over ⅛", raveling, slippage, or cracking will not be accepted. Such areas will be removed and replaced at no additional cost to the State.

Bituminous mixture placed prior to correction for deficiencies in VMA and total voids @ N_{Design}, gradation, or asphalt content, as required in Subsection 907-401.02.5.8 and determined by the Engineer satisfactory to remain in place will be paid for in accordance with the following pay factors times the contract unit price per ton.

Pay Factor for Mixture Quality *

Item	Produced in Warning Bands	Produced Outside JMF Limits, Allowed to Remain in Place
Gradation	0.90	0.75
Asphalt Content	0.85	0.75
Total Voids @ N_{Design}	0.70	0.50
VMA @ N_{Design}	0.90	0.75

* The minimum single payment will apply.

907-401.02.6.4--Acceptance Procedure for Density. Each completed lift will be accepted with respect to compaction on a lot to lot basis from density tests performed by the Department. For normal production days, divide the production into approximately equal lots as shown in the following table. When cores are being used for the compaction evaluation, randomly obtain one core from each lot. When the nuclear density gauge is being used for compaction evaluation, obtain two random readings from each lot and average the results. See Chapter 7 of the latest edition of MDOT's Field Manual for HMA for more details. Additional tests may be required by the Engineer to determine acceptance of work appearing deficient. The Contractor shall furnish and maintain traffic control for all compaction evaluations, including coring, required in satisfying specified density requirements.

Lot Determination

Daily Production - Tons	Number of Lots
0 - 300	1
301 - 600	2
601 - 1000	3
1001 - 1500	4
1501 - 2100	5
2101 - 2800	6
2801+	7

907-401.02.6.4.1--Roadway Density. The density requirement for each completed lift on a lot to lot basis from density tests performed by the Department shall be as follows:

1. For all leveling lifts, when full lane width and with a thickness as specified in the table in Subsection 907-401.02.4, 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.

When it is determined that the density for a lot is below the required density (93.0 percent or 92.0 percent) but not lower than 91.0 or 90.0 percent of maximum density, respectively, the Contractor will have the right to remove and replace the lot(s) not meeting the specified density requirements in lieu of accepting reduced payment for the lot(s).

When it is determined that the density for a lot is above 96.0 percent, the Engineer shall notify the Contractor who will make plant adjustments to resolve the problem.

When it is determined that the density for a lot is below 91.0 or 90.0 percent, respectively, the lot(s), or portions thereof shall be removed and replaced in accordance with Chapter 7 of the latest edition of MDOT's Field Manual for HMA at no additional cost to the State. A corrected lot will be retested for approval. No resampling will be performed when pavement samples are used for determining density.

At any time the average daily compaction (the total of the percent compaction for the lots produced in one day divided by the total number of lots for the day) does not meet the required percent compaction or more for two consecutive days, the Contractor shall notify the Engineer of proposed changes to the compactive effort. If the average daily compaction does not meet the

required percent compaction or more for a third consecutive day, the Contractor shall stop production until compaction procedures are established to meet the specified density requirements.

Each lot of work found not to meet the density requirement of 92.0% or 93% of maximum density, respectively, may remain in place with a reduction in payment as set out in the following tables:

PAYMENT SCHEDULE FOR COMPACTION OF 92.0 PERCENT OF MAXIMUM DENSITY

Pay Factor	Lot Density ** % of Maximum Density
1.00	92.0 and above
0.90	91.0 - 91.9
0.70	90.0 - 90.9

** Any lot or portion thereof with a density of less than 90.0 percent of maximum density shall be removed and replaced at no additional cost to the State.

PAYMENT SCHEDULE FOR COMPACTION OF 93.0 PERCENT OF MAXIMUM DENSITY

Lot Density *** Pay Factor	% of Maximum Density
1.00	93.0 and above
0.90	92.0 - 92.9
0.70	91.0 - 91.9

*** Any lot or portion thereof with a density of less than 91.0 percent of maximum density shall be removed and replaced at no additional cost to the State.

The compaction pay factors and mixture quality pay factor, as described in Subsection 907-401.02.6.3, will each apply separately. However, the combined pay factor shall not be less than 0.50 for any mixture allowed to remain in place.

907-401.02.6.4.2--Trench Widening Density. The density for trench widening on a lot to lot basis shall be determined from density tests performed by the Department using pavement samples (cores).

When it is determined that the density for a trench widening lot is below 89.0 percent but not lower than 88.0 percent of maximum density, the Contractor will have the right to remove and replace the lot(s) not meeting the specified density requirements in lieu of accepting reduced payment for the lot(s).

When it is determined that the density for a trench widening lot is above 95.0 percent, the

Engineer shall notify the Contractor who will make plant adjustments to resolve the problem.

When it is determined that the density for a trench widening lot is below 88.0 percent, the lot(s), or portions thereof shall be removed and replaced in accordance with Chapter 7 of the latest edition of MDOT's Field Manual for HMA at no additional cost to the State. A corrected lot will be retested for approval. No resampling will be performed when pavement samples are used for determining density.

At any time the daily compaction (the total of the percent compaction for the lots produced in one day divided by the total number of lots for the day) does not meet 89.0 percent compaction or more for two consecutive days, the Contractor shall notify the Engineer of proposed changes to the compactive effort. If the average daily compaction does not meet 89.0 percent compaction or more for a third consecutive day, the Contractor shall stop production until compaction procedures are established to meet the specified density requirement.

Each lot of trench widening work found not to meet the density requirement of 91.0 percent of maximum density may remain in place with a reduction in payment as set out in the following table:

PAYMENT SCHEDULE FOR COMPACTION
TRENCH WIDENING WORK

Pay Factor	Lot Density *** % of Maximum Density
1.00	89.0 and above
0.50	88.0 - 88.9

*** Any lot or portion thereof with a density of less than 88.0 percent of maximum density shall be removed and replaced at no additional cost to the State.

The compaction pay factors and mixture quality pay factor, as described in Subsection 907-401.02.6.3, will each apply separately. However, the combined pay factor shall not be less than 0.50 for any mixture allowed to remain in place.

907-401.02.6.5--Blank.

907-401.02.6.6--Blank.

907-401.02.6.7--Surface Correction. Corrective work to sections exceeding short continuous interval thresholds reported by ProVal, as described in Subsection 907-403.03.2.1, shall consist of diamond grinding in accordance with these specifications or methods approved by the Engineer. All surface areas corrected by grinding shall be sealed with a sealant approved by the Engineer.

907-401.02.6.7.1--Diamond Grinding. Grinding of asphalt surfaces shall consist of diamond grinding the existing asphalt pavement surface to remove surface distortions to achieve the specified surface smoothness requirements.

907-401.02.6.7.2--Equipment. The grinding equipment shall be a power driven, self-propelled machine that is specifically designed to smooth and texture pavement surfaces with diamond blades. The effective wheel base of the machine shall not be less than 12.0 feet. It shall have a set of pivoting tandem bogey wheels at the front of the machine and the rear wheels shall be arranged to travel in the track of the fresh cut pavement. The center of the grinding head shall be no further than 3.0 feet forward from the center of the back wheels.

The equipment shall be of a size that will cut or plane at least two feet (2') wide. It shall also be of a shape and dimension that does not encroach on traffic movement outside of the work area. The equipment shall be capable of grinding the surface without causing spalls at joints, or other locations.

907-401.02.6.7.3--Construction. The construction operation shall be scheduled and proceed in a manner that produces a uniform finish surface. Grinding will be accomplished in a manner to provide positive lateral drainage by maintaining a constant cross-slope between grinding extremities in each lane.

The operation shall result in pavement that conforms to the typical cross-section and the requirements specified in Subsection 907-401.02.6.7.4. It is the intent of this specification that the surface smoothness characteristics be within the limits specified.

The Contractor shall establish positive means for removal of grinding residue. Solid residue shall be removed from pavement surfaces before it is blown by traffic action or wind. Residue shall not be permitted to flow across lanes used by public traffic or into gutters or drainage facilities, but may be allowed to flow into adjacent ditches.

907-401.02.6.7.4--Finished Pavement Surface. The grinding process shall produce a pavement surface that is smooth and uniform in appearance with a longitudinal line type texture. The line type texture shall contain parallel longitudinal corrugations that present a narrow ridge corduroy type appearance. The peaks of the ridges shall not be more than 1/16 inch higher than the bottoms of the grooves.

The finished pavement surface will be measured for riding quality. The grinding shall produce a riding surface which does not exceed either the specified profile index or the specified bump and dip limit.

907-401.02.6.8--Acceptance Procedure for Pavement Smoothness Using Mean Roughness Index (MRI). When compaction is completed, the lift shall have a uniform surface and be in reasonably close conformity with the line, grade and cross section shown on the plans.

The smoothness of the surface lift will be determined by using an Inertial Profiling System (IPS) to measure and record roughness data in each designated location. Roughness data for each longitudinal profile will be reported as a Mean Roughness Index (MRI). MRI is calculated by averaging the International Roughness Index (IRI) values from the two individual wheelpath profiles. The surface shall be tested and corrected to a smoothness index as described herein

with the exception of those locations or specific projects that are excluded from smoothness testing with an IPS.

The smoothness of the surface lift will be determined for traffic lanes, auxiliary lanes, climbing lane and two-way turn lanes. Areas excluded from a smoothness test with the IPS are acceleration and deceleration lanes, tapered sections, transition sections for width, shoulders, crossovers, ramps, side street returns, etc. The roadway pavement on bridge replacement projects having 1,000 feet or less of pavement on each side of the structure will be excluded from a smoothness test. Pavement on horizontal curves having a radius of less than 1,000 feet at the centerline and pavement within the super elevation transition of such curves are excluded from smoothness testing. Smoothness testing shall terminate 264 feet from each transverse joint that separates the pavement from a bridge deck, bridge approach slab or existing pavement not constructed under the contract. This shall apply to any other exceptions including, but not limited to, railroad crossings and manholes. Segments containing a considerable amount of encroachments such as intersections, manholes, curb and gutter sections, etc. may be excluded at the Project Engineer's discretion.

Initial smoothness measurements shall take place no more than 72 hours following placement of surface and must be performed at the posted speed limit or 50 miles per hour (±5 mile per hour), whichever is lower. This speed requirement will be waived for all lightweight profilers. Measurements will be made in both wheel paths of exterior and interior lanes. The wheel paths shall be designated as being located three feet (3') and nine feet (9') from centerline or longitudinal joint, respectively. Beginning and ending latitude and longitude coordinates shall be required on each smoothness surface test. Testing will also be required on sections that have been surface corrected. No smoothness testing shall be performed when there is moisture of any kind on the pavement surface. Any additional testing shall meet the requirements of Subsection 907-403.03.2.

The surface lift will be accepted on a continuous interval basis for pavement smoothness. Continuous reporting is based upon all MRI values for a specified running interval. These values are averaged and presented at the midpoint of the specified running interval. The last 15 feet of a day's lift may not be obtainable until the lift is continued and for this reason may be included in the subsequent section.

Areas of localized roughness exceeding the continuous 25-foot interval threshold described in Subsection 907-403.03.2.1 shall be corrected regardless of the 528-foot interval MRI value of the section. Surface correction by grinding shall be performed in accordance with Subsection 907-401.02.6.7. The Contractor shall also make other necessary surface corrections to ensure that the final mean roughness index of the section meets the requirements of Subsection 907-403.03.2.

Continuous sections exceeding the accepted long interval MRI value shall be corrected as specified in Subsection 403.03.4. All such corrections shall be performed at no additional costs to the State. Scheduling and traffic control will be the responsibility of the Contractor with approval of the Engineer. All tests and corrections shall be in accordance with AASHTO R 54-10, Accepting Pavement Ride Quality When Measured Using Inertial Profiling Systems.

907-401.02.6.9--High Speed Inertial Profiling System.

907-401.02.6.9.1--General. The IPS, furnished and operated by the Contractor under the supervision of the Engineer or the Engineer's representative, shall be a dual laser high speed or lightweight vehicle meeting the requirements of AASHTO M 328-10, Standard Specification for Inertial Profiler.

907-401.02.6.9.2--Mechanical Requirements. The IPS should function independent of vehicle suspension and speed with an operational range of 15-70 mph (for high speed profilers only) and must collect data at a sample interval of no more than three inches (3"). All IPSs, operators, and combinations thereof shall be verified in accordance with AASHTO R 56-10, Standard Practice for Certification of Inertial Profiler Systems and AASHTO R 57-10, Operating Inertial Profiler Systems.

907-401.02.6.9.3--Computer Requirements. The computer measurement program must be menu driven, Windows compatible, and able to produce unfiltered profiler runs in any one of the following file formats: University of Michigan's Transportation Research Institute's (UMTRI) Engineering Research Division (*.erd) file, ProVAL's Pavement Profile (*.ppf) file, or Ames Engineering's (*.adf) file format. The computer shall have the ability to display and print data on site for verification and shall have the ability to save and transfer data via Universal Serial Bus (USB) flash drive, which shall be provided by the Contractor.

All profiler runs must be named in the following format for acceptance by the Project Engineer:

- County_Route_Direction_Lane_BeginStation_EndStation

In addition to manufacturers software; the latest version of FHWA's ProVAL software shall be installed on the IPS computer. ProVAL software is available for free download at http://www.roadprofile.com.

907-401.02.7--Nuclear Gauges.

907-401.02.7.1--Nuclear Moisture-Density Gauge. The nuclear gauge unit used to monitor density shall contain a full data processor which holds all calibration constants necessary to compute and directly display wet density, moisture, and dry density in pounds per cubic foot. The data processor shall compute and display the percent moisture and percent density based on dry weight.

907-401.02.7.2--Nuclear Asphalt Content Gauge. The Contractor shall furnish and calibrate, unless designated otherwise in the contract, a Troxler Nuclear Asphalt Content Gauge Model 3241 or updated model, or a Campbell Nuclear Asphalt Content Gauge Model AC-2 or an approved equal.

907-401.03--Construction Requirements. Mississippi DOT has adopted the "Hot-Mix Asphalt Paving Handbook" as the guideline for acceptable asphalt construction practices.

907-401.03.1--Specific Requirements.

907-401.03.1.1--Weather Limitations - General. The mixture shall not be placed when weather conditions prevent the proper handling and finishing or the surface on which it is to be placed is wet or frozen.

When paving operations are discontinued because of rain, the mixture in transit shall be protected until the rain ceases. The surface on which the mixture is to be placed shall be swept to remove as much moisture as possible and the mixture may then be placed subject to removal and replacement at no additional cost to the State if contract requirements are not met.

907-401.03.1.1.1--Weather Limitations For HMA. At the time of placement, the air and pavement surface temperature limitations shall be equal to or exceed that specified in the following table.

TEMPERATURE LIMITATIONS

Compacted Thickness	Temperature
Less than 1½ inches	55°F
1½ inches to 2 inches	50°F
2¼ inches to 3 inches	45°F
Greater than 3 inches	40°F

907-401.03.1.1.2--Weather Limitations For WMA. The air and pavement temperature at the time of placement shall equal or exceed 40ºF, regardless of compacted lift thickness.

907-401.03.1.2--Tack Coat. Tack coat shall be applied to previously placed asphalt 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.

907-401.03.1.3--Blank.

907-401.03.1.4--Density. 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 907-401.02.4, the required lot density shall be 92.0 percent of maximum density. If a job-mix formula adjustment is made during the day which affects the maximum specific gravity, calculate a new average maximum density for the lot(s) placed after the change.

Pavement core samples obtained for determining density which has a thickness less than two times the maximum size aggregate permitted by the job-mix formula will not be used as a

representative sample.

Preleveling, wedging (less than fifty percent of width greater than minimum lift thickness), ramp pads, irregular shoulder areas, median crossovers, turnouts, and other areas where an established rolling pattern cannot be obtained shall be compacted to refusal densification.

907-401.03.2--Bituminous Mixing Plants.

907-401.03.2.1--Plant Requirements.

907-401.03.2.1.1--Cold Aggregate Storage. The cold storage for hydrated lime shall be a separate bulk storage bin with a vane feeder or other approved feeder system which can readily be calibrated. The system shall provide a means for easy sampling of the hydrated lime additive and verifying the quantity of lime dispensed. The feeder system shall require a totalizer.

The hydrated lime additive equipment shall be interlocked and synchronized with the cold feed controls to operate concurrently with the cold feed operation which will automatically adjust the hydrated lime feed to variations in the cold aggregate feed. A positive signal system shall be installed which will automatically shut the plant down when malfunctions cause an improper supply of hydrated lime or water.

The plant shall not operate unless the entire hydrated lime system is functioning properly.

907-401.03.2.1.2--Cold Aggregate Feed. The hydrated lime shall be dispensed dry or as a slurry directly onto the composite aggregate between the cold feed and the dryer. The slurry shall consist of 1 part hydrated lime to 3 parts water.

When hydrated lime is introduced dry, a spray bar or other approved system capable of spraying all aggregate with water shall be installed in order to maintain all aggregate at the moisture condition set out in Subsection 907-401.02.3.1 prior to addition of the hydrated lime. An alternate system for spraying the coarse aggregate stockpiles may be allowed when approved by the Engineer. The approved equipment and methods shall consistently maintain the aggregate in a uniform, surface wet condition. The moisture content of the aggregate-hydrated lime mixture, following spraying and mixing, shall be introduced into the automatic moisture controls of the plant.

The aggregate-hydrated lime mixture shall be uniformly blended by some mechanical means such as a motorized "on the belt" mixer or pug mill located between the cold feed and the dryer. Other mixing devices may be used subject to approval by the Engineer.

A maximum of forty five (45) percent of the total aggregate blend may be fed through any single cold feed bin. If the JMF calls for more than forty five (45) percent of a specific aggregate, that aggregate must be fed through two (2) or more separate cold feed bins.

907-401.03.2.1.3--Dryer. The efficiency of drying aggregates shall be such that the moisture content of the top asphalt mixture shall not exceed 0.50 percent by weight of the total mixture, and the moisture content of all the underlying mixtures shall not exceed 0.75 percent by weight

of the total mixture being produced.

907-401.03.2.1.4--Blank.

907-401.03.2.1.5--Control of Bituminous Material and Antistripping Agent. Specified bituminous materials from different manufacturers or from different refineries of a single manufacturer shall not be mixed in the plant's asphalt cement supply system storage tank and used in the work without prior written approval of the Engineer. Approval is contingent upon the Engineer's receipt of three copies of the manufacturer's certified test report(s) from the Contractor showing that the bituminous material blend conforms to the specifications.

A satisfactory method of weighing or metering shall be provided to ensure the specified quantity of bituminous material. Provisions shall be provided for checking the quantity or rate of flow. Weighing or metering devices shall be accurate within plus or minus one-half percent.

The antistripping agent shall be injected into the bituminous material immediately prior to the mixing operation with an approved in-line injector system capable of being calibrated so as to ensure the prescribed dosage.

An in-line spigot for sampling of asphalt shall be located between the asphalt storage tank and the antistripping agent in-line injector.

907-401.03.2.1.6--Thermometric Equipment. An armored thermometer of adequate range and calibrated in 5°F increments shall be fixed at a suitable location in the bituminous line near the charging valve of the mixer unit.

The plant shall be equipped with an approved dial-scale, mercury-actuated thermometer, pyrometer or other approved thermometric instrument placed at the discharge chute of the dryer to measure the temperature of the material.

When the temperature control is unsatisfactory, the Engineer may require an approved temperature-recording apparatus for better regulation of the temperature.

907-401.03.2.1.7--Screens. A scalping screen shall be used.

907-401.03.2.1.8--Dust Collector. The plant shall be equipped with a dust collector constructed to waste or return collected material. When collected material is returned, it shall be returned through a controlling device which will provide a uniform flow of material into the aggregate mixture.

907-401.03.2.1.9--Safety Requirements. A platform or other suitable device shall be provided so the Engineer will have access to the truck bodies for sampling and mixture temperature data.

907-401.03.2.1.10--Blank.

907-401.03.2.1.11--Truck Scales. The specifications, tolerances and regulations for commercial weighing and measuring devices as recommended by the National Bureau of Standards [National

Institute of Standards and Technology (NIST) Handbook 44] shall govern truck scales used in the State of Mississippi, except weighing devices with a capacity of ten thousand (10,000) pounds or more used to weigh road construction materials (i.e. sand, gravel, asphalt, fill dirt, topsoil and concrete) shall have a tolerance of one-half of one percent (1/2 of 1%) in lieu of the requirements of Handbook 44 and shall be regulated by the Mississippi Department of Transportation.

Scales shall be checked and certified by a scale company certified in heavy truck weights by the Mississippi Department of Agriculture and Commerce. In the case of scales used for measurement of materials on Department of Transportation projects, certification shall be performed in the presence of an authorized representative of the Department or a copy of the certification may be furnished for scales that have been checked and certified within the last six months for use on other Department of Transportation projects and are still in the position where previously tested. Scales that have not been checked and certified under NIST Handbook 44 guidelines, except for the herein modified tolerances allowed, shall be so checked and certified prior to use for measurement of materials on Department of Transportation projects. Tests shall be continued on six month intervals with the test conducted in the presence of an authorized representative of the Department.

Truck scales shall be accurate to one-half of one percent of the applied load, shall be sensitive to 20 pounds, and shall have a graduation of not more than 20 pounds.

The Contractor may use an electronic weighing system approved by the Engineer in lieu of truck scales. The system shall be equipped with an automatic print out system which will print a ticket for each load with the following information:

> MDOT, Contractor's name, project number, county, ticket number, load number, pay item number, item description of the material delivered, date, time of day, haul vehicle number, gross weight, tare weight, net weight and total daily net weight.

When approved by the Engineer and materials are measured directly from a storage bin equipped with load cells, exceptions may be made to the gross and tare weight requirements.

The ticket shall also have a place for recording the temperature of asphalt mixtures, if applicable, and the signatures of MDOT's plant and roadway inspectors. The load numbers for each project shall begin with load number one (1) for the first load of the day and shall be numbered consecutively without a break until the last load of the day. The Contractor shall provide MDOT with an original and one copy of each ticket. When the ticket information provided by the Contractor proves to be unsatisfactory, MDOT will use imprinter(s) and imprinter tickets to record load information. All recorded weights shall be in pounds and shall be accurate to within one-half of one percent of the true weight, and the system shall be sensitive to 20 pounds. The Engineer will require random loads to be checked on certified platform scales at no cost to the Department.

When an electronic weighing system utilizes the plant scales of a batch plant, the system may be used only in conjunction with a fully automatic batching and control system.

907-401.03.2.2--Additional Requirements for Batching Plants.

907-401.03.2.2.1--Plant Scales. The plant batch scale weight shall not exceed the platform scale weight by more than one percent (1.0%).

907-401.03.2.3--Additional Requirements for Drum Mixing Plants.

907-401.03.2.3.1--Plant Controls. The plant shall be operated with all the automatic controls as designed and provided by the plant manufacturer. If the automatic controls malfunction, brief periods of manual operations to complete the day's work or to protect the work already placed may be conducted with the approval of the Engineer. During manual operation, the Contractor must continue to produce a uniform mixture meeting all contract requirements.

907-401.03.2.3.2--Aggregate Handling and Proportioning. A screening unit shall be placed between the bins and the mixer to remove oversized aggregate, roots, clayballs, etc.

907-401.03.2.4--Surge or Storage Bins. Surge and/or storage systems may be used at the option of the Contractor provided each system is approved by the Department prior to use. Surge bins shall be emptied at the end of each day's operation. Storage silos may be used to store mixtures as follows:

19-mm & 25-mm mixtures ..... 24 hours
9.5-mm & 12.5-mm mixtures ..... 36 hours

The storage silos must be well sealed, completely heated and very well insulated. The mixture when removed from the storage silo shall be tested to ensure that it meets all the same specifications and requirements as the mixture delivered directly to the paving site. See Subsection 907-401.02.5.3, subparagraph (i) for sampling and testing requirements.

907-401.03.3--Hauling Equipment. The inside surfaces of each vehicle bed shall be coated with a light application of water and thin oil, soap solution, lime water solution or other approved material to prevent the mixture from sticking. Diesel fuel or gasoline shall not be used to lubricate vehicle beds. Truck beds shall be raised to drain excessive lubricants before placing mixture in the bed. An excess of lubricant will not be permitted.

907-401.03.4--Bituminous Pavers. The screed or strikeoff assembly shall be capable of vibrating and heating the full width of the mixture being placed and shall lay the lift with an automatic control device to the specified slope and grade without tearing, pulling or gouging the mixture surface.

907-401.03.5--Rollers. All rollers shall be self-propelled units capable of maintaining a smooth and uniform forward and reverse speed as required for proper compaction. They shall be equipped with adjustable scrapers, water tanks, mats and a device for wetting the wheels or tires to prevent the mixture from sticking. Adhesion of the mixture to the rollers will not be permitted. The use of diesel fuel or gasoline for cleaning roller wheels or tires or to aid in preventing the mixture from sticking to the wheels or tires is prohibited.

All rollers shall be in good mechanical condition, free from leaking fuels and lubricants, loose link motion, faulty steering mechanism, worn king bolts and bearings. They shall be operational at slow speeds to avoid displacement of the mixture and capable of reversing direction smoothly and without backlash.

907-401.03.6--Preparation of Grade. The foundation upon which asphalt pavement is to be placed shall be prepared in accordance with the applicable Section of the Standard Specification.

Unless otherwise directed, tack coat shall be applied to the underlying surface on which the mixture is to be placed. Emulsions, if used, must be allowed to "break" prior to placement of the bituminous mixture.

Bituminous mixture shall not be placed against the edge of pavements, curbs, gutters, manholes and other structures until sprayed with a thin uniform tack coating. The tack coat shall be protected until the mixture has been placed.

Existing asphalt pavements that require preliminary leveling or patching in advance of placing the bituminous mixture shall be sprayed with a tack coat material and then brought as nearly as practicable to uniform grade and cross section. The material shall be placed by hand or machine in one or more compacted layers approximately two (2) inches or less in compacted thickness.

907-401.03.7--Blank.

907-401.03.8--Preparation of Mixture.

907-401.03.8.1--Preparation of Mixture For HMA. The temperature of the mixture, when discharged from the mixer, shall not exceed 340°F.

907-401.03.8.2--Preparation of Mixture For WMA. Warm mix asphalt is defined as a plant produced asphalt mixture that can be produced and constructed at lower temperatures than typical hot mix asphalt. Typical temperature ranges of non-polymer modified, WMA produced by foaming the asphalt binder at the plant are typically 270ºF to 295ºF at the point of discharge of the plant. Typical temperature ranges of polymer modified, WMA produced by foaming the asphalt binder at the plant are typically 280ºF to 305ºF at the point of discharge of the plant. WMA produced by addition of a terminal blended additive may allow the producer to reduce the temperatures below 270ºF as long as all mixture quality and field density requirements are met. Production temperatures at the plant may need to be increased or decreased due to factors such as material characteristics, environmental conditions, and haul time to achieve mixture temperatures at the time of compaction in which uniform mat density can be achieved.

907-401.03.9--Material Transfer Equipment. 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 asphalt 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.

907-401.03.10--Spreading and Finishing. Grade control for asphalt pavements shall be established by stringline at least 500 feet ahead of spreading, unless placement is adjacent to curb and gutter, concrete pavement, or other allowed grade control.

The mixture shall be spread to the depth and width that will provide the specified compacted thickness, line, grade and cross section. Placing of the mixture shall be as continuous as possible. On areas where mechanical spreading and finishing is impracticable, the mixture may be spread, raked and luted by hand tools.

Immediately after screeding and prior to compaction, the surface shall be checked by the Contractor and irregularities adjusted. When the edge is feathered as in a wedge lift, it may be sealed by rolling. Irregularities in alignment and grade along the edges shall be corrected before the edges are rolled.

Hauling, spreading and finishing equipment shall be furnished that is capable of and operated in such a manner that the rolling operation will satisfactorily correct any surface blemishes.

The longitudinal joint in the subsequent lift shall offset that in the underlying lift by approximately six (6) inches. However, the joint in the top lift shall be at the centerline or lane line.

907-401.03.11--Compaction. After the mixture has been spread and surface irregularities corrected, it shall be thoroughly and uniformly compacted to the required line, grade, cross section and density.

907-401.03.12--Joints. Joints between previously placed pavement and pavement being placed shall be so formed as to insure thorough and continuous bond.

Transverse construction joints shall be formed by cutting the previously placed mixture to expose the full depth of the lift.

The contact surface of transverse joints and longitudinal joints, except hot joints, shall be sprayed with a thin uniform tack coating before additional mixture is placed against the previously placed material.

Longitudinal joints shall be formed by overlapping the screed on the previously placed material for a width of at least one (1) inch and depositing the quantity of mixture to form a smooth, tight joint.

Joint Sealant. When a pay item for 907-403-S, Joint Sealant, is included in the contract, 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, Dura-Fill Cold Joint Adhesive, or approved equal, prior to placement of additional

asphalt 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.

907-401.03.13--Pavement Samples. The Contractor shall cut samples from each lift of asphalt at the time and locations designated by the Engineer. The samples shall be taken for the full depth of each lift and shall be of a size approved by the Engineer but not to exceed 120 square inches. Tools used for cutting or coring of samples shall be of the revolving blade type such as saw or core drill. Cores shall be taken using a 4.0 to 6.0-inch inside diameter coring bit. The sample hole shall be filled, compacted and finished by the Contractor to conform with the surrounding area. No additional compensation will be allowed for furnishing samples and repairing the areas with new pavement.

907-401.03.14--Shoulder Wedge. The Contractor shall attach a device to the screed of the paver that confines the material at the end gate and extrudes the asphalt material in such a way that results in a compacted wedge shape pavement edge of approximately 30 degrees, but not steeper than 35 degrees. The device shall maintain contact between itself and the road shoulder surface and allow for automatic transition to cross roads, driveways, and obstructions. The device shall be used to constrain the asphalt head reducing the area by 10% to 15% increasing the density of the extruded profile. Conventional single plate strike off shall not be used.

The device shall be TransTech Shoulder Wedge Maker, the Advant-Edge, or a similar approved equal device that produces the same wedge consolidation results. Contact information for these wedge shape compaction devices is the following.

1. TransTech Systems, Inc.
   1594 State Street
   Schenectady, NY 12304
   800-724-6306
   www.transtechsys.com

2. Advant-Edge Paving Equipment, LLC
   P.O. Box 9163
   Niskayuna, NY 12309-0163
   518-280-6090
   Contact; Gary D. Antonelli
   Cell: 518-368-5699

email: garya@nycap.rr.com
Website: www.advantedgepaving.com

Before using a similar device, the Contractor shall provide proof that the device has been used on previous projects with acceptable results, or construct a test section prior to the beginning of work and demonstrate wedge compaction to the satisfaction of the Engineer. Short sections of handwork will be allowed when necessary for transitions and turnouts, or otherwise authorized by the Engineer.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-402-6 DB **CODE: (SP)**

DATE: **02/17/2015**

SUBJECT: **Open Graded Friction Course (OGFC)**

Section 907-402, Open Graded Friction Course (OGFC), is hereby added to and made part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-402 –- OPEN GRADED FRICTION COURSE (OGFC)

907-402.01--Description. These specifications include general requirements that are applicable to Open Graded Friction Course (OGFC).

This work consists of the construction of one lift of OGFC in accordance with these specifications and the specific requirements for the mixture to be produced and placed in reasonably close conformity with the lines, grades, thicknesses and typical sections shown on the plans or established by the Engineer.

907-402.01.1--Definitions.

Maximum Sieve Size - Maximum sieve size is the smallest sieve size at which 100 percent of the aggregate passes.

Nominal Maximum Sieve Size - The nominal maximum sieve size is one sieve size larger than the first sieve to retain more than 10 percent of the aggregate.

Mechanically Fractured Face - An angular, rough, or broken surface of an aggregate particle created by crushing as determined by ASTM Designation: D 5821.

Break Point Sieve – The sieve size which separates the coarse and fine aggregate fractions of an OGFC mixture.

907-402.02--Materials.

907-402.02.1--Component Materials.

907-402.02.1.1--General. Component materials will be conditionally accepted at the plant subject to later rejection if incorporated in a mixture or in work that fails to meet contract requirements.

907-402.02.1.2--Aggregates. The source of aggregates shall meet the applicable requirements of Section 703.

907-402.02.1.2.1--Coarse Aggregate Blend. Mechanically fractured faces by weight of the combined aggregate blend retained on the break point sieve shall be 90 percent two or more fractured faces, as determined by ASTM Designation: D 5821.

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The maximum percentage by weight of flat and elongated particles, maximum to minimum dimension greater than three (3), shall not exceed 20% for OGFC mixtures. This shall be determined in accordance with ASTM Designation: D 4791, Section 8.4, on the combined mineral aggregate retained on the break point sieve.

The following table indicates the break point sieves for various nominal maximum size OGFC mixes.

Mixture Size	Break Point Sieve
12.5-mm	No. 4
9.5-mm	No. 8

907-402.02.1.2.2--Combined Aggregate Blend. All gradations will be based on percent passing by weight. The gradation requirements for OGFC mixtures are provided in the following table. Natural sand shall not be used in OGFC mixtures.

Sieve Size	**12.5-mm**	**9.5-mm**
12.5-mm	100	100
9.5-mm	80-89	90-100
4.75-mm	15-30	15-30
2.36-mm	10-20	10-20
75-µm	2-5	2-5

907-402.02.1.3--Bituminous Materials. Bituminous materials shall meet the applicable requirements of Section 702 for the grade specified. A PG 76-22 asphalt binder shall be used for all OGFC mixtures. The asphalt content (by weight of total mix) shall be based on the bulk specific gravity of the combined aggregate blend (G_{sb}) to ensure a constant asphalt binder volume in the mix for durability purposes. The relationship between G_{sb} and the minimum asphalt binder content by weight of total mix is provided in the following table.

Combined Aggregate Bulk Specific Gravity, G_{sb}	Minimum Asphalt Content (%)
2.40	6.6
2.45	6.5
2.50	6.3
2.55	6.2
2.60	6.1
2.65	6.0
2.70	5.9
2.75	5.8
2.80	5.7
2.85	5.6

2.90	5.5
2.95	5.4
3.00	5.3

Tack coat shall meet the requirements of Subsection 907-402.03.1.2.

907-402.02.1.4--Hydrated Lime. Hydrated lime shall meet the requirements of Subsection 714.03.2 for lime used in soil stabilization.

907-402.02.1.5--Asphalt Admixtures. Additives for liquid asphalt, when required or permitted, shall meet the requirements of Subsection 702.08.

907-402.02.1.6--Polymers. Polymers for use in OGFC shall meet the requirements of Subsection 702.08.3.

907-402.02.1.7--Stabilizing Fiber. Stabilizing fiber shall meet the requirements of Subsection 907-714.07, with the exception that if mineral fibers are used, the minimum dosage rate shall be 0.40 percent.

907-402.02.2--Blank.

907-402.02.3--Composition of Mixtures.

907-402.02.3.1--General. Unless otherwise specified or permitted, the OGFC shall consist of a uniform mixture of asphalt, aggregate, stabilizing fibers, hydrated lime and, when required or necessary to obtain desired properties, antistripping agent and/or other materials.

The total amount of crushed limestone aggregate shall not exceed 50 percent of the total combined aggregate by weight.

Hydrated lime shall be used in all OGFC at the rate of one percent (1%) by weight of the total dry aggregate. The aggregate, prior to the addition of the hydrated lime, shall contain sufficient surface moisture. If necessary, the Contractor shall add moisture to the aggregate according to the procedures set out in Subsection 401.03.2.1.2.

The Contractor shall obtain a shipping ticket for each shipment of hydrated lime. The Contractor shall provide the District Materials Engineer with a copy of each shipping ticket from the supplier, including the date, time and weight of hydrated lime shipped.

Mixtures will require the addition of an antistripping agent when the Tensile Strength Ratio (MT-63*) and/or the Boiling Water Test (MT-59) fail to meet the following criteria.

Tensile Strength Ratio (TSR - MT-63*)

Wet Strength / Dry Strength	85 percent minimum
Interior Face Coating	95 percent minimum

Boiling Water Test (MT-59)

Particle Coating	95 percent minimum

*__Note:__ MT-63 shall be performed at design air void content of OGFC mixtures rather than seven percent (7%) air voids. Vacuum saturation shall not be required. All other testing parameters shall apply.

Reclaimed asphalt pavement (RAP) or crushed reclaimed concrete may not be used as an aggregate component in the production of OGFC.

907-402.02.3.1.1--Mixture Properties. All mixes shall be designed according to Mississippi Test Method MT-83. OGFC mixes shall be designed with the Superpave gyratory compactor utilizing an N_{design} of 50 gyrations. The design air voids for all OGFC mixes shall be a minimum of 15.0 percent, as determined by ASTM Designation: D 6752 (vacuum sealing method). The ratio of the voids in the coarse aggregate in the compacted mix (VCA_{mix}) to the voids in the coarse aggregate as determined with the dry rodded unit weight test (VCA_{dr}) shall be less than 1.0.

The designed mixture shall have a draindown of less than 0.3 percent when tested in accordance with Mississippi Test Method MT-82. The minimum permeability of the mixture shall be 30 meters per day as determined by Mississippi Test Method MT-84. The aged abrasion loss of compacted specimens at the optimum asphalt content shall not exceed 40%, and the unaged abrasion loss of compacted specimens at the optimum asphalt content shall not exceed 30%, as determined by Mississippi Test Method MT-85.

907-402.02.3.2--Job Mix Formula. At least 14 business days prior to the proposed use of each mixture, the Contractor shall submit in writing to the Engineer a proposed job-mix formula or request the transfer of a verified job-mix formula as set forth in the latest edition of MDOT's Field Manual for HMA and MT-83. The job-mix formula shall be signed by a Certified Mixture Design Technician (CMDT).

The Department will perform the tests necessary for review of a proposed job-mix formula for each OGFC mixture free of charge one time only. A charge will be made for additional job-mix formulas submitted by the Contractor for review.

Review of the proposed job-mix formula will be based on ratio of Voids in the Coarse Aggregate (VCA_{mix}/VCA_{dr}), draindown, permeability, abrasion loss, resistance to stripping, and other criteria specified for the mixture.

The mixture shall conform thereto within the range of tolerances specified for the particular mixture. No change in properties or proportion of any component of the job-mix formula shall be made without permission of the Engineer. The job-mix formula for each mixture shall be in effect until revised in writing by the Engineer.

A job-mix formula may be transferred to other contracts in accordance with conditions set forth in the Department's Field Manual for HMA.

The Contractor shall not place any OGFC prior to receiving “tentative” approval and a MDOT design number from the Central Laboratory.

When a change in source of materials, unsatisfactory mixture production results (such as segregation, bleeding, shoving, rutting over ⅛ inch, raveling & cracking) or changed conditions make it necessary, a new job-mix formula will be required. The conditions set out herein for the original job-mix formula are applicable to the new job-mix formula.

907-402.02.4--Layer Thickness. The minimum and maximum laying thickness for OGFC mixtures are provided in the following table.

Mixture Nominal Maximum Size	Single Lift Laying Thickness, Inches	
	Minimum	Maximum
12.5-mm	1	1¼
9.5-mm	¾	1

907-402.02.5--Contractor's Quality Management Program.

907-402.02.5.1--General. The Contractor shall have full responsibility for quality management and maintain a quality control system that will furnish reasonable assurance that the mixtures and all component materials incorporated in the work conform to contract requirements. The Contractor shall have responsibility for the initial determination and all subsequent adjustments in proportioning materials used to produce the specified mixture. Adjustments to plant operation and spreading and compaction procedures shall be made immediately when results indicate that they are necessary. Mixture produced by the Contractor without the required testing or personnel on the project shall be subject to removal and replacement by the Contractor at no additional cost to the State.

907-402.02.5.2--Personnel Requirements. The Contractor shall provide at least one Certified Asphalt Technician-I (CAT-I) full-time during OGFC production at each plant site used to furnish material to the project. Sampling shall be conducted by a certified technician or by plant personnel under the direct observation of a certified technician. All testing, data analysis and data posting will be performed by the CAT-I or by an assistant under the direct supervision of the CAT-I. The Contractor shall have a Certified Asphalt Technician-II (CAT-II) available to make any necessary process adjustments. Technician certification shall be in accordance with MDOT’s *Materials Division Inspection, Testing, and Certification Manual*, Section 1.3.3 - MDOT HMA Technician Certification Program. An organizational chart, including names, telephone numbers and current certification, of all those responsible for the quality control program shall be posted in the contractor's laboratory while the OGFC paving work is in progress.

907-402.02.5.3--Testing Requirements. As a minimum, the Contractor's quality management program shall include the following:

(a) Bituminous Material. Provide the Engineer with samples in a sealed one quart metal container at the frequency given in MDOT SOP TMD-20-04-00-000.

(b) Mechanically Fractured Face. Determine mechanically fractured face content of aggregates retained on the break point sieve, at a minimum of one test per day of production.

(c) Mixture Gradation. Conduct extraction tests for gradation determination on the mixture. Sample according to the frequency in paragraph (h) and test according to Mississippi Test Method MT-31.

(d) Total Voids. Determine total voids at N_{Design} from the results of bulk specific gravity tests on laboratory compacted specimens. Sample according to the sampling frequency in paragraph (h) and test according to ASTM Designation: D 6752.

(e) Asphalt Content. Sample according to the sampling frequency in paragraph (h), and determine the asphalt content using one of the following procedures.

(1) Nuclear gauge. (Mississippi Test Method MT-6)
(2) Incinerator oven. (AASHTO Designation: T 308, Method A)

Draindown tests shall also be conducted according to Mississippi Test Method MT-82, at a minimum of one test per day of production..

(f) Stripping Tests. Conduct a minimum of one stripping test at the beginning of each job-mix production and thereafter, at least once per each two weeks of production according to Mississippi Test Method: MT-63 (as amended) and one stripping test per day of production according to Mississippi Test Method: MT-59. Should either the TSR (MT-63) or the boiling water (MT-59) stripping tests fail, a new antistrip additive or rate shall be established or other changes made immediately that will result in a mixture which conforms to the specifications; otherwise, production shall be suspended until corrections are made.

(g) Quality Control Charts. Plot the individual test data, the average of the last four tests and the control limits for the following items as a minimum:

Mixture Gradation (Percent Passing) Sieves:
1/2-in, 3/8-in, No. 4, No. 8, and No. 200
Asphalt Content, Percent
Maximum Specific Gravity
Total Voids @ N_{Design}, Percent

Keep charts up-to-date and posted in a readily observable location. Charts may be kept on a computer; however, the charts shall be printed out a minimum of once each production day and displayed in the laboratory. Note any process changes or adjustments on the Air Voids chart.

(h) Sampling Frequency. Conduct those tests as required above at the following frequency for each mixture produced based on the estimated plant tonnage at the beginning of the day.

Total Estimated Production, tons	Number of Tests
1-400	1
401-800	2
801-1200	3
1201+	4

(i) Sample Requirements. Obtain the OGFC mixture samples from trucks at the plant. Obtain aggregate samples from cold feed bins or aggregate stockpile. Save a split portion of all mixture samples at the laboratory site in a dry and protected location for 14 calendar days. At the completion of the project, the remaining samples may be disposed of with the approval of the Engineer.

The above testing frequencies are for the estimated plant production for the day. If production is discontinued or interrupted, the tests will be conducted at the previously established sample tonnage points for the materials that are actually produced. If the production exceeds the estimated tonnage, sampling and testing will continue at the testing increments previously established for the day. A testing increment is defined as the estimated daily tonnage divided by the required number of tests from the table in Subsection 907-402.02.5.3 paragraph (h).

In addition to the above program, aggregate stockpile gradation tests (AASHTO Designations: T-11 and T-27) shall be conducted every other production day. Tests to determine VCA_{dr} shall be conducted on the first day of production and once for every eight production samples thereafter, with a minimum of one test per production week.

907-402.02.5.4--Documentation. The Contractor shall document all observations, records of inspection, adjustments to the mixture, and test results on a daily basis. All tests conducted by the Contractor in accordance with Subsection 907-402.02.5.3(g) shall be included in the running average calculations. If single tests are performed as a check on individual OGFC properties, between regular samples, without performing all tests required in Subsection 907-402.02.5.3(g), the results of those individual tests shall not be included in the running average calculations for that particular property. The Contractor shall record the results of observations and records of inspection as they occur in a permanent field record. The Contractor shall record all process adjustments and job mix formula (JMF) changes on the air void charts. The Contractor shall provide copies of all test data sheets and the daily summary reports on the appropriate Mississippi DOT forms to the Engineer on a daily basis. The Contractor shall provide a written description of any process change, including blend proportions, to the Engineer as they occur. Information provided to the Engineer must be received in the Engineer's office by no later than 9:00 AM the day after the OGFC is produced. Fourteen days after the completion of the placement of the OGFC, the Contractor shall provide the Engineer with the original testing records and control charts in a neat and orderly manner.

907-402.02.5.5--Control Limits. The following control limits for the job mix formula (JMF) and warning limits are based on a running average of the last four data points.

Item	JMF Limits	Warning Limits
Sieve - % Passing		

1/2-inch	± 4.0	± 3.0
3/8-inch	± 4.0	± 3.0
No. 4	± 3.0	± 2.0
No. 8	± 3.0	± 2.0
No. 200	± 1.5	± 1.0
Asphalt Content, %	-0.3 to +0.5	-0.2 to +0.4
Total Voids @ N_{Design}, %	-1.3 to +2.5	-1.0 to +2.0

907-402.02.5.6--Warning Bands. Warning bands are defined as the area between the JMF limits and the warning limits.

907-402.02.5.7--Job Mix Formula Adjustments. A request for a JMF adjustment signed by a CAT-II may be made to the Engineer by the Contractor. Sufficient testing data shall be submitted with the request to justify the change. The requested change will be reviewed by the State Materials Engineer for the Department. If current production values meet the mixture design requirements, a revised JMF will be issued. Adjustments to the JMF shall conform to the latest edition of MDOT's Field Manual for HMA. Adjustments to the JMF to conform to actual production shall not exceed the tolerances specified for the JMF limits. Regardless of such tolerances, any adjusted JMF gradation shall be within the range given in Subsection 907-402.02.1.2.3 for the mixture specified. **The JMF asphalt content may only be adjusted after verification for minimum voids, permeability, and abrasion loss.**

907-402.02.5.8--Actions and Adjustments. Based on the process control test results for any property in question, the following actions shall be taken or adjustments made when appropriate:

(a) When the running average trends toward the warning limits, the Contractor shall consider taking corrective action. The corrective action, if any, shall be documented. All tests shall be part of the contract files and shall be included in the running average calculations.
(b) The Contractor shall notify the Engineer whenever the running average exceeds the warning limits.
(c) If two consecutive running averages exceed the warning limit, the Contractor shall stop production and make adjustments. Production shall only be restarted after notifying the Engineer of the adjustments made.
(d) If the adjustment made under (c) improves the process such that the running average after four additional tests is within the warning limits, the Contractor may continue production with no reduction in payment.
(e) If the adjustment made under (c) does not improve the process and the running average after four additional tests stays in the warning band, the mixture will be considered unsatisfactory. Reduced payment for unsatisfactory mixtures will be applied starting from the stop point to the point when the running average is back within the warning limits in accordance with Subsection 907-402.02.6.3.
(f) Failure to stop production and make adjustments when required shall subject all mixture produced from the stop point to the point when the running average is back within the warning limits to be considered unsatisfactory. Reduced payment for unsatisfactory mixtures will be applied in accordance with Subsection 907-402.02.6.3.

(g) If the running average exceeds the JMF limits, the Contractor shall stop production and make adjustments. Production shall only be restarted after notifying the Engineer of the adjustments made.

(h) All materials for which the running average exceeds the JMF limits will be considered unacceptable and shall be removed and replaced by the Contractor at no additional cost to the State. The Engineer will determine the quantity of material to be replaced based on a review of the individual testing data which make up the running average in question and an inspection of the completed pavement. If the Engineer decides to leave the mixture in place because of special circumstances, the quantity of mixture, as defined above, will be paid for in accordance with Subsection 907-402.02.6.3.

(i) Single test results shall be compared to 1.7 times the warning and JMF limits. If the QC test results, as verified by the Engineer's tests (within allowable differences in Subsection 907-402.02.6.2), exceed these limits, the pay factor provided in Subsection 907-402.02.6.3 will apply for the quantity of material represented by the test(s). Single test limits will be used for the acceptance of projects when insufficient tonnage is produced to require four (4) Contractor's tests.

(j) The above corrective action will also apply for a mixture when the Contractor's testing data has been proven incorrect. The Contractor's data will be considered incorrect when; 1) the Contractor's QC tests and the Engineer's verification tests do not agree within the allowable differences given in Subsection 907-402.02.6.2 and the difference can not be resolved, or 2) the Engineer's verification tests indicates that production is outside the JMF limits and the results have been substantiated by the Materials Division's test results. The Engineer's data will be used in place of the Contractor's data to determine the appropriate pay factor.

907-402.02.5.9--Trial Section. At the beginning of placement for the lift, the Contractor shall construct a trial section of a maximum of 250 tons of mix, for the purpose of establishing and evaluating consistent mixture and compaction properties. The Contractor shall determine the production point at which the mix shall be sampled during trial section construction. This sample does not have to be selected by the formal random selection procedures used during actual production, but should be representative of the mix produced.

The Contractor (QC) and the Department (QA) will conduct tests for mixture quality. A trial section is considered to be successful if the QC test results are within the Warning Limits (the testing indicates a pay factor of 1.0) and the QC tests compare to the QA tests within the allowable differences set forth in Section 907-402.02.6.2. If the criteria for a successful trial section is not achieved, additional trial sections shall be constructed until the criteria is achieved, at which time full production may begin. In the event a successful trial section is not accomplished by the completion of the second trial section, the Contractor will be required to construct additional trial sections at an offsite location. The Engineer reserves the right to have any trial section removed and replaced at no additional cost to the State, if the pay factor for any characteristic for a trial section is less than 0.75.

For actual payment purposes, a pay factor of 1.00 will be used for the first and second trial sections allowed to remain in place. Any required offsite trial sections will be constructed at no additional cost to the State.

907-402.02.6--Standards of Acceptance.

907-402.02.6.1--General. Acceptance for mixture quality (Total voids @ N_{Design}, gradation, and asphalt content) will be based on random samples tested in accordance with the latest edition of MDOT's Field Manual for HMA.

907-402.02.6.2--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. 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 907- 402.02.5.8(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.

907-402.02.6.3--Acceptance Procedure for Mixture Quality. All obviously defective material or mixture will be subject to rejection by the Engineer. Such defective material or mixture shall

not be incorporated into the finished work. If the defective material has already been placed in the work, the material shall be removed and replaced at no additional cost to the State.

The Engineer will base final acceptance of the asphalt mixture production on the results of the Contractor's testing for total voids, gradation, and asphalt content as verified by the Engineer in the manner hereinbefore described and the uniformity and condition of the completed pavement. Areas of pavement that exhibit nonuniformity or failures (materials or construction related) such as but not limited to segregation, bleeding, shoving, rutting over 1/8 inch, raveling, slippage, or cracking will not be accepted. Such areas will be removed and replaced at no additional cost to the State.

Bituminous mixture placed prior to correction for deficiencies in total voids @ N_{Design}, gradation, or asphalt content, as required in Subsection 907-402.02.5.8 and determined by the Engineer satisfactory to remain in place will be paid for in accordance with the following pay factors times the contract unit price per ton.

Pay Factor for Mixture Quality *

Item	Produced in Warning Bands	Produced Outside JMF Limits (Allowed to Remain in Place)
Gradation	0.90	0.50
Asphalt Content	0.85	0.50
Total Voids @ N_{Design}	0.70	0.50

* The minimum single payment will apply.

907-402.02.7--Acceptance Procedure for OGFC Pavement Smoothness. The OGFC will not be considered a surface lift in the completed pavement structure. There shall be no smoothness requirement for OGFC pavements. However, all transverse joints in or abutting the OGFC shall meet a tolerance of 1/8" or less when checked using a 10-foot straight edge.

907-402.03--Construction Requirements. Mississippi DOT has adopted the "Hot-Mix Asphalt Paving Handbook" as the guideline for acceptable asphalt construction practices.

907-402.03.1--Specific Requirements.

907-402.03.1.1--Weather Limitations. The mixture shall not be placed when weather conditions prevent the proper handling and finishing or the surface on which it is to be placed is wet or frozen. At the time of placement, the air and pavement surface temperature limitations shall be equal to or exceed 55°F.

When paving operations are discontinued because of rain, the mixture in transit shall be protected until the rain ceases. The surface on which the mixture is to be placed shall be swept to remove as much moisture as possible and the mixture may then be placed subject to removal and replacement at no additional cost to the State if contract requirements are not met.

907-402.03.1.2--Tack Coat. Tack coat for OGFC shall be hot applied, asphalt cement of performance grade PG 76-22 or one from the Department's Approved Sources of Materials

under the category “Open Graded Friction Course (OGFC) Asphalt Tack Materials”. PG 76-22 binder shall meet the requirements of Section 702 of the Standard Specifications.

Tack Coat for OGFC shall be applied with a distributor spray bar at the applied rate of between 0.10 and 0.14 gallons per square yard. The application rate of the tack coat shall result in complete and uniform coverage of the underlying lift in which the OGFC will be placed.

The tack coat for OGFC should be allowed to break, cool and/or cure until a point in time that the tack coat does not pick-up or track due to traffic from trucks or the paving equipment. It should be pointed out that breaking, cooling, and/or curing times of the tack coat may vary based on the environmental conditions at the time of placement.

907-402.03.1.3--Blank.

907-402.03.2--Bituminous Mixing Plants.

907-402.03.2.1--Plant Requirements.

907-402.03.2.1.1--Cold Aggregate Storage. The cold storage for hydrated lime shall be a separate bulk storage bin with a vane feeder or other approved feeder system which can readily be calibrated. The system shall provide a means for easy sampling of the hydrated lime additive and verifying the quantity of lime dispensed. The feeder system shall require a totalizer.

The hydrated lime additive equipment shall be interlocked and synchronized with the cold feed controls to operate concurrently with the cold feed operation which will automatically adjust the hydrated lime feed to variations in the cold aggregate feed. A positive signal system shall be installed which will automatically shut the plant down when malfunctions cause an improper supply of hydrated lime or water.

The plant shall not operate unless the entire hydrated lime system is functioning properly.

907-402.03.2.1.2--Cold Aggregate Feed. The hydrated lime shall be dispensed dry or as a slurry (1 part hydrated lime to 3 parts water) directly onto the composite aggregate between the cold feed and the dryer.

When hydrated lime is introduced dry, a spray bar or other approved system capable of spraying all aggregate with water shall be installed in order to maintain all aggregate at the moisture condition set out in Subsection 907-402.02.3.1 prior to addition of the hydrated lime. An alternate system for spraying the coarse aggregate stockpiles may be allowed when approved by the Engineer. The approved equipment and methods shall consistently maintain the aggregate in a uniform, surface wet condition. The moisture content of the aggregate-hydrated lime mixture, following spraying and mixing, shall be introduced into the automatic moisture controls of the plant.

The aggregate-hydrated lime mixture shall be uniformly blended by some mechanical means such as a motorized "on the belt" mixer or pug mill located between the cold feed and the dryer. Other mixing devices may be used subject to approval by the Engineer.

A maximum of forty five (45) percent of the total aggregate blend may be fed through any single cold feed bin. If the JMF calls for more than forty five (45) percent of a specific aggregate, that aggregate must be fed through two (2) or more separate cold feed bins.

907-402.03.2.1.3--Dryer. The efficiency of drying aggregates shall be such that the moisture content of an OGFC mixture shall not exceed 0.50 percent by weight of the total mixture, and the moisture content of any underlying lifts shall not exceed 0.75 percent by weight of the total mixture being produced.

907-402.03.2.1.4--Stabilizing Fiber Addition. For batch plants, fibers shall be added (manually or automatic) to either the pugmill or the weigh hopper. At least one aggregate source shall be added prior to the fiber addition, if fibers are added to the weigh hopper. Otherwise, fibers shall be added to the pugmill immediately after the addition of all the aggregate and prior to the addition of the asphalt binder.

907-402.03.2.1.4.1--Manual Method. Provided it is demonstrated to the satisfaction of the Engineer that the proper dosage rate of the stabilizing fibers is uniformly distributed into the mix, manual introduction of the fibers is acceptable when a batch plant is used to make the mix. When the fibers are available in prepackaged (weighed) containers, proper dosage may be pre-determined per batch. A device is required to interrupt mixture production and warn the plant operator if the operator manually feeding the fiber fails to introduce it properly.

Manual introduction of fibers shall not be used in drum plants.

907-402.03.2.1.4.2--Automatic Method. The automatic method requires specialized equipment that can accurately proportion and meter, by weight, the proper amount per batch for batch plants, or continuously and in a steady uniform manner for drum plants. Fiber, pelletized or loose, shall not be fed through the cold feed bins or through the RAP bins.

These proportioning devices shall be interlocked with the plant system and controlled to ±10 percent of the weight of the fibers required so as to maintain the correct proportions for all production rates and batch sizes. During trial section construction, an equipment calibration check shall be performed to the satisfaction of the Engineer that shows the fiber is being accurately metered and uniformly distributed into the mix. These metering devices shall provide in- process high flow (≥10 percent or more) and low flow (<10 percent or less) plant operator notification and interrupt the mix production where the fiber rate is not properly controlled. The fiber metering system shall also provide a record of feed rate (weight per time) and include a minimum two-foot long section of translucent pipe for visual confirmation of consistent flow rates. Care shall be taken to insure that the fibers are not entrained in the plant's exhaust system. If there is any evidence of fiber in the bag-house or wet-washer fines, the liquid asphalt binder line and/or the fiber line shall be relocated so that the fiber is captured by liquid asphalt binder spray and incorporated into the mix. If there is any evidence of clumps of fibers or pellets at the discharge chute, the contractor shall increase the mixing time and/or intensity. This may entail extending the liquid asphalt binder and fiber feeding lines further into the drum.

Note: Various stabilizing fiber suppliers have developed methodology and equipment for metering bulk loose and pelletized fiber into asphalt plants. Whenever the fiber supplier's recommendations are more stringent than this specification, the fiber supplier's recommendations shall control.

907-402.03.2.1.5--Control of Bituminous Material and Antistripping Agent. Specified bituminous materials from different manufacturers or from different refineries of a single manufacturer shall not be mixed in the plant's asphalt cement supply system storage tank and used in the work without prior written approval of the Engineer. Approval is contingent upon the Engineer's receipt of three copies of the manufacturer's certified test report(s) from the Contractor showing that the bituminous material blend conforms to the specifications.

A satisfactory method of weighing or metering shall be provided to ensure the specified quantity of bituminous material. Provisions shall be provided for checking the quantity or rate of flow. Weighing or metering devices shall be accurate within plus or minus one-half percent.

The antistripping agent shall be injected into the bituminous material immediately prior to the mixing operation with an approved in-line injector system capable of being calibrated so as to ensure the prescribed dosage.

An in-line spigot for sampling of asphalt shall be located between the asphalt storage tank and the antistripping agent in-line injector.

907-402.03.2.1.6--Thermometric Equipment. An armored thermometer of adequate range and calibrated in 5°F increments shall be fixed at a suitable location in the bituminous line near the charging valve of the mixer unit.

The plant shall be equipped with an approved dial-scale, mercury-actuated thermometer, pyrometer or other approved thermometric instrument placed at the discharge chute of the dryer to measure the temperature of the material.

When the temperature control is unsatisfactory, the Engineer may require an approved temperature-recording apparatus for better regulation of the temperature.

907-402.03.2.1.7--Screens. A 1-inch scalping screen shall be used.

907-402.03.2.1.8--Dust Collector. The plant shall be equipped with a dust collector constructed to waste or return collected material. When collected material is returned, it shall be returned through a controlling device which will provide a uniform flow of material into the aggregate mixture.

907-402.03.2.1.9--Safety Requirements. A platform or other suitable device shall be provided so the Engineer will have access to the truck bodies for sampling and mixture temperature data.

907-402.03.2.1.10--Blank.

907-402.03.2.1.11--Truck Scales. The specifications, tolerances and regulations for commercial weighing and measuring devices as recommended by the National Bureau of Standards [National Institute of Standards and Technology (NIST) Handbook 44] shall govern truck scales used in the State of Mississippi, except weighing devices with a capacity of ten thousand (10,000) pounds or more used to weigh road construction materials (i.e. sand, gravel, asphalt, fill dirt, topsoil and concrete) shall have a tolerance of one-half of one percent (1/2 of 1%) in lieu of the requirements of Handbook 44 and shall be regulated by the Mississippi Department of Transportation.

Scales shall be checked and certified by a scale company certified in heavy truck weights by the Mississippi Department of Agriculture and Commerce. In the case of scales used for measurement of materials on Department of Transportation projects, certification shall be performed in the presence of an authorized representative of the Department or a copy of the certification may be furnished for scales that have been checked and certified within the last six months for use on other Department of Transportation projects and are still in the position where previously tested. Scales that have not been checked and certified under NIST Handbook 44 guidelines, except for the herein modified tolerances allowed, shall be so checked and certified prior to use for measurement of materials on Department of Transportation projects. Tests shall be continued on six month intervals with the test conducted in the presence of an authorized representative of the Department.

Truck scales shall be accurate to one-half of one percent of the applied load, shall be sensitive to 20 pounds, and shall have a graduation of not more than 20 pounds.

The Contractor may use an electronic weighing system approved by the Engineer in lieu of truck scales. The system shall be equipped with an automatic print out system which will print a ticket for each load with the following information:

> MDOT, Contractor's name, project number, county, ticket number, load number, pay item number, item description of the material delivered, date, time of day, haul vehicle number, gross weight, tare weight, net weight and total daily net weight.

When approved by the Engineer and materials are measured directly from a storage bin equipped with load cells, exceptions may be made to the gross and tare weight requirements.

The ticket shall also have a place for recording the temperature of OGFC mixtures, if applicable, and the signatures of MDOT's plant and roadway inspectors. The load numbers for each project shall begin with load number one (1) for the first load of the day and shall be numbered consecutively without a break until the last load of the day. The Contractor shall provide MDOT with an original and one copy of each ticket. When the ticket information provided by the Contractor proves to be unsatisfactory, MDOT will use imprinter(s) and imprinter tickets to record load information. All recorded weights shall be in pounds and shall be accurate to within one-half of one percent of the true weight, and the system shall be sensitive to 20 pounds. The Engineer will require random loads to be checked on certified platform scales at no cost to the Department.

When an electronic weighing system utilizes the plant scales of a batch plant, the system may be used only in conjunction with a fully automatic batching and control system.

907-402.03.2.2--Additional Requirements for Batching Plants.

907-402.03.2.2.1--Plant Scales. The plant batch scale weight shall not exceed the platform scale weight by more than one percent (1%).

907-402.03.2.3--Additional Requirements for Drum Mixing Plants.

907-402.03.2.3.1--Plant Controls. The plant shall be operated with all the automatic controls as designed and provided by the plant manufacturer. If the automatic controls malfunction, brief periods of manual operations to complete the day's work or to protect the work already placed may be conducted with the approval of the Engineer. During manual operation, the Contractor must continue to produce a uniform mixture meeting all contract requirements.

907-402.03.2.3.2--Aggregate Handling and Proportioning. A screening unit shall be placed between the bins and the mixer to remove oversized aggregate, roots, clayballs, etc.

907-402.03.2.4--Surge or Storage Bins. Normally the surge bins shall be emptied at the end of each day's operation. During breakdowns or adverse weather conditions, the material may be stored for a period not to exceed three hours in a well-sealed, well-insulated, heated bin.

907-402.03.3--Hauling Equipment. The inside surfaces of each vehicle bed shall be coated with a light application of water and thin oil, soap solution, lime water solution or other approved material to prevent the mixture from sticking. Diesel fuel or gasoline shall not be used to lubricate vehicle beds. Truck beds shall be raised to drain excessive lubricants before placing mixture in the bed. An excess of lubricant will not be permitted.

907-402.03.4--Bituminous Pavers. The screed or strikeoff assembly shall be capable of vibrating and heating the full width of the mixture being placed and shall lay the lift with an automatic control device to the specified slope and grade without tearing, pulling or gouging the mixture surface.

907-402.03.5--Rollers. All rollers shall be self-propelled units capable of maintaining a smooth and uniform forward and reverse speed as required for proper compaction. Pneumatic-tired rollers shall not be permitted for compacting OGFC mixes. Rollers shall be equipped with adjustable scrapers, water tanks, mats and a device for wetting the wheels to prevent the mixture from sticking. Adhesion of the mixture to the rollers will not be permitted. The use of diesel fuel or gasoline for cleaning roller wheels, or to aid in preventing the mixture from sticking to the wheels, is prohibited.

All rollers shall be in good mechanical condition, free from leaking fuels and lubricants, loose link motion, faulty steering mechanism, worn king bolts and bearings. They shall be operational at slow speeds to avoid displacement of the mixture and capable of reversing direction smoothly and without backlash.

907-402.03.6--Preparation of Grade. The foundation upon which OGFC pavement is to be placed shall be prepared in accordance with the applicable Section of the Standard Specifications.

Unless otherwise directed, tack coat shall be applied to the underlying surface on which the mixture is to be placed. Emulsions, if used, must be allowed to "break" prior to placement of the bituminous mixture.

Bituminous mixture shall not be placed against the edge of pavements, curbs, gutters, manholes and other structures until sprayed with a thin uniform tack coating. The tack coat shall be protected until the mixture has been placed.

Existing pavements that require preliminary leveling or patching in advance of placing the OGFC mixture shall be sprayed with a tack coat material and then brought as nearly as practicable to uniform grade and cross section. The material shall be placed by hand or machine in one or more compacted layers approximately two (2) inches or less in compacted thickness.

907-402.03.7--Blank.

907-402.03.8--Preparation of Mixture. The temperature of the mixture, when discharged from the mixer, shall not exceed 340°F.

907-402.03.9--Material Transfer Equipment. Except for the areas mentioned below, the material transferred from the hauling unit 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: 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.

907-402.03.10--Spreading and Finishing. The mixture shall be spread to the depth and width that will provide the specified compacted thickness, line, grade and cross section. Placing of the mixture shall be as continuous as possible. On areas where mechanical spreading and finishing is impracticable, the mixture may be spread, raked and luted by hand tools.

Immediately after screeding and prior to compaction, the surface shall be checked by the Contractor and irregularities adjusted. When the edge is feathered as in a wedge lift, it may be sealed by rolling. Irregularities in alignment and grade along the edges shall be corrected before the edges are rolled.

Hauling, spreading and finishing equipment shall be furnished that is capable of and operated in such a manner that the rolling operation will satisfactorily correct any surface blemishes.

The longitudinal joint in the subsequent lift shall offset that in the underlying lift by approximately six (6) inches. However, the joint in the top lift shall be at the centerline or lane line.

907-402.03.11--Roadway Compaction. Compaction shall be achieved by two to three passes of a 10 to 12-ton steel wheel roller operating in static mode. Finish rolling to remove any roller marks shall be performed after the mat temperature decreases to 250°F.

907-402.03.12--Joints. Joints between previously placed pavement and pavement being placed shall be so formed as to insure thorough and continuous bond.

The contact surface of longitudinal joints, except hot joints, shall be sprayed with a thin uniform tack coating before additional mixture is placed against the previously placed material.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-403-13 DB **CODE: (SP)**

DATE: 01/07/2015

SUBJECT: Stone Matrix Asphalt (SMA)

Section 403, Hot Bituminous Pavement, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as amended by this special provision is applicable to Stone Matrix Asphalt (SMA) Only.

SECTION 907-403 - STONE MATRIX ASPHALT PAVEMENT

907-403.0l--Description. This work consists of constructing one or more lifts of SMA pavement on a prepared surface in accordance with the requirements of Section 403 for Asphalt Pavement, with the exceptions set forth in this special provision. The SMA shall meet the requirements of this section and in reasonably close conformity with the lines, grades, thicknesses, and typical cross sections shown on the plans or established by the Engineer. This work shall also include applicable in-grade preparation of the underlying course in accordance with Section 321.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-403-14 DB **CODE: (SP)**

DATE: **01/07/2015**

SUBJECT: **Asphalt Pavements**

Section 403, Asphalt Pavements, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is deleted and replaced as follows.

SECTION 907-403 - ASPHALT PAVEMENTS

907-403.01--Description. This work consists of constructing one or more lifts of asphalt pavement meeting the requirements of Section 907-401 on a prepared surface in accordance with the requirements of this section and in reasonably close conformity with the lines, grades, thicknesses, and typical cross sections shown on the plans or established by the Engineer. This work shall also include applicable in-grade preparation of the underlying course in accordance with Section 321.

The Contractor must select one of the asphalt mixture processes (HMA or WMA) to be used on this project.

907-403.02--Material Requirements. Materials and their use shall conform to the applicable requirements of Subsection 907-401.02.

907-403.03--Construction Requirements.

907-403.03.1--General. Construction requirements shall be as specified in Subsection 907-401.03, except as otherwise indicated in this section or applicable special provisions.

907-403.03.2--Smoothness Tolerances. Except as noted herein, the finished smoothness of each lift shall conform to the designated grade and cross section within the following tolerances from grade stakes or other grade reference points set at 25-foot intervals:

	Lower* & Leveling Lifts	Lower* Intermediate Lift	Top Intermediate Lift	Surface Lift
Maximum deviation from grade and cross section at any point	1/2"	3/8"	1/4"	1/4"
Maximum deviation from A 10 foot straight edge.....	3/8"	1/4"	1/8"	1/8"

Note: Where more than four (4) lifts of asphalt are required, all lifts, excluding the top three

(3) lifts, shall meet the requirements of the lower lift.

* When tested longitudinally from a stringline located equidistant above points 50 feet apart, the distance from the stringline to the surface at any two points located 12½ feet apart shall not vary one from the other more than the maximum deviation allowed above from a 10-foot straight edge.

Grade stakes or other grade reference points set at 25-foot intervals and maximum deviation from grade and cross section will not be required provided an approved profile averaging device is furnished and properly used for the four conditions set forth herein; however, all other surface requirements are applicable.

(a) Overlays with one overall lift.

(b) Overlays with two or more overall lifts -- for each lift above the first overall lift provided each underlying overall lift is within the allowable tolerances.

(c) Surface lift of new construction provided the underlying lift is within the allowable tolerances.

(d) Full-depth asphalt construction for lifts above the lower lift provided the lower lift is within the specified tolerances for the lower intermediate lift.

In the placement of full depth asphalt pavement, where the chemically treated base is constructed, graded and/or trimmed, full lane width, to a surface tolerance of ±3/8 inches from design grade, stringline grade controls may be eliminated for the placement of the asphalt drainage course and all asphalt lifts. In addition, where the base course is crushed stone or crushed concrete and is constructed to a surface tolerance of ±3/8 inches from design grade using a stringline controlled spreader, stringline grade controls may be eliminated for the placement of the asphalt drainage course and all asphalt lifts.

All other tolerances as specified in Section 321 are applicable, except for bases, when tested longitudinally, the maximum deviation when measured at the 12½-foot midpoint shall be ±3/8 inches.

Acceptance and payment of asphalt will be determined on a lot to lot basis by cores taken from the completed pavement as outlined in Subsection 907-403.03.3.

Approved contacting type profile averaging devices are those devices capable of working in conjunction with a taut string or wire set to grade, or ski-type device with extreme contact points with the surface at least 30 feet apart. Approved non-contacting type profile averaging devices are laser type ski devices with at least four referencing mobile stations at a minimum length of 24 feet, or an approved equal.

When approved by the Engineer, a short ski or shoe may be substituted for a long ski on the second paving operation working in tandem.

During the finishing and compacting of pavement lifts, it shall be the responsibility of the Contractor to check the surface and joints for progress toward conformance to surface requirements set forth herein. Variations from surface requirements exceeding the allowable tolerances shall be corrected at the Contractor's expense.

When a portland cement concrete pavement is to be placed on an asphalt lift, the finished top of the asphalt lift shall meet the requirements of Sections 32l and 50l.

Sections(s) or portions thereof representing areas excluded from a smoothness test with the High Speed Inertial Profiling System (IPS) shall also be excluded from consideration for a contract price adjustment for rideability.

Any contract price adjustment for rideability will be applied on a continuous basis to the pay tonnage, determined in accordance with Subsections 907-401.02.6.8 and 907-403.04, for the section(s) or portions thereof for which an adjustment is warranted.

Contract price adjustments for rideability shall only be applicable to the surface lift and furthermore to only the long continuous section(s) or portions of the long continuous section(s) of the surface lift that require smoothness be determined by using a profiling device.

907-403.03.2.1--Smoothness Tolerances for Mean Roughness Index (MRI). Smoothness tolerances shall be applied to asphalt pavements based on the following pavement categories.

Category A applies to the following pavement constructions:

- New construction
- Construction with three (3) or more lifts
- Mill and two (2) or more lifts

Category B applies to the following pavement constructions:

- Mill and one (1) lift
- Two (2) lift overlays without milling

Category C applies to the following pavement constructions:

- Single lift overlay without milling
- All 57,650-pound routes regardless of the pavement construction

Additional projects may qualify for Category C construction at the department's discretion. Spot Leveling does not count as a lift. Full width / continuous leveling courses that have a minimum thickness of ¾" across the entire lane width will be considered a lift.

Category A projects shall have a long continuous interval (528-foot) surface MRI of not more than 60 inches per mile.

Category B projects shall have a long continuous interval (528-foot) surface MRI of not more than 70 inches per mile.

Category C projects shall have the existing surface profiled at no additional cost to the State. These projects shall be measured by a long fixed interval (528-foot) surface MRI and meet the higher value of the following requirements:

A 50% improvement in MRI from the existing surface
OR
80 inches per mile

In the case that 50% of the existing surface MRI is greater than 80 inches per mile, the short continuous threshold shall be increased from 160 inches per mile by the difference between 50% of the existing surface MRI and 80 inches per mile.

For all projects, areas of the surface lift with localized roughness greater than 160 inches per mile as determined by the continuous short interval (25') report will be identified for correction by the Project Engineer.

When a project has multiple lifts, the lift underlying the surface lift shall have a MRI of no more than 10 inches/mile more than the surface lift threshold for both long and short continuous intervals. Category B projects containing multiple lifts must meet the Category C percent improvement requirement for the underlying lift. Corrective action must be taken on those segments that do not meet this requirement. No unit price adjustment will be applied on any underlying lift.

For Category A and B projects, a unit price increase will be added when the MRI for the final surface lift, prior to any required localized roughness (short interval) corrective action, is less than or equal to fifty inches per mile (50.0 inches / mile) on the long interval report. These Projects will be considered for incentive pay based on the following guidelines for the long interval surface lift MRI.

Mean Roughness Index inches / mile	Contract Price Adjustment Percent of Asphalt Unit Bid Price
Less than 35.0	108
35.1 to 40.0	106
40.1 to 45.0	104
45.1 to 50.0	102
50.1 to Required Surface MRI	100

In addition to the above pay incentive factors, a project may be subject to a disincentive when the Long Continuous Interval MRI for the surface exceeds the allowable tolerance.

Mean Roughness Index (inches / mile)	Contract Price Adjustment Percent of Asphalt Unit Bid Price
Above 20.0 Over	REMOVE AND REPLACE
15.1 to 20.0 Over	80
10.1 to 15.0 Over	85
5.1 to 10.0 Over	90
0.1 to 5.0 Over	95
Required Surface MRI	100

For Category C projects, segments may be subject to a disincentive when the Fixed Interval MRI for the surface does not meet the minimum requirements.

Percent Improvement MRI (inches/mile)	Contract Price Adjustment Percent of Asphalt Unit Bid Price
Below 30 Percent	REMOVE AND REPLACE
30.1 to 35.0 Percent	80
35.1 to 40.0 Percent	85
40.1 to 45.0 Percent	90
45.1 to 50.0 Percent	95
Above 50%	100

Segment(s) or portions thereof representing areas excluded from a smoothness test shall also be excluded from consideration for a contract price adjustment for rideability. Where a segment less than 528 feet occurs at the end of a section, it will be combined with the preceding 528-foot segment for calculation of MRI. Corrective action must be taken on those sections that exceed the 'Remove and Replace' threshold as directed by the Project Engineer. The minimum remove and replace length will be 528 feet (0.1 mile). Additional smoothness testing shall be required on sections following replacement and will be required to meet *at least* the maximum surface MRI short of 'Remove and Replace' tolerance.

The above pay factors will be applied in conjunction with the Long Continuous Histogram Chart from ProVAL's Smoothness Assurance Module. The price adjustments for rideability will be tabulated in MDOT's Pay Incentive spreadsheet on the basis of a theoretical tonnage of 110 lbs/yd^2 * inch thickness (pounds per square yard * inch thickness) determined in accordance with Subsections 907-401.02.6.5 and 907-403.04, for the segment(s) or portions thereof for which an adjustment is warranted.

907-403.03.3--Thickness Requirements. Asphalt overlay lifts shall be constructed as nearly in accordance with the thickness shown on the plans as the underlying pavement and foundation will permit. Periodic and cumulative yield tests will be made to determine practicable conformity to the thickness of each lift. The Engineer may order modifications in placement thicknesses to prevent unwarranted variations in plan quantities.

When the paver is operating off an established grade line, no thickness determination will be required for the various lifts of pavement. It is understood that the tolerances from design grade

will control the thickness requirements.

When grade stakes are eliminated by Notice to Bidders or as outlined in Subsection 907-403.03.2(d) and where resulting in the placement of two (2) or more lifts, acceptance and payment will be determined on a lot to lot basis by cores taken from the completed pavement. Lots will be coincidental with acceptance lots for the surface lift as provided in Subsection 907-401.02.6.4, except that only lots resulting from the placement of mainline surface lift will be used for thickness assessment. One core will be obtained at random from each lot. Irregular areas will not be cored.

When the average thickness of all the cores from the lots representing a day's production, excluding any discarded by the Engineer for justifiable reason, is within three-eighths of an inch (3/8") of the total pavement thickness shown on the plans, excluding lift(s) placed using an established grade line, corrective action will not be required and a price adjustment will not be made for non-conformity to specified thickness.

When the average thickness of all the cores from the lots representing a day's production is deficient in thickness by more than three eights of an inch (3/8") of the total pavement thickness shown on the plans, excluding lift(s) placed using an established grade line, the deficiency shall be corrected by overlaying the entire length of the day's production. The thickness of the overlay shall be equal to the thickness deficiency but no less than the minimum single lift laying thickness for the specified mixture.

When the thickness of all the cores from the lots representing a day's production is more than three eights of an inch (3/8") thicker than the total thickness shown on the plans, excluding lift(s) placed using an established grade line, a price adjustment will be made in accordance with Subsection 907-403.05.1.

The cores shall be cut and removed by the Contractor in the presence of the Engineer's representative and turned over to the Engineer's representative for further handling. The Contractor shall fill each core hole with surface lift mixture and compact to the satisfaction of the Engineer within 24 hours after coring.

907-403.03.4--Lift Corrections. Pavement exceeding the allowable surface tolerances shall be corrected at the Contractor's expense by the following methods:

Lower, Leveling and Lower Intermediate Lifts:

(a) Removal or addition of mixture by skin patching, feather edging, wedge lift construction or full depth patching where appropriate and can be completed in a satisfactory manner.

(b) Superimposing an additional layer which shall be an approved grade raise for the full roadway width and length of the area to be corrected.

Top Intermediate Lift:

(a) Removal and the addition of sufficient mixture to provide the specified thickness.

Corrections by this method shall be square or rectangular in shape and shall completely cover the area to be corrected.

(b) Superimposing an additional layer of minimum lift thickness for mixture being used which shall be an approved grade raise for full roadway width of the area to be corrected. Transverse joints shall be perpendicular to the centerline of the pavement.

Surface Lift:

(a) Removal and the addition of sufficient mixture to provide new material of at least minimum single lift laying thickness for full lane width of the area to be corrected. Transverse joints shall be perpendicular to the centerline of the lane.

(b) Superimposing an additional layer (minimum lift thickness for mixture being used) which shall be an approved grade raise for full roadway width of the area to be corrected. Transverse joints shall be perpendicular to the centerline of the pavement.

All mixtures used in the correction of unacceptable pavement shall be approved by the Engineer prior to use.

907-403.03.5--Overlays or Widening and Overlays. In addition to the requirements of Subsections 907-403.03.1 through 907-403.03.4, the following requirements will be applicable when an existing pavement is to be overlaid or widened and overlaid.

907-403.03.5.1--Blank.

907-403.03.5.2--Sequence of Operations. In order to expedite the safe movement of traffic and to protect each phase of the work as it is performed, a firm sequence of operations is essential. Unless otherwise provided in the traffic control plan and/or the contract, the following appropriate items of work shall be begun and continually prosecuted in the order listed:

(a) In sections designated by the Engineer, trim the shoulders along the pavement edges to provide drainage from the pavement.

(b) Perform pre-rolling to locate areas of pavement with excessive movement per Section 511.

(c) Perform selective undercutting and patching as directed per Subsection 907-403.03.5.4.

(d) Perform pressure grouting as specified in Section 512.

(e) Clean and seal joints per Section 413.

(f) Complete preparation on one side of roadway to be widened and place widening materials.

(g) Reconstruct shoulders to elevation necessary to assure traffic safety.

(h) Open the widened section to traffic.

(i) Complete above work for other side of roadway.

(j) Perform preliminary leveling as directed.

(k) Apply interlayer as specified.

(l) Place the first overall leveling lift.

(m) After the first overall leveling lift, reconstruct shoulders as necessary to eliminate vertical differentials which may be hazardous to traffic.

(n) Place first intermediate lift.

(o) Construct shoulders to the contiguous elevation of the first intermediate lift.

(p) Place remaining intermediate lift, if required.

(q) Place surface lift.

(r) Complete construction of shoulders.

(s) Apply permanent traffic marking.

(t) Final cleanup.

The above operations shall be performed in such a manner that traffic will be maintained on a paved surface at all times. Two-lane, two-way highways should not be restricted to a single lane in excess of a 3,000-foot section.

907-403.03.5.3--Widening of Pavement. The foundation for widening shall be formed by trenching or excavating to the required depth and constructing a smooth, firm and compacted foundation. It shall have sufficient density and stability to withstand the placement and compaction of subsequent lifts. Soft, yielding and other unsuitable material which the Engineer determines will not compact readily shall be removed and backfilled with granular material or asphalt as directed.

Except as provided herein, excavation for widening, undercutting or other required excavation shall be spread along the edge of the shoulders, foreslopes or other adjacent areas as directed and will be an absorbed item. When the quantity is in excess of what may be used satisfactorily on adjacent areas, the Engineer may direct that the material be loaded, hauled and spread uniformly on other designated areas. In this case, compensation for handling surplus material will be in accordance with the appropriate pay items as provided in the contract or as extra work.

If the plans require widening of the shoulders or embankment with Contractor furnished

material, all suitable material obtained from widening excavation may be used and will be measured and paid for as Contractor furnished materials. No measurement for payment of haul will be made.

Removal and disposal of old stakes, forms and other debris encountered in excavating shall be in accordance with Section 201 and shall be considered as incidental to and included in the unit prices bid for other items. No separate measurement will be made therefor. Pavement edges and surfaces shall be cleaned prior to final shaping and compaction of adjacent trenching or undercut areas.

Granular material for widening shall be placed on a previously prepared, smooth, firm and unyielding foundation in accordance with the typical section. Density of the granular material shall be as specified.

Asphalt for widening, including trench widening, shall meet the applicable requirements of Section 907-401, Section 907-403, and shall be placed in one or more layers as shown on the plans or directed. The surface of the mixture shall be finished as a continuation of the adjacent pavement slope.

Trench rollers or other compaction equipment shall be used to compact the foundation, granular material and bituminous mixtures for widening when standard width rolling equipment cannot be used.

907-403.03.5.4--Patching. Existing pavement which has failed or unsatisfactorily stabilized shall be removed as directed. Removal of pavement will be measured and paid for under the appropriate pay items as provided in the contract.

Backfill shall consist of asphalt or a combination of compacted layers of aggregate material and asphalt. Unless otherwise specified, the Engineer will make this determination based on depth and field conditions.

Asphalt used for backfilling will be measured and paid for at the contract unit price for the mixture designated on the plans as the lowest lift. Aggregate will be measured and paid for under the appropriate pay item as provided in the contract or as extra work.

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.

907-403.03.5.6--Placement of Lifts. The leveling lift shall be placed in a layer, or layers, not exceeding approximately two and one-half inches compacted thickness.

When single lane construction is required, placement of a lift on the adjacent lane may be performed by an approved profile averaging device provided the lane previously placed is within the allowable tolerances for all surface requirements. When any of the tolerances are exceeded, the Contractor shall reestablish the control stringline for laying the adjacent lane should the Contractor elect to perform this work prior to correcting the deficiencies of the lane previously

placed. In no case shall a "matching shoe" be used to control the grade of an adjacent lane.

In instances where there are only minor deviations from the allowable tolerances in the first overall lift, the Engineer may permit the Contractor to place the next higher lift by graded stringline in lieu of making the corrections.

Single lane placement of leveling, intermediate and surface lifts shall be limited to the distance covered in one and one-half days in advance of that placed in the adjacent lane.

907-403.03.5.7--Protection of Pavement. The pavement shall be protected and properly maintained until it has been compacted and cooled sufficiently for use by traffic.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-407-2 DB **CODE: (SP)**

DATE: 01/07/2015

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, or to a wet surface. Emulsions shall be allowed to "break" prior to superimposed construction.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-413-5 DB **CODE: (SP)**

DATE: 01/07/2015

SUBJECT: Sawing and Sealing Transverse Joints in Asphalt Pavement

Section 413, Cleaning and Sealing Joints and Cracks, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-413.02--Materials. Delete the second and third sentence of the second paragraph of Subsection 413.02 on page 294.

907-413.03--Construction Requirements.

907-413.03.3-- Sawing and Sealing Transverse Joints in Asphalt Pavement.

907-413.03.3.1--General. Delete the first paragraph of Subsection 413.03.3.1 on page 296 and substitute the following.

The Contractor's operation shall be conducted so that sawcutting of transverse joints, cleaning, and sealing is a continuous operation. The entire sawing and sealing operation shall be completed within seven (7) days after the placement of the final wearing course, unless the approved traffic control plan or sequence of operations provide otherwise. Traffic shall not be allowed on sawed unsealed joints in the final wearing course.

When intermediate lifts must be exposed to traffic for over seven (7) days, the Contractor shall be required to make an interim 1/8-inch wide saw cut which is one third (1/3) as deep as the asphalt layer. This interim saw cut does not require sealing. Costs of any interim cut(s) shall be included in the pay item for sawing and sealing transverse joints in asphalt pavement.

The detail for sawing and sealing transverse joints in asphalt pavement shall be as shown below. No sawing and sealing of transverse joints will be required in Open Graded Friction Courses (OGFC). However, the lift under the OGFC will require sawing and sealing.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-601-1 DB **CODE: (SP)**

DATE: 01/07/2015

SUBJECT: Structural Concrete

Division 600, Incidental Construction, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

After the heading **DIVISION 600 - INCIDENTAL CONSTRUCTION**, add the following:

Unless otherwise specified, all testing of Portland cement concrete in Division 600 shall be in accordance with the requirements of Subsection 907-601.02.1.

907-601.02--Materials.

907-601.02.1--General. Delete the second and third sentence of the first paragraph of Subsection 601.02.1 on page 348, and substitute the following:

Sampling and testing will be in accordance with TMD-20-04-00-000 or TMD-20-05-00-000, as applicable.

907-601.03.6.3--Removal of Falsework, Forms, and Housing. Delete the first paragraph, the table and second paragraph of Subsection 601.03.6.3 on pages 349 and 350, and substitute the following:

The removal of falsework, forms, and the discontinuance of heating, shall be in accordance with the provisions and requirements of Subsection 907-804.03.15, except that the concrete shall conform to the following compressive strength requirements:

Wingwall and Wall Forms not Under Stress ..... 1000 psi
Wall Forms under Stress ..... 2200 psi
Backfill and Cover clear ..... 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 Subsection 907-804.03.15. Procedures for using the maturity meter and developing the strength/maturity relationship shall follow the requirements of Subsection 907-804.03.15. Technicians using the maturity meter or calculating strength/maturity graphs shall meet the requirements of Subsection 907-804.03.15.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-603-8 DB **CODE: (SP)**

DATE: 02/10/2015

SUBJECT: Culverts and Storm Drains

Section 603, Culverts and Storm Drains, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-603.03--Construction Requirements.

907-603.03.2--Bedding. After the first paragraph of the Subsection 603.03.2 on page 356, add the following:

Non-rigid pipe used in cross drains and storm drains shall have a Class B bedding. Non-rigid pipe used in side drains shall have a Class C bedding. No separate measurement will be made for pipe bedding. Costs associated with pipe bedding shall be included in the cost of the pipe.

907-603.03.4--Joining Conduit.

907-603.03.4.1--Storm Drainage. Delete the first sentence of the seventh paragraph of Subsection 603.03.4.1 on page 358, and substitute the following:

Flexible steel conduits shall be firmly joined by coupling bands.

907-603.03.7--Backfilling. After the first paragraph of the Subsection 603.03.7 on page 360, add the following:

Backfill of non-rigid corrugated polyethylene and poly (vinyl chloride) (PVC) pipe used in cross drains and storm drains shall be performed using one of the following methods:

1. Flowable fill meeting the requirements of Section 631 of the Standard Specifications. If flowable fill is used, care shall be taken to prevent the pipe from “floating”.
2. Crushed stone aggregate meeting the requirements of Subsection 703.04.3 of the Standard Specification.

No separate measurement will be made for backfilling pipe. Costs associated with backfilling pipe will be included in the cost of the pipe.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-604-7 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Trench Drains**

Section 604, Manholes, Inlets and Catch Basins, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as amended by this special provision is applicable for Trench Drains only.

SECTION 907-604 -- TRENCH DRAINS

907-604.01--Description. This work shall consist of furnishing and installing a pre-engineered trench drain system in accordance with the plan details, standard specifications, and this special provision. The drain system shall consist of a pre-fabricated channel encased in concrete per the plan detail. The drain system shall be constructed to form a channel for the collection and flow of storm water. Grates shall be installed to allow water to pass into the channel and to allow vehicular traffic to move over the drains.

907-604.02--Materials.

907-604.02.1--Drain Channel. The drain channel shall be constructed on plastic, fiberglass, or polymer concrete. The minimum width and depth of the drain channel below the drain grate, or minimum required flow rate, will be shown on the plan detail. Connections to structures shall not restrict the hydraulic flow of the drain channel.

The drain channel shall have a smooth interior face.

The precast channels must have a radius or trapezoidal bottom and a minimum channel flow width of four inches (4”). The drain channel must be smooth to the touch and have interconnecting end profiles to obtain channel alignment within 1/16 inch.

Trench drain channel must conform to the requirements listed in Table 1.

Table 1

Physical Property	**Requirement**	**Test Method**
Lateral/Vertical Deflection	Pass	See Below
Compressive Strength	11,000 psi minimum	ASTM C 579
Moisture Absorption	1% maximum after 24 hr. immersion	ASTM D 570
Freeze/Thaw	1% maximum weight loss after 300 cycles	ASTM C 666
Chemical Resistance	Hydrocarbons / Automotive fluids -- No weight loss	ASTM C 267
Weathering Resistance	No cracking after 2000-hour exposure	ASTM D 2565
Burning Rate	HB	ASTMD 635

Lateral Deflection. The channel body shall be tested without the grate in a typical section of the length and width described in the catalog and supplied to the Contractor. The channel body must have a maximum lateral deflection of 1/4 inch when test loaded by 350 pounds per square foot applied over the entire sidewall of the channel body. Validation of the deepest channel body will validate all shallower channel bodies manufactured with the same design.

Vertical Deflection. The grate and channel body shall be tested as a unit in accordance with AASHTO Designation: M 306, with the following modifications.

- test block dimensions are nine inches (9") long by 75% of the trench grate width;
- proof pressure is 200 psi applied for one minute duration;
- acceptance criteria is no breaking, buckling, or bowing and a maximum deflection of 1/8 inch; and
- each grate width must be validated.

Prefabricated drain channels shall be made from components that are anchored by the placement of concrete to encase the anchoring lugs that are integral to the channel components. Prefabricated drain channels shall interlock with adjoining channels.

Unless otherwise indicated, Class B concrete shall meet the requirements of Section 804 shall be used Concrete shall be placed in a monolithic pour between inlet structures. Construction joints will only be allowed if approved by the Engineer. If joints are allowed, they shall be constructed with a concrete lug or keyway approved by the Engineer.

907-604.02.2--Grates and Frames. The grates for the trench drains must have openings consisting of a minimum of 60 percent of the total top surface area of the grate, with no individual opening or slot having a dimension greater than two inches (2") when measured in the direction of the grated line drain flow line.

Grates or frames must have studs for anchoring to the surrounding concrete. Studs must extend at least three inches (3") from the grate or frame. The anchor studs must be spaced 24 inches or less along the length of the grate or frame on both sides. Studs must either be integrally cast with or may be welded to the grate or frame. Welded studs must have a 360 degree flash.

Grates and frames must be either grey iron casting in accordance with ASTM Designation: A 48, Class 35B, or ductile iron casting in accordance with ASTM Designation: A 536, Grade 80-55-06.

All grates and frames must have a load capacity meeting or exceeding AASHTO HS-20 for bridge construction. The grates supplied must meet AASHTO M 306-09, with the following modifications:

- proof load contact area width is 75% of trench flow width to a maximum contact width of nine inches (9");

- proof load contact length is nine inches (9") for all trench widths; and

- proof load is 494 psi for a maximum proof load of 40,000 pounds over a 9-inch x 9-inch contact area.

Grate retaining devices shall not obstruct the flow of water into the channel or through the channel. The grate shall fit into the frame without rocking.

Frames shall be anchored into the surrounding concrete by metal extensions attached to the frame at all four corners. Frames which extend past the channel sidewall and bear on the adjacent concrete shall include vent holes to help release entrapped air during concrete consolidation. Vent holes shall be a large enough for visually observe proper consolidation of the concrete.

907-604.03--Construction Requirements. The Contractor shall submit the trench drain manufacturer's recommendations for installation to the Engineer prior to beginning installation. The submittal shall include a quantity listing of all materials required for the construction of the trench drain. The submittal shall be delivered to the Engineer at least ten calendar days prior to beginning the construction of the trench drain.

A representative of the trench drain manufacturer shall be present to advise the Engineer of the adequacy of the first trench drain units that are installed. The installation of the trench drain units shall not begin until the manufacturer's representative is present at the site of installation.

Connection to an existing structure may require the use of a transitional fitting and/or sections of pipe to provide a suitable connection without damage to the grate, drain and structure. Connections to structures shall be approved by the Engineer prior to construction.

When the trench drain begins or terminates without a connection to other pipes or drainage structures, the trench drain end shall be sealed or plugged with a cap suitable to the Engineer. The seal shall provide a waterproof connection. Unless otherwise detailed in the plans, outlet/inlet end attachments to connect existing or required pipe to the trench drain shall be standard manufactured attachments that are compatible with the trench drain and the outlet/inlet pipe. Unless otherwise detailed in the plans, adequate sized pipe shall be used to connect existing or required structure to the trench drain.

Excavation shall be kept as nearly as possible to the minimum width, depth, and length shown on the plan detail.

Trench drains shall be installed to the lines and grades shown on the plans or as directed by the Engineer. The trench opening should be protected during installation by a removable wood strip, heavy duty tape, or other suitable material, affixed to the opening to prevent infiltration of material into the drain. After finishing, any protective covering shall be removed and any debris that entered the trench shall be removed.

The furnishing and placement of the concrete backfill shall be in accordance with the requirements of Sections 601 and 804. The prefabricated trench drain components shall be

supported or held in place in such a manner as to permit flow of the concrete backfill material around the drain. Unless otherwise shown, the concrete encasement adjacent and beneath the drain channel shall be a minimum thickness of six inches (6”). Drain channels shall be positioned in the excavated trench so that, when finished, the surrounding concrete backfill will encase the channel. Concrete backfill shall be placed in the trench against undisturbed material at the sides and bottom of the trench and in a manner that will prevent floating or shifting of the trench drain components and voids in, or segregation of, the concrete. Where necessary, earth plugs shall be constructed and compacted at the ends of the planned concrete backfill to contain the concrete within the trench. Concrete shall be finished flush with the adjacent finish grade. The surface of the concrete shall be textured with a broom or burlap drag to produce a durable skid-resistant surface.

Under no circumstances shall any portion of the trench drain slot extend above the paving material or curb and gutter section.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-605-3 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Underdrains**

Section 605, Underdrains, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-605.03--Construction Requirements.

907-605.03.5--Edge Drain Installation. Delete the seventh paragraph of Subsection 605.03.5 on page 376 and substitute the following:

When corrugated polyethylene drainage tubing is used, joints shall be made with snap-on or split couplings, corrugated to engage the pipe corrugations, and shall engage a minimum of four corrugations, two on each side of the pipe joint.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-606-8 DB **CODE: (SP)**

DATE: 1/07/2015

SUBJECT: High Tension Cable Barrier

Section 606, Guard Rail, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as amended by this special provision is applicable to High Tension Cable Barrier Only.

907-606.01--Description. This work shall consist of constructing high tension cable barrier by designing, laying out, furnishing and installing posts, cables, terminal sections (end terminals), and any special connections and fittings which may be required in the contract documents. This also includes maintenance and repair of the system until final acceptance of the project.

Cable barrier shall be staked and layed out by the Contractor in accordance with the plans or as directed by the Engineer.

High tension cable barrier shall meet the requirements of NCHRP Report 350, Test Level 4 (TL-4) criteria. The Contractor shall provide a copy of the FHWA letter of approval for the system prior to installation.

The high tension cable barrier system shall be a four (4) wire rope system with maximum post spacing of 10.5 feet, center to center, and be appropriate for applicable field conditions and speed rating.

In addition to certifications, the Engineer may opt to sample any materials to be used in the work at any time ranging from the point of manufacture to the construction site for whatever testing or inspection the Engineer deems necessary.

The Contractor shall select and install only one single manufacturer's high tension cable barrier system for the entire project. Terminal sections and high tension cable barrier shall be produced by the same manufacturer.

907-606.02--Materials. High tension cable barrier shall meet the following general requirements.

Concrete, minimum Class C ..... Section 804
Reinforcing Steel ..... Section 602
Anchor Bolts and Nuts ..... Subsection 810.02.21
Galvanizing (Bolts, Nuts & Washers) ..... AASHTO M 232
Fittings (Steel) Hardware ..... Subsection 712.06
Reflective Sheeting ..... Subsection 721.07

907-606.02.1--Cable. The cable shall be ¾-inch, 3 x 7, pre-stretched galvanized wire rope meeting the requirements of AASHTO Designation: M 30 / ASTM Designation: A741, Type I, Class A coating, with a Modified Breaking Strength equal to 39,000 pounds in accordance with the following:

- Pre-stretched to exhibit a minimum modulus of elasticity of 21,661,553 psi based on a steel surface area of a fixed 0.2394877 square inches, and
- Testing must be done in accordance with ISO 12076-202 Wire Rope Modulus of Elasticity "Initial (as manufactured)", with no bedding of the rope permitted in testing.

907-606.02.1--Posts. Steel posts shall be socketed in metal or plastic sleeves installed in a concrete footing. Steel posts, blocks, and metal sleeves shall conform to AASHTO Designation: M 270, Grade 36, and shall be galvanized in accordance with ASTM Designation: A 123. Welding and repair welding for all steel fabrication shall be performed by certified welders and meet the requirements of AWS D1.1. All fabrication shall be completed prior to galvanizing.

Posts shall be domestic hot-rolled mild steel, or cold-formed from hot-rolled mild steel. A fitting gasket, profiled to fit tightly around each post, shall be provided to prevent debris from entering the socket.

907-606.02.2--Fittings. Threaded terminals may be wedged or swaged fitting. Swaged fitting may be shop or field swaged. The engagement depth shall be equivalent to or greater than the depth of the tested system and shall be threaded to fit the system turnbuckles. Fully fitted ropes shall develop a Minimum Breaking Load (MBL) of 36,800 pounds. Threaded terminals shall be galvanized, after threading, to ASTM Designation: A 153, or stainless steel. At all locations where the cable is connected to a cable socket with a wedge type connection, one wire of the wire rope shall be crimped over the base of the wedge to hold it firmly in place.

907-606.02.3--Turnbuckles. Turnbuckles shall be threaded to accept the fittings described above. Turnbuckles shall be of the solid or closed body type with two inspection holes to determine threaded rope terminal penetration. Turnbuckles shall allow for a terminal penetration depth equivalent to or greater than the depth of the tested system, shall develop minimum tensile load without yielding to 36,800 pounds, and shall be galvanized, after threading, to ASTM Designation: A153, or stainless steel.

907-606.02.4--Mechanical Anchor Fittings. Fittings shall be provided at the anchor terminations of each wire rope and shall be of the same type as used in the connection to the turnbuckles. The fittings shall develop minimum tensile load of the entire wire rope of 36,800 pounds without yielding, shall be capable of release and reuse, and shall be galvanized to ASTM Designation: A153 after threading.

907-606.02.5--End Terminals. End terminals shall be NCHRP Report 350 compliant, meeting Test Level 3 (TL-3) requirements, and having an FHWA letter of acceptance. Each of the four cables of the system shall have anchor connections at the terminal end section. The four cables shall not terminate at the end section with a common cable. All welding shall be performed by a certified welder in accordance with AWS D1.1.

907-606.02.6--Delineation. The sheeting for delineation shall be Type III retroreflective sheeting meeting the requirements of Section 721 of the Standard Specifications. Sheeting shall be available in standard colors of white and yellow and may be installed on cable barrier posts or on delineator posts which are attached to the cable barrier post in accordance with the manufacturer's recommendations.

When used, delineator posts shall be made of high impact fiberglass reinforced composite, engineering blended plastic or thermosetting polymers which is reasonably unaffected by long term U.V. exposure and shall be of good workmanship free of burrs, discoloration, contamination and other objectionable marks or defects that affect appearance or serviceability.

907-606.03--Construction Requirements. A manufacturer's representative shall be present during the initial installation of all components (posts, anchors, tensioning) of the cable barrier system. Upon completion of the entire system, a manufacturer's representative shall inspect and certify in writing that the cable barrier system was installed in accordance with the design and manufacturer's recommendation.

907-606.03.1--Cable. The Contractor shall install high tension cable barrier system according to the manufacturer's design and recommendations. Prior to construction, the Contractor shall provide the Engineer with two copies of the manufacturer's most current product manuals covering installation and maintenance of the barrier system including detailed drawings.

Turnbuckles shall be included to allow for tensioning of the cables. For installations greater than 1000 feet in length, at least one turnbuckle per 1000-foot strand shall be included. For installations less than 1000 feet in length, one turnbuckle per strand shall be included near the center of the installation.

Cable Barrier Tensioning. The cable barrier system shall be placed and tensioned immediately after initial installation per the manufacturer's recommendations. The tension shall be rechecked approximately two (2) to three (3) weeks after initial tensioning and adjusted, if necessary. Concrete shall have a minimum compressive strength of 3,000 psi prior to applying tension to the cables. The compressive strength shall be verified by cylinder tests. The Contractor shall maintain a log showing the date, time, location, temperature, and final tension reading. The log shall be signed by the person performing the readings. The log shall be given to the Project Engineer at the conclusion of the re-tensioning period.

The Contractor shall be responsible for providing the Project Engineer with an inventory table of all high tension cable barrier installed prior to the final inspection of the project. The inventory should include the following data: County, Route, Date Installed, System Name, Manufacturer, Beginning and Ending Latitude/Longitude at each terminal (DECIMAL), and the tension (LBS) of each cable taken near every turnbuckle in a section.

Cable Splices. Only one splice per cable is allowed between end anchor assemblies. Cable splices shall be staggered a minimum of 20 feet from splices on adjacent cables. Cable splices shall be made in accordance with the recommendations of the manufacturer of the splice

hardware.

907-606.03.2--Posts. The posts shall be installed plumb and in accordance with the manufacturer's recommended location, spacing, and elevation.

All posts shall be socketed steel posts. Sleeves for insertion of socketed posts shall be set in concrete foundations. All posts shall have a means of holding the wire ropes at the design height.

Post foundations shall be to the size and shape recommended and designed by manufacturer based on soil types and ground conditions. The contract documents may include information regarding the existing soil, but is the Contractor's responsibility to supply the designer of the cable barrier with all the soil information needed to design the cable system. The depth must be determined by manufacturer's Design Engineer for the project's existing soil condition, but the minimum size shall not be less than l2 inches in diameter by 36 inches in depth (12" x 36").

907-606.03.3--Terminal Section. Concrete for end terminals shall be a minimum Class C in accordance with Section 804 of the Standard Specifications.

End terminal foundations shall be placed in excavations of natural, undisturbed ground, to the size and shape required by the manufacturer based on soil types and ground conditions. The contract documents may include information regarding the existing soil, but is the Contractor's responsibility to supply the designer of the cable barrier with all the soil information needed to design the cable system. If over-excavation is unavoidable, the sides must be vertical and additional concrete shall be used to completely fill the excavated area. Alternatively, foundations may be formed and cast, then backfilled by a means to achieve a compacted density acceptable to the Engineer.

Exposed concrete shall be finished in accordance with the manufacturer's recommendations and as directed by the Engineer.

907-606.03.4--Delineating High Tension Cable Barrier. High tension cable barrier installations shall be delineated with retroreflective sheeting. Unless otherwise indicated, the delineation shall be applied to the last five posts at each end of an installation and throughout the remainder of the installation at a maximum spacing of 50 feet. The delineation shall provide a minimum of seven (7) square inches of area per post when viewed on a line parallel to the roadway centerline. The delineation shall be attached near the top of the post as recommended by the manufacturer. For median installations, the sheeting shall be applied to both sides of the post. For roadside installations, the sheeting shall be applied only to the side of the post facing traffic. The sheeting shall be yellow or white and shall be the same color as the adjacent edge line.

The Contractor may elect to attach delineators to the posts in accordance with the manufacturer's recommendations.

907-606.03.5--Installation Training. The Contractor shall provide a minimum of eight (8) hours of instruction on the installation, maintenance and repair of the system. This training shall be provided in a location central to the project and the local District Office. The scheduling and location of this training shall be approved by the Engineer. The Project Engineer will advise the District Maintenance Representatives of the training location and schedule.

The Contractor shall provide on-site field instruction by the manufacturer of the system using a minimum 2000-foot section of the system. The amount of this training will be as necessary to provide field training on all aspects of the system installation, including grading, line post installation, wire rope installation and tensioning, and terminal or anchor installation. Upon completion of the cable barrier system or within ten (10) days of the Maintenance Release, the Contractor shall deliver to the Project Engineer one new cable tensioning device/meter for future MDOT maintenance activities. This device shall become the property of MDOT and its cost shall be included in other items bid.

907-606.03.6--Cable Barrier Repair. The Contractor shall maintain and repair the cable barrier until final inspection of the project. Should the cable barrier be damaged, the Contractor shall repair the barrier immediately. The cable barrier post shall be replaced and the cable re-installed to the post. When the damage is caused by the traveling public to a complete-in-place section of cable barrier, the repair will be paid for under pay item Cable Barrier Post Repair.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-618-9 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Placement of Temporary Traffic Stripe**

Section 618, Maintenance of Traffic and Traffic Control Plan, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-618.03.3--Safe Movement of Traffic. Delete subparagraphs (2) and (3) of Subsection 618.03.3 on page 416, and substitute the following.

(2) Temporary edge lines on projects requiring shoulders constructed of granular material may be delayed for a period not to exceed three (3) days.

Temporary edge lines placed on the final pavement course of projects requiring paved shoulders with surface treatment may be placed on the adjacent shoulder in as near the permanent location as possible until the surface treatment is placed. When the edge lines are obliterated by the placement of the surface treatment, the edge lines shall be placed in the permanent stripe location. The replacement of edge lines may be delayed for a period not to exceed three (3) days for a two or three-lane roads.

Delete the first sentence of next to last paragraph of Subsection 618.03.3 on page 416 and substitute the following.

Permanent pavement markings are to be applied no sooner than 10 days nor later than 45 days after placement of the final lift of pavement.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-618-10 DB **CODE: (SP)**

DATE: 1/21/2015

SUBJECT: Service Patrol

Section 618, Maintenance of Traffic and Traffic Control Plan, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-618.01--Description. After Subsection 618.01.2 on page 413, add the following.

907-618.01.3--Service Patrol. This work shall consist of providing Service Patrol inclusive of the equipment and operator to patrol the roadways within the project limits to clear the lanes and shoulders of disabled automobiles, motorcycles and small trucks, and to provide assistance at other incidents as directed by law enforcement personnel or the Engineer. The Service Patrol vehicle shall be a tow truck as described in this special provision.

907-618.01.3.1--Service Patrol Limits. The limits of operation for Service Patrol included in this contract shall be mainline roadways and ramps and other roadways within the construction limits defined on the plans for the project.

907-618-01.3.2--Service Patrol Truck. The Contractor shall provide one (1) Service Patrol truck with operator. The Service Patrol truck shall be one ton or larger, having a minimum gross vehicle weight rating of 10,000 pounds and a dual wheel chassis. At the commencement of service to the Department on this contract, the truck shall be less than two years old.

The truck shall be equipped, as a minimum, with the following.

(1) Wheel lift towing equipment with a minimum lift rating of 3,000 pounds.

(2) Hydraulically extendible boom with a minimum static rating of 8,000 pounds.

(3) Winch - 8,000 pound rating on the first layer of cable.

(4) Winch Cable - 100 feet, 3/8-inch diameter, steel center, with a minimum working load capacity of 3,500 pounds.

(5) Towing sling.

(6) Push bumper and grill guard.

(7) AM/FM radio.

(8) Spotlight(s) capable of directing a beam centered in any direction of a 360 degree horizontal arc around the truck.

(9) Roof-mounted amber warning lights, flashing, with on/off switch in cab.

(10) Power outlets ("hot boxes"), front mounted with outlets compatible to booster cables.

(11) Heavy duty, 75-amp± battery.

(12) Cellular mobile telephone.

(13) Wiring harness for powering portable, remote brake/tail lights on towed vehicles.

(14) Lamp, high intensity, dashboard mounted.

(15) Trailer hitch.

(16) Motorcycle transporting capability.

(17) Rear work lights.

(18) Safety chain D-ring or eyelet mounted or rear of truck.

(19) "Loudhailer" with Microphone and External Speaker, 100-watt.

(20) Vehicle Mounted Flashing Warning Sign (Arrow Board) and Roof Rack. Flashing Arrow Board shall be capable of flashing 50 times per minute and display right arrow, left arrow, warning bar or double arrow messages.

(21) 40-Channel Citizens Band (CB) Radio.

The truck shall display the Service Patrol title and the name of the Prime Contractor. The displays shall be mounted on the doors and in a readable location on the front and rear of the truck. The displays shall be maintained in a clean, readable condition throughout the Service Patrol operation.

The Service Patrol truck shall be assigned exclusively to this project. The truck shall be used only at the times and locations as specified herein, or as designated by the Engineer, and until such time as the Contractor is released from maintenance.

Truck maintenance shall be performed during off-duty hours. The truck shall be kept neat and clean, and shall be maintained in conformance with the requirements of the Motor Vehicle Code.

The Service Patrol truck and the equipment it carries shall be subject to periodic inspection by the Engineer who, for an unsafe or a poorly maintained truck, or for an improperly equipped truck, may order the truck removed from service and replaced at no cost to the Department. The

Contractor shall replace the truck removed from service within 24 hours. Failure to comply may result in the Contractor's monthly estimate being held until such time the Service Patrol is returned to service.

907-618.01.3.3--Toolbox. The Service Patrol truck shall carry a toolbox with the tools and supplies required to perform operations specified herein. Such tools and supplies shall included the following as a minimum.

	Quantity
Screwdrivers:	
Standard - 1/8", 3/16", 1/4", 5/16"	1 each, min.
Phillips head - No. 1 & No. 2	1 each, min.
Needle nose pliers	1
Adjustable, rib-joint pliers, 2-inch min. capacity	1
Crescent wrench - 8-inch	1
Crescent wrench - 12-inch	1
3-lb. hammer	1
20-oz. claw hammer	1
Rubber mallet	1
Wire cutters	1
Jackknife	1
Electrical tape, roll	1
Hacksaw & spare blades	1
Duct tape, 20-yard roll	1
Light or penetrating oil, 2-oz. or larger can	1
Battery cable puller	1
Tire pressure gauge	1
Ratchet Wrenches	1 complete set
Open-end Wrenches	1 complete set

907-618.01.3.4--Equipment for Operations. Each Service Patrol vehicle shall carry as a minimum the following equipment needed to perform the intended service function.

Two - 5-gallon fuel cans filled with	
Diesel fuel	1
Unleaded gasoline	1
Safety chain, towing	1
Snatch block, 4-ton capacity	1
First aid kit	1
Fire extinguishers	
20-lb. Chemical ABC	1
20-lb. Carbon Dioxide	1
Pry bar - 36" or longer	1
5-gallon can of radiator water	1
4" x 6" x 12" wood blocks	4
24" Wide street broom	1

Square point shovel 1
Highway flares, 15 minutes 12
Traffic cones - fluorescent orange, 28" 6
Star type lug wrench 1
Air compressor or rechargeable air bottle hoses &
fittings to fit tire valve stems, 200 psi capacity 1
Paper towels, roll 1
Hand cleaner, waterless, can 1
Flashlights & spare batteries 2
Booster cables, 25 feet long, 3-AWG copper,
with heavy duty clamps and one end adapted to
truck's power outlets ..... 1 set
Vehicle door unlocking tool ..... 1 set
Funnel, multipurpose, flexible spout 1
Tow chain and hooks 1
Self-loading dolly 1
5-gallon cans, filled with sand 2

Expendable items such as gasoline, fire extinguishers and fusees shall be replenished after use and prior to commencing the next circuit of the patrol route. Such re-stocking shall be accomplished at sites which do not require the operators to travel more than 1½ miles from the Service Patrol route.

907-618.01.3.5--Communications Equipment. Service Patrol trucks shall be equipped and maintained with a cellular mobile telephone capable of communicating with the Prime Contractor from any and all points along the patrol route, and for contacting the Mississippi Highway Patrol, other law enforcement agencies and the Engineer.

907-618.01.3.6--Operators Uniforms. Operators shall wear protective shoes or boots, a cap, white shirt, and dark slacks, not blue jeans. Jackets and shirts shall bear the name of the Prime Contractor and the designation 'Service Patrol'. Clearly visible and readable plates or badges showing the operator's name shall be worn on the shirts and jackets.

907-618.01.3.7--Operations.

907-618.01.3.7.1--Patrol Route. The Service Patrol truck shall operate on mainline roadways, ramps and other roadways located within the construction limits as designated on the plans for this project. The Service Patrol truck shall not leave the designated area except:

(1) To discontinue patrol at the end of a shift.

(2) For mechanical failure of the Service Patrol vehicle or equipment.

(3) To replenish expendable supplies.

(4) To circumvent a queue to reach an incident or lane blockage.

(5) In response to an order from a law enforcement officer or fire department official carrying out their duties, or an order from the Engineer or his representative.

(6) To provide an operator a rest period of no longer than 15 minutes. Such rest periods shall be outside peak periods and shall be no more frequent than one such break per four-hour shift segment.

(7) To change operators in the event of operator illness.

(8) To dispose of collected debris gathered during the previous circuit.

The operator shall maintain a detailed, written log of his time during the work shift as indicated herein. A copy of the Service Patrol logs documenting its activities shall be submitted to the Engineer on a weekly basis.

907-618.01.3.7.2--Time of Operation. Service Patrol operation shall commence on the first day of construction and shall remain in operation until all work has been completed and the Contractor released from maintenance on the project.

The Service Patrol vehicle shall operate within the limits of the project 24 hours a day / 7 days a week, regardless of whether or not the Contractor is working on the project.

When Service Patrol operators receive a request for service from either the Engineer or law enforcement agencies near the end of the Service Patrol operator's shift, the operator shall respond and provide the necessary services. The specified level of service shall be provided for each incident or disabled vehicle, even if it requires work past an otherwise scheduled break or end of shift, all at no additional cost to the State.

Service Patrol operators shall keep a log of the times their truck physically commences its patrol of the designated route, and the times the truck goes off duty, and any time the truck leaves the designated patrol area. The operator shall provide a copy of the log to the Engineer each week. The log shall contain the reason for each departure from the patrol route.

907-618.01.3.7.3--Duties. The Service Patrol shall perform the following duties within the specified time and patrol area.

Patrol: Continuously patrol the designated area seeking disabled vehicles, stranded motorists, debris in the roadway, spilled loads, accidents, obstructions to traffic, and other potential hazards.

Clearing, Clean-up and Communications: Clear lanes and shoulders of all disabled vehicles encountered on patrol, and call the following parties where appropriate:

a) The Contractors forces for large spilled loads or large debris.

b) Local fire departments for verified fires.

c) The Mississippi Highway Patrol for accidents, law enforcement situations, or for towing of vehicles beyond the Service Patrol truck's capacity.

Assistance to Motorists: The Service Patrol operator shall provide assistance to motorists as follows:

a) Change flat tires for motorists.

b) Provide jump starts with booster cables for vehicles with dead batteries.

c) Attempt unlocking of vehicles for locked-out motorists.

d) Provide fuel for motorists where necessary.

e) Perform minor repairs where time permits.

Advice to Motorists: Motorists shall be advised, and given a card, approved by the Engineer, explaining that prior to towing, pushing, fueling, or servicing their vehicles, their vehicle must be removed from the highway, that this service is being provided free of charge as a courtesy by MDOT, that the Service Patrol may attempt minor repairs when time permits, once the vehicle is cleared from the highway, and that, should the repairs not prove feasible, the motorist may make two local telephone calls not longer than three minutes using the Service Patrol's cellular telephone to telephone arrangements for further service, towing , or transportation.

Disabled Vehicles: Disabled vehicles shall be cleared of lanes, with the least delay practicable, by either pushing or towing. Vehicles that are disabled due to lack of fuel shall be provided with a maximum of two (2) gallons of the proper fuel after which re-starting of the vehicle should be attempted. Then, if the vehicle is not able to continue under its own power, it shall be towed to a safer location on the next exit ramp or to the nearest designated staging area, when provided in the contract. Vehicles with flat tires shall be towed to safer location and the tire changed there.

Disabled vehicles shall be pushed or towed to a safer location on the next exit ramp or to the nearest designated staging area, when provided in the contract.

Disabled vehicles may be towed to an open service station, located within the above limits, only at the specific request of the patron. Within these stated limits, the patron's request for disposition of the disabled vehicle shall be followed.

After towing or pushing a disabled vehicle to a location other than a service station, as described above, the Service patrol operator shall attempt to discern the cause of the disability and offer to attempt simple repairs and/or remedies. The patrol operator may spend up to 15 minutes during off-peak periods 'with any single disable vehicle and shall inform the motorist of this requirement prior to commencing repairs. If repairs cannot be made, or would take longer than 15 minutes, the Service Patrol operator shall offer the motorist the opportunity to make two local

telephone calls (not more than three (3) minutes) using the Service Patrol Vehicle's cellular telephone.

Should a motorist refuse to allow the disabled vehicle to be cleared of the traffic lanes, the Service Patrol operator shall contact the Mississippi Highway Patrol for assistance and remain on the scene, directing traffic around the disabled vehicle while providing additional protection to same from traffic via the patrol truck. If the driver does not grant permission, vehicles shall not be removed unless a Mississippi Highway Patrol officer authorizes the removal.

Abandoned Vehicles: When an abandoned vehicle is encountered, the attending Service Patrol operator shall contact the Mississippi Highway Patrol to advise the vehicle location, make, color, body type, plate number and whether or not it is impeding traffic.

When an abandoned vehicle is not impeding traffic, or is not considered to be a potential safety hazard, the Service Patrol shall notify the MHP of the vehicle location for tagging and for scheduling of wrecker services for removal.

If the abandoned vehicle is impeding traffic, or is considered to be a potential safety hazard, the Service Patrol shall request the MHP for authorization for the Service Patrol vehicle to move the abandoned vehicle to a safer location or to the nearest designated staging area, when provided in the contract. Once moved to a safer location the vehicle shall be treated as abandoned as described in the previous paragraph.

After towing an abandoned vehicle, or removing a vehicle from the scene of an accident, it shall be parked at a safer location, the wheels turned away from the roadway, the parking brake set, the windows closed, and doors locked, if possible. The vehicle may be removed to the nearest designated staging area, when provided in the contract. An inventory of vehicle items shall be conducted to include, but not limited to, radios, C.B.'s and other personal items. The location of the vehicle shall be reported to MHP.

Accidents: The Service Patrol operator shall call for police, fire and ambulance assistance as necessary at accident scenes. Where no apparent physical injury is evident, the operator shall request drivers to drive or be pushed to emergency lanes or off the road to open the obstructed lane to traffic. Operators shall take no action without the driver's consent except under police direction. Where apparent physical injury or driver intoxication is evident or suspected the operator shall not move vehicles involved in an accident until so directed by the police. In such cases, the operator shall not follow directions or requests made by vehicle's driver or occupants.

The Service Patrol Operator shall protect accident scenes by setting flares, cones, flagging, and/or flashing amber lights and assisting in traffic control.

When a vehicle's operator has been involved in an accident and is unable or not available to authorize towing, the Service Patrol operator shall request and receive authorization and orders from the Mississippi Highway Patrol prior to removing the vehicle.

Assistance to Mississippi Highway Patrol and/or other Law Enforcement Agencies: The Service Patrol operator shall render assistance to Mississippi Highway Patrol and/or other law enforcement officers when requested. Service Patrol operators shall follow the instructions of, and obey the orders of law enforcement officers at the scene of any incident.

Towing: The Service Patrol operator shall use an appropriate method of towing for each encountered situation and type of vehicle to be towed. The operator shall use towing procedures considered appropriate by the towing industry and other competent tow service operators acting in similar circumstances with similar equipment. Safety chain(s) between the towed vehicle and the Service Patrol truck shall be used during all towing.

People shall not be permitted to ride in vehicles being towed, but shall ride in the Service Patrol truck instead. If there are more than two such persons, the Service Patrol shall call the Mississippi Highway Patrol or a cab service for transportation. Costs of any needed cab service shall be included in the Service Patrol bid price.

Transporting People: When transporting passengers, the Service Patrol operator shall keep a log with the names, destination and time and mileage at the moment of departure with the passenger, and again with the mileage and time of arrival at the destination.

Animals: The location, type, and condition of injured or dead animals shall be telephone to the Animal Control Agency. The location of dead animals shall be communicated to the Contractor for his disposal.

Disposal of Rubbish, Debris and Dead Animals: The Contractor shall dispose of collected rubbish, debris, and dead animals at a legal site and in a manner conforming to local sanitation laws. The locations and nature of heavy or voluminous debris shall be reported to the Contractor for removal.

907-618.01.3.7.4--Service Patrol Log. Service Patrol operators shall maintain "Service Patrol Logs" which shall be completed for each incident attended to by the Patrol. The log form shall be approved by the Engineer.

Service Patrol Logs shall show:

(1) The date of the incident.

(2) The following times (using military time):

a) The time when the Service Patrol dispatcher noted the incident.
b) The time of arrival at the incident.
c) The time of departure from the scene of the incident.
d) The time of return to patrol duty.

(3) The nature of the incident, such as debris removal, injured or dead animal, stalled vehicle, accident.

(4) Whether the incident was detected by normal patrol activity or in response to a dispatcher's call.

(5) The incident location by route name and approximate distance north, south, east, or west to a cross street, the lane number(s) in which the incident was located, and the direction travel of the lanes.

(6) Where applicable, the following information shall be recorded.

a) The vehicle's make model, body type, and license plate number.

b) The nature of the problem, such as out of gas, overheated and flat tire.

c) The disabled vehicle driver's sex.

d) The type of assistance provided by the Service Patrol.

e) Any damage evident before, and again after, towing or pushing the disabled vehicle.

f) The location at which the disabled vehicle was disengaged from the tow truck and parked.

g) The location to which the disabled vehicle's driver and/or passengers were transported.

h) Expendable items and quantities furnished.

(7) If additional assistance by other tow services or government agencies was required.

(8) Weather conditions.

(9) The Service Patrol operator's name.

907-618.01.3.7.5--Operator Qualifications. Service Patrol truck operators shall be licensed in accordance with the Mississippi Motor Vehicle Code.

Operators shall be competent in the tasks of tow truck operations to provide safe and proper discharge of their service responsibilities. The Contractor shall provide resumes of the proposed operators for approval by the Engineer.

907-618.01.3.7.6--Operator Conduct. The operators shall exercise good sound judgment in carrying out their duties and conduct themselves in such a manner that it will reflect favorably upon the Mississippi Department of Transportation and State of Mississippi.

Operators shall:

(1) Wear clean uniforms at the start of each shift.

(2) Be well-groomed.

(3) Wear name plates where they can be seen.

(4) Be courteous at all times.

Service Patrol operators shall follow the following safety rules and general regulations.

Operator shall:

(1) Not drink alcoholic beverages on, or less than 4 hours before a shift, nor use illegal or controlled substances.

(2) Inspect assigned Service Patrol vehicles at the beginning of each shift.

(3) Always wear uniform while on duty. Uniform shirt or jacket must be clearly visible.

(4) Keep all communications radio and monitors 'on' and the volume 'up'.

(5) Remain in their assigned area and depart from the area only when absolutely necessary.

(6) Obey all traffic laws.

(7) Stop on the Interstate only to service an incident. Paperwork should be done off the Interstate, along ramps.

(8) When clearing an incident, use caution.

(9) Never push a truck or any other vehicle that obscures the vision directly ahead of you. Tow instead.

(10) Not accept payment for any type of service rendered. This is a free service and operators shall not accept any payment or gratuity for services rendered, even if the motorist insists.

(11) Contact the Mississippi Highway Patrol when arriving at situations which the Service Patrol cannot handle.

(12) Not carry firearms or other weapons either on their persons or in the Service Patrol truck.

(13) Use flashing amber lights in conformance with the Mississippi Motor Vehicle Code and only in the following circumstances:

a) When needed to warn overtaking traffic of the Service Patrol truck's low speed when accelerating into traffic lanes.

b) To warn traffic when using the truck to protect the scene of an incident.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-619-2 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Glare Paddles**

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

907-619.02--Materials. After Subsection 619.02.13 on page 424, add the following:

907-619.02.15--Glare Paddles. Glare paddles shall be as manufactured by one of the following companies, or an approved equal.

1. Carsonite International
   2900 Lockhead Way
   Carson City, Nevada 89701
   1-800-327-9647

2. Flexstake, Inc.
   2150 Andre Lane
   Fort Myers, Florida 33912
   1-800-348-9839

3. Safe-Hit Corporation
   23785 Cabot Blvd., #322
   Hayward, California 94545
   1-800-537-8958

4. Gulf Industries, Inc.
   P.O. Box 309
   Mandeville, LA 70740-0309
   1-985-892-6500

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

907-619.03.11--Glare Paddles. Glare paddle installation shall consist of furnishing, installing, maintaining, removing and relocating glare paddles as required. Glare paddles shall be placed atop precast median barriers, or other devices, at locations shown in the plans, or as directed by the Engineer.

The paddles shall be six to nine inches (6" to 9") in width, 24 to 36 inches in height, and spaced a maximum of 24 inches apart. The paddles shall be attached to the top of the devices in accordance with manufacturers recommendations at a 22 degree angle. A yellow high-intensity

reflective strip shall be attached vertically to each side of one of the paddles such that the spacing is 10 feet apart. Unless otherwise directed, these strips shall be placed on the edge of the paddle adjacent to traffic. These reflective strips shall be made of 2-inch by 12-inch material conforming to the requirements of Subsection 721.06 of the Standard Specifications.

All glare paddles shall be properly maintained. Maintenance will include replacement of damaged or missing blades, improper reflectorization, and any other portions of the installation that may fail, for the entire length of time that the paddles are in place. Cleaning of the reflective material shall be accomplished by any means that does not damage the paddles and in a manner that is not hazardous to traffic. Cleaning shall be accomplished on an as-needed basis or as ordered by the Engineer.

The Contractor shall relocate the glare paddles as required during construction at no additional cost to the State.

After completion of the work, glare paddles and attachments shall remain the property of the Contractor.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

DATE: 1/07/2015

SUBJECT: Changeable Message Signs

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

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

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

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

Each PCMS shall include the following main components:

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

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

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

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

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

NTCIP Standards.

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

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

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

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

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

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

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

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

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

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

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

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

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

It shall be comply with latest structural AASHTO requirements.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

- Bulk
- Absorption
- Float

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

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

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

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

- Bulk
- Absorption
- Float

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Table 1
Modified Object Ranges for Mandatory Objects

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

Table 2
Content of Permanent Messages

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

Table 3
Required MULTI Tags

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

Table 4
Modified Object Ranges for the Report Conformance Group

Object	Reference	Project Requirement
maxEventLogConfigs	NTCIP 1201 Clause 2.5.1	Shall be at least 50
eventConfigurationMode	NTCIP 1201 Clause 2.4.3.1	The NTCIP Component shall support the following Event Configuration Modes: 1.onChange 2.greaterThanValue 3.smallerThanValue
maxEventLogSize	NTCIP 1201 Clause 2.5.3	Shall be at least 200
maxEventClasses	NTCIP 1201 Clause 2.5.5	Shall be at least 16

Table 5
Modified Object Ranges for the Font Configuration Conformance Group

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

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

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

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

Table 6
Modified Object Ranges for the MULTI Configuration Conformance Group

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

Table 7
Optional Object Requirements

Object	Reference	Project Requirement
globalSetIDParameter	NTCIP 1201 Clause 2.2.1	
eventConfigLogOID	NTCIP 1201 Clause 2.5.2.7	
eventConfigAction	NTCIP 1201 Clause 2.5.2.8	
eventClassDescription	NTCIP 1201 Clause 2.5.6.4	
defaultFlashOn	NTCIP 1203 Clause 2.5.1.1.1.3	The PCMS shall support the full range of these objects with step sizes no larger than 0.5 seconds
defaultFlashOff	NTCIP 1203 Clause 2.5.1.1.1.4	The PCMS shall support the full range of these objects with step sizes no larger than 0.5 seconds
PCMSSWReset	NTCIP 1203 Clause 2.7.1.1.1.2	
PCMSMessageTimeRemaining	NTCIP 1203 Clause 2.7.1.1.1.4	
PCMSShortPowerRecoveryMessage	NTCIP 1203 Clause 2.7.1.1.1.8	
PCMSLongPowerRecoveryMessage	NTCIP 1203 Clause 2.7.1.1.1.9	
PCMSShortPowerLossTime	NTCIP 1203 Clause 2.7.1.1.1.10	
PCMSResetMessage	NTCIP 1203 Clause 2.7.1.1.1.11	
PCMSCommunicationsLossMessage	NTCIP 1203 Clause 2.7.1.1.1.12	
PCMSTimeCommLoss	NTCIP 1203 Clause 2.7.1.1.1.13	
PCMSEndDurationMessage	NTCIP 1203 Clause 2.7.1.1.1.15	
PCMSMemoryMgmt	NTCIP 1203 Clause 2.7.1.1.1.16	The PCMS shall support the following Memory management Modes: 1.normal

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

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

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

A MIB Module in ASN.l format containing any and all manufacturer-specific objects supported by the device with accurate and meaningful DESCRIPTION fields and supported ranges

indicated in the SYNTAX field of the OBJECT-TYPE macros shall be provided. This includes a MIB containing any other objects supported by the device.

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

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

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

Each copy shall be bound and shall contain laminated sheets.

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

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

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-619-6 DB **CODE: (SP)**

DATE: 1/07/2015

SUBJECT: Impact Attenuators

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

907-619.02--Material Requirements. After the last paragraph of Subsection 619.02.9 on page 421, add the following.

When an impact attenuator is no longer needed at one location, as determined by the Engineer, the attenuator shall be removed. When the contract has provisions for the removal and resetting of impact attenuators, the attenuator shall be removed and reset at other designated locations. When an impact attenuators has to be stored until needed at another location, payment for removing and resetting will not be made until the attenuator is reset at the designated location. The Contractor shall furnish the storage area.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-622-7 DB **CODE:**

DATE: **02/28/2015**

SUBJECT: **Engineer's Field Office Building**

Section 622, Engineer's Field Office Building, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction, is hereby amended as follows:

907-622.03.1.1—Type 1, Type 2 and Type 3 Field Office Buildings. At the end of the third paragraph of subparagraph K in Subsection 622.03.1.1 on page 436, add the following.

In addition to the telephone service, the Contractor shall also provide a broadband connection to the internet. The service shall be capable of providing a download speed of 100 Mbps and a upload speed of 20 Mbps.

The Engineer's Field Office Building shall be Type 3.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-626-25 DB **CODE: (IS)**

DATE: 01/07/2015

SUBJECT: Thermoplastic Traffic Markings

Section 626, Thermoplastic Traffic Markings, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-626.01--Description. After the last sentence of the first paragraph of Subsection 626.01 on page 443, add the following.

All pavement marking material, excluding edge lines over rumble strips, shall be applied using the extrusion/ribbon method. Edge lines placed over rumble strips shall be applied using the atomization/spray method.

907-626.03.1.1--Equipment. After the second paragraph of Subsection 626.03.1.1 on page 444, add the following.

When edge lines are placed over rumble strips, the equipment must be able to apply the marking material using the atomization/spray method instead of extrusion/ribbon method.

907-626.03.1.2--Construction Details. Delete the second sentence of the first full paragraph of Subsection 626.03.1.2 on page 445, and substitute the following.

Unless otherwise specified in the plans or contract documents, the thickness shall be 90 mils for edge lines, center lines, lane lines, barrier lines and detail stripe including gore markings, and 120 mils for crosswalks, stop lines, and railroad, word and symbol markings.

After the last sentence of the third full paragraph of Subsection 626.03.1.2 on page 445, add the following.

When double drop thermoplastic stripe is called for in the contract, additional beads by the drop-on method shall be applied as follows.

Class A glass beads at a rate of not less than three pounds of beads per 100 feet of six-inch stripe.
Class B glass beads at a rate of not less than three pounds of beads per 100 feet of six-inch stripe.

The Class B glass beads shall be applied to the newly placed stripe first, followed by the application of the Class A glass beads.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-630-2 DB **CODE: (SP)**

DATE: 1/07/2015

SUBJECT: Remove and Reset Ground Mounted Signs

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

907-630.01--Description. After the last paragraph of Subsection 630.01 on page 454, add the following:

Selected existing, temporarily installed, and/or permanently installed ground mounted sign assemblies other than construction traffic control sign assemblies shall be removed and reset as directed by the Engineer. Removing and resetting of ground mounted sign assemblies shall include provision of continuous sign visibility by the traveling public before, during, and after the operation. The Contractor shall provide all materials necessary to effect the removal and resetting, including footings, supports, brackets, hardware, breakaway features and other incidentals. All installations within 30 feet of the pavement edge of temporary or permanent through lanes shall include breakaway support features certified to meet NCHRP Report 350 prior to the removal and resetting of the sign assembly.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-630-7 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Remove and Reset Signs**

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

907-630.01--Description. After the last paragraph of Subsection 630.01 on page 454, add the following:

Selected existing, temporarily installed, and/or permanently installed signs other than construction traffic control signs shall be removed and reset as shown on the plans, in the contract documents, or as directed by the Engineer. Removing and resetting of signs may include provisions of continuous sign visibility by the traveling public before, during, and after the operation. The Contractor shall provide all materials necessary to remove and reset the sign, including any footings, supports, brackets, hardware, breakaway features and other incidentals. All installations within 30 feet of the pavement edge of temporary or permanent thru lanes shall include breakaway support features certified to meet NCHRP Report 350 prior to the removal and resetting of the sign.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-630-13 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Sign Supports**

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 three paragraphs of Subsection 630.01 on page 454 and substitute the following.

907-630.01.1--Contractor Designed Supports. When specified as Contractor Designed Metal Overhead Sign Supports, the Contractor will be responsible for the design of the metal overhead sign support(s) and overhead sign supports on bridges(s). The design shall meet the latest requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals.

The Contractor shall submit to the Director of Structures, State 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 controlling sign configuration and total area of design sign shall be labeled on the design drawings. The design shall be prepared by a Professional Engineer registered in the State of Mississippi proficient in the design of overhead sign structures.

The Contractor shall provide a detailed cross section at the location of each new sign truss. At the locations where the truss will span existing roadways, the Contractor shall obtain a surveyed cross section extending beyond the limits of the truss. The cross section will show the horizontal dimensions and elevations of ditches, edge of travel lanes, shoulder lines, pavement crown lines, barriers and retaining walls, etc. The truss and signs shall be located on the cross section and shall include both vertical and horizontal dimensions to the finished roadway surface. The overhead sign truss details provided in the contract plans or documents will not be acceptable as the Contractor's detailed cross section. The cross section information shall be of sufficient accuracy to verify the sign truss dimensions required for each specific location. This information shall be submitted for review with the sign truss shop drawings and calculations.

The Contractor is responsible for designing and constructing modifications to barriers and retaining walls as necessary to carry sign truss loads for sign truss assemblies attached to such structures. Barrier faces must smoothly transition back to the existing barrier section as specified in the plans. All designs and proposed modifications must be stamped by the Contractor's engineer and submitted to the Engineer for review.

Bridge information plans are provided to assist the Contractor's Engineer in designing attachments to bridges. All bridge attachments must be submitted to the Director of Structures, State Bridge Engineer through the Project Engineer for review. Use of chemical adhesive anchors is prohibited. Mechanical anchors are permissible as approved by the Director of Structures, State Bridge Engineer. Mounting holes for sign assemblies attached to prestressed concrete girders shall be placed at locations where the prestressing strands are not damaged by drilling. Mounting sign assemblies to steel girders by welding is prohibited. A limited number of mounting holes may be drilled only in the steel girder webs at locations which do not interfere with existing members such as bolts, stiffeners, and splice plates. Attachments which cause concentrated loads on girder webs will be spread out along the web both vertically and horizontally by use of steel plates so as to not cause distortion in the web. Drilling in steel girder bottom flanges is prohibited.

The design wind speed shall be as shown in the design specifications with a minimum of 90 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 vertically to the truss to which the signs are attached, extending along the truss across the roadway below from points four feet outside each outer edge of exterior travel lane, 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: Outer Edge of Exterior Travel Lane to Outer Edge of Exterior Travel Lane plus six (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.

907-630.02--Materials. Delete the last three paragraphs of Subsection 630.02 on page 455, and substitute the following.

Structural Steel. Material for posts, chords and bracing members shall meet the requirements of ASTM Designation: A 501 or ASTM Designation: A 53, Grade B. Material for structural shapes, plates, posts and chord caps shall meet the requirements of ASTM Designation: A 36. Material for round tapered monotube shall meet the requirements of ASTM Designation: A 595, Grade A.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-631-1 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Flowable Fill**

Section 631, Flowable Fill, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is deleted in toto and replaced as follows:

SECTION 907-631 - FLOWABLE FILL

907-631.01--Description. This work shall consist of furnishing and placing a flowable fill material. Uses include, but are not limited to, placement under existing bridges, around or within box culverts or pipe culverts, or at other locations shown on the plans.

907-631.02--Materials. All materials shall meet the requirements of the following Subsections, or as stated herein:

Fine Aggregate..... *
Portland Cement..... 701.01 and 701.02
Fly Ash..... 714.05
Air Entraining Admixtures ** 713.02
Water..... 714.01.1 and 714.01.2
Calcium Chloride **.....714.02

* The gradation of the fine aggregate shall be fine enough for the fine aggregate to stay in suspension in the mortar to the extent required for proper flow and shall conform to the following grading:

Sieve Size	% Passing
1/2 inch	100
No. 200	< 1

** High air generators shall be used, as required, in order to increase the total air content to 25 – 35%. Only approved high air generators shall be used to obtain the required air content. Either a Type C or E chemical admixture or maximum 1.0% calcium chloride by weight of the total cementitious materials may be added as required by the application and with the approval of the Engineer. Calcium chloride may not be used where the flowable fill comes into contact with metal. Adding the Type C or E chemical admixture or calcium chloride does not require a different or new mixture design from one previously approved.

907-631.02.1--Mixture Design. Flowable fill is a mixture of Portland cement, fine aggregate, water, and, as required to obtain the required total air content, either high air generators or air

entraining admixtures. Fly ash shall be used for Non-Excavatable applications. Flowable fill contains a low cementitious content for reduced strength development.

At least 30 days prior to production of flowable fill, the Contractor shall submit to the Engineer proposed flowable fill mixtures design following the mixture design submittal procedures listed in the Department's *Concrete Field Manual*.

The concrete producer shall assign a permanent unique mixture number to each flowable fill mixture design. All flowable fill mixture designs will be reviewed by the Materials Division prior to use. Flowable fill mixture designs disapproved will be returned to the Contractor with a statement explaining the disapproval.

Once approved, a flowable fill mixture design may be transferred to other projects without additional testing provided the material sources have not changed. Allowable changes in material sources shall meet the requirements of the Department's *Concrete Field Manual*, Section 5.7. For allowable changes in material sources, the mixture design shall be re-verified following the requirements of Subsection 907-631.02.1.2.

907-631.02.1.1--Proportioning of Mixture Design. The mixture design proportions shall be determined based on batches mixed using production equipment.

Table 1, "Flowable Fill Mixture Design Proportioning Guide", is a guide for proportioning flowable fill, except where noted.

Table 1
Flowable Fill Mixture Design Proportioning Guide

	Excavatable	Non-Excavatable
Material	Amount (lbs/yd^3)	
Cement	75 – 150 *	75 – 150 *
Fly Ash	-	150 – 600 *
Fine Aggregate	**	**
Water	***	***

* Guideline for proportioning. The actual amount may vary from the amount listed the Table 1.

** Fine aggregate shall be proportioned to yield one cubic yard of mixture as verified by unit weight.

*** Mixture designs shall produce a consistency that will result in a flowable self-leveling product at time of placement.

Each mixture design shall be verified using production equipment prior to submittal of the mixture design for review. During the verification, the mixture design shall meet the

requirements of the "Performance Requirements Flowable Fill Design" listed in Table 2. The verification performance data and the corresponding batch ticket shall be submitted with the mixture design.

Table 2
Performance Requirements for Verification of Flowable Fill Mixture Designs

Mixture Property	Performance Requirement		Required Test Method
	Excavatable	Non-Excavatable	
Consistency	Approximate 8-inch spread		(see below)
Total Air Content (%)	25 – 35	5 – 15	AASHTO T121
28 Day Compressive Strength (psi)	–	Minimum 125	AASHTO T22 and T23
Unit Weight (lbs/ft^3)	90 – 110	100 – 125	AASHTO T121

The consistency of the fresh mixture shall be that of a thin slurry. The consistency shall be tested by filling to the top a three-inch diameter by six-inch high cylinder which is open on both ends. With the mixture in the cylinder, immediately pull the cylinder straight up. The correct consistency of the mixture will produce a spread meeting the requirements in Table 2 with no segregation.

907-631.02.1.2--Verification of Mixture Design. The verification shall be performed by the Contractor prior to submittal of the mixture design proportions for review. The verification performance data and the corresponding batch ticket shall be submitted with the mixture design. The verification shall be performed using the batching and mixing equipment anticipated to be used during production of the mixture for the project. In addition to the performance requirements listed in Table 2, the verification shall meet the batching tolerance requirements for the material weights listed in the Department's *Concrete Field Manual*.

Adjustments of the proportions of fine aggregate and/or water shall be made to achieve suspension of the fine aggregate.

The requirements in Table 2 for consistency, percent total air content, compressive strength, and unit weight are for verification of the mixture design proportion purposes only and are not intended for jobsite acceptance requirements.

907-631.02.2--Acceptance of Mixture. The acceptance of the mixture at the job site will be based on the performance of the flowable fill mixture placed and will be at the discretion of the Engineer. For acceptance of the mixture at the job site, the mixture shall be self-leveling and shall not settle, segregate, or have excessive bleed water.

907-631.02.3--Manufacturing. Flowable fill will be batched, mixed, and transported in accordance with the requirements of Section 804.

907-631.02.4--Sampling and Testing. The yield shall be determined by testing the first load

placed on each production day in accordance with AASHTO Designation: T121. If adjustments are made to the mixture design proportions to correct for yield, the yield shall be determined on the next load with the adjusted proportions.

907-631.03--Construction Requirements. Prior to placing flowable fill, each end of the structure shall be plugged leaving an opening at each end no larger than necessary to accommodate the filling equipment. Flowable fill shall be discharged from the mixer by any reasonable means into the area to be filled. Unless otherwise approved by the Engineer, filling will begin on the downstream end of the structure and continue until no further material will enter the structure. The flowable fill will then be continued from the upstream end of the structure.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-637-49 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **ITS Equipment Cabinets**

PROJECT: **DB/IM-0055-02(244) / 106023305 -- Hinds County**

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

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

SECTION 907-637--ITS EQUIPMENT CABINETS

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

This work shall also consist of relocating existing Type B cabinets to the locations shown on the Plans and described herein.

907-637.02--Materials.

907-637.02.1-- Blank.

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

1) Furnish equipment cabinets and integral materials recommended by the manufacturers for outside plant use and the intended application. This requirement includes wiring and electrical materials and configurations (including connector pin-outs) that are wholly or partially related to the field device applications (CCTV, RDS, VDS, etc.).
2) Furnish and configure equipment cabinets to be installed at locations as shown in the Plans. Furnish and configure all equipment and materials for each specific location as shown in the Plans.

3) Provide electrical system and components with UL-listings.

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

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

1) DIN EN 50022 (NS35) component rails.

2) Component rails shall be the perforated type and of sufficient length as to protrude beyond the mounted components for fastening to cabinet panels as specified herein.

3) UL 1059.

4) UL 486E.

5) NEMA ISC-4.

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

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

1) Shall be nickel-plated copper, copper alloy or brass.

2) Terminal blocks shall have voltage and current ratings greater than the ratings of the wires that are terminated, be able to terminate wires from #8 AWG to #1/0 AWG wiring and shall be assembled into housing enclosures such that all exposed surfaces are touch-safe. Conductor fastening screws shall be captive. Terminal block housings shall be colored as follows:

   a. 120 VAC line/hot: black

   b. 120 VAC neutral: white

   c. 24 VDC positive: red

   d. 24 VDC negative: gray

   e. RS485 communications: orange

   f. Ground: green or green/yellow

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

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

2) Provide two keys with each cabinet.

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

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

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

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

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

1) All Type A cabinets shall be identical in manufacture and assembly, capable of supporting Radar Detection System units.
2) Provide a Type A cabinet intended for outdoor use with a minimum NEMA 3R rating.
3) The cabinet enclosure shall be manufactured from 0.125-inch aluminum.
4) The cabinet shall provide a minimum of one ventilation louver on at least two sides. Any louver opening greater than 3/16 inch in any dimension shall be screened to prevent insect entry.

5) The cabinet shall be intended for strapped pole-mounting; provide all mounting hardware necessary including ½-inch stainless steel mounting straps.

6) Provide a Type A cabinet enclosure with dimensions of 18 inches (H) by 14 inches (W) by 8 inches (D) with a tolerance of +/- 0.25 inches.

7) Cabinet door shall reveal the entire front opening of the cabinet for accessibility. The hinge shall be designed to prevent the door from sagging.

8) Include a single-piece 0.125-inch aluminum back panel covering no less than 90% of the cabinet back wall. Back panel shall be affixed to the enclosure with threaded fasteners and shall be removable from the enclosure with hand tools only and without requirement to remove the cabinet door, mounting straps, or any other components other than communications or device wiring.

9) The cabinet shall be furnished with doorstops, which retain the doors open in a 90 degree and 120 degree positions.

10) Provide on the back panel a grounding lug directly bonded to the back panel capable of terminating #6 AWG wire.

RDS Communications Wiring. RDS communication wiring shall meet the following.

1) Component rail physically and electrically fastened to the cabinet back panel.

2) Strain relief brackets for the RDS comm. cable(s) and the RDS unit harness cables.

3) Parallel-connection single-stage surge suppressors for the four wire RS-485 data signal for the RDS units with integral or separate terminals for a minimum of three RDS comm. Cables.

4) Parallel-connection zero-power dissipation surge suppressor for the 12-24VDC power supply for the RDS units with integral or separate terminals for a minimum of three RDS comm. cables and two RDS unit harness cables.

5) Connection/jumper wiring between the surge suppressors and the local/remote communications disconnect module(s) shall be of the same conductor size, type, and insulation color as in the RDS comm. cable.

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

1) All Type B cabinets (except those at solar power locations) shall be uniform in manufacture and assembly, capable of supporting the field equipment as shown on the plans. As a minimum support is required for two RDS units, one Type A or B network switch, one video encoder, one Type A radio/antenna, RDS comm. cable and fiber drop panel terminations, regardless of the devices shown in the Plans at a specific location.

2) A complete Type B cabinet shall be an assembly consisting of a cabinet housing and electrical subsystems.

3) Provide a Type B cabinet housing that conforms to the standards for a Type 170 336S (approximate exterior dimensions 46 inches (H) x 24 inches (W) x 23 inches (D)),

including standard EIA 19-inch rack cabinet cage, as defined in the latest version of the Caltrans Transportation Electrical Equipment Specifications (TEES). The minimum clear vertical inside dimension of the 19-inch rack for equipment mounting shall be 39.5 inches. Standard cabinet accessories for traffic signal operations, such as controller, power distribution assembly, input/output file and termination panels, and the police panel, are not required as part of this cabinet assembly.

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

1) Provide all mounting hardware necessary for base or pole mounting as shown on the plans. As a minimum provide three (3) 3/4-inch stainless steel mounting straps for pole mounted cabinets.
2) Include hooks, welded to the inside of each cabinet door, for hanging a side-opening, opaque, resealable, heavy-duty plastic documentation pouch with metal or hard-plastic reinforced holes for the door hooks. Provide one pouch with each cabinet.
3) Include a rack-mounted cabinet sliding storage drawer in accordance with the following:
   a. Approximate exterior dimensions 1.75 inches (H) x 16 inches (W) x 14 inches (D).
   b. Telescoping drawer guides to allow full extension from the rack cage.
   c. Opening storage compartment lid to access storage space for cabinet documentation and other items.
   d. Supports a weight of 25 lb when extended.
   e. Non-slip plastic laminate surface attached to the compartment lid which covers a minimum of 90% of the surface area of the lid.
   f. Mounted in the rack cage with the bottom surface approximately 9 inches above the bottom of the rack cage.
4) Includes side panels within the two sides of the rack cabinet cage, inserted and fastened from the inside of the cage. Use side panels fabricated from 0.125 inch 5052 sheet aluminum alloy and sized to the full inside dimensions of the rack cabinet cage. Side panel surfaces for equipment mounting are denoted by cabinet side, with the “right” side being the support pole side, and by upper or lower as related to the sliding storage drawer. Upper right side panel (support pole side of cabinet, above the drawer) and lower left side panel (opposite side from the support pole, below the drawer) are example side panel surface names.
   a. Includes a 12-inch long DIN rail (for future components) mounted in the horizontal and vertical center of the lower left side panel.

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

1) Includes an electrical distribution module comprised of the following DIN rail-mounted components:

   a. Service entrance terminal block with positions for 120VAC line, neutral, and ground and capable of terminating minimally #6 through #8 AWG wire, located at one end of the mounting rail with an approximately 0.75 inch blank spacer module adjacent to the main cabinet breaker.

2) Main cabinet automatic overcurrent 15A circuit breaker that is UL-listed and of the mechanical-magnetic type rated for use from -18° C to 50° C minimum.

3) Main cabinet surge suppressor for single-phase 120VAC service entrance, parallel wired with a clamp voltage of approximately 280V and capable of a surge current of at least 20,000 amps.

4) Main cabinet filter for power line noise and switching transient suppression, integral to, or separate from and wired to, the main cabinet surge suppressor.

5) Electrical distribution terminal block for line and neutral conductors parallel wired to the main cabinet surge suppressor but non-filtered, with a minimum terminating capability of six conductors of #10 to #18 AWG. Label the terminal block as “ACCY POWER”.

6) Electrical distribution terminal block for line and neutral conductors for circuits on the load/equipment side of the power line filter, with a minimum terminating capability of six conductors of #10 to #18 AWG. Label the block as “EQUIP POWER”.

7) Electrical distribution terminal block for grounding and bonding conductors located on the same rail but separate from the service entrance terminal block and connected to the entrance ground with a #6 AWG green insulated wire. The grounding block shall have a minimum terminating capability of two #6 AWG conductors and ten #10 to #18 AWG conductors.

8) Ground fault interrupt duplex receptacle (NEMA 5-15R) with 2.5A circuit breaker connected to the ACCY POWER distribution block. Permanently affixed to the receptacle, provide two red, orange or green/yellow labels with minimum 0.25 inch lettering with the legend “300 WATTS MAX”. This receptacle is for technician use only and shall not be used to power equipment.

9) Include two duplex non-GFCI equipment power receptacles (NEMA 5-15R) connected to the EQUIP POWER distribution block mounted on the upper rear corner of the cabinet upper right side panel. Permanently affixed to the receptacle, Provide two red, orange or green/yellow labels with minimum 0.25 inch lettering with the legend “75 WATTS MAX” permanently affixed to the receptacle.

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

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

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

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

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

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

907-637.03--Construction Requirements.

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

1) Install and configure cabinets as shown in the Plans and according to manufacturers recommendations, including installations and dimensions given for pole-mounting in relationship to the surrounding grade.
2) Bond all cabinets to the pole grounding lug with minimum #6 AWG stranded copper bare or green-insulated cabinet grounding wire. Alternately on existing poles only, bond the cabinet grounding wire to an existing pole grounding wire with a cast brass or copper alloy threaded compression connector within 4 inches of the existing pole grounding lug.

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

4) Provide a cabinet wiring and interface diagram to be included in the required hanging, side-opening, able to be resealed opaque, heavy-duty plastic documentation pouch.

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

1) Install and configure equipment in the Type B cabinet in accordance with the requirements for that equipment, including RDS units, CCTV, Type A and B network switches, video encoders, Type A radio/antennas, RDS comm. cables and/or fiber distribution or drop panels.

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

3) Install network switches and video encoders in the top most area of the cabinet rack. Use the equipment receptacles for power.

4) Install supporting equipment/electronics for CCTV on the lower area of the cabinet upper left side panel. Ensure there is no physical or access conflict with the network switch and video encoder. Use the EQUIP POWER distribution block for the power source.

5) Install fiber drop panels in a vertical configuration on the lower rear edge of the cabinet upper right side panel.

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

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

1) The Contractor shall conduct a project testing program for all equipment cabinets. The project testing program shall include but is not limited to the specific requirements in this subsection.

2) All test results shall confirm physical and performance compliance with this Special Provision.

3) Submit all test results documentation to the Engineer within 7 days of completion of the tests. The Engineer will review test documentation.

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

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

2) A SAT for a given equipment cabinet shall only be performed in conjunction with the SAT for all devices installed in or connected to that given cabinet.

3) Visual inspection of installation.

4) Inspection of cabinet documentation.

5) Functional test of all cabinet equipment, including circuit breaker, receptacles, fan and thermostat, and lights and door switches.

6) Measurement of DC power supply operating under full load.

907-637.03.4--Relocation of Type B Cabinets. The Contractor shall relocate existing Type B cabinets from and to the locations in the following table.

Existing Location	Proposed Location
588+70	590+25
765+57	765+59
848+09	848+40
854+77	854+80
947+63	947+59

The existing Type B Cabinets shall be relocated as shown on the Plans. These cabinets shall be connected to MDOT fiber optic cable and shall be routed to the Mississippi Statewide Traffic Management Center (TMC).

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-639-69 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Traffic Signal and ITS Equipment Poles**

PROJECT: **DB/IM-0055-02(244) / 106023305 -- Hinds County**

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

SECTION 907-639 - TRAFFIC SIGNAL AND ITS EQUIPMENT POLES

907-639.01--Description. This work consists of furnishing all component materials required to form completed independent signal equipment poles and extensions of the types specified and assembling, constructing, erecting and installing same in conformity with these specifications to ensure support poles in accordance with the design(s) and at the lines and grades shown on the plans or as directed.

This work also consists of furnishing and installing support poles and foundations for 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.

This work may also consist of relocating an existing camera pole and installing a new pole foundation as described below.

This project requires relocating an existing camera pole from Station 947+63 to Station 947+59 as shown on the Plans. The camera pole on a new foundation shall be connected to MDOT fiber optic cable and shall be routed to the Mississippi Statewide Traffic Management Center (TMC). The foundation for the camera pole shall be Contractor designed and the Contractor shall submit two (2) sets of calculations and four (4) sets of shop drawings for all items associated with the construction and installation of the structure, including ITS attachments and foundation for approval.

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

907-639.02.1--Poles.

907-639.02.1.1--Traffic Signal Poles. Traffic signal poles shall meet the requirements of Subsection 722.02. The traffic signal equipment pole shaft extension shall meet the requirements of the plan.

907-639.02.1.2--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 90 mph. For projects that are in areas with higher wind standards, the higher standard shall be used. 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:

   - Consideration shall be given for all parts of the structure.
   - Consideration shall be given for all possible loading combinations including wind and ice loads.
   - Computations shall include design stresses and allowable stresses for all components which comprise the proposed structure.
   - Top of pole deflection shall not exceed 1-inch deflection from center due to 30 mph (non-gust) winds for the 50-foot poles.
   - All complete shop drawings and design computations shall bear the stamp of a Professional Engineer registered in the State of Mississippi.

- 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.
- The Engineer reserves the right to reject a pole design if the calculated deflection exceeds that specified herein.
- 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.
- 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:
   - Top/bottom diameter, taper rate, wall thickness, section modulus, moment of inertia, and cross sectional area for each pole section.
   - The centroid, weight, projected area, drag coefficient, velocity pressure, and wind force of each trapezoidal pole section.
   - 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.
   - The pole's angular and linear deflection at each section.
8) Pole Mounted Cabinet Access Conduit Nipple:
   - Each pole will be manufactured with a 2-inch diameter rigid threaded nipple for conduit connection to a pole-mounted cabinet.
   - 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:
   - Hand hole openings shall be reinforced with 2-inch wide hot rolled steel bar. The opening shall be rectangular and 5" x 8" nominal.
   - The cover shall be 11-gauge steel and shall be secured to a clip-on lock with a tamper-proof screw.
   - The reinforcing rim shall be provided with a ½-inch tapped hole and ½-inch hex head cap screw for grounding.
   - 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.
   - 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:

- Base plates shall conform to ASTM A572 (50 ksi min. yield).
- Plates shall be integrally welded to the tubes with a telescopic welded joint or a full penetration butt weld with backup bar.
- Plates shall be hot dip galvanized.

12) Anchor Bolts:
    - Anchor bolts shall conform to the requirements of AASHTO M314-90 (105 ksi min. yield.) The upper 12 inches of the bolts shall be hot dip galvanized per ASTM A153.
    - Each anchor bolt shall be supplied with two (2) hex nuts and two (2) hardened washers.
    - The strength of the nuts shall equal or exceed the proof load of the bolts.
    - The top nut shall be torqued so as to produce 60% yield stress of anchor bolt.
    - 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.

907-639.02.1.3--Galvanized Steel Poles for Detectors. Ground mounted detector 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. Poles shall be designed to withstand the specified forces including those produced by a 100 mph wind with a 1.14 gust effect factor.
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) Poles shall be formed from a single sheet of hot rolled weldable grade steel, galvanized in accordance with ASTM Designation: A 123. Unless otherwise noted on the plans, poles shall be made from steel meeting the requirements of ASTM Designation: A 572 Grade 55, or A 595 Grade A. Minimum yield strength shall be 48,000 psi after fabrication. Design wind loading shall be as indicated on the plans. The pole shall meet design wind loading with detector(s) installed.
5) Poles shall have a constant taper of 0.14 inch nominal per foot.
6) 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.
7) Pole heights shall be as indicated on the plans.

8) 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.
9) 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; minimum yield strength shall be 50,000 psi. 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.

907-639.02.1.4--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 90 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.
3) 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.
4) External surface of poles shall have a satin-type finish, clean and smooth, with all details defined and true to pattern.
5) Poles shall have a constant taper of 0.14 inch nominal per foot.
6) 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.
7) Pole heights shall be as indicated on the plans.
8) 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.
9) 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; minimum yield strength shall be 50,000 psi. 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.

907-639.02.1.5--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 90 mph. For projects that are in areas with higher wind standards, the higher standard is required. 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:

   - Consideration shall be given for all parts of the structure.
   - Consideration shall be given for all possible loading combinations including wind and ice loads.
   - Computations shall include design stresses and allowable stresses for all components which comprise the proposed structure.
   - Top of pole deflection shall not exceed 1-inch deflection from center (2-inch deflection diameter) due to 30 mph (non-gust) winds.
   - All complete shop drawings and design computations shall bear the stamp of a Professional Engineer registered in the State of Mississippi.

- 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.
- The Engineer reserves the right to reject a pole design if the calculated deflection exceeds that specified herein.
- 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:
   - Top/bottom diameter, taper rate, wall thickness, section modulus, moment of inertia, and cross sectional area for each pole section.
   - The centroid, weight, projected area, drag coefficient, velocity pressure, and wind force of each trapezoidal pole section.
   - 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.
   - The pole's angular and linear deflection at each section.
8) Hand Holes:
   - Hand hole openings shall be reinforced with 2-inch wide hot rolled steel bar. The opening shall be rectangular and 5" x 8" nominal.
   - The cover shall be 11-gauge steel and shall be secured to a clip-on lock with a tamper-proof screw.
   - The reinforcing rim shall be provided with a ½-inch tapped hole and ½-inch hex head cap screw for grounding.
   - 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.

907-639.02.2--Traffic Signal Mast Arms. Traffic signal mast arms and mast arm extensions shall be steel meeting the requirements of Subsection 722.16.

907-639.02.3--Foundations.

907-639.02.3.1--Foundations for Traffic Signal Poles. Cast-in-place foundations for concrete, steel, and/or aluminum shafts shall be as specified on plans, and shall be cast of reinforced Class "B" Concrete conforming to the requirements of Sections 601 and 602. Anchor bolts, washers, and hexagon bolts for use in the foundation shall conform to Subsections 722.11 and 722.12. The anchor bolt shall be galvanized only through the threaded section and a minimum of six inches below the top of the concrete foundation. The foundation bolts shall be set in the concrete

foundation to fit the bolt circle of each type of pole. Conduit for electric cable shall comply with the requirements for such materials as set out in Subsection 722.05.

907-639.02.3.2--Foundations for ITS Poles. Cast-in-place foundations for ground mounted equipment poles shall be Contractor Designed in accordance with this specification and the plans. It shall be cast with 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.

907-639.03--Construction Requirements.

907-639.03.1--Installation of ITS Equipment. 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:

- The Contractor shall submit a design for each pole foundation that has been sealed by a Professional Engineer registered in the State of Mississippi.
- 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.
- 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.
- 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.
- 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.
- Concrete shall cure a minimum of seven (7) days before any load is applied to the foundation.
- Conduit shall be installed in the pole foundation for access and includes conduit to the nearest pull box as shown in the Plans.

- 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:

- The Contractor shall supply and install a grounding system with ground rod array at the base of all poles as shown on the Plans.
- The ground rod array system shall be connected to the pole through an appropriate ground clamp.
- 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.
- 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.

907-639.03.2--Foundations. In some instances, it may be necessary to use slip casing to keep the foundation holes open. Casing may be required in portions of the holes that are not stable. Casings authorized by the Engineer shall be of suitable size and strength to accommodate the drilling equipment and to withstand ground-pressures and removal operations without deformation of the poured shaft. When removed, the casings shall revert to the Contractor for disposal.

Due to the soil conditions in certain areas, the plans may indicate locations where the concrete shall be placed with a tremie. When a tremie is used, it shall perform in accordance with the requirements in Subsection 907-804.03.9 of the Standard Specifications.

907-639.03.2.1--Foundations for Traffic Signal Poles. Excavation for concrete foundations or butts shall be opened vertically in accordance with the methods of Section 801 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 under Subsection 722.02.1.3. 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. 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.

907-639.03.2.2--Foundations for Ground Mounted ITS Poles. Pole foundations shall be constructed as per the details on the plans, these specifications, and Section 803 of the Standard Specifications. Casings, if required, will be in accordance with Section 803 of the Standard Specifications.

907-639.03.3--Setting and Aligning Traffic Signal Poles.. Traffic signal poles anchored to the concrete foundation or with precast butts shall have sufficient rake so as to assume a vertical position when the load is applied. Poles with precast butt shall be wet-tamped in place with crushed aggregate, concrete or satisfactory cement stabilized soil, as directed. Poles set on concrete foundations may use leveling nuts to align poles. After alignment of pole on the

concrete foundation is completed, the entire area between the bottom of the pole and the top of the concrete foundation shall be filled with grout meeting the requirements of Subsection 714.11. Careful aligning of the poles shall be considered a most essential feature of the installation of the assembly and shall be as nearly perfect as practicable.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-641-4 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Radar Detection System (RDS)**

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. 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 six feet (6') 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 – 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 six (6) user-defined classes.
5) RDS in forward-looking configuration shall monitor traffic in one lane and be capable 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	±20%

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 12–24 V DC or 115-220 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 eight (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 RDS 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 shall be provided. The surge suppressor shall protect the 4-wire RS485 data signal with hybrid multi-stage suppression components including gas tube and silicon avalanche diode. The surge suppressor shall have a response time no greater than one (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 and/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--Installation Requirements. All equipment shall be installed according to the manufacturer's recommendations, the Plans and as follows:

1) The RDS shall be mounted in side-fired or front facing 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.
2) The Contractor shall install the detector unit on a pole at the manufacture's recommended height above the road surface so that the masking of vehicles in minimized and that all detection zones are contained within the specified elevation angle as suggested by the manufacturer.
3) 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.
4) The RDS mode of operation, detection zones and other calibration and set up will be performed using a 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.
5) Unused conductors in the RDS Comm Cable shall be grounded or terminated in the cabinet in accordance with the manufacture's recommendations. Terminated conductors shall be individually doubled back and taped, then loosely bundled and secured.
6) The Contractor shall provide the MDOT with a written inventory of items received and the condition in which they were received. Inventory shall be inclusive of make, model, and serial numbers, MAC address, and installation GPS coordinates. All equipment shall be installed according to the manufacturer's recommendations or as directed by the MDOT.
7) Any new, additional or updated drivers required for the existing ATMS software to communicate and control new RDS installed by Contractor shall be the responsibility of the Contractor.

907-641.03.1--Testing. The Contractor shall conduct a Project Testing Program as required below. All costs associated with the Project Testing Program shall be included in overall contract prices; no separate payment will be made for any testing.

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

required to perform the Conditional Acceptance test with the MDOT ITS Engineer or his designee present.

2) Each test shall fully demonstrate that the equipment being tested is clearly and definitely in full compliance with all project requirements.
3) 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.
4) No testing shall be scheduled until approval of all project submittals and approval of the test procedures for the given test.
5) The Contractor shall provide all ancillary equipment and materials as required in the approved test procedures.
6) 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.
7) 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.
8) 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 or his designee.
9) 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.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

DATE: 03/05/2015

SUBJECT: Dynamic Message Sign

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 color (RGB) 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 (21 characters per line) shall each have a nominal height of 18 inches.
   c) Pixel pitch shall be 66mm (2.6”) or less.
   d) The signs housing shall be a walk-in enclosure.
2) DMS Type 2 shall meet the following requirements:
   a) Shall be full color (RGB) 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 (21 characters per line) shall each have a nominal height of 18 inches.
   c) Pixel pitch shall be 66mm (2.6”) or less.
   d) The sign 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) Surge Protection Device (SPD)

907-656.02.3--References. These Special Provisions incorporate 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 outline in Section 2 of NEMA TS-4 standard in addition to the following minimum requirements:

1) SPD 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 SPD shall be designed to meet IEEE C62.41 C3 conditions.
3) A SPD intalled for AC power feed at the panel board shall be connected in parallel and meet the following minimum electrical requirements:
   a) Withstand a peak 100,000-ampere surge current, 50kA L-N, 50kA L-G
   b) 5000 Category (C3 High) impulses with <10% drift, short-circuit current rating (SCCR) of 200,000 rms symmetrical amperes (UL Listed) .
   c) UL 1449 200kA SCCR, UL 1283 4th Edition, and Canadian safety standards.
   d) Temperature range of -40°F to +140°F (-40°C to +60°C)

4) A SPD intalled for DMS control equipment protection shall be connected in series and meet the following minimum electrical requirements:

a) Withstand a peak 50,000-ampere surge current for an 8x20 microsecond wave form
b) Maximum continuous operating current of 15 amps at 120 VAC, 60 Hz
c) UL 1449 surge rating of 400V or less
d) Temperature range of -40°F to +158°F (-40°C to +70°C)

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) Air filters shall completely cover the vent opening area.
4) Air filters shall be manufactured per ASHRAE Standard 52.2P or Standard 52.1.
5) Air filters 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 (25° to 50°C).

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 no 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 surfaces other than the front of the sign housing 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 the side of

the DMS housing that is immediately adjacent to roadside, but NOT directly above the travel lanes, and facing traveled way..

907-656.02.7--Controller to Sign Interface. Each DMS shall meet all of the performance and testing requirements as outline 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 pixels in addition to the following requirements:

Pixels. Each pixel shall meet the following requirements:

1) DMS pixel shall be manufactured using Light Emitting Diodes (LED).
2) Each pixel shall contain the quantity of discrete LEDs needed to output white colored light at a minimum luminous intensity of 12,400 candelas per square meter when measured using a photometric meter through the DMS front face panel assembly.
3) Each pixel shall be capable of displaying amber colored light with a minimum luminous intensity of 7,440 candelas per square meter when measured using a photometric meter through the DMS front face panel assembly.
4) Each pixel shall consist of a minimum of one (1) independent string of discrete LEDs for each color. All pixels shall contain an equal quantity of LED strings.
5) 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.
6) The failure of an LED in one string within a pixel shall not affect the operation of any other string or pixel.

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) DMS pixels shall be constructed with discrete LEDs manufactured by Avago Technologies (formerly Agilent Technologies), Toshiba Corporation, or Nichia Corporation, OSRAM, EOI, or a manufacturer submitted and approved in writing from the Department
2) LED lenses shall be UV light resistant.
3) All LEDs shall be water resistant.
4) All LEDs shall have a nominal viewing cone of 30 degress with a half-power angle of 15 degrees measured from the longitudinal axis of the LED. Viewing cone tolerances shall be as specified in the LED manufacturer's product specifications and shall not exceed +/- 5 degrees. Using optical enhancing lenses with 15 degress LED's will not conform to 30 degree half-power viewing cone specification.
5) Red LEDs shall utilize AlInGaP semiconductor technology and shall emit red light that has

a peak wavelength of 615-635 nm.

6) Green LEDs shall utilize InGaN semiconductor technology and shall emit green light that has a peak wavelength of 520-535 nm.
7) Blue LEDs shall utilize InGaN semiconductor technology and shall emit blue light that has a peak wavelength of 464-470 nm.
8) The various LED color and intensity bins shall be distributed evenly throughout the sign and shall be consistent from pixel to pixel.
9) The LED manufacturer shall assure color uniformity and consistency on the LED display face within 30 degree cone of vision. Inconsistent color shifts of intensity will be cause for rejection.
10) The LEDs shall be rated by the LED manufacturer to have a minimum lifetime of 100,000 hours of continuous operation while maintaining a minimum of 70% of the original brightness.

907-656.02.10--DMS Controller Cabinet. Each DMS controller cabinet 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.

907-656.02.11.3--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 any one 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 3.
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, including a CD-ROM containing ASCII versions of the following Management Information Base (MIB) 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--Installation Requirements. All equipment shall be installed according to the manufacturer's recommendations, the Plans and as follows:

1) The Contractor shall provide the MDOT with a written inventory of items received and the condition in which they were received. Inventory shall be inclusive of make, model, and serial numbers, MAC address, and installation GPS coordinates. All equipment shall be installed according to the manufacturer's recommendations or as directed by the MDOT.
2) Any new, additional or updated drivers required for the existing ATMS software to communicate and control new DMS installed by the Contractor shall be the responsibility of the Contractor.

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, a supplier factory representative shall supervise and assist a Contractor during installation and configuration.

907-656.03.2--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.

1) The Contractor is responsible for planning, coordinating, conducting and documenting all aspects of the Project Testing Program. The Project Engineer, ITS Engineer, and/or their designee(s) are only responsible for attending and observing each test, and reviewing and approving the Contractor's test results documentation. The Project Engineer, ITS Engineer,

and/or their designee(s) reserve the right to attend and observe all tests. The Contractor is required to perform the DMS Sub-System test and the Conditional Acceptance test with the MDOT ITS Engineer or his designee present.

2) Each test shall fully demonstrate that the equipment being tested is clearly and definitely in full compliance with all project requirements.
3) 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.
4) No testing shall be scheduled until approval of all project submittals and approval of the test procedures for the given test.
5) The Contractor shall provide all ancillary equipment and materials as required in the approved test procedures.
6) 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.
7) 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.
8) 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.
9) 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 connected to the power.
4) Verify the sign case has no structural damage or 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. The Contractor shall coordinate the SST with the MDOT ITS Engineer. The Contractor shall provide a SST plan to the MDOT ITS Engineer and be approved a minimum of two week in advance of tests being performed.

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. The Contractor shall coordinate the CSAT with the MDOT ITS Engineer. The Contractor shall provide a CSAT plan to the MDOT ITS Engineer and be approved a minimum of thirty (30) calendar days in advance of tests being performed. The CSAT plan shall be inclusive of steps and procedures to be performed and scheduled times to perform test procedures.

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 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.

1) **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 presence of the MDOT ITS Engineer or his designee is required during the 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 outline 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. Minimum Training Requirements are as follows:

1) 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.

2) 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. This training shall include One (1) day of site device operation, maintenance, and configuration training for up to ten (10) individuals and One (1) day of on site system training at the TMC for up to ten (10) individuals that is separate from the above training and specifically for software control of the integrated devices. The operations and maintenance class shall be scheduled at a mutually acceptable time and location.
3) The training shall be approved two (2) week ahead of the scheduled date.

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 per each DMS installation. Such installation shall be inclusive of 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. It shall also include all system documentation including: shop drawings, operations and maintenance manuals, wiring diagrams, block diagrams, and other material necessary to document the operation of the DMS.

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 price shall be full compensation for all labor, tools, materials, equipment, and incidentals necessary to complete the work for a complete and functional DMS.

This work does not include the sign support structure.

Progress payments for Dynamic message signs shall be paid as follows:

1) 20% of the contract unit price upon completion of the Factory Acceptance Test and Pre-Installation Test.
2) Additional 20% of the contract price upon delivery to the site. Delivery cannot be more than 60 days before anticipated installations.
3) Additional 50% of the contract unit price upon complete installation and stand alone testing of the dynamic message sign.
4) Final 10% of the contract unit price upon Final System Acceptance.

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. 907-658-7 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Networking Equipment**

Section 907-658, Network Switch, is hereby added to and becomes part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-658 -- NETWORKING EQUIPMENT

907-658.01--Description. This section specifies the minimum requirements for network switches furnished and installed. Type A, Type B, and Type D shall be hardened. These switches support Intelligent Transportation Elements deployed on arterial streets and the highway system. Elements include but are not limited to traffic signals, dynamic message signs, surveillance cameras, and vehicle detection systems. Type C switches will support the Intelligent Transportation System and be installed in the Traffic Management Center and Communications Huts which are environmentally controlled. Type C switches are not required to be hardened. This Section also specifies the minimum requirements for Terminal Servers and Category 6 cable furnished and installed on this project. The Terminal Servers shall be hardened. The work shall consist of providing all labor, materials, equipment and incidentals necessary to furnish, install and test Terminal Servers. The Terminal Server device, also commonly referred to as a Port Server device, will be used to communicate bi directionally between IP-based Ethernet network systems and existing field devices that communicate or are controlled via a full-duplex serial interface. The Category 6 cable will be installed in conduit between elements that are within 300 feet of each other to eliminate the need for two hardened switches.

907-658.02--Materials. Network Switches Type A, Type B, Type C, Type D, Terminal Servers and associated cabling will be placed in the field device cabinets and shall meet the following requirements:

907-658.02.1--Network Switch Requirements. The Type A, Type B, Type C, and Type D Network switches shall adhere to the following minimum requirements.

1) Field switch optical ports shall meet the following:
   a. The minimum optical budget between transmit and received ports shall be 19dB.
   b. Shall include LC connector types.
   c. Optical receiver maximum input power level shall not be exceeded.
   d. Optical attenuators shall be added as needed; fiber optic attenuator patch cords shall be in accordance with Section 657 of the Mississippi Standard Specifications for Road and Bridge Construction. It is the Contractor's responsibility to determine where attenuators are needed and shall be included in the cost of the switch.

e. The Contractor shall be required to measure the optical power on each optical port to ensure that power entering the receiver is within the acceptable power budget of the optical port.
f. Optical interface equipment shall operate at 1310 nm.

2) Operate from 100 VAC to 200 VAC.
3) The field switches shall operate between -34 to +74 degree Celsius, including power supply.
4) The field switches shall operate from 10% to 90% non-condensing humidity.
5) Meet the IEEE 802.3 (10Mbps Ethernet) standard.
6) Meet the IEEE 802.3u (Fast Ethernet 100 Mbps) standard.
7) Meet the IEEE 802.3x (Full Duplex with Flow Control) standard.
8) Meet the IEEE 802.1p (Priority Queuing) standard.
9) Meet the IEEE 802.1Q (VLAN) standard per port for up to four VLAN's.
10) Meet the IEEE 802.1w (Rapid Spanning Tree Protocol) standard.
11) Meet the IEEE 802.3ad (Port Trunking) standard for a minimum of two groups of four ports.
12) The field switches shall meet IEEE 802.3D (Spanning Tree Protocol) standard.
13) Capable of mirroring any port to any other port within the switch.
14) Passwo**rd** manageable through:
    a. SNMP
    b. Telnet/CLI
    c. HTTP (Embedded Web Server) with Secure Sockets Layer (SSL)
15) Full implementation of SNMPv1 and SNMPv2c.
16) Full implementation of GVRP (Generic VLAN Registration Protocol).
17) Full implementation of IGMP and IGMP snooping.
18) Minimum MTBF of 100,000 hrs using Bellcore TS-332 standard.
19) Full implementation of RFC 783 (TFTP) to allow remote firmware upgrades.
20) UL approved.
21) 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.
22) Unused ports (copper and optical) shall be covered with rubber or plastic dust caps/cover.

907-658.02.2--Type A Network Switch. Type A network switches shall adhere to the following minimum requirements.

1) Minimum of six 10/100/1000 Base-TX ports. Each port shall connect via RJ-45 connector.
2) Minimum of two 1000 Base Long Reach optical ports.
3) Full implementation of RMON I and RMON II.
4) Rack, shelf or DIN Rail mountable. If shelf mounted, the Contractor must furnish and install a shelf if shelf space is not available in the facility. Any shelf used shall be ventilated as per the Network Switch manufacturer recommendation.
5) All power transformers provided shall be "fastening mechanism" type. No plug-in types shall be permitted. All corded transformers shall be mountable with the ability to neatly secure power cords.

907-658.02.3--Type B Network Switch. Type B network switches shall adhere to the following minimum requirements.

1) Minimum of twelve 10/100 Base-TX ports. Each port shall connect via RJ-45 connector.
2) Minimum of one 10/100/1000 Base-TX ports. Each port shall connect via RJ-45 connector.
3) Full implementation of RMON I and RMON II.
4) Minimum of two 1000 Base Long Reach optical ports.
5) Rack, shelf or DIN Rail mountable. If shelf mounted, the Contractor must furnish and install a shelf if shelf space is not available in the facility. Any shelf used shall be ventilated as per the Network Switch manufacturer recommendation.
6) All power transformers provided shall be "fastening mechanism" type. No plug-in types shall be permitted. All corded transformers shall be mountable with the ability to neatly secure power cords.

907-658.02.4--Type C Network Switch Requirements. The Type C Network Switch will be installed in the Communication Hubs and shall meet the following requirements:

1) Each switch shall be populated with the following modules:
   a. Two redundant switch fabric modules that meet the following minimum requirements:
      i. Layer 2/3/4 switching and routing services
      ii. 64Gbps/48Mpps module Bandwidth
      iii. Min of 2-GE uplinks available per card. The Contractor shall provide an uplink SFP optical module compatible with the interface for the uplink as indicated in the Comm Node notice to bidders for each uplink
   b. In one (or more) SFP-based module(s): a minimum of 48 ports of 1000Base-X (SFP-based) compatible. The Contractor shall provide whichever is greater between a min number of SFP optic modules to interface to the fiber as indicated in the plans and NTBs, or a min of 14 and shall meet the following minimum requirements:
      i. Optical budget of 19dB
      ii. Hot-swappable
      iii. Same optical wavelength as Type A & B switches
      iv. Same optical transmitter power as Type A & B switches
   c. In one (or more) modules: 24 Ethernet 10/100/1000 ports
2) Optical receiver maximum input power level shall not be exceeded.
3) Optical attenuators shall be added as needed; fiber optic attenuator patch cords shall be in accordance with Section 657 of the Mississippi Standard Specifications for Road and Bridge Construction. It is the Contractor's responsibility to determine where attenuators are needed and shall be included in the cost of the switch.
4) 19" rack mountable.
5) Operate from 5 to 40 degree Celsius.
6) NEBS Level 3 compliant.
7) Operate from 5 to 80 non-condensing humidity
8) Designed as a chassis with easy to remove modules.
9) Chassis backplane shall be passive.

10) All modules shall be hot-swappable.
11) Meet the IEEE 802.1d (Virtual Bridge) standard.
12) Meet the IEEE 802.1x (authentication) standard.
13) Meet the requirements of :
    a. IEEE 802.3z
    b. IEEE 802.3ah
    c. GR-20-CORE: Generic requirements for Optical Fiber and Optical Fiber Cable
    d. GR-326-CORE: Generic Requirements for Singlemode
14) Full implementation of RIP protocol as outlined by RFCs: 1058, 1723, 1812
15) Full implementation of OSPF protocol as outlined by RFCs: 2178, 1583, 1587, 1745, 1765, 1850, 2154, 2328, 1850, 1997, 2385, 2439, 2842, 2918, 2370.
16) Capable of mirroring any port to any other port within the switch.
17) Password manageable through:
    a. SSHv2 (Secure Shell)
18) Full implementation of GMRP (Generic Multicast Registration Protocol).
19) Full implementation of IGMPv2.
20) Full implementation of PIM-SM and PIM-DM.
21) Full implementation of DVMRPv3.
22) Full implementation of VRRP.
23) Comply with FCC 47 CRF Part 15 Class A emissions.
24) Bandwidth flow rate limiting policing support per port.
25) Full security implementation of
    a. Support SSH2, 802.1x (rel 2)
    b. Access Control Lists (ACL's)
    c. RADIUS
    d. TACACS
26) Have redundant power supplies installed.
27) The power supply units shall be hot swappable.
28) Switch chassis shall have a minimum of 6 module slots.
29) Blank covers for all remaining slots.

907-658.02.5--Type D Network Switch Requirements. The Type D Network Switch shall be of chassis design. The switch shall be able to accept a minimum of 4 different type modular cards and have Layer 2 switch and Layer 3 routing cababilities. The Type D Network Switch shall meet the minimum requirements specified below:

1) The switch shall be chassis designed with a minimum of 4 module slots.
2) Each switch shall be able to accept the following type modules:
    a. Ethernet module:
        i. A minimum number of six (6) 10/100Base-TX compatible RJ45 ports.
        ii. The Contractor shall provide the minimum number of modules necessary to meet or exceed the required number of ports as indicated in the plans and NTBs.
        iii. Total required bandwidth shall per chassis shall not exceed 10 Gbps
    b. Fiber based modules:
        i. The module shall accept SFP type fiber modules

ii. The Contractor shall supply any necessary fiber modules that meet the requirements of speed, type of fiber, and link budget connection.
iii. The Contractor shall provide the minimum number of modules necessary to meet or exceed the required number of ports as indicated in the plans and NTB

c. WAN module:
   i. T1, DS3 or Metro Ethernet Interface (as per NTB or project plans)
      1. The Interface shall be T1, DS3 or Metro Ethernet
      2. The ports shall connect via RJ45 connector.
   ii. Cellular Interface
      1. Contractor shall provide information to the Project Engineer to enable activation of the modem.
      2. Contractor shall get prior approval from the Projcet Engineer on selection of cellular radio type (HSPA/EVDO)

d. Power Supply module:
   i. The power module provided shall be "screw terminal block" type. No pluggable terminal block.
   ii. Input power: Same as Type A and Type B switches.
   iii. Power module shall be hot-swappable.
   iv. The Contractor shall supply the necessary amount of power supplies to meet power requirements for all cards installed and the chassis itself

3) Software license shall provided to match functionality of installed modules.
4) Shall be DIN or Panel mountable.
5) The swich shall provide layer 2 and 3 switching and routing services
6) Meet the IEEE 802.1d (Virtual Bridge) standard.
7) Meet the IEEE 802.1x (authentication) standard.
8) Password manageable through:
   a. SSHv2 (Secure Shell)
9) Full implementation of VRRP.
10) Comply with FCC 47 CRF Part 15 Class A emissions.
11) Bandwidth flow rate limiting policing support per port.
12) Full security implementation of
   a. Support SSH2, 802.1x (rel 2)
   b. Access Control Lists (ACL's)
   c. RADIUS
13) Blank covers for all remaining slots.
14) Electronic surfaces shall be covered with conformal coating for additional environmental protection.

907-658.02.6--Terminal Server. Terminal server shall adhere to the following minimum requirements.

1) 10/100 Base-T Ethernet port connection
2) RJ-45/DB9 Serial port connection
3) RS-232/422/485 selectable serial connections
4) Baud rates up to 230 Kbps

5) Full Modem and hardware flow control
6) TCP/UDP Socket Services
7) UDP Multicast
8) Telnet and Reverse Telnet
9) Modem emulation
10) SNMP (Read/Write)
11) PPP
12) Port buffering
13) HTTP
14) Remote management
15) DHCP/RARP/ARP-Ping for IP address assignment
16) LED status for link and power
17) The Terminal Server shall support a minimum of Four (4) bi-directional serial communications over Ethernet 10/100 Base-TX.
18) Each Terminal Server shall have a minimum of four (4) EIA-232/422/485 serial interface ports. These ports shall be individually and independently configurable, directly or over the network, to EIA-232/422/485 mode of operation as defined by the EIA for data format, data rate and data structure (e.g., the number of bits, parity, stop bits, etc.). Each serial port shall support up to 230 Kbps.
19) Each serial port shall support IP addressing and socket number selection.
20) The equipment shall provide the capability to establish an IP connection directly from a workstation to any encoder IP address and socket number transport serial data.
21) Each Terminal Server shall have an Ethernet Interface (10/100Base-TX protocol, Full/Half-Duplex, Auto Sense (802.3), RJ-45).

907-658.02.7--Category 6 Cable. Category 6 cable shall adhere to the following minimum requirements.

1) 4 Pair #24 AWG UTP Category 6 Cable
2) This item is paid for Category 6 cables installed between cabinets and does not apply to other patch cords installed inside cabinets or huts.
3) Supplied Category 6 cable shall be suitable for use outdoors in duct and as a minimum meet the following requirements:
4) Fully water blocked
5) Conforms to the National Electrical Code Article 800
6) UL 1581 certified
7) Voltage Rating 300 Volts or greater
8) Operating and installation temperature (-4°F to 140°F)
9) Bend Radius 10 x Cable OD or smaller
10) Recommended for 1000Base-T applications for a distance of 100 meters.

907-658.02.8--Category 6 Patch Cords. The Cat 6 Patch Cords shall be furnished and installed as needed to connect the Network Switches with other equipment. Cat 6 Patch Cords shall be considered an incidental component for this project and furnished and installed as needed to provide a functional system. Cat 6 Patch Cords shall meet the following minimum requirements:

1) All patch cords shall be from the same manufacturer.
2) Shall incorporate four (4) pair 24 AWG stranded PVC Category 6.
3) Shall be factory made; Contractor or vendor assembled patch cords are not permitted.
4) Shall be TIA/EIA 568-B.2-1 compliant. Patch Cords shall be compliant to T568B pin configuration (which ever is used).
5) Certified by the manufacturer for Category 6 performance criteria.
6) Length as needed. Excessive slack is not permitted.

907-658.02.9--Project Submittal Program Requirements. The Contractor shall provide project submittals for network switches including scheduling requirements. The project submittals for network switches and terminal servers shall include but are not limited to the specific requirements in this subsection.

1) The Contractor shall submit detailed cut sheets which document compliance with all parameters required in this section. If a parameter is not covered in the cut sheet a signed statement from the manufacturer on letterhead shall be submitted as an attachment. Failure to address all requirements will result in rejection of the submittal.
2) The Contractor shall submit documentation and proof of manufacturer-recommended training and certification for the installation and configuration of network switches.
3) The Contractor shall submit technical specifications for the minimum transmitter port to receiver port optical attenuation required for the switches to function in accordance with this specification for the optical links shown on the plans.

907-658.03--Installation Requirements. All Networking Equipment shall be installed according to the manufacturer's recommendations, the Plans and as follows:

1) Network switches shall only be configured and installed by the switch manufacturer trained personnel.
2) Network switches shall be installed in accordance with manufacturer's guidelines and requirements.
3) The Contractor shall request from the Department, switch configuration information (such as IP address, VLAN Tag values, etc.) not more than 30 days after the switch submittals have been approved.
4) The Contractor shall provide as needed the necessary Cat 6 patch cords and fiber optic patch cords for a complete and functional installation.
5) Category 6 cable installed in conduit shall be installed and terminated per the manufacturers recommended procedures. Five feet of spare slack shall be provided in the pull boxes nearest each Type B or Type C cabinet.
6) The Contractor shall provide training for proper management of the equipment installed. This training should cover daily operation as well as maintenance and configuration of the switching equipment installed as part of this project and meet the requirements of subsection 658.03.3 of this document.
7) The Contractor shall provide the MDOT with a written inventory of items received and the condition in which they were received. Inventory shall be inclusive of make, model, and serial numbers, MAC address, and installation GPS coordinates. All equipment shall be installed according to the manufacturer's recommendations or as directed by the MDOT.

8) Any new, additional or updated drivers required for the existing ATMS software to communicate and control new Networking Equipment installed by the Contractor shall be the responsibility of the Contractor.

907-658.03.1--Switch Configuration Requirements. The Contractor shall configure Network Switches as follows:

1) All 100 Base-TX ports shall be configured as follows:
   a. RSTP/STP – Off.
   b. Unused TX ports shall be disabled.
   c. Operating TX ports shall be programmed to filter only for the MAC address of the connected device.
2) All 1000 Base-FX ports shall be configured as follows:
   a. RSTP/STP – On.
   b. IGMP Snooping – On.
3) The Type D switch configuration shall be as outline in the Project plans and details.
4) All network switches shall be installed and configured with the same firmware configuration. The optimum settings shall be used consistently system-wide. Any locations that require different settings for optimum performance shall be approved by the Engineer.
5) The Switches shall be configured to enable multicasting of video.
6) The Contractor may submit an alternate switch configuration to the ITS Engineer for review and approval; The ITS Engineer will review alternate switch configuration documentation. The goal of the switch configuration is to reduce the network delay, as well as provide network redundancy.
7) The Contractor shall submit an electronic copy of all final and approved configurations of all switches to the Project engineer and to the ITS Engineer.

907-658.03.2--Documentation. The Contractor shall submit documentation and proof of manufacturer-recommended training and certification for the installation and configuration of network switches.

As-built Plans showing switch configuration and connections shall be provided to the Project Engineer and ITS Engineer in electronic format.

The Contractor shall submit documentation and proof of measured optical power budgets to all optical links of all type switches.

907-658.03.3--MDOT Employee Training. After the installation is complete, the Contractor shall provide formal classroom training and "hands-on" operations training for proper operation and maintenance of the network switch. The training shall be provided for up to six personnel designated by the ITS Engineer and shall be a minimum of four hours in duration. The training shall cover as a minimum preventive maintenance, troubleshooting techniques, fault isolation and circuit analysis. All training materials shall be provided by the Contractor.

1) Prior to training, submit resume and references of instructor(s). Also submit an outline of the training course in a Training Plan. Submit the Training Plan within 90 days of Contract Notice-to-Proceed. Obtain approval of the Plan from the Engineer and the Traffic Engineering ITS Department. Explain in detail the contents of the course and the time schedule of when the training will be given.
2) Furnish all handouts, manuals and product information.
3) For the training, use the same models of equipment furnished for the project. Furnish all media and test equipment needed to present the training.
4) Training shall be conducted in the Jackson area.
5) Training instructor(s) shall be manufacturer-certified, experienced in the skill of training others.
6) The training shall be conducted by a trainer with a minimum of four years of experience in training personnel on the operation and maintenance of fiber optic systems.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-659-3 DB **CODE: (SP)**

DATE: 1/07/2015

SUBJECT: Traffic Management Center (TMC) Modifications

Section 907-659, Traffic Management Center (TMC) Modifications, is hereby added to and becomes part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-659 -- TRAFFIC MANAGEMENT CENTER (TMC) MODIFICATIONS

907-659.01--Description. The MDOT Statewide Traffic Management Center (TMC) is located in the Traffic Engineering Division in the MDOT Shop Complex at 2567 North West Street, Jackson, Mississippi. Regional and City Traffic Management Centers may be located statewide. The following is a list of existing/planned centers and their addresses:

City of Jackson TMC – 300 North State Street, Jackson, Mississippi (basement)
Northwest Regional Combined TMC – 8791 Northwest Drive, Southaven, Mississippi (Police Department)
City of Ridgeland TOC – 304 Hwy 51, Ridgeland, Mississippi (City Hall)
Oxford Combined TMC – 715 Mollybarr Road, Oxford, Mississippi (Oxford Police Department)
Hattiesburg Regional TMC/EOC – 6356 Hwy 49N, Hattiesburg, Mississippi (MDOT District 6 Headquarters)
Batesville Regional TMC/EOC – 150 Hwy 51N, Batesville, Mississippi (MDOT District 2 Headquarters)
Natchez Combined TMC – 233 Devereaux Drive, Natchez, Mississippi (Police Department)
Gulf Regional TMC – 16499 Hwy 49, Saucier, Mississippi (MDOT Lyman Project Office)

Additional Traffic Management Centers may be added as needed.

907-659.02--Blank.

907-659.03--Construction and Operation Requirements.

907-659-03.1--TMC Modifications. The MDOT TMC modifications required to integrate and operate the traffic systems and devices shall be provided. These include, but are not limited to, expanding the central video management system, interconnecting the appropriate number of video interfaces to the TMC video management systems, expanding the MDOTTraffic backbone network through radio communications, wireless communications, T1 lines or fiber communications, expanding the Advanced Central Traffic Response Algorithm (ACTRA) signal system, or upgrading existing signal systems, expanding the Automated Traffic Management System (ATMS), and integrating all the existing computing facilities. All TMC modifications

must meet U.S. Department of Transportation Intelligent Transportation System (ITS) Standards, Policies, and Architectures as well as MDOTs applicable Statewide or Regional Architecture.

907-659.03.2--TMC Modifications - Monitor Systems. Roadway traffic monitor locations shall provide local control functions related to traffic slowdowns and other congestion monitors as defined by MDOT Traffic Engineering. Additionally, the traffic monitor systems shall provide on-line data for use by the existing MDOT ATMS for engineering, operations, planning, incident, and mdottraffic.com purposes. This data shall include, but is not limited to, per vehicle data raw data which shall be transmitted to and stored and managed by the ATMS. The traffic monitor systems shall be capable of utilizing both or either loop, microloop, radar, and/or video detection information. The system shall provide a consistent communication and management system regardless of detection methods used. All Traffic Monitoring Systems must meet U.S. Department of Transportation Intelligent Transportation System (ITS) Standards, Policies, and Architectures as well as MDOT's applicable Statewide or Regional Architecture.

907-659.03.3--TMC Modifications – Installation Requirements. All equipment shall be installed according to the manufacturer's recommendations, the Plans and as follows:

1) Any new, additional or updated drivers required for the existing ATMS software to communicate and control new devices installed by Contractor shall be the responsibility of the Contractor.
2) Installation of all equipment and software shall be included. The Contractor must provide the MDOT ITS Manager with an Installation Schedule. The Installation Schedule must be approved by the State Traffic Engineer.
3) All equipment and software must be fully functional and pass a Final Inspection by the ITS Manager and Project Engineer before being accepted by MDOT.

907-659.03.4—MDOT Employee Training. Training shall be provided covering the system architecture, operations, and maintenance of the TMC systems. If training requirements include travel on the part of training participants then the cost of the travel shall be included.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-660-4 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Communications Node**

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 one inch (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
- 1½ 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 ft by 8ft 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
- H.264 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 four 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 CO2 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 6 inches thicknesses. The vault shall be sized and installed as detailed in these specifications and NTBs. 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 2 to 3 inches 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 and Operation 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 MDOTTraffic 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 & 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 2' 0" to 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’ x 5” concrete pad 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 8 inches.
- Minimum bending radius of any interior grounding wire #2 or larger or any grounding strap shall be 12 inches.
- 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" x 4" x 12" 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. 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 lb. 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 Engineer 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 Project Engineer and ITS 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.

The Contractor shall provide the MDOT with a written inventory of items received and the condition in which they were received. Inventory shall be inclusive of make, model, and serial numbers, MAC address, and installation GPS coordinates. All equipment shall be installed according to the manufacturer's recommendations or as directed by the MDOT.

Any new, additional or updated drivers required for the existing ATMS software to communicate and control new equipment installed by Contractor shall be the responsibility of the Contractor.

Training shall be provided covering the system architecture, operations, and maintenance of the OTN Nodes and MDOTTraffic network. If training requirements include travel on the part of training participants then the cost of travel shall be included.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-662-6 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Video Communication Equipment**

Section 907-662, Video Communication Equipment, is hereby added to and made a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-662 -- VIDEO COMMUNICATION EQUIPMENT

907-662.01--Description. This Section specifies the minimum requirements for video communications equipment furnished and installed to support CCTV camera equipment. The work shall consist of providing all labor, materials, equipment, and incidentals necessary to furnish, install, and test a fully operational video communications system.

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, video decoders, and video fiber codex.

The Contractor shall supply, install, test and integrate the video equipment as indicated in the Contract Documents and Plans, and as further 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) shall support the following general requirements:

1) All VE and VD provided by the Contractor shall be new and shall be from the same manufacturer and be fully compatible and interoperable with each type provided.
2) All VE and VD types provided by the Contractor shall be fully compatible and interoperable with the network equipment and the MDOT MDOTTraffic WEB servers video streaming format and MDOT video wall IP video streaming systems.
3) Interoperability: The VE shall fully interoperate with the VD (hardware and/or software) as defined in these Special Provisions.
4) Mean Time Between Failures (MTBF): The VE shall have a minimum MTBF of 20,000 hours.

5) 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.

6) 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.

7) Decoding: The Contractor shall provide decoders that are capable of auto-detecting the corresponding encoder's streaming parameters such as compression, resolution and bit rate, and appropriately decode the encoded digitized video signal.

8) Video equipment shall support the NTSC signal format.

907-662.02.2--Video Encoder/Decoder Requirements. The Video Encoder (VE) and Video Decoder (VD) shall be of the type defined by the Video Compression Technology and the minimum requirements are as follows:

907-662.02.2.1--Video and Data Requirements. The VE/VD shall meet the following minimum video and data requirements:

1) The VE /VD shall be capable of decoding or streaming a minimum of the following Video Compression Technology types:

   a. H.264 (Video Coding Experts Group (VCEG)/Moving Picture Experts Group).

   b. MPEG -4 (Moving Picture Experts Group).

   c. MJPEG Motion JPEG(Moving Picture Experts Group).

2) VE shall be capable of streaming multiple bandwidth and compression types simultaneously per video input channel.

3) VE shall support streaming multicast and unicast streams simultaneously.

4) VE shall have the ability to automatically initiate and stream a multicast stream upon starting without any remote request to join the multicast group.

5) VE shall support multiple simultaneous Real Time Streaming Protocol (RTSP) requests.

6) VE shall be able to supply multiple unique and independent video streams with frame rate, bit rate, and image size settings adjustable through an RTSP request.

7) VE shall support a minimum of two (2) simultaneous unique and independent H.264 video streams with frame rate, bit rate, and image size settings adjustable per video input channel.

8) The VE shall support capturing of snapshot images of the video stream.

9) VE shall be a hardware-based network device able to accept a minimum of one analog National Television System Committee (NTSC) video input and encode for transport across IP networks.

10) VE and VD shall be specifically designed for network operation, and adhere to ISO standards.

11) VE video encoded streams shall be compatible with the existing video wall server decoders, MDOTTraffic, and streaming web servers or as approved by the Intelligent Transportation Systems Program Manager.

12) Support the following minimum encoded resolutions:

    a. NTSC - Full D1

    b. CIF/SIF

    c. QCIF/QSIF

13) 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.).

14) Bandwidth increments shall be user configurable via the network. The minimum bandwidth setting shall be 56Kbs or less.

15) VE streams shall be capable of being set to variable or constant bit rates.

16) The default bandwidth for the VE as furnished shall be set to 2Mbps when communicating over fiber and 56kbs when communicating otherwise.

17) Provide on-board buffered video memory for protection against potential network disruptions.

18) VE shall be capable of providing JPEG snapshots and transfer image via FTP.

19) There shall be available standard software decoders that are compatible with the provided hardware VE.

907-662.02.2.2--Serial Data Interface Requirements. The 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 VE/VD and the CCTV control interface).

2) Each serial port shall provide full-duplex serial interface and data rates up to 115.2 Kbps (minimum).

3) 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.

4) No serial adaptors or interface converters shall be permitted.

5) Each VE shall use the serial interface port to support PTZ camera control functions.

6) VE serial port shall provide IP addressing and socket number selection and 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 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 6 or higher quality stranded patch cords.

4) All network RJ-45 ports shall be standard EIA/TIA-568-A pin-outs and shall be rated at 10/100Mbps or greater.

5) All VE and VD provided by the Contractor 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.

6) Static IP Addressing (class A, B, and C).

7) RTP, UDP, Unicast and IP Multicast (Internet Group Multicast Protocol / IGMP V2) features for digital video transmission.

8) All VE shall support Real Time Streaming Protocol (RTSP) over RTP.

9) All VE shall support multiple stream requests.

907-662.02.2.4--Physical and Environmental Requirements. The VE/VD shall meet the following minimum physical and environmental requirements:

1) The Video Encoder/Decoder shall have the following ports as a minimum:

   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 port/connector. Serial port may utilize D-sub connectors or thumb screw terminals as approved by the MDOT.

d. In locations where there are more than one video source, and VE with multiple video ports are used, each video input port shall meet all the video and data requirements of section 907-662.02.2.1 independently.

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 conform 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/VD for field site locations 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 individual 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--Chassis Based VE and VD. In environmentally controlled locations where more than 2 encoders or decoders are needed, Chassis based encoders and decoders should be supplied and in full compliance with these special provisions.

VE/VD Chassis and Cards:

1) Chassis shall support a minimum of 12 VE or VD cards.

2) Chassis shall be 7U or less and be 19" rack mountable.

3) Each VE card shall include a minimum of four (4) encoders per card with a corresponding number of BNC ports per encoder.

4) Each VD card shall include a minimum of four (4) decoders per card with a corresponding number of BNC ports per decoder.

5) VE and VD cards shall be fully contained and obtain power from the chassis.

6) All Contractor provided VE and VD cards shall be compatible with, and of the same make as standalone VE and VD provided by the Contractor

907-662.02.2.6--On-Screen Display (OSD) Requirements. Where OSD functionality is not supplied by cameras 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.

907-662.02.2.7--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) Have the capability to remotely change any of the device configuration settings including bit rates, image resolution and compression settings and serial interface type.

5) Provide pre-defined optimized video compression and streaming settings for various bit rates.

6) 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.

7) Provide ability for remote firmware upgrades.

907-662.02.2.8--Electrical Requirements. The minimum electrical/power requirements include:

1) Power: nominal input voltage of 120 VAC, 60 Hz. ±3 Hz

2) If the device requires operating voltages of less than 120 VAC, the appropriate voltage converter shall be supplied. All voltage conversion devices shall also be temperature hardened as specified herein for location (field or central).

3) The equipment or it's voltage converter shall operate within a voltage range of 90 VAC to 135 VAC.

4) Power Consumption for a single VE or VD shall not exceed 30 Watts per 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) 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.

7) Include UL listing.

907-662.02.3--Fiber Video Codex. Fiber Video Codex will be used where video will be transported in a non IP and/or ETHERNET communication system. This unit will be used when interfacing with current sites or when expanding existing sites or links that require the use of traditional video communication means. All Fiber Video Codex will be completely compatible and of same make and type as with existing Fiber Video Codex in the system unless approved otherwise by the Intelligent Transportation Systems Program Manager.

907-662.03--Installation Requirements. All video equipment shall be installed according to the manufacturer's recommendations, the Plans and as follows:

4) The Contractor shall furnish and install auxiliary video equipment in support of a communications network that will transport video as specified in these Special Provisions.

5) Materials and associated accessories/adapters shall not be applied contrary to the manufacturer's recommendations and standard practices.

6) 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.

7) The Contractor shall provide the MDOT with a written inventory of items received and the condition in which they were received. Inventory shall be inclusive of make, model, and serial numbers, MAC address, and installation GPS coordinates. All equipment shall be installed according to the manufacturer's recommendations or as directed by the MDOT.

8) Any new, additional or updated drivers required for the existing ATMS software to communicate and control new video communication equipment installed by Contractor shall be the responsibility of the Contractor.

907-662.03.1--Testing. The Contractor shall conduct a Project Testing Program as required below. All costs associated with the Project Testing Program shall be included in overall contract prices; no separate payment will be made for any testing.

907-662.03.1.1--Testing General Requirements. The Contractor shall conduct a project testing program for all VE and VD provided. The project testing program for VE/VD shall include but is not limited to the specific requirements in this subsection.

1) All test results shall confirm physical and performance compliance with these Special Provisions.
2) Contractor shall submit all test results documentation to the Engineer for review within 14 calendar days of completion of the tests.
3) All test results shall be reviewed and approved by the Department prior to continuing with further tests and deployment activities. The Contractor is responsible for planning, coordinating, conducting and documenting all aspects of the Project Testing Program. The ITS Engineer, Project Engineer and/or their designee(s) are only responsible for attending and observing each test, and reviewing and approving the Contractor's test results documentation. The ITS Engineer, Project Engineer and/or their designee(s) reserve the right to attend and observe all tests. The Contractor is required to perform the Stand Alone Acceptance Test (SAT) and the Integration Test with the MDOT ITS Engineer or his designee present.

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, cabling, 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. 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 through the VE serial ports.

907-662.03.1.3--Integration Test. The Contractor shall be responsible for a Integration Test on all provided video communications equipment with MDOTs existing Traffic Management control software and with the existing video wall control. The Contractor shall be responsible to provide equipment that meets all requirements and is compatible with existing systems, TMC software, software drivers, and video wall systems or the Contractor shall provide new or updated software, software drivers, and system upgrades necessary to meet requirements at no additional cost to the State.

The Integration Test shall demonstrate full compliance with all operational and performance requirements of the project requirements including communications and control from the TMC. Integration Test shall include but are not limited to:

1) Verify VE supports unicast, multicast and network management features.

2) Video Switching through existing Traffic Management control software.

3) Verify integration with CCTV video and controls.

4) Compatibility with Existing Video Wall display formats.

5) Compatibility with MDOTTraffic web servers.

6) Verify RTSP functionality.

Warranty. Minimum warranty requirements are as follows:

- All warranties and guarantees shall be assigned to the Mississippi Department of Transportation.
- The warranty shall be a **minimum of one (1) year warranty** per VE and VD and all other installed and/or attached appurtenances.
- The warranty period begins upon final acceptance of the video subsystem.
- 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.
- Products repaired or replaced under warranty by the manufacturer shall be returned prepaid by the manufacturer.
- 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.
- During the warranty period, **updates and corrections to hardware**, software and firmware shall be made available to the Department by the Contractor at no additional cost.

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

1) The training shall be approved two (2) week ahead of the scheduled date.
2) For provided devices that MDOT already has the same make and model existing in the system:
    1. One (1) day of **on site** device operation, maintenance, and configuration training for up to 10 individuals.
    2. One (1) day of **on site** system training at TMC for up to 10 people, that is separate from above training and specifically for software control of integrated devices.
3) For provided devices that MDOT does not have the same make and model existing in the system:
    1. Three (3) days of **on site** device operation, maintenance, and configuration training for up to 10 individuals.
    2. Three (3) days of **on site** system training at TMC for up to 10 people, that is separate from above training and specifically for software control of integrated devices.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-680-1 DB **CODE: (SP)**

DATE: 01/07/2015

SUBJECT: Portable Construction Lighting

Section 680, Portable Construction Lighting, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-680.02--Materials.

907-680.02.1--Tower Lights. Delete the second and third paragraphs of Subsection 680.02.1 on page 561, and substitute the following:

Tower lights shall be of sufficient wattage and/or quantity to provide an average maintained horizontal luminance in accordance with Subsection 907-680.02.3. In no case shall the main beam of the light be aimed higher than 30° above straight down. The lights should be set as far from traffic as practical and aimed in the direction of, or normal to, the traffic flow.

Delete Subsection 680.02.2 on page 561, and substitute the following:

907-680.02.2--Balloon Lights. All moving equipment used during night time operations shall have a balloon lighting system and flashing amber light on the equipment. In lieu of a flashing amber light, the Contractor may install four square feet of approved reflective material on the equipment in a location that will be seen by the traveling public. This lighting system shall illuminate the work area in each direction of travel of the equipment. Machine balloon lights shall be mercury vapor, metal halide, high pressure sodium or low pressure sodium in conventional roadway enclosed fixtures mounted on supports attached to the construction machine at a height of approximately thirteen (13) feet. The power supply shall be of sufficient capacity to operate the light(s) and shall be securely mounted on the machine. Electrical grounding of generators to frames of machines on which they are mounted shall be done in conformance with the National Electrical Code (NEC).

The light fixtures shall be of sufficient wattage and/or quantity to provide an average maintained horizontal luminance in accordance with Subsection 907-680.02.3.

Balloon lights are in addition to conventional automotive type head lights which are necessary for maneuverability.

Delete Subsection 680.02.3 on pages 561 & 562, and substitute the following:

907-680.02.3--Lighting Levels. The submitted lighting plan shall indicate how the Contractor intends to accomplish the lighting of the work area(s). The lighting system shall provide a minimum of five (5) foot-candles throughout the work area. For stationary operations, the work

area shall be defined as the entire area where work is being performed. For mobile operations the work area shall be defined as 25 feet in front of and behind moving equipment.

907-680.03--Construction Requirements. Delete the first, second, third, and fourth paragraphs of Subsection 680.03 on page 562 and substitute the following:

Tower lights may be used when the night work is confined to a fairly small area and is essentially a stationary operation.

Balloon lights shall be used when the night work is not confined to a small area and is essentially a continuous moving construction operation.

Use of tower lights in lieu of balloon lights will be considered when the number of machines, type of work, or need for inspection justify their use as decided by the Engineer.

The work area where traffic control devices are being set up or repositioned at night shall be illuminated.

If night work requires the use of a flagger, then the flagger must be illuminated by balloon lighting.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-681-2 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Submittal Data**

Section 681, Roadway Lighting System, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

Delete the first paragraph of Subsection 681.04.2 on page 568 and substitute the following:

907-681.04--Basic Materials and Methods. The Contractor shall submit to the Engineer eight (8) copies of submittal data for all electrical materials and equipment proposed for use not later than forty-five (45) days prior to beginning any lighting work.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-682-11 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Roadway Lighting System**

Section 682, Electrical Distribution System, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-682.03.3--Pull Boxes and Junction Box. After the last sentence of Subsection 682.03.3 on page 572, add following:

The junction box shall be encased in Class 'B' concrete as indicated on the plans.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-687-16 DB **CODE: (SP)**

DATE: 1/07/2015

SUBJECT: Traffic Recorder Classification System

Section 907-687, Traffic Recorder Classification System, is hereby added to and made a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-687 - TRAFFIC RECORDER CLASSIFICATION SYSTEM

907-687.01--Description. This work consists of furnishing Traffic Recorder Classification Systems of the types specified which includes assembling, constructing, erecting, and installing a new complete system in conformity with these specifications to insure properly operating units in accordance with the designs and at the locations shown on the plans, or as directed. This axle detector system should classify vehicles in all lanes of traffic. Submittals shall be sent directly to the Planning Analysis Section of the Planning Division with a copy of the cover letter sent to the Project Engineer. The submittals will be returned within a seven (7) business day period from when they are received.

The Contractor shall include all hardware and software necessary to operate the field station unattended. The station is to operate continuously without human intervention.

The system may be a Traffic Recorder Classification Permanent System (907-687-A) or a Traffic Recorder Classification Short Term Permanent System (907-687-B). The type of system shall be defined in the plans or contract documents.

The Traffic Recorder Classification Permanent System shall require an AC power source and communication source via a data communication phone line as referenced in the plans.

The Traffic Recorder Classification Short Term Permanent System shall not require an AC power source and communication source via a data communication phone line.

Both systems shall utilize two (2) Class 1 Brass Linguini (BL) Piezo strips as utilized by Mikros RAKTEL 8010 System or latest system as approved by MDOT and one (1) loop per lane in all lanes as recommended by the manufacturer.

The person(s) performing the installation of the Mikros RAKTEL Piezo Classification System must be certified by Mikros or an authorized Mikros representative in the installation procedures of the Mikros RAKTEL Piezo Classification System and must be on the job site at each installation when the Mikros RAKTEL Systems are being installed. Certification can be acquired from Mikros or an authorized Mikros representative as long as a certified Mikros representative is on site to assist during the installation. Details regarding Mikros certification

can be acquired through direct communication with Mikros or an authorized Mikros representative. Any delays in the construction due to the certification process will not be grounds for an extension of the completion date.

A multiplexer shall be required for sites utilizing two (2) Mikros RAKTEL Systems in order for both systems to have access to one phone line.

The Contractor shall provide three (3) copies of all manuals on Installation, Operating, Schematics, and Maintenance for the entire System.

The BL Piezo sensors, equipment cabinet, inductive loops, cables, leads and electronic hardware and software will be furnished, installed, tested, calibrated and made operational by the Contractor. The Contractor shall provide all services required for construction, tests, the satisfactory performance period(s), and miscellaneous usage on this project until the site inspection of the project. Deposits, customer charges, connection cost, etc., associated with the System up to and including the date of the site inspection (Subsection 907-687.03.18.1--Site Inspection) of the System shall be the responsibility of the Contractor. At least five (5) business days prior to starting work, the Contractor shall provide notice to the MDOT Planning Division and the MDOT Project Office so that a representative of the Planning Division can be on site while the work is being performed.

907-687.02--Materials. The materials used in the traffic recorder classification system shall conform with the requirements of these specifications as set out herein. Prior to the scheduled start of work, the Contractor shall provide the Engineer with submittals on the following items and shall obtain the Engineer's approval before starting affected work. The Contractor shall use new materials and equipment. Any existing traffic counting equipment at the site is the sole property of the MDOT and shall not be removed by the Contractor.

907-687.02.1--Sensors. Vehicle axle detectors shall utilize piezoelectric cable in a sensor assembly and be of a type that has been shown to be successful for vehicle classification in both asphaltic and portland cement concrete pavements. BL Piezo sensor length shall be eleven (11) feet minimum. Sensors as delivered from manufacturer shall include a shielded transmission cable of sufficient length for a continuous run to the equipment cabinet without splicing.

907-687.02.1.1--Automatic Traffic Recorder Station. Piezoelectric Cable/Sensors shall be as those utilized by Mikros RAKTEL 8010 System or latest system as approved by MDOT. Sensitivity dispersion shall be Class 1, ±5%.

907-687-02.2--Shielded Transmission Cable. Coaxial cable type RG58 C/U shall conform to IMSA 50-2 for polyethylene insulated, polyethylene jacketed cable, AWG #14. Cable shall meet the requirements of Section 636 for the Standard Specifications.

907-687.02.3--Conduit and Pull Boxes. Conduit and pull boxes shall meet the requirements of Sections 647 & 668 of the Standard Specifications.

907-687.02.3.1--Under Roadways. Conduits under the roadway shall be Schedule 80 PVC or coated rigid galvanized steel.

907-687.02.3.2--Other Conduit. Other conduit shall be Schedule 40 PVC direct buried conduit unless noted otherwise.

907-687.02.3.3--Pull Boxes. Pull boxes shall be size Type 2 and the cover does not require words inscribed on the top.

907-687.02.4--Loop Wire. Loop wire, IMSA 51-3, AWG #14, shall meet the requirements of Subsection 722.03 of the Standard Specifications.

907-687.02.5--Loop Sealant. Loop sealant shall be "Traffic Loop Sealant" as manufactured by 3M Corporation, or approved equal.

907-687.02.6--Sensor Cement. The sensor assembly shall be cemented into the pavement with an epoxy resin of a type recommended by the sensor manufacturer.

907-687.02.7--Equipment Cabinet. The installation and setup of the equipment cabinet and all its applications must comply with all requirements of the plans. The Contractor will install the equipment cabinet along the highway right of way at a location approved by the Engineer. The equipment cabinet shall utilize a locking door. The housing shall be positioned so that the data collector will be approximately four (4) feet above the ground and mounted on a timber pole meeting the requirements of Subsection 723.08.6 unless an equivalent pole is specified and depicted in the plans. Lightning protection shall be provided for each installation. A 5/8-inch by 12-foot ground rod shall be used with AWG #6 copper conductors. Class B concrete shall be used for equipment cabinet footings.

907-687.03--Construction Requirements. The general layout of the work shall conform to the details shown on the typical installation plans and shall be verified at each location with the Project Engineer. No hazards, such as open holes on site during construction, shall be left overnight.

All traffic control shall meet the requirements as defined in the most updated Manual on Uniform Traffic Control Devices.

907-687.03.1--Manufacturer's Recommendations. Sensors must be installed in accordance with the approved procedures and specifications provided by the sensor manufacturer. All sensors and connecting cables shall be positioned and installed to assure compatibility with the inductive loops to provide electrical signals for vehicle classification.

907-687.03.2--Conflicts. Conflicts between any piece of equipment, which if installed as shown in relation to any previously installed equipment that may impair the proper operation of that equipment, shall be resolved by the Contractor as approved by the Engineer.

907-687.03.3--Conduit Runs. The number of conductors, conduits and fittings necessary to produce an operative system as specified herein shall be provided. All joints, connections, etc. shall be completely water and moisture tight. Shielded transmission cable and wire leads shall be installed in conduit from paved shoulders to pull boxes.

907-687.03.4--Slots in Pavement. All slots required in pavement and paved shoulders shall be saw cut with diamond blade power saw. Edges shall be straight, smooth and true. Depth shall be uniform.

907-687.03.4.1--Loop Slots. Slots for loop wire shall be ¼-inch minimum width. Slot depth shall be 2½ inches in asphalt and 1½ inches in concrete. Diagonal slots shall be cut at corners by overlapping cuts so that the entire slot intended for wire has full depth. There shall be no jagged edges or protrusions which may damage wire. When the top lift of asphalt is an Open Graded Friction Course, the loops shall be cut in the top immediate lift beneath the open graded friction course.

907-687.03.4.2--Cable Slots. Slots for cable shall be 3/8-inch width (±1/16") and 2¼-inch depth. To ensure that the slots are full depth, all turns and overlay cuts shall not exceed 45 degrees. There shall be no jagged edges or protrusions which may damage cable. Cable leads from each sensor shall be run in individual saw cut slots at a minimum spacing of 12 inches.

907-687.03.4.3--Sensors Slots. Slots for sensors shall be of the width and depth specified by the sensor manufacturer. Cavity of sensor slots may be made with chisel between saw cut sides, but the bottom shall be smooth and level without protrusions. In overlays of four inches (4") or less, the slot shall extend to the top of the course below the overlay. Before placing sensor, the slot shall be cleaned with compressed air.

907-687.03.5--Loop Assemblies. Inductive loop assemblies shall meet the requirements of Section 635 of the Standard Specifications.

907-687.03.6--Inspection. Pavement slots shall be inspected at time of sensor and cable installation. Surfaces shall be clean and dry, free of all dust, grit, moisture and other contaminants that might affect sealant or cement bond.

907-687.03.6.1--Sensor Check. Prior to final installation, sensor assembly shall be placed in position in slot and inspected for compliance with manufacturer's requirements as to clearance, surface alignment, etc. Sensor output shall be checked using an oscilloscope or other test equipment recommended by the sensor manufacturer.

907-687.03.6.2--Cable Inspection. The cable shall not have any cuts, nicks, abrasions or breaks in the insulation at the time of filling slot with sealant. Any sensor having defects in the shielded transmission cable shall be replaced.

907-687.03.6.3--Loop Inspection. The loop wire shall not have any cuts, nicks, abrasions or breaks in the insulation before or after installation in the slot. Loop inductance shall be 124 microhenries.

907-687.03.7--Sensor Installation. Approved epoxy cement shall completely fill the cavity spaces and surround all four sides of the sensor assembly. All excess encapsulant shall be removed from pavement surface and sensor to conduit to prevent damage during installation. Sensor installation shall be protected from traffic until epoxy cement is sufficiently cured.

907-687.03.8--Sleeves. Flexible sleeve or other protection shall be provided for shielded cable at sensor ends to prevent damage. The Contractor shall take care to insure that the sleeve is not filled with epoxy cement. In addition, the Contractor shall provide flexible sleeve, approximately 12 inches long, at pavement construction joints including joints between lanes and between pavement and paved shoulder.

907-687.03.9--Cable and Wire Installation. The cable or lead wires shall be placed in the bottom of the slot so that there are no kinks, curls, straining or stretching of the insulation. The two loop lead wires shall be twisted two to five turns per foot before placement in the slot. Special care shall be taken in seating the cable and wire so that the insulation will not be broken or abraded. No sharp tools such as screwdriver or metal object shall be used for this operation.

907-687.03.9.1--Conditions. The Contractor shall install the sealant in strict adherence to the manufacturer's recommendation and these specifications. No sealant shall be installed during inclement weather or under any condition which might introduce moisture into the pavement slots.

907-687.03.9.2--Sealant. The viscosity of the sealant shall be such that it can be readily placed in the slot, completely surround the wires, displace all air and fill the slot so that the sealant is flush with the roadway surface. The finished installation shall be waterproof and present a neat workmanlike appearance. Minimum required clearance shall be maintained to cable and wire.

907-687.03.9.3--Protection. The sealant shall be sufficiently hardened before opening to traffic.

907-687.03.10--Cleaning. All excess encapsulate and sealant shall be removed from pavement surface, inductive loop, and sensor after installation. A hand grinder shall be used, if necessary, to smooth out rough or high areas that might affect sensor operation.

907-687.03.11--Tags. Each shielded transmission cable and pair of lead wires shall be uniquely identified by an insulated, waterproof tag in every pull box.

907-687.03.12--Trenching and Backfilling. All trenching shall be done by mechanical means and all sides shall be straight and vertical. Width of trenches shall not exceed eight (8) inches on either side of placed conduits. All backfill shall be made with a friable material, which has been approved by the Engineer. Material shall be placed in compacted lifts as approved by the Engineer. The site, including shoulders and grassing, shall be returned to its original condition.

907-687.03.13--Jacking or Boring. Approved jacking or boring methods shall be used where a conduit must be placed under an existing roadway. Jacking/boring pits shall be kept a minimum of five (5) feet from the edge of shoulder, and care shall be taken not to disturb existing

pavement. Excessive use of water or other methods which could undermine pavements shall not be permitted. The jacking/boring site must be returned to its undisturbed state upon completion of the operation. Only experienced labor shall be used for jacking/boring work. Conduit shall be not less than 36 inches below pavement surface.

907-687.03.14--Pull Boxes. The location of the pull boxes must be approved by the Project Engineer. Pull boxes shall be set on 12-inch minimum thickness washed gravel. Holes for drainage shall be provided in bottom of pull box. Conduit entering pull box shall be located so as to leave the major portion of the box clear.

907-687.03.15--Conduit. Conduit shall be laid to a depth of not less than 36 inches below the finished grade, except at conduit ends. All conduits shall be run at least 10 feet outside shoulder unless otherwise approved. One size of conduit shall be used for each run; no reducing couplings will be permitted.

907-687.03.16--Conductor Installation. Before placing shielded cable or wire leads in conduit, the conduit shall be cleaned with compressed air and rigid metal conduit shall be cleaned with a mandrel. Only approved lubricants which will not injure conductor insulation while pulling cables shall be used.

Loop splices shall be made in pull boxes only, soldered, and sealed in an inline resin splice kit. An insulation equal in rating and thickness to the conductor insulation shall be provided.

907-687.03.17--System Acceptance. The Contractor shall be required to demonstrate to the Engineer the satisfactory operation of each device installed on this project.

907-687.03.18--Material Warranty. The following warranty stipulations are in addition to those covered by Subsection 106.01 of the Standard Specifications.

907-687.03.18.1--Site Inspection. After meeting the consecutive polling requirement, a site inspection may be made upon completion of an individual site but must be made before the final inspection of the project.

The Contractor, with MDOT's representatives present to verify that the site is working properly, shall test all Traffic Recorder Classification Systems.

Sensors, loops and related components at all sites shall be operational at the final inspection of the project.

907-687.03.18.1.1--Consecutive Polling. All Traffic Recorder Classification Permanent Systems shall have polled without any problems for at least 10 consecutive days and data for each day must pass quality control and quality assurance checks prior to the site inspection.

907-687.03.18.1.2--Data Collection. The Contractor shall provide 48 hours of data (IMG files) to the Planning Division for all Traffic Recorder Classification Short Term Permanent Systems prior to the site inspection.

907-687.03.18.2--Guarantee. At each location, the Contractor shall warrant and guarantee all sensors, loops and related components for a period of 12 months, beginning at the date of release from maintenance, or partial release from maintenance, of the project.

907-687.03.18.3--Responsibility. It is the intent of the preceding paragraph to provide for equipment that performs as intended by the manufacturer. It is the further intent to obtain from the Contractor a level of workmanship that will assure the Department of an operation system devoid of Contractor laxities. Failure to perform as indicated shall require the Contractor to replace in kind or repair, at the Contractor's option, the equipment or workmanship in question. All material and labor cost resulting from the replacement or repair of equipment or correction of poor workmanship shall be at no additional costs to the Department.

907-687.03.18.4--Repairs. The Department shall report any failures and outages to the Contractor. The Contractor will be required to make the necessary repairs within 10 business days of the report. The Contractor shall not be responsible for outages occurring during the 12-month warranty period due to vandalism, traffic accidents, or any problems not related to materials or workmanship. The Contractor will be required to make the necessary repairs for such outages and a reasonable cost for such repair(s) will be borne by the Department.

907-687.03.18.5--Manufacturer's Guarantees. All manufacturer's standard warranties or guarantees for all electrical and mechanical equipment which are provided as customary trade practice shall be made out to the Department and shall begin simultaneously with the commencement of the 12-month warranty period.

907-687.03.18.6--Guarantee of Repairs. This warranty and guarantee on the fixed or replaced items shall be identical in scope to the warranty and guarantee in Subsections 907-687.03.18.1 through 907-687.03.18.5.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-699-5 DB **CODE: (SP)**

DATE: **2/28/2015**

SUBJECT: **Construction Stakes**

Section 699, Construction Stakes, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby deleted and replaced as follows.

SECTION 907-699 - CONSTRUCTION STAKES

907-699.01--Description. This work consists of performing all calculations and other work necessary to establish and/or verify all horizontal and vertical control data; and furnishing, placing and maintaining roadway construction stakes or bridge construction stakes, or both, necessary for the proper prosecution of all features and items of the work under contract. This shall include, but not be limited to, grades and drainage structure locations, lengths, elevations and skews. When the contract includes a pay item for roadway construction stakes as provided herein, any references in other sections of the Standard Specifications to establishment of control points or construction staking "by the Department" shall be construed to mean "by the Contractor".

This work may be performed utilizing Automated Machine Guidance technologies and systems in accordance with the standard specifications and contract documents. Automated Machine Guidance (AMG) is defined as the utilization of positioning technologies such as Global Positioning Systems (GPS), Robotic Total Stations, lasers, and sonic systems to automatically guide and adjust construction equipment according to the intended design requirements. Global Positioning Systems (GPS) shall NOT be used for determining any points above the subgrade line. The Contractor may use any type of AMG system(s) that result in compliance with the contract documents and applicable Standard Specifications.

Automated Machine Guidance (AMG) is not a mandatory requirement. Automated Machine Guidance (AMG), conventional staking, or a combination of both may be used at the Contractor’s option for staking on this project.

907-699.02--Materials. The Contractor shall furnish all personnel, materials, equipment and devices necessary for determining, establishing, setting, checking and maintaining points, lines, grades and layout of the work. All surveying equipment shall be properly adjusted and suited for performing the work required. Traffic control necessary for the proper execution of the work shall be furnished by the Contractor without separate measurement for payment. Stakes shall be of sufficient length, thickness and quality to serve the purpose for which they are being used.

All equipment required to accomplish automated machine guidance shall be provided by the Contractor. The Contractor may use any type of AMG equipment that achieves compliance with the contract documents and applicable Standard Specifications.

The Contractor shall provide the Department with an acceptable portable grade-verification device (Rover) to be used by the Department during the duration of the contract. The Rover shall have the capability to verify accuracy within +/- 0.04-ft. On large projects with high production rates, the Contractor may have to provide more than one device. At the end of the contract, the device will be returned to the Contractor. This device shall have the same capabilities as the unit used by the Contractor.

907-699.03--Construction Requirements.

907-699.03.1--General. The Department will establish, one time only, secondary control points with elevations at distances not to exceed 1500 feet or that minimum distance necessary to maintain inter-visibility. For bridge work, the Engineer's field control will consist of a stationed baseline reference point near each end of the bridge(s) and one accessible bench mark near each bridge site. For the purpose of determining responsibility for construction stakes, lines and grades, a box bridge will not be considered as a bridge. The Contractor shall verify the accuracy of the control points before proceeding with the layout for construction.

When errors are discovered and control points do not agree with the plans, the Contractor shall promptly notify the Engineer in writing, and explain the problem in detail. The Engineer will advise the Contractor within five (5) business days of any corrective actions which may be deemed necessary.

The Contractor will be responsible for verifying and modifying, as necessary to best fit existing field conditions, lengths, locations, elevations and skew angles of all drainage structures shown on the construction plans. All junction box and inlet locations and heights shall also be verified and modified as necessary to fit existing field conditions. Modifications to the plans shall not be made without the consent of the Project Engineer. The Contractor will not be responsible for determining the size of drainage structures, but should immediately report any suspected error to the Engineer. Heights of fill over drainage structures shall be checked to verify class of pipe, bedding and the appropriate standard and/or modified standard drawing(s) required in the construction with any differences from the plans being reported to the Engineer.

The Contractor shall perform work necessary to verify alignment and plan grades on all roadway intersections and tie-ins. Any discrepancies in grades, alignment, location and or dimension detected by the Contractor shall immediately be brought to the attention of the Project Engineer.

The Contractor shall employ sufficient qualified personnel experienced in highway surveying and layout to complete the work accurately. The Contractor shall also determine and provide all additional grade controls and staking operations necessary to secure a correct layout and construction of the work. All minor variations in layout and grades required to meet field conditions shall be resolved with the Engineer and shall not be considered justification for adjusting contract price or time.

Examples of minor variations in layout and grades are:

(a) Adjustment of drainage or other structure length, alignment, and flow line elevation.

(b) The adjustment of grades and alignment at roadway intersections, cross-overs, railroad crossings, interchanges, existing bridges and roadways.

(c) Adjustment of curve data.

The Contractor will be responsible for calculating and laying out all additional lines, grades, elevations and dimensions necessary to construct the work required in the plans. All grades and other layout data computed by the Contractor shall be recorded and a copy of this data shall be furnished, with sufficient time for checking, to the Engineer before field work is started. The originals of all data shall be furnished to the Engineer on or before final inspection for the Department's permanent file. The Contractor shall also furnish personnel to assist the Engineer in taking tolerance verification checks or other notes to determine whether specified tolerances are met. Any inspection or checking of the Contractor's layout by the Engineer and the approval of all or any part of it will not relieve the Contractor of the responsibility to secure proper dimensions, grades, and elevations of the several parts of the work.

Prior to beginning construction on any structure which is referenced to an existing structure or topographical feature, the Contractor shall check the pertinent location and grades of the existing structures or topographical features to determine whether the location and grade shown on the plans are correct.

The Contractor shall stake centerline control at each station, BOP, EOP, PC, PT, SC, CS, TS, ST, and equations just before field cross sectioning by the Department for both original and final cross sections.

The Contractor shall furnish "as built" finish centerline elevations to the Project Engineer prior to final inspection of the project.

The Contractor shall set stakes and/or flags on the right-of-way line at each station and right-of-way break or as directed by the Engineer before clearing operations are started on any section of roadway.

Regardless of the method used, the Contractor shall meet the surface tolerances addressed in Section 321.

The Contractor shall exercise care in the preservation of stakes and bench marks and shall reset them when they are damaged, lost, displaced or removed. The Contractor shall use competent personnel and suitable equipment for the layout work required and shall provide that it be performed under the supervision of, or directed by, a Registered Professional Engineer or Registered Land Surveyor who is duly registered and entitled to practice as a Professional Engineer or Professional Land Surveyor in the State of Mississippi. The duties performed by said Registrant shall conform to the definitions under the “practice of engineering” and practice of “land surveying” in Mississippi Law and the latest edition of the MDOT Survey Manual. The MDOT Survey Manual can be obtained online at the following address.

http://sp.mdot.ms.gov/RoadwayDesign/Pages/MDOT-Survey-Manual.aspx

The Contractor shall not engage the services of any person in the employ of the Department for the performance of any of the work covered by this Section or any person who has been employed by the Department within the past six months except those who have legitimately retired from service with the Department during this period.

All cross sections, measurements, and tickets required for determining pay quantities will be the responsibility of the Department.

The Department reserves the right to check for accuracy any or all of the Contractor's layout work and shall be assisted by the Contractor's personnel in such checking. When errors or discrepancies are found, the Contractor will take measures necessary to correct, at no expense to the State, any construction that has been performed using the improper layout. Any inspection, checking and approval thereof by the Engineer of work for which the Contractor is responsible will not relieve the Contractor of responsibility to secure correct dimensions, grades, elevations, alignments and locations of the work for satisfactory completion of the project and as a condition for final acceptance by the Department.

907-699.03.2--Conventional Staking. In addition to the requirements set forth in Subsection 907-699.03.1, the following shall be required when using the conventional staking method.

On grading projects, the Contractor shall set slope stakes at each station and at the beginning and end of spirals and curves. Closer intervals will be required for sharp changes in grades or alignment, widening and certain other geometric details.

The Contractor shall set subgrade blue tops on centerline, break points and at the left and right subgrade shoulder lines at intervals of not more than 100 feet on tangents and intervals of not more than 50 feet in curves. Closer intervals will be required for sharp changes in grades or alignment, widening, or super elevation.

The Contractor shall furnish personnel to assist the Engineer in taking stringline and other notes to determine whether specified tolerances are met.

On paving contracts, the Contractor shall set subgrade, base and paving blue tops. The base and pavement grade stakes shall be set on intervals in accordance with the applicable requirements of Sections 321, 403 and 501.

907-699.03.3--Automated Machine Guidance. In addition to the requirements set forth in Subsection 907-699.03.1, the following shall be required when using the automated machine grading method.

907-699.03.3.1--Automated Machine Guidance Work Plan. The Contractor shall submit a comprehensive written Automated Machine Guidance Work Plan to the Engineer for review at least 30 days prior to use. The Project Engineer will have to concur with the Plan prior to the Contractor performing any AMG work. The submittal of an AMG Work Plan shall be an

indication of the Contractor's intention to utilize AMG instead of conventional methods on the project areas and elements stated in the Work Plan. The Engineer shall review the Automated Machine Guidance Work Plan to ensure that the requirements of this special provision are addressed. The Contractor shall assume total responsibility for the performance of the system utilized in the Work Plan. Any update or alteration of the Automated Machine Guidance Work Plan in the course of the work shall be approved and submitted to MDOT for determination of conformance with requirements of this special provision.

The Automated Machine Guidance Work Plan shall describe how the automated machine guidance technology will be integrated into other technologies employed on the project. This shall include, but not limited to, the following:

1. A description of the manufacturer, model, and software version of the AMG equipment.
2. Information on the Contractor's experience in the use of Automated Machine Guidance system (or Related Technologies) to be used on the project, including formal training and field experience of project staff.
3. A single onsite staff person as the primary contact, and up to one alternate contact person for Automated Machine Guidance technology issues.
4. A definition of the project boundaries and scope of work to be accomplished with the AMG system.
5. A description of how the project proposed secondary control(s) is to be established. It shall also include a list and map detailing control points enveloping the site.
6. A description of site calibration procedures including, but not limited to, equipment calibration and the frequency of calibration as well as how the equipment calibration and information will be documented to MDOT and the Project Engineer. The documentation shall contain a complete record of when and where the tests were performed and the status of each equipment item tested within or out of the ranges of required tolerances.
7. A description of the Contractor's quality control procedures for checking mechanical calibration and maintenance of equipment. It shall also include the frequency and type of checks to be performed.
8. A description of the method and frequency of field verification checks and the submission schedule of results to the Project Engineer.
9. A description of the Contractor's contingency plan in the event of failure/outage of the AMG system.
10. A schedule of Digital Terrain Models (DTM) intended for use on the project. This shall be submitted to the Engineer for review, feedback, and communication.

907-699.03.3.2--State's Responsibilities. The District Surveyor will set the primary horizontal and vertical control points in the field for the project as per latest edition of the MDOT Survey Manual. The control points shall be in Mississippi State Plane coordinate system.

MDOT will provide an electronic alignment file and primary control file for the project. This file will be based on the appropriate Mississippi State Plane Coordinate Zone either West or East. These files will be created with the computer software applications MicroStation (CADD software) and GEOPAK (civil engineering software). The data files will be provided in the native formats. The Contractor shall perform necessary conversion of the files for their selected

grade control equipment, field verify the data for accuracy, and immediately report any errors to MDOT.

MDOT will provide design data, if available, in an electronic format to the Contractor. These files will be created with the computer software applications MicroStation (CADD software) and GEOPAK (civil engineering software). The data files will be provided in the native formats as specified in the Data Format section of this specification. No guarantee is made to the data accuracy or completeness, or that the data systems used by MDOT will be directly compatible with the systems used by the Contractor. Information shown on the paper plans marked with the seal (official plans as advertised) shall govern.

The Engineer will perform spot checks as necessary of the Contractor's machine control grading results, surveying calculations, records, field procedures, and actual staking. If the Engineer determines that the work is not being performed in accordance with the Specifications, the Engineer shall order the Contractor to re-construct the work to the requirements of the contract documents at no additional cost to the Department.

907-699.03.3.3--Contractor's Responsibilities. The Contractor shall provide formal training, as requested, on the use of the Automated Machine Guidance Equipment, including Rover, and the Contractor's systems to MDOT project personnel prior to the start of construction activities utilizing AMG. This training is for providing MDOT project personnel with an understanding of the equipment, software, and electronic data being used by the Contractor.

The Contractor shall use the alignment and control data provided by MDOT.

The Contractor shall bear all costs, including but not limited to the cost of actual reconstruction work that may be incurred due to errors in application of Automated Machine Guidance techniques or manipulation of MDOT design data in Digital Terrain Models (DTM). The Contractor shall also bear all costs associated with any graphical grading outside the model / typical section, such as tying to existing grades at the beginning or end of a project.

The Contractor shall be responsible for converting the information on the plans and/or electronic data file provided by MDOT into a format compatible with the Contractor's AMG system.

The Contractor shall establish secondary control points at locations along the length of the project and outside the project limits and/or where work is performed beyond the project limits as required by the Automated Machine Guidance system utilized. The Contractor shall establish this secondary control using survey procedures as outlined in the latest edition of the MDOT Survey Manual. A copy of all new control point information shall be provided to the Engineer prior to construction activities. The Contractor shall be responsible for all errors resulting from their efforts and shall correct deficiencies to the satisfaction of the Engineer and at no additional cost to the State.

The Contractor shall preserve all reference points and monuments that are established by the District Surveyor outside the construction limits. If the Contractor fails to preserve these items, they shall be re-established by the Contractor to their original quality at no additional cost to the

State.

The Contractor shall set grade stakes at the top of the finished sub-grade and base course at all hinge points on the typical sections at 1000-foot maximum intervals on mainline, critical points such as, but not limited to, PC's, PT's, beginning and ending super elevation transition sections, middle of the curve, and at least two locations on each of the side roads and ramps, and at the beginning and end of each cross slope transition where Automated Machine Guidance is used. These grade stakes shall be established using conventional survey methods for use by the Engineer to check the accuracy of the construction.

On grading projects, the Contractor shall set slope stakes and centerline stationing every 500 feet and at the beginning and end of spirals and curves. Closer intervals will be required for sharp changes in grades or alignment, widening and certain other geometric details.

The staking requirements for pavement grade stakes addressed in Sections 403 and 501will not apply. The Contractor shall furnish an acceptable portable grade-verification device(s) (Rover) to verify grade tolerances.

The Contractor will be required to set 20 grade points (hubs) per mile at locations determined by the Engineer for field verification. If tolerances are not met, additional grade points may be required by the Engineer.

The Contractor shall furnish personnel to assist the Engineer in taking tolerance verification checks as necessary to determine whether specified tolerances are met.

The Contractor shall meet the same accuracy requirements as detailed in the Mississippi Standard Specifications for Road and Bridge Construction.

The Contractor shall be responsible for implementing the AMG system using the Mississippi State Plane Coordinate System. No localization methods will be accepted.

907-699.03.3.4--Data Format. It is the Contractor's responsibility to produce the Digital Terrain Model(s) and/or 3D line work needed for Automated Machine Guidance. MDOT does not produce this data in its design process. MDOT does provide CADD files created in the design process to the Contractor. The CADD files provided by MDOT are provided in the native software application formats in which they are created with no conversions, and their use in developing 3D data for machine guidance is at the discretion of the Contractor. The CADD files that may be available are listed below. Cross-Sections are one of the items provided but are not necessarily created at critical design locations. Therefore their use in Digital Terrain Models (DTM) for AMG is limited.

1. Project Control - Microstation DGN file and ASCII file
2. Existing Topographic Data - Microstation DGN file(s)
3. Preliminary Surveyed Ground Surface - GeoPak TIN, if available
4. Horizontal and Vertical alignment information - GeoPak GPK file and/or Microstation DGN file(s)

5. 2D Design line work (edge of pavement, shoulder, etc.) - Microstation DGN file(s)
6. Cross sections - Microstation DGN file(s), GeoPak format
7. Superelevation - Microstation DGN file(s), GeoPak format
8. Form Grades - Microstation DGN file(s)
9. Design Drainage - Microstation DGN file(s)

It is expressly understood and agreed that MDOT assumes no responsibility in respect to the sufficiency or accuracy of these CADD files. These files are provided for convenience only and the contract plans are the legal document for constructing the project.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-701-5 DB **CODE: (SP)**

DATE: 1/07/2015

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. 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, 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, or 8% silica fume
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, 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 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.

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

Blended cement Types IS and IP 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 3 and the "(MS)" suffix shall be added to the type designation.

907-701.04.1.2--Alkali Content. All blended cement shall be made with clinker that would result in cement meeting the requirements of Subsection 907-701.02.1.2 when used in the production of AASHTO Designation: M 85, Type I or Type II cement.

907-701.04.2--Replacement by Other Cementitious Materials. The maximum replacement of blended cement Type IL by weight is 35% for fly ash or 50% for GGBFS. Replacement contents below 20% fly ash or 45% 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 blended cement by fly ash or GGBFS. 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 Types IS and IP.

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 3.

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. 907-702-5 DB **CODE: (SP)**

DATE: 1/07/2015

SUBJECT: Specifications for Bituminous Materials

Section 702, Bituminous Materials, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-702.05--Petroleum Asphalt Cement. Delete the third paragraph of Subsection 702.05 on page 598, and substitute the following.

The bituminous material used in all types of asphalt mixtures shall conform to AASHTO Designation: M 320, Performance Grade PG 67-22, as modified in the table below, except that Polyphosphoric Acid (PPA) may be used at low dosage rates as a modifier to enhance the physical properties of a base binder to meet the requirements for Performance Grade PG 67-22. In addition, PPA may be used as a catalyst or mixing agent at low dosage rates in the production of Polymer Modified, Performance Grade PG 76-22.

When PPA is used as a modifier, in no case shall the PPA modifier be used to adjust the physical properties of the binder a full binder grade. For example: the base binder (unmodified) is graded as a PG 64-22 and should only be modified by the addition of PPA to a modified binder grade of PG 67-22.

When petroleum asphalt cement is modified by PPA, the following dosage limits shall be applied.

Grade	Dosage Limit
PG 67-22	0.75% by weight of binder
PG 76-22	0.50% by weight of binder

907-702.07--Emulsified Asphalt.

907-702.07.2--Anionic and Cationic. After the last paragraph of Subsection 702.07.2 on page 600, add the following.

LockDown (LD-7) and CQS-1h shall conform to the requirements of Table V.

907-702.07.3--Polymer Modified Cationic Emulsified Asphalt (CRS-2P). Delete the paragraph in Subsection 702.07.3 on page 600, and substitute the following.

Polymer Modified Cationic Emulsified Asphalt shall conform to the requirements of AASHTO Designation: M 316, with the following exception:

In Table 1, the Ductility, 25˚C, 5 cm/min, shall be a minimum of 100 cm.

907-702.12--Tables. After the last Table of Subsection 702.12 on page 606, add the following.

TABLE V
SPECIFICATION FOR FOG SEAL

	LD-7		**CQS-1h**		
Test Requirements	**Min.**	**Max.**	**Min.**	**Max.**	**Test Method**
Viscosity, Saybolt Furol, @ 25°C, Sec.	15	100	20	150	AASHTO T 72
Storage Stability Test, 24 hr, %	-	1	-	1	AASHTO T 59
Settlement, 5 day, %	-	5	-	-	AASHTO T 59
Particle Charge	-	-	Positive		AASHTO T 59
Oil Distillate, %	-	1	-	-	AASHTO T 59
Sieve Test, % *	-	0.3	-	0.1	AASHTO T 59
Residue by Distillation, %	40	-	60	-	AASHTO T 59
Test on Residue from Distilation					
Penetration @ 25°C	-	20	-	-	AASHTO T 49
Penetration @ 25°C, 100g, 5s	-	-	60	110	AASHTO T 49
Softening Point, °C	65	-	-	-	ASTM 36
Solubility in trichloroethylene, %	97.5	-	97.5	-	AASHTO T 44
Ductility @ 25°C, cm	-	-	40	-	AASHTO T 51
Original DSR @ 82° (G*/Sinδ, 10 rad/sec)	1	-	-	-	AASHTO T 111

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-703-12 DB **CODE: (SP)**

DATE: **1/07/2015**

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 table in Subsection 703.03.2.4 on page 611 and substitute the following.

Table of Sizes and Gradation of Coarse Aggregate for Portland Cement Concrete

Square Mesh Sieves	Percent Passing by Weight						
	Size No. 467	Size No. 57	Size No. 67	Size No. 7	Size No. 78	Size No. 8	Size No. 89
2 inch	100						
l½ inch	95-100	100					
1 inch		80-100	100				
3/4 inch	35-70		80-100	100	100	100	
1/2 inch		25-60		90-100	90-100	95 100	100
3/8 inch	10-30		20-55	40-70	40-75	75-100	85 100
No. 4	0-5	0-10	0-10	0-15	5-25	5-30	20-40
No. 8		0-5	0-5	0-5	0-10	0-10	0-10
No. 16					0-5	0-5	0-5

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 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 limestone, steel slag, granite, concrete, or combination thereof. Crushed concrete is defined as recycled concrete pavement, structural concrete, or other concrete sources that can be crushed to meet the gradation requirements for Size No. 825B as modified below. In no case shall waste from concrete production (wash-out) be used as a crushed stone base.

907-703.04.2--Fine Aggregate. Delete the first sentence of the first paragraph of Subsection 703.04.2 on page 612, and substitute the following.

Fine aggregate, defined as material passing the No. 8 sieve, shall be material resulting from the crushing of limestone, steel slag, granite, concrete, or combination thereof.

Delete the third paragraph of Subsection 703.04.2 on page 612.

907-703.04.3--Gradation. In the table of Subsection 703.04.3 on page 613, change the requirement for the 1-inch sieve under Size No. 825 B from “75 - 98” to “75 - 100”.

After the table in Subsection 703.04.3 on page 613, add the following.

If crushed concrete is used, the crushed material shall meet the gradation requirements of Size No. 825 B with the exception that the percent passing by weight of the No. 200 sieve shall be 2 – 18.

907-703.06--Aggregates for Hot Mix Asphalt.

907-703.06.1--Coarse Aggregates. Delete the third paragraph of Subsection 703.06.1 on page 613, and substitute the following.

When tested in accordance with AASHTO Designation: T 19, the dry rodded unit weight of all aggregates except expanded clay and shale shall not be less than 70 pounds per cubic foot.

907-703.06.1.2--Fine Aggregates. Delete the last sentence of Subsection 703.06.1.2 on page 614.

907-703.14--Aggregates for Bituminous Surface Treatments.

907-703.14.2--Detail Requirements.

907-703.14.2.1--Gradation. In the table entitled "Gradation Requirements For Cover Aggregate" in Subsection 703.14.2.1 on page 622, delete the requirement for the No. 16 sieve for Size No. 7 under the column "Slag or Expanded Clay".

Delete Subsection 703.19 on page 624, and substitute the following.

907-703.19--Lightweight Aggregate for Concrete.

907-703.19.1--Lightweight Aggregate for Structural Concrete. Lightweight aggregate for structural concrete shall meet the requirements of AASHTO Designation: M 195.

907-703.19.2--Lightweight Aggregate for Internal Curing of Concrete. Lightweight aggregate for internal curing of concrete shall meet the requirements of ASTM Designation: C 1761. The lightweight aggregate shall meet the gradation requirements listed in Table 1 for either "9.5 mm to 2.36 mm (3/8 in. to No. 8)" Coarse aggregate, "9.5 mm to 0 (3/8 in. to 0)" Combined fine and coarse aggregate, or "4.75 mm to 0 (No. 4 to 0)" Fine aggregate. The fineness modulus of the lightweight aggregate shall not be less than 2.70.

907-703.20--Aggregate for Stabilizer.

907-703.20.3--Gradation. Delete the table and notes in Subsection 703.20.3 at the top of page 626, and substitute the following.

PERCENT PASSING BY WEIGHT

Square Mesh Sieves	Shell	Coarse			Medium	Fine
		Size I	Size II Note (1)	Size III Note (3)		
3 inch				100		
2 1/2 inch	90-100			90-100		
2 inch		100				
1 1/2 inch		90-100	100	25-60		
1 inch		80-100	97-100			
3/4 inch		55-100	55-100	0-10		
1/2 inch		35-85	35-85	0-5	100	
3/8 inch		12-65	12-65		97-100	
No. 4, Note (2)		0-30	0-30		92-100	
No. 10		0-8	0-8		80-100	100
No. 40					10-40	80-100
No. 60					0-20	30-100
No. 100						15-80
No. 200	0-5	0-4	0-4		0-5	0-30
PI Material Passing No. 40					6 or less	0

Note (1): Size II is intended for use in bases in which portland cement is used.

Note (2): Ground shell shall contain at least 97% passing the No. 4 sieve.
Note (3): Size III is intended for use in stabilized construction entrances.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-707-5 DB **CODE: (SP)**

DATE: 1/07/2015

SUBJECT: Joint Materials

Section 707, Joint Materials, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-707.02.1.3--Concrete Joint Sealer Compound - Hot-Poured Elastic Type. In the first paragraph of Subsection 707.02.1.3 on page 633, delete "AASHTO Designation: M 173" and replace with "AASHTO Designation: M 324 for Type I Joint and Crack Sealant".

Delete in toto Subsection 707.02.1.5 on pages 634 and 635 and substitute:

907-707.02.1.5--Backer Rod for Use with Hot and Cold Poured Joint Sealer. The backer rod shall be a closed-cell foam rod made from polyethylene, polyolefin or similar type material, and shall conform to ASTM Designation: D 5249 with the exception that water absorption shall be determined by ASTM Designation: C 1016, Procedure A. The backer rod shall either be a Type I, for use with either hot or cold poured joint sealers, or a Type 3, for use with cold poured joint sealers only. Open-cell foam rods or open-cell foam rods covered with an impermeable sheath or skin shall not be allowed.

The Contractor shall furnish a three linear foot sample of each shipment and three copies of the manufacturer's certification that the backer rod meets the requirements of this specification.

907-707.04--Rubber Type Gaskets for Joining Conduit. In the first sentence of Subsection 707.04 on page 636, delete the reference to "AASHTO Designation: M 315" and substitute "ASTM Designation: C 443".

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-708-6 DB **CODE: (SP)**

DATE: 1/07/2015

SUBJECT: Non-Metal Drainage Structures

Section 708, Non-Metal Structures and Cattlepasses, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-708.02.1.2--Fly Ash. In the first sentence of Subsection 708.02.1.2 on page 639, change "20 percent" to "25%".

907-708.02.1.4--Coarse Aggregate. Delete the last sentence of Subsection 708.02.1.4 on page 639.

907-708.02.3.2--Marking. Delete the second sentence of Subsection 708.02.3.2 on page 640, and substitute the following.

Machine made pipe shall be marked in accordance with one of the following methods: 1) the pipe shall be inscribed on the outside of the pipe and stenciled on the inside of the pipe, or 2) the pipe shall be inscribed on the inside of the pipe, only. All other pipe may be stenciled.

907-708.17--Corrugated Plastic Pipe Culverts.

907-708.17.1--Corrugated Polyethylene Pipe Culverts. Delete the first sentence of the first paragraph of Subsection 708.17.1 on page 645 and substitute the following.

Corrugated polyethylene pipe shall conform to the requirements of AASHTO Designation: M 294, Type S and/or SP, as applicable, and shall have soil tight joints, unless otherwise specified.

Delete the last sentence of the second paragraph of Subsection 708.17.1 on page 645.

After Subsection 708.17.1 on page 645, add the following.

907-708.17.1.1--Inspection and Final Acceptance of Corrugated Polyethylene Pipe Culverts. Approximately 50% of the installed length of corrugated polyethylene pipe shall be inspected for excess deflection no sooner than 30 days after the embankment material over the pipe is placed to the required subgrade elevation or the maximum required fill height. The inspection shall be performed using either electronic deflectometers, calibrated television or video cameras, or a "go, no-go" mandrel that has an effective diameter of 95% of the nominal inside diameter of the pipe.

Pipe found to have deflection values greater than 5% shall be removed and replaced at no cost to the State.

907-708.17.2--Corrugated Poly (Vinyl Chloride) (PVC) Pipe Culverts. Delete the first sentence of the first paragraph of Subsection 708.17.2 on page 645 and substitute the following.

Corrugated poly (vinyl chloride) (PVC) pipe shall conform to the requirements of AASHTO Designation: M 304 and shall have soil tight joints, unless otherwise specified. Non-perforated PVC pipe used in underdrains shall either be manufactured with an ultra-violet light inhibitor or be fully coated with an ultra-violet light inhibitor.

After Subsection 708.17.2 on page 645, add the following.

907-708.17.2.1--Inspection and Final Acceptance of Poly (Vinyl Chloride) (PVC) Pipe Culverts. Approximately 50% of the installed length of PVC pipe shall be inspected for excess deflection no sooner than 30 days after the embankment material over the pipe is placed to the required subgrade elevation or the maximum required fill height. The inspection shall be performed using either electronic deflectometers, calibrated television or video cameras, or a "go, no-go" mandrel that has an effective diameter of 95% of the nominal inside diameter of the pipe.

Pipe found to have deflection values greater than 5% shall be removed and replaced at no cost to the State.

907-708.18--Sewer Pipe Used for Underdrains.

907-708.18.1--General. After the second paragraph of Subsection 708.18.1 on page 645 add the following.

In lieu of the pipe listed in this subsection, pipe meeting the requirements of Subsection 708.19 may also be used for plastic underdrain pipe.

907-708.18.3--Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe. After the first sentence of Subsection 708.18.3 on page 645, add the following.

Non-perforated PVC pipe shall either be manufactured with an ultra-violet light inhibitor or be fully coated with an ultra-violet light inhibitor.

907-708.18.4--Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe. Delete the paragraph in Subsection 708.18.4 on page 645 and substitute the following.

This pipe shall conform to the following requirements. For pipe sizes less than or equal to six inches (≤ 6"), the pipe shall be Class PS46 meeting the requirements of AASHTO Designation: M 278. For pipe sizes greater than six inches (> 6"), the pipe shall meet the requirements of AASHTO Designation: M 304. Non-perforated PVC pipe shall either be manufactured with an ultra-violet light inhibitor or be fully coated with an ultra-violet light inhibitor.

Delete Subsection 708.19 on page 645 and substitute the following.

907-708.19--Corrugated Polyethylene Pipe. This pipe shall be high density polyethylene pipe

or drainage tubing meet the requirements of AASHTO Designation: M 294, Type S or SP, or AASHTO Designation: M 252, Type S or Type SP, as applicable.

907-708.22.2--Exceptions to AASHTO. Delete the sixth paragraph of Subsection 708.22.2 on page 647.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-709-1 DB **CODE: (SP)**

DATE: 1/07/2015

SUBJECT: Metal Pipe

Section 709, Metal Pipe, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

After Subsection 709.02 on page 649, add the following:

907-709.02.1--Aluminized Corrugated Metal Culvert Pipe and Pipe Arches. All aluminized metal pipe and arches shall be manufactured from Type 2 corrugated metal pipe and arches in accordance with the requirements of Subsection 709.02.

907-709.03--Bituminous Coated Corrugated Metal Pipe and Pipe Arches.

907-709.03.1--Materials. Delete the first sentence of the first paragraph of Subsection 709.03.1 on page 649, and substitute the following:

Bituminous coated corrugated metal pipe and arches shall conform to the requirements of AASHTO Designation: M 190 and be completely coated inside and out with an asphalt cement which will meet the performance requirements hereinafter set forth.

907-709.05--Polymer Coated Corrugated Metal Pipe and Pipe Arches. Delete the first sentence of the first paragraph of Subsection 709.05 on pages 649 and 650, and substitute the following:

Polymer coated corrugated metal pipe and arches shall conform to the requirements of AASHTO Designation: M 245, except the minimum gauge thickness shall be as shown on the plans or in the contract; however, corrugated metal pipe manufactured from sheets thicker than that specified will be acceptable when approved by the Engineer. The internal diameter of corrugated metal pipe will be determined by inside measurement between the crests of the corrugations. Corrugations greater than 3" x 1" will not be allowed in arch pipe.

907-709.06--Corrugated Metal Pipe for Underdrains. Delete the sentence in Subsection 709.06 on page 650, and substitute the following:

Corrugated metal pipe shall conform to AASHTO Designation: M 36, Type III. Type I pipe which has been perforated to permit the in-flow or out-flow of water may be used in lieu of Type III pipe.

907-709.06.1--Aluminized Corrugated Metal Culvert Pipe For Underdrains. All aluminized corrugated metal pipe for underdrains shall be manufactured from Type 2 corrugated metal pipe and arches in accordance with the requirements of AASHTO Designation: M 36, Type III.

Manufacturer must repair any damaged coating caused from perforating the pipe.

907-709.07--Bituminous Coated Corrugated Metal Pipe for Underdrains. Delete the sentence in Subsection 709.07 on page 650, and substitute the following:

Bituminous coated corrugated metal pipe shall conform to the requirements of AASHTO Designation: M 190, Type A with a bituminous coating applied in accordance with the requirements of Subsection 709.03. Manufacturer must repair any damaged coating caused from perforating the pipe.

907-709.08--Polymer Coated Corrugated Metal Pipe for Underdrains. Delete the sentence in Subsection 709.08 on page 650, and substitute the following:

The metal pipe for underdrains shall conform to the requirements of AASHTO Designation: M 245, Type III and the polymer coating shall conform to the requirements of Subsection 709.05. Type I pipe which has been perforated to permit the in-flow or out-flow of water may be used in lieu of Type III pipe. Manufacturer must repair any damaged coating caused from perforating the pipe.

907-709.09--Corrugated Aluminum Alloy Culvert Pipe and Arches. Delete the first sentence in Subsection 709.09 on page 650, and substitute the following:

Corrugated aluminum culvert pipe and arches shall conform to the requirements of AASHTO Designation: M l96, Type IA.

907-709.10--Corrugated Aluminum Alloy Pipe for Underdrains. Delete the first sentence in Subsection 709.10 on page 650, and substitute the following:

Corrugated aluminum pipe underdrains shall conform to the requirements of AASHTO Designation: M 196, Type III. Type I pipe which has been perforated to permit the in-flow or out-flow of water may be used in lieu of Type III pipe.

907-709.11--Bituminous Coated Corrugated Aluminum Alloy Culvert Pipe and Arches. Delete the sentence in Subsection 709.11 on page 650, and substitute the following:

Bituminous coated aluminum culvert pipe and arches shall conform to AASHTO Designation: M 196, Type IA, and in addition shall be coated inside and out as specified in Subsection 709.03. Manufacturer must repair any damaged coating caused from perforating the pipe.

907-709.13--Bituminous Coated Corrugated Aluminum Alloy Pipe for Underdrains. Delete the sentence in Subsection 709.13 on page 650, and substitute the following:

This pipe shall conform to AASHTO Designation: M 196, Type III, and shall be coated with bituminous material conforming to AASHTO Designation: M 190, type coating as specified. Manufacturer must repair any damaged coating caused from perforating the pipe.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-710-1 DB **CODE: (SP)**

DATE: 1/07/2015

SUBJECT: Fast Dry Solvent Traffic Paint

Section 710, Paint, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is amended as follows:

After Subsection 710.05 on Page 661, add the following:

907-710.06--Fast Dry Solvent Traffic Paint. Fast dry solvent traffic paints intended for use under this specification shall include products that are single packaged and ready mixed. Upon curing, these materials shall produce an adherent, reflective pavement marking capable of resisting deformation by traffic. The manufacturer shall have the option of formulating the material according to their own specifications. However, the requirements delineated in this specification, Section 619 and Section 710 shall apply regardless of the formulation used. The material shall be free from all skins, dirt and foreign objects.

907-710.06.1--Composition.

907-710.06.1.1--Percent Pigment. The percent pigment by weight shall be not less than 51% nor more than 58% when tested in accordance with ASTM D 3723.

907-710.06.1.2--Viscosity. The consistency of the paint shall be not less than 75 nor more than 95 Krebs Units (KU) when tested in accordance with ASTM D 562.

907-710.06.1.3--Weight per Gallon. The paint shall weigh a minimum 11.8 pounds per gallon and the weight of the production batches shall not vary more than +/- 0.5 pounds per gallon from the weight of the qualification samples when tested in accordance with ASTM D 1475.

907-710.06.1.4--Total Solids. The percent of total solids shall not be less than 70% by weight when tested in accordance with ASTM D 2369.

907-710.06.1.5--Dry Time (No pick-up). The paint shall dry to a no tracking condition in a maximum of 10 minutes.

907-710.06.1.6--Volatile Organic Content. The volatile organic content (VOC) shall contain a maximum of 1.25 pounds of volatile organic matter per gallon of total non-volatile paint material when tested in accordance with ASTM D 3960.

907-710.06.1.7--Bleeding. The paint shall have a minimum bleeding ratio of 0.95 when tested in accordance with Federal Specification TT-P-115D.

907-710.06.1.8--Color. The initial daytime chromaticity for yellow materials shall fall within the box created by the following coordinates:

Initial Daytime Chromaticity Coordinates (Corner Points)

	1	2	3	4
x	**0.53**	**0.51**	**0.455**	**0.472**
y	**0.456**	**0.485**	**0.444**	**0.4**

The initial daytime chromaticity of white materials shall fall within the box created by the following coordinates:

Initial Daytime Chromaticity Coordinates (Corner Points)

	1	2	3	4
x	**0.355**	**0.305**	**0.285**	**0.355**
y	**0.355**	**0.305**	**0.325**	**0.375**

907-710.06.2--Environmental Requirements. All yellow materials using lead chromate pigments shall meet the criteria of non-hazardous waste as defined by 40 CFR 261.24 when tested in accordance with EPA Test Method 1311, Toxicity Characteristics Leaching Procedures (TCLP). The striping and marking material , upon preparation and installation, shall not exude fumes which are toxic, or detrimental to persons or property. All material using lead free pigments shall NOT contain either lead or other Resource Conservation and Recovery Act (RCCA) materials in excess of the standard defined by EPA Method 3050 and 6010.

907-710.06.3--Acceptance Procedures. Acceptance of all fast dry solvent based traffics paint will be based on the Manufacturer's Certification and Certified Test Results. The Contractor shall furnish the Engineer with three copies of the manufacturer's certification stating that each lot of material in a shipment complies with the requirements of this contract. In addition, the Contractor shall provide Certified Test Reports for all tests required by this specification. The test results shall be representative of the material contained with the shipment.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-711-4 DB **CODE: (SP)**

DATE: 1/07/2015

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. The synthetic structural fibers shall be approved for listing in the Department's "Approved Sources of Materials" prior to use. The synthetic structural fibers shall be added to the concrete and mixed in accordance with the manufacturer's recommended methods.

907-711.04.1--Material Properties. The fibers shall meet the requirements of ASTM Designation: C 1116, Section 4.1.3. The fibers shall be made of polypropylene, polypropylene/polyethylene blend, nylon, or polyvinyl alcohol (PVA).

907-711.04.2--Minimum Dosage Rate. The dosage rate shall be such that the average residual strength ratio ($R_{150,3.0}$) of fiber reinforced concrete beams is a minimum of 20.0 percent when the beams are tested in accordance with ASTM Designation: C 1609. The dosage rate for fibers shall be determined by the following.

The fiber manufacturer shall have the fibers tested by an acceptable, independent laboratory acceptable to the Department and regularly inspected by the Cement and Concrete Reference Laboratory of the National Institutes of Standards and Technology and approved to perform ASTM Designations: C 39, C 78, and C192.

The laboratory shall test the fibers following the requirements of ASTM Designation: C 1609 in a minimum of three (3) test specimens cast from the same batch of concrete, molded in 6 x 6 x 20-inch standard beam molds meeting the requirements of ASTM Designation: C 31. The beams shall be tested on an 18-inch span. The tests for $R_{150,3.0}$ shall be performed when the average compressive strength of concrete used to cast the beams is between 3500 and 4500 psi. The tests for compressive strength shall follow the requirements of ASTM Designation: C 39. The average compressive strength shall be determined from a minimum of two (2) compressive strength cylinders.

The value for $R_{150,3}$ shall be determined using the following equation:

$$R_{150,3.0} = \frac{f_{150,3.0}}{f_1} \times 100$$

The residual flexural strength ($f_{150,3.0}$) shall be determined using the following equation:

$$f_{150,3.0} = \frac{P_{150,3.0} \times L}{b \times d^2}$$

where:

$f_{150,3.0}$ is the residual flexural strength at the midspan deflection of L/150, (psi),

$P_{150,3.0}$ is the residual load capacity at the midspan deflection of L/150, (lbf),

L is the span, (in),

b is the width of the specimen at the fracture, (in), and

d is the depth of the specimen at the fracture, (in).

For a 6 x 6 x 20-inch beam, the $P_{150,3.0}$ shall be measured at a midspan deflection of 0.12 inch.

Additionally, $R_{150,3.0}$, $f_{150,3.0}$, and $P_{150,3.0}$ may also be referred to as R_{150}^{150}, f_{150}^{150}, and P_{150}^{150} respectively.

At the dosage rate required to achieve the minimum $R_{150,3}$, the mixture shall both be workable and the fibers shall not form clumps.

The manufacturer shall submit to the State Materials Engineer certified test reports from the independent laboratory showing the test results of each test specimen.

907-711.04.3--Job Control Requirements. The synthetic structural fibers shall be one from the Department's "Approved Sources of Materials."

At the required dosage rate, the mixture shall both be workable and the fibers shall not form clumps to the satisfaction of the Engineer. If the mixture is determined by the Engineer to not be workable or have clumps of fibers, the mixture may be rejected.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-713-3 DB **CODE: (SP)**

DATE: 1/07/2015

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 responsibility of the Contractor 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 Concrete. Air-entraining admixtures used in Portland cement concrete shall comply with AASHTO Designation: M 154. Set-retarding, accelerating, and/or water-reducing admixtures shall comply with AASHTO Designation: M 194. Water-reducing admixture shall meet the minimum requirements for Type A. Set-retarding admixtures shall meet the minimum requirements for Type D. Admixtures providing a specific performance characteristic(s) other than those of water reduction or set retardation shall meet the minimum requirements for Type S. For admixtures meeting the requirements for Type S, the manufacturer shall provide data to substantiate the specific performance characteristic(s) to the satisfaction of the State Materials Engineer.

In order to obtain approval of an admixture, the State Materials Engineer shall have been furnished 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 Standard Specification.

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.

After an admixture has been approved, the Contractor shall submit to the State Materials Engineer, with each new lot of material shipped, a certification from the manufacturer in accordance with the requirements of Subsection 700.05.1 and stating the material is of the same composition as originally approved and has not been changed or altered in any way. The

requirement in Subsection 700.05.1(b) is not required on the certification from the manufacturer.

Admixtures containing chlorides will not be permitted.

Failure to maintain compliance with any requirement of these specifications shall be cause for rejection of any previously approved source or brand of admixture.

Admixtures shall only be used in accordance with the manufacturer's recommended dosage range as set forth in the manufacturer's approval request correspondence. When an admixture is used in Portland cement concrete, it shall be the responsibility of the Contractor to produce satisfactory results.

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

SPECIAL PROVISION NO. 907-714-3 DB **CODE: (SP)**

DATE: **1/07/2015**

SUBJECT: **Stabilizing Fibers**

Section 714, Miscellaneous Materials, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

Delete Subsection 714.07 on page 682 and substitute the following:

907-714.07--Stabilizing Fibers.

907-714.07.1--General. Stabilizing fibers shall be used in Stone Matrix Asphalt (SMA) mixtures and other mixtures, as necessary, for draindown reduction. Fibers shall be added at a minimum dosage rate of 0.30 percent for both cellulose and mineral fibers by weight of total mix. The produced mixture containing the fibers shall exhibit a draindown of 0.30 percent or less when tested in accordance with Mississippi Test Method MT-82.

Either cellulose or mineral fibers may be used. A pelletized fiber comprised of either cellulose or mineral fiber may also be used.

907-714.07.2--Cellulose Fibers. Cellulose fibers shall conform to the following properties:

Property	**Specification Requirement**
Fiber Length	0.25 inch maximum
Sieve Analysis	
a. Alpine Air Jet Sieve Method (Passing No. 100 sieve)	60 – 80 percent
b. Mesh Screen Sieve Method (Passing No. 20 sieve) (Passing No. 40 sieve) (Passing No. 100 sieve)	 75 – 95 percent 55 – 75 percent 20 – 40 percent
Ash Content	18.0 ± 5 percent
PH	7.5 ± 1.0
Oil Absorption	5.0 ± 1.0
Moisture Content	5.0 percent maximum

907-714.07.3--Mineral Fibers. Mineral fibers shall conform to the following properties:

Property	**Specification Requirement**
Average Fiber Length	0.25 inch maximum
Average Fiber Thickness	0.0002 inch maximum
Shot Content (ASTM C612)	
(Passing the No. 60 sieve)	85 – 95 percent
(Passing the No. 230 sieve)	60 – 80 percent

907-714.07.4--Pelletized Fibers.
Pelletized fibers shall conform to the properties provided in Subsection 907-714.07.2 or 907-714.07.3.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-714-8 DB **CODE: (SP)**

DATE: 1/07/2015

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 8.0%.

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 exception:

The loss on ignition shall not exceed 6.0 percent.

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.

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.

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. 907-715-4 DB **CODE: (SP)**

DATE: 1/07/2015

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
Wheat	-	80	98

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

DATE: 1/07/2015

SUBJECT: Pavement Marking Materials

Section 720, Pavement Marking Materials, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-720.01--Glass Beads. After the first sentence of Subsection 720.01 on page 729, add the following.

The glass beads shall contain no more than 200 ppm (mg/kg) total concentration for lead, arsenic, or antimony. The manufacture shall furnish the Engineer with a certified test report indicating that the glass beads meet the above requirement.

907-720.02--Thermoplastic Pavement Markings. Delete the first paragraph of Subsection 720.02 on page 730 and substitute the following.

The thermoplastic material shall be lead free and conform to AASHTO Designation: M 249 except the glass beads shall be moisture resistant coated.

After the first sentence of the second paragraph of Subsection 720.02 on page 730, add the following.

In addition, the certification for the thermoplastic material shall state that the material is lead free.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-723-1 DB **CODE: (SP)**

DATE: 1/07/2015

SUBJECT: High Mast Lighting Wind Velocity

Section 723, Materials For Roadway Lighting Installation, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-723.04--High Mast Lighting Assembly.

907-723.04.1--Pole. Delete the last sentence of the first paragraph of Subsection 723.04.1 on page 792 and substitute the following.

Designed wind velocity shall be in accordance with the 2001 AASHTO Standard Specifications for Structural Supports for High Signs, Luminaires and Traffic Signals to support the number and type luminaires and lowering device required on the different assembly types. Design wind velocities shall be as follows:

140 MPH -------Hancock, Harrison & Jackson Counties
130 MPH -------Pearl River, Stone, & George Counties
120 MPH -------Lamar, Forrest, Perry & Greene Counties
110 MPH -------Pike, Walthall, Marion, Jefferson Davis, Covington, Jones & Wayne Counties
100 MPH -------Wilkinson, Amite, Adams, Franklin, Lincoln,, Lawrence, Simpson, Smith, Jasper & Clarke Counties
90 MPH -------All counties north of and including Jefferson, Copiah, Rankin, Scott, Newton, & Lauderdale

Ice Loading shall be considered in the design for structures in all counties above and including Washington, Humphreys, Holmes, Attala, Winston, & Noxubee.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-804-16 DB **CODE: (SP)**

DATE: **1/07/2015**

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 deleted and replaced as follows.

SECTION 907-804--CONCRETE BRIDGES AND STRUCTURES

907-804.01--Description. This work consists of constructing concrete bridges and structures in accordance with these specifications and in reasonably close conformity with the dimensions, designs, lines, and grades indicated on the plans or established.

Construction of box bridges shall be in accordance with Sections 601 and 602.

907-804.02--Materials.

907-804.02.1--General. Concrete produced and controlled from this specification shall be accepted upon proper certification of concrete production through an approved quality control program and verification by job site acceptance criteria. The Contractor shall develop and implement a quality control program which shall be used to maintain the required properties of concrete. 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. For projects less than or equal to 200 cubic yards, refer to the requirements of TMD-20-05-00-000 "Sampling and Testing of Small Quantities of Miscellaneous Materials" for mixture design and testing requirements.

The materials for concrete bridges and structures, when sampled and tested in accordance with Subsection 700.03, shall meet the requirements of the following Subsections:

Portland Cement ..... 701.01 and 701.02
Blended Cement ..... 907-701.01 and 907-701.04
Admixtures 713.02
Fly Ash 714.05
Ground Granulated Blast Furnace Slag (GGBFS) 907-714.06
Silica Fume 907-714.07.2
Water ..... 714.01.1 and 714.01.2
Fine Aggregate 703.02
Coarse Aggregate 703.03
Lightweight Aggregate 907-703.19
Curing Materials 713.01
Joint Materials ..... 707.01, 707.02, and 707.07

Structural Steel Joints and Bearing Devices 717.01
Bearing Pads 714.10
Wire Rope or Wire Cable for Prestressed Concrete ..... 700.01 and 711.03
Sprayed Finish for Concrete Surface 714.12
Reinforcing Steel 711.02

907-804.02.2--Use, Care, and Handling. The use, care, and handling of materials shall conform to the applicable requirements of Subsection 501.03.10 and the specific requirements of Subsections 907-804.02.4 and 907-804.02.5. Unless otherwise authorized, only fine aggregate or coarse aggregate of one type and from the same source shall be used in the construction of any one unit of a structure. Should the Contractor, with written permission of the Engineer, elect to substitute high early strength cement for cement of the type specified, the Contractor will not receive additional compensation for the substitution.

907-804.02.3--Blank.

907-804.02.4--Care and Storage of Concrete Aggregates. The handling and storage of aggregates shall be such as to prevent segregation or contamination with foreign materials. The Engineer may require that aggregates be stored on separate platforms at satisfactory locations.

When specified, coarse aggregates shall be separated into two or more sizes in order to secure greater uniformity of the concrete mixture. Different sizes of aggregate shall be stored in separate stock piles sufficiently removed from each other to prevent the material at the edges of the piles from becoming intermixed.

907-804.02.5--Storage of Cementitious Materials. All cementitious materials shall be stored in suitable weather-proof buildings or bins. These buildings or bins shall be placed in locations approved by the Engineer. Provision for storage shall be ample, and the shipments of cementitious materials as received shall be stored separately or other provisions made to the satisfaction of the Engineer for easy access for the identification, inspection, and sampling of each shipment as deemed desirable. Stored cementitious materials shall meet the test requirements at any time after storage when a retest is ordered by the Engineer.

On small jobs, open storage consisting of a raised platform and ample waterproof covering may be permitted by written authorization from the Engineer.

When specified, the Contractor shall keep accurate records of deliveries of cementitious materials and of their use in the work. Copies of these records shall be supplied in the form required by the Engineer.

907-804.02.6--Classification and Uses of Concrete. When a specific class of concrete is not specified on the plans or in the contract documents, the structure or parts thereof shall be constructed with the class of concrete as directed by the Engineer.

The classes and their uses are as follows:

(1) Class AA - Concrete for bridge construction and concrete exposed to seawater.

(2) Class A - Concrete shown as Class A shall herein be classified as and required to meet the performance criteria of Class AA.
(3) Class B - General use, heavily reinforced sections, cast-in-place concrete piles, and conventional concrete piles.
(4) Class C - Massive sections or lightly reinforced sections.
(5) Class D - Massive unreinforced sections and riprap.
(6) Class F - Concrete for prestressed members.
(7) Class FX - Extra strength concrete for prestressed members, as shown on plans.
(8) Class S - For all seal concrete deposited under water.
(9) Class DS - Drilled Shaft

907-804.02.7--Blank.

907-804.02.8--Laboratory Accreditation. The Contractor shall be responsible for furnishing the laboratory used to perform concrete quality control tests. The laboratory may be the Contractor's facility, the concrete producer's facility, or a certified independent testing laboratory.

Only laboratories certified by the Mississippi Department of Transportation are qualified to perform material testing. Certification by AASHTO Accreditation Program (AAP) will be acceptable if the laboratory is listed in the latest AAP publication and maintains accreditation to completion of concrete work.

The Contractor's laboratory designated for quality control testing shall have equipment necessary to test aggregates and concrete for the test methods listed in Table 1.

Table 1

AASHTO: R 39	Making and Curing Concrete Test Specimens in the Laboratory
AASHTO: R 60	Sampling Freshly Mixed Concrete
AASHTO: T 2	Sampling Aggregates
AASHTO: T 19	Bulk Density ("Unit Weight") and Voids in Aggregates
AASHTO: T 22	Compressive Strength of Cylindrical Concrete Specimens
AASHTO: T 23	Making and Curing Concrete Test Specimens in the Field
AASHTO: T 27	Sieve Analysis of Fine and Coarse Aggregates
AASHTO: T 84	Specific Gravity and Absorption of Fine Aggregate
AASHTO: T 85	Specific Gravity and Absorption of Coarse Aggregate
AASHTO: T 119	Slump of Hydraulic Cement Concrete
AASHTO: T 121	Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
AASHTO: T 152	Air Content of Freshly Mixed Concrete by Pressure Method *
AASHTO: T 196	Air Content of Freshly Mixed Concrete by the Volumetric Method *
AASHTO: T 231	Capping Cylindrical Concrete Specimens
AASHTO: T 248	Reducing Field Samples of Aggregate to Testing Size
AASHTO: T 255	Total Evaporable Moisture Content of Aggregate by Drying
AASHTO: T 325	Standard Method of Test for Estimating the Strength of Concrete in Transportation Construction by Maturity Tests **
ASTM: C 1064	Standard Test Method for Temperature of Freshly Mixed

	Hydraulic Cement Concrete
ASTM: C 1074	Standard Practice for Estimating Concrete Strength by the Maturity Method **

* Equipment necessary for either pressure or volumetric air content.
** Equipment necessary for estimating concrete strength following the maturity method.

Testing equipment shall have been inspected by the Department or through the AASHTO Accreditation Program. Testing equipment calibration files shall be made available upon request by the Department.

907-804.02.9--Testing Personnel. Technicians testing portland cement concrete, for either acceptance or production control purposes, shall be certified by an accepted certification program. Recertification is required for each Class after five years. Certification requirements are listed in Table 2.

Table 2

Concrete Technician's Tasks	Test Method Required	Certification Required**
Sampling or Testing of Plastic Concrete	AASHTO Designation: R 60, T 23, T 119, T 121, 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 a 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 certification
Interpretation and Application of Maturity Meter Readings	AASHTO Designation: T 325 and ASTM Designation: C 1074	MDOT Class III certification or Two hours maturity method training

* Technicians making concrete test specimens for meeting the requirements of Subsection 907-804.02.10.1.2 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.

Specific requirements for each level of certification are in the latest edition of the Department's *Concrete Field Manual*. Current MDOT Class I, MDOT Class II, and/or MDOT Class III

certifications shall be acceptable until those certifications expire. Upon expiration of a current certification, recertification with the certifications listed in Table 2 shall be required. Technicians 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 Mixture Design. At least 10 days prior to production of concrete, the Contractor shall submit to the Engineer proposed concrete mixture designs complying with the Department's *Concrete Field Manual*. Materials shall be from approved sources meeting the requirements of the Standard Specifications. Proportions for the mixture designs shall be for the class concrete required by the contract plans and shall meet the requirements of the "Master Proportion Table for Structural Concrete Design" listed in Table 3. The concrete producer shall assign a permanent unique mixture number to each mixture design. Each mixture design shall be field verified as required in Subsection 907-804.02.10.3. Acceptable field verification data shall be required for final approval of a mixture design.

All concrete mixture designs will be reviewed by the Materials Division prior to use. Concrete mixture designs disapproved will be returned to the Contractor with a statement explaining the disapproval.

If the Contractor chooses to cure the concrete in accordance with the requirements listed under **Length of Time Defined by Development of Compressive Strength** in Subsection 907-804.03.17, the compressive strength/maturity relationship shall be developed for the mixture design for a minimum of 28 days following the requirements of Subsection 907-804.03.15. The compressive strength/maturity relationship information shall be submitted with the mixture design information.

Table 3
MASTER PROPORTION TABLE FOR STRUCTURAL CONCRETE DESIGN

Class	Coarse Aggregate Size No.*	Maximum Water/ Cementitious** Ratio	Specified Compressive Strength (f'_c) psi	Maximum Permitted Slump*** inches	Nominal Total Air Content**** %
AA*****	57 or 67	0.45**	4000	3***	4.5****
B	57 or 67	0.50	3500	4	4.5
C	57 or 67	0.55	3000	4	4.5
D	57 or 67	0.70	2000	4	4.5
F	67	0.40	5000	3	******
FX	67	(As per mixture design)	(As shown on plans)	3	******
S	57 or 67	0.45	3000	8	4.5
DS	67	0.45	4000	***	******

* Maximum size aggregate shall conform to the concrete mixture design for the specified aggregate. Other smaller coarse aggregate sizes meeting the requirements of Subsection 907-703.03.2.4 may also be used in conjunction with the coarse aggregate sizes listed. Lightweight aggregate (LWA) meeting the requirements of Subsection 907-703.19.2 may also be used as a partial replacement for fine aggregate.

** The replacement limits of portland cement by weight by other cementitious materials (such as fly ash, GGBFS, 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.

For Class AA concrete for concrete bridge decks, the water / cementitious ratio range shall be 0.43 – 0.45 and the maximum cementitious material content shall be 550 pounds per cubic yard.

*** Unless otherwise specified, minus slump requirements shall meet those set forth in Table 3 of AASHTO Designation: M157.

For Class AA concrete for concrete bridge decks the maximum permitted slump may be increased to five (5) inches. Also, for each additional pound of fibers per cubic yard added in excess of the requirement in Note *****, an additional inch of slump will be allowed up to a maximum permitted slump of eight (8) inches.

For Class AA not used in bridge decks and all other Classes of concrete, the maximum permitted slump may be increased to eight (8) inches.

For Class DS concrete for drilled shafts the slump range shall be 8 inches ±1 inch.

**** The tolerance on total air content shall be ±1.5%. For Class AA concrete for concrete bridge decks, the nominal total air content may be increased to 6.5%.

***** For Class AA concrete for concrete bridge decks, an approved synthetic structural fiber meeting the requirements of Special Provision 907-711, Synthetic Structural Fiber Reinforcement, shall be incorporated into the mixture at 1.25 times the approved dosage rate.

****** Entrained air is not required except for concrete exposed to seawater. For concrete not exposed to seawater, the total air content shall not exceed 6.0%. For concrete exposed to seawater, the nominal total air content shall be 4.5%.

At least one water-reducing admixture or water-reducing/set-retarding admixture shall be used in all classes of concrete in accordance with the manufacturer's recommended dosage range. Admixtures providing a specific performance characteristic other than those of water reduction or set retardation may be used in accordance with the manufacturer's recommended dosage range. Mixture designs containing accelerating admixtures will not be approved. Any combinations of admixtures shall be approved by the Engineer before their use.

907-804.02.10.1--Proportioning of Portland Cement Concrete Mixture Design. Proportioning of portland cement concrete shall be based on an existing mixture of which the producer has field experience and documentation or based on a recently batched laboratory mixture tested according to the required specifications.

907-804.02.10.1.1--Proportioning on the Basis of Previous Field Experience of Trial Mixtures. 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. The record of tests from which the standard deviation is calculated shall:

a) Represent similar materials and conditions to those expected. Changes in materials and proportions within the test record shall not have been more closely restricted than those for the proposed work.

b) Represent concrete produced to meet a specified strength.

c) Consist of 10 consecutive tests, average of two cylinders per test, tested at 28 days.

The standard deviation, s , shall be calculated as:

$$s = \left[\sum \left(X_i - \overline{X}\right)^2 \div \left(N - 1\right)\right]^{1/2}$$

where:

X_i = the strength result of an individual test
$\overline{X}$ = the average of individual tests in the series
N = number of tests in the series

When the concrete production facility does not have a record of tests for calculation of standard deviation, as required in the above formula, the requirements of Subsection 907-804.02.10.1.2 shall govern.

The required average compressive strength (f'_{cr}) used as the basis for selection of concrete proportions shall conform to the inequality listed below, while using a standard deviation, *s*, calculated as shown above.

$$\overline{X} \geq f'_{cr}$$

where:

$$f'_{cr} = f'_c + 1.43s$$

where:

f'_c = specified compressive strength of concrete, psi
f'_{cr} = required average compressive strength of concrete, psi
s = standard deviation, psi

1.43 represents the Lower Quality Index necessary to assure that 93% of compressive strength tests are above f'_c.

907-804.02.10.1.2--Proportioning on the Basis of Laboratory Trial Mixtures. When an acceptable record of field test results is not available, concrete proportions shall be established based on laboratory trial mixtures meeting the following restrictions:

a) The combination of materials shall be those intended for use in the proposed work.

b) Trial mixtures having proportions and consistencies suitable for the proposed work shall be made using the ACI 211.1 as a guide to proportion the mixture design.

c) Trial mixtures shall be designed to produce a slump within ±3/4 inch of the maximum permitted, and for air-entrained concrete, ±0.5 percent of the maximum total air content. The temperature of freshly mixed concrete in trial mixtures shall be reported.

d) For each proposed mixture, at least three compressive test cylinders shall be made and cured in accordance with AASHTO Designation: R 39. Each change of water-cement ratio shall be considered a new mixture. The cylinders shall be tested for strength in accordance with AASHTO Designation: T 22 and shall be tested at 28 days.

e) The required average strength of laboratory trial mixes shall exceed f'_c by 1200 psi for concrete mixture designs less than 5000 psi and by 1400 psi for concrete mixture designs of 5000 psi or more.

f) The laboratory trial batch mixtures shall have been made within the previous 12 months before being submitted for approval and shall not have been previously used on Department projects.

907-804.02.10.2--Documentation of Average Strength. Documentation that the proposed concrete proportions will produce an average strength equal to or greater than the required average shall consist of the strength test records from field tests or results from laboratory trial mixtures.

907-804.02.10.3--Field Verification of Concrete Mixture Design. Concrete mixture designs will only be tentatively approved pending field verification. The requirements for yield, slump, or total air content shall be successfully met within the first three (3) production days. Mixture designs may be transferred to other projects without additional field verification testing, once the mixture design has passed the field verification process.

The Contractor's Certified Quality Control Technicians shall test each concrete mixture design upon the first placement of the mix. Aggregates and concrete tests during the first placement shall be as follows.

Aggregates	Concrete
Bulk Specific Gravity	Water Content
Moisture	Slump
Gradation	Air Content
	Unit Weight
	Yield

For all Classes of concrete, the mixture shall be verified to yield within 2.0% of the correct volume when all the mix water is added to the batch.

For all Classes of concrete other than DS, F, and FX, the mixture shall produce a slump within a minus 1½-inch tolerance of the maximum permitted for mixtures with a maximum permitted slump of three inches (3") or less or within a minus 2½-inch tolerance of the maximum permitted for mixtures with a maximum permitted slump of greater than three inches (3"), and producing a total air content within a minus 1½ percent tolerance of the maximum allowable air content in Table 3.

For Class DS, the slump shall be within the requirements in Note *** below Table 3. For Class DS exposed to seawater, the total air content shall be within a minus 1½ percent tolerance of the maximum allowable air content in Note ****** below Table 3. For Class DS not exposed to seawater the total air content shall be within the requirements in Note ****** below Table 3.

For Classes F and FX, the slump shall be within a minus 1½-inch tolerance of the maximum permitted for mixtures with a maximum permitted slump of three inches (3") or less or within a minus 2½-inch tolerance of the maximum permitted for mixtures with a maximum permitted slump of greater than three inches (3"). For Classes F and FX exposed to seawater, the total air content shall be within a minus 1½ percent tolerance of the maximum allowable air content in Note ****** below Table 3. For Classes F and FX not exposed to seawater the total air content shall be within the requirements in Note ****** below Table 3.

The mixture shall be adjusted and retested, if necessary, on subsequent placements until the above mentioned properties are met.

If the requirements for yield, slump, or total air content are not met within the first three (3) production days, subsequent field verification testing shall not be permitted on Department projects, and the mixture design shall not be used until the requirements listed above are met. Any mixture design adjustments, changes in the mixture proportions, are to be made by a Class III Certified Technician representing the Contractor. After the mixture design has been verified and adjustments made, verification test results will be reviewed by the Engineer.

907-804.02.10.3.1--Slump Retention of Class DS Concrete Mixture Designs. Prior to concrete placement, the Contractor shall provide test results of a slump loss test using approved methods to demonstrate that the mixture meets the four hour requirement in Subsection 907-803.02.7.1. These tests shall be conducted successfully by an approved testing laboratory within 30 days prior to installation of the trial shaft, with personnel from the Materials Division present. The slump loss test shall be conducted at temperatures and conditions similar to those expected at the job site at the time of the installation of the trial shaft. The sample for the slump loss test shall be from a minimum batch size of four (4) cubic yards of concrete. If the time between the previous successful slump loss test and the installation of the trial shaft exceeds 30 days, another successful slump loss test shall be performed on the first truckload of concrete as part of the installation of the trial shaft. This requirement limiting the time between the previous slump loss test and an installation of the trial shaft also applies to Class DS concrete mixture designs being transferred from another project. During any shaft installation a slump loss test shall be conducted by the Contractor at the direction of the Engineer from the concrete at the site for verification of slump loss requirements using a sample from a minimum batch size of four cubic yards of concrete.

907-804.02.10.4--Adjustments of Mixtures. The mixture design 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 907-804.02.10.3 and approval by the Engineer.

907-804.02.11--Concrete Batch Plants. 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 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.

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. The Contractor shall provide and maintain a quality control program that will provide reasonable assurance that all materials and products submitted to the Department for acceptance will conform to the contract requirements, whether manufactured or processed by the Contractor or procured from suppliers, subcontractors, or vendors.

The Contractor's Quality Control program shall implement the minimum quality control requirements shown in Table 4, "CONTRACTOR'S MINIMUM REQUIREMENTS FOR QUALITY CONTROL". The quality control activities shown in the table are considered to be normal activities necessary to control the production and placing of a given product or material at an acceptable quality level. To facilitate the Department's activities, all completed gradation samples shall be retained for a maximum of sixty (60) days by the Contractor until further disposition is designated by the Department.

The Contractor shall perform, or have performed, the tests required to substantiate product conformance to contract document requirements and shall also perform, or have performed, all tests otherwise required.

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 shall be allowed to be added. Water shall not be added at a later time. Job site adjustment of a batch using chemical admixtures or the mechanical adjustment of a batch may be performed by the Contractor if the requirements of Subsection 907-804.02.12.1.1 have been satisfactorily addressed in the Quality Control Plan. If either the maximum permitted slump is exceeded or the total air content is not within the required range after all adjustments are made at the job site, the concrete shall be rejected.

The Contractor's quality control tests shall be documented and shall be available for review by the Engineer throughout the life of the contract.

As set out in these specifications, quality control sampling and testing performed by the Contractor will be used by the Department for determination of acceptability of the concrete.

The Contractor shall maintain standard equipment and qualified personnel as required to assure conformance to contract requirements.

907-804.02.12.1--Quality Control Plan. The Contractor shall prepare a Quality Control Plan which shall identify the personnel responsible for the Contractor's quality control including the company official who will act as liaison with Department personnel. The Quality Control Plan

shall be submitted in writing to the Engineer for approval 30 days prior to the production of concrete.

The class(es) of concrete involved will be listed separately. If an existing mixture design(s) is to be used, the mixture design number(s) as previously approved shall be listed.

It is intended that sampling and testing be in accordance with standard methods and procedures, and that measuring and testing equipment be standard and properly calibrated. If alternative sampling methods and procedures, and inspection equipment are to be used, they shall be detailed in the Quality Control Plan.

907-804.02.12.1.1--Elements of Plan. The Plan shall address all elements that affect the quality of the structural concrete including, but not limited to, the following items:

1) Stockpile Management
2) Procedures for Corrective Actions for Non Compliance of Specifications
3) Procedure for Controlling Concrete Temperatures
4) Job Site Batch Adjustments by Addition of Chemical Admixtures:

   The Plan shall address if the Contractor intends to adjust either the slump and/or total air content of a batch on the job site by adding chemical admixture(s) to a batch. The Contractor shall include the names of the personnel designated to perform this batch adjustment, the equipment used to add the chemical admixture(s), and the procedure by which the batch adjustment will be accomplished. Only the Contractor's designated personnel shall adjust a batch. Only calibrated dispensing equipment shall be used to add chemical admixture(s) to a batch. Only the procedure described in this section of the Plan shall be utilized.

   If either the maximum permitted slump is exceeded or the total air content is not within the required range after all adjustments are made at the job site, the concrete shall be rejected.

   If the Contractor elects to utilize Job Site Batch Adjustments by Addition of Chemical Admixture within Item 2, Procedures for Corrective Actions for Non Compliance of Specifications, to adjust batches which do not meet the minimum specification requirements for slump and/or total air content, no more than three batches on any one project shall be allowed to be adjusted regardless of the number of mixtures associated with the project.

5) Construction of Concrete Bridge Decks, including the following:

   - the description of the equipment used for placing concrete on the bridge deck in accordance with Subsection 907-804.03.6 and, as applicable, Subsections 907-804.03.7 and 907-804.03.8 including any accessories added to the pump to ensure the entrained air in the concrete mixture remains entrained during pumping and depositing of the concrete mixture,

- the description of and the number of pieces of equipment used to consolidate the concrete in accordance with Subsection 907-804.03.6.2,
- the description of the equipment used to finish the bridge deck in accordance with Subsection 907-804.03.19.7,
- the plan for ensuring a continuous rate of finishing the bridge deck without delaying the application of curing materials within the time specified in Subsection 907-804.03.17, including ensuring a continuous supply of concrete throughout the placement with an adequate quantity of concrete to complete the deck and filling diaphragms and end walls in advance of deck placement,
- the plan for applying the curing materials within the time specified in Subsection 907-804.03.17,
- the description of the powered fogging equipment in accordance with Subsection 907-804.03.17,
- a sample of the documentation used as the daily inspection report for ensuring maintenance of the continuous wet curing in accordance with Subsection 907-804.03.17, as required,
- the description of the equipment used to apply the liquid membrane, including but not limited to, the nozzles, pumping/pressurization equipment, and liquid membrane tanks, in accordance with Subsection 907-804.03.17,
- the method for determining the rate of applied liquid membrane meets the application rate requirements in accordance with Subsection 907-804.03.17,
- a sample of the documentation used for the application rate verification of the liquid membrane in accordance with Subsection 907-804.03.17.

6) Mechanical Adjustment of Trucks

907-804.02.12.2--Personnel Requirements. The Contractor's Designated Certified Technician shall perform and use quality control tests and other quality control practices to assure that delivered materials and proportioning meet the requirements of the mixture design including temperature, slump, air content, and strength and shall periodically inspect all equipment used in transporting, proportioning, and mixing.

The Contractor's Designated Technician shall periodically inspect all equipment used placing, consolidating, finishing, and curing to assure it is operating properly and that placement, consolidation, finishing, and curing conform to the mixture design and other contract requirements.

907-804.02.12.3--Documentation. The Contractor shall maintain adequate records of all inspections and tests. The records shall indicate the nature and number of observations made, the number and type of deficiencies found, date and time of samples taken, the quantities approved and rejected, and the nature of corrective action taken as appropriate. The Contractor's documentation procedures will be subject to approval of the Department prior to the start of the work and to compliance checks during the progress of the work.

All conforming and non-conforming results shall be kept complete and shall be available at all times to the Department during the performance of the work. Forms shall be on a computer-

acceptable medium. 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. All material added to a batch by both the batch plant or added manually shall be documented on the ticket. Batch tickets shall also contain the concrete producer's permanent unique mixture number assigned to the concrete mixture design. Copies shall be submitted to the Department as the work progresses.

Test data for portland cement concrete, including gradation, shall be charted in accordance with the applicable requirements.

The Contractor may use additional control charts as deemed appropriate. It is normally expected that testing and charting will be completed within 24 hours after sampling.

All records documenting the Contractor's quality control tests shall become the property of the Department upon completion of the work.

907-804.02.12.4--Corrective Action. The Contractor shall take prompt action to correct conditions that have resulted, or could result, in the submission to the Department of materials and products that do not conform to the requirements of the contract documents. All corrective actions shall be documented.

907-804.02.12.5--Non-Conforming Materials. The Contractor shall establish and maintain an effective and positive system for controlling non-conforming material, including procedures for its identification, isolation and disposition. Reclaiming or reworking of non-conforming materials shall be in accordance with procedures acceptable to the Department.

All non-conforming materials and products shall be positively identified to prevent use, shipment, and intermingling with conforming materials and products. Holding areas, mutually agreeable to the Department and the Contractor, shall be provided by the Contractor.

TABLE 4
CONTRACTOR'S MINIMUM REQUIREMENTS FOR QUALITY CONTROL

Portland Cement Concrete		
Control Requirement	**Frequency**	**AASHTO/ASTM Designation**
A. PLANT AND TRUCKS		
1. Mixer Blades	Monthly	
2. Scales		
a. Tared	Daily	
b. Calibrate	Every 6 months	
c. Check Calibration	Weekly	
3. Gauges & Meters - Plant & Truck		
a. Calibrate	Every 6 months	
b. Check Calibration	Weekly	
4. Admixture Dispenser		
a. Calibrate	Every 6 months	
b. Check Operation & Calibration	Daily	
B. AGGREGATES		
1. Sampling		T 2
2. Fine Aggregate		
a. Gradation / FM	250 yd^3 concrete	T 27
b. Moisture	Check meter against test results weekly 2500 yd^3 concrete	T 255
c. Specific Gravity / Absorption		T 84
3. Coarse Aggregates		
a. Gradation	250 yd^3 concrete	T 27
b. Moisture	Minimum of once daily or more as needed to control production. Check meter against test results weekly.	T 255
c. Specific Gravity / Absorption	2500 yd^3 Concrete	T 85
C. PLASTIC CONCRETE		
1. Sampling		T 141
2. Air Content	First load then one per 50 yd^3	T 152 or T 196
3. Slump	First load then one per 50 yd^3	T 119
4. Compressive Strength	A minimum of one set (three cylinders) for each 100 yd^3 inclusive and one set for each additional 100 yd^3 or fraction thereof for each class concrete delivered and placed on a calendar day from a single supplier. A test shall be the average of three cylinders.	T 22, T 23, T 231
5. Yield	Each 400 yd^3	T 121
6. Temperature	With each sample	C 1064

907-804.02.13--Quality Assurance Sampling and Testing. Quality Assurance (QA) inspection and testing will be provided by the Department to assure that the Contractor's Quality Control (QC) testing meets the requirements of these specifications.

Acceptance of the material is based on the inspection of the construction, monitoring of the Contractor's QC program, QC and QA test results per Subsection 907-804.02.13.1, and the comparison of the QA test results with the QC test results. The Department may use the results of the Contractor's QC tests as a part of the acceptance procedures instead of the results of QA tests, provided:

a) The Department's inspection and monitoring activities indicate that the Contractor is following the approved QC program and, respectively,
b) For aggregates, the results from the Contractor's QC and the Department's QA testing of aggregate gradations compare by both meeting the aggregate type's gradation requirements;
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.

The minimum frequency for QA testing of aggregate and plastic concrete by the Department will follow the frequencies listed in Table 5, **"**DEPARTMENT'S MINIMUM REQUIREMENTS FOR QUALITY ASSURANCE".

TABLE 5
DEPARTMENT'S MINIMUM REQUIREMENTS FOR QUALITY ASSURANCE

Quality Assurance Tests	Frequency	AASHTO/ASTM Designation
A. AGGREGATES		
1. Sampling		T 2
2. Fine Aggregate Gradation and FM	250 yd^3 concrete	T 27
3. Coarse Aggregates Gradation	250 yd^3 concrete	T 27
B. PLASTIC CONCRETE		
1. Sampling		T 141
2. Air Content	Every 100 yd^3	T 152 or T 196
3. Slump	Every 100 yd^3	T 119
4. Compressive Strength	One set (three cylinders) for every 100 yd^3 inclusive. A test shall be the average of three cylinders.	T 22, T 23, T 231
5. Temperature	With each sample	C 1064

Periodic inspection by the Department of the Contractor's QC testing and production will continue through the duration of the project. Weekly reviews will be made of the Contractor's QC records and charts.

For aggregates, comparison of data of the Contractor's QC aggregate gradation test results to those of the Department's QA aggregate gradation test results will be made monthly during

concrete production periods according to Department Standard Operating Procedures. When it is determined that the Contractor's QC test results of aggregate gradations are comparative to that of the Department's QA test results, then the Department will use the Contractor's QC results as a basis for acceptance of the aggregates and the Department's QA testing frequency of aggregates may be reduced to a frequency of no less than three QA tests to every 10 QC tests. If the Contractor's QC aggregate gradation test results fail to compare to those of the Department's QA aggregate gradation test results, Department testing for aggregate gradations will revert to the frequency shown in Table 5 for aggregates until the Contractor's and Department's aggregate gradation test data compare.

For concrete compressive strength, comparison of data of the Contractor's QC compressive strength test results to those of the Department's QA compressive strength test results will be made monthly during concrete production periods according to Department's *Concrete Field Manual*. When it is determined that the Contractor's QC test results of concrete compressive strengths are comparative to that of the Department's QA test results, then the Department will use the Contractor's QC results as a basis for acceptance of the concrete and the Department's QA testing frequency of concrete compressive strengths may be reduced to a frequency of no less than three QA tests to every 10 QC tests. If the Contractor's QC compressive strength test results fail to compare to those of the Department's QA compressive strength test results, Department testing will revert to the frequency shown in Table 5 for plastic concrete until the Contractor's and Department's compressive strength test data compare.

907-804.02.13.1--Job Control Testing.

907-804.02.13.1.1--Sampling. Sampling of concrete mixture shall be performed in accordance with the latest edition of the Department's *Concrete Field Manual*.

907-804.02.13.1.2--Slump. Slump of plastic concrete shall meet the requirements of Table 3: MASTER PROPORTION TABLE FOR STRUCTURAL CONCRETE DESIGN. A check test shall be made on another portion of the sample before rejection of any load.

907-804.02.13.1.3--Air. Total air content of concrete shall be within the specified range for the class of concrete listed in Table 3: MASTER PROPORTION TABLE FOR STRUCTURAL CONCRETE DESIGN. A check test shall be made on another portion of the sample before rejection of any load.

907-804.02.13.1.4--Yield. If the yield of the concrete mix design is more than plus or minus three percent (±3%) of the designed volume, the mix shall be adjusted by a Class III Certified Technician representing the Contractor to yield the correct volume plus or minus three percent (±3%). If batching of the proportions of the mixture design varies outside the batching tolerance range of the originally approved proportions by more than the tolerances allowed in Subsection 907-804.02.12, the new proportions shall be field verified per Subsection 907-804.02.10.3.

907-804.02.13.1.5--Temperature. Cold weather concreting shall follow the requirements of Subsection 907-804.03.16.1. Hot weather concreting shall follow the requirements of Subsection 907-804.03.16.2. Concrete with a temperature more than the maximum allowable temperature shall be rejected and not used in Department work.

The maximum acceptance temperature for Class DS concrete mixtures is 95°F.

The maximum acceptance temperature of Class C concrete mixtures is 100°F for mixtures meeting the cement replacement requirements of Subsection 907-701.02.2. For Class C concrete mixtures used in these Pay Items which do not meet the cement replacement requirements of Subsection 907-701.02.2, the maximum acceptance temperature is 95°F.

The maximum acceptance temperature for all other concrete mixtures meeting the cement replacement requirements of Subsection 907-701.02.2 is 95°F. The maximum acceptance temperature for all other concrete mixtures which do not meet the cement replacement requirements of Subsection 907-701.02.2 is 90°F.

907-804.02.13.1.6--Compressive Strength. Laboratory cured concrete compressive strength tests shall conform to the specified strength (f'_c) listed in the specifications. Concrete represented by compressive strength test below the specified strength (f'_c) may be removed and replaced by the Contractor. If the Contractor elects not to remove the material, it will be evaluated by the Department as to the adequacy for the use intended. All concrete evaluated as unsatisfactory for the intended use shall be removed and replaced by the Contractor at no additional cost to the Department. For concrete allowed to remain in place, reduction in payment will be as follows:

Projects with 1000 Cubic Yards and More. When the evaluation indicates that the work may remain in place, a statistical analysis will be made of the QC and QA concrete test results. If this statistical analysis indicates at least 93% of the material would be expected to have a compressive strength equal to or greater than the specified strength (f'_c) and 99.87% of the material would be expected to have a compressive strength at least one standard deviation above the allowable design stress (f_c), the work will be accepted. If the statistical analysis indicates that either of the two criteria are not met, the Engineer will provide for an adjustment in pay as follows for the material represented by the test result.

Total Pay on Material in Question = Unit Price - (Unit Price x % Reduction)

$$\text{\% Reduction} = \frac{\left(f'_c - X\right)}{f'_c - \left(f_c + s\right)} \times 100 \text{ x M}$$

where:

f'_c = Specified 28-day compressive strength, psi
X = Individual compressive strength below f'_c, psi
s = standard deviation, psi*
f_c = allowable design stress, psi
M = pay reduction multiplier, per the *Concrete Field Manual*, paragraph 7.3

* Standard deviation used in the above reduction of pay formula shall be calculated from the applicable preceding compressive strengths test results plus the individual compressive

strength below f'_c. If below f'_c strengths occur during the project's first ten compressive strength tests, the standard deviation shall be calculated from the first ten compressive strength tests results.

Projects of More Than 200 but Less Than 1000 Cubic Yards. When the evaluation indicates that the work may remain in place, a percent reduction in pay will be assessed based on a comparison of the deficient 28-day test result to the specified strength. The Engineer will provide for an adjustment in pay as follows for the material represented by the test result.

Total Pay on Material in Question = Unit Price - (Unit Price x % Reduction)

$$\% \text{ Reduction} = \frac{\left(f'_c - X\right)}{f'_c} \times 100 \text{ x M}$$

where:

f'c = Specified 28-day compressive strength, psi
X = Individual compressive strength below f'c, psi
M = pay reduction multiplier, per the *Concrete Field Manual*, paragraph 7.3

907-804.02.14--Dispute Resolution. Disputes over variations between Contractor's QC test results and the Department's QA test results shall be resolved at the lowest possible level using the latest edition of the Department's *Concrete Field Manual*. When there are significant discrepancies between the QC test results and the QA test results, the Contractor's QC Manager, the Project Engineer, and/or the District Materials Engineer shall look for differences in the procedures, and correct the inappropriate procedure before requesting a third party resolution.

If the dispute cannot be resolved at the project or District level, the Department's Materials Division will serve as a third party to resolve the dispute. The Materials Division's decision shall be binding.

The Contractor shall be responsible for the cost associated with the third party resolution if the final decision is such that the Department's QA test results were correct. Likewise, the Department will be responsible for the cost when the final decision is such that the Contractor's QC test results were correct.

907-804.03--Construction Requirements.

907-804.03.1--Measurement of Materials.

907-804.03.1.1--General. The accuracy for measuring materials shall be in accordance with AASHTO Designation: M 157.

907-804.03.1.2--Measurement by Weighing. Except when otherwise specified or authorized, the materials shall be measured by weighing. The apparatus provided for weighing materials shall be suitably designed and constructed for this purpose. Cementitious materials and aggregates shall be weighed separately. Cement in standard bags need not be weighed, but bulk

cement and other cementitious materials shall be weighed. The mixing water shall be measured by volume or by weight. All measuring devices shall be subject to approval.

907-804.03.2--Blank.

907-804.03.3--Blank.

907-804.03.4--Hand Mixing. Hand mixing of concrete will not be allowed.

907-804.03.5--Delivery. The plant supplying concrete shall have sufficient capacity and transporting apparatus to ensure continuous delivery at the rate required. The rate of delivery shall be such as to provide for the proper continuity in handling, placing, and furnishing of the concrete. The rate shall be such that the interval between batches shall not exceed 20 minutes. The methods of delivering and handling the concrete shall be that which will facilitate placing with minimum re-handling and without damage to the structure or the concrete.

907-804.03.6--Handling and Placing Concrete.

907-804.03.6.1--General. Prior to placing concrete, all reinforcement shall have been accurately placed in the position shown on the plans and fastened as set out in Section 805. All sawdust, chips, and other construction debris and extraneous matter shall have been removed from the interior of the forms. Temporary struts, braces, and stays holding the forms in correct shape and alignment shall be removed when the concrete placing has reached an elevation rendering their service unnecessary. These temporary members shall be entirely removed from the forms and shall not be buried in the concrete.

No concrete shall be placed until the forms and reinforcement have been inspected.

Except as provided for truck mixers and truck agitators, concrete shall be placed in the forms within 30 minutes after the time that the cement is first added to the mixture.

Concrete shall be placed so as to avoid segregation of materials and displacement of reinforcement. The use of troughs, chutes, and pipes over 25 feet in length for gravity conveyance of concrete to the forms, will not be permitted except when authorized by the Engineer and subject to the production of quality concrete.

Only approved mechanical conveyors will be permitted.

Open troughs and chutes shall be metal or metal lined. The use of aluminum pipes, chutes, or other devices made of aluminum that come into direct contact with the concrete shall not be used. Where steep slopes are required, the chutes shall be equipped with baffles or be in short sections that change the direction of movement.

All chutes, troughs, and pipes shall be kept clean and free from coatings of hardened concrete by thoroughly flushing with water after each run. Water used for flushing shall be discharged clear of the structure.

When placing operations involve dropping the concrete more than five feet, it shall be deposited through sheet metal or other approved pipes to prevent segregation and unnecessary splashing. The pipes shall be made in sections to permit discharging and raising as the placement progresses. A non-jointed pipe may be used if sufficient openings of the proper size are provided to allow for the flow of the concrete into the shaft. As far as practicable, the pipes shall be kept full of concrete during placing, and their ends shall be kept buried in the newly placed concrete.

Except as herein provided, concrete shall be placed in horizontal layers not more than 12 inches thick. When, with the Engineer's approval, less than the complete length of a layer is placed in one operation, it shall be terminated in a vertical bulkhead. Each layer shall be placed and compacted before the preceding layer has taken its initial set and shall be compacted so as to avoid the formation of a construction joint with the preceding layer.

If the Department determines that there is an excessive number of projections, swells, ridges, depressions, waves, voids, holes, honeycombs, or other defects in the completed structure, removal of the entire structure may be required as set out in Subsection 105.12.

907-804.03.6.2--Consolidation. Immediately after depositing the concrete mixture, the concrete mixture shall be thoroughly consolidated by the use of approved mechanical vibrators and suitable spading tools. Only concrete mixture which has not achieved initial set shall be consolidated. Hand spading alone will be permitted on small structural members such as railing, small culvert headwalls, and as necessary to ensure smooth surfaces and dense concrete along form surfaces, in corners, and in locations impossible to reach with vibrators. When hand spading is used for consolidation, a sufficient number of workmen with spading tools shall be provided. For hand spading, flush a thin layer of mortar to all the surfaces and thoroughly and satisfactorily consolidate the concrete.

The Contractor shall conduct operations of depositing and consolidating the concrete mixture such that the operation produces concrete which is uniformly smooth and dense, having no honeycombing or pockets of segregated aggregate.

Movement of personnel through the consolidated concrete shall not be permitted. If it is determined it is necessary to step into previously consolidated concrete, the concrete in the stepped into area shall be consolidated again.

907-804.03.6.2.1--Requirements for Vibrators. Mechanical vibrators shall be subject to the following:

1. To verify compliance with these requirements, the Contractor shall provide the Engineer with a copy of the manufacturer’s specifications for each type and brand of vibrator used on the project.
2. The Contractor shall provide a sufficient number of personnel with vibrators to properly consolidate each batch immediately after the concrete is placed in the forms. The Contractor shall provide at least one stand-by vibrator and required power source.

3. Concrete having been consolidated shall not be walked in or through. If it is determined it is necessary to step into previously consolidated concrete, the concrete in the stepped into area shall be consolidated again.
4. Internal vibrators shall be of the spud or tube type, meeting the following characteristics and performance:
    a. The diameter of the head of the vibrator shall be 1¼ to 2½ inches.
    b. The frequency of vibration shall be 8000 to 12000 vibrations per minute (Hz) while operating in the concrete.
    c. The average amplitude shall be 0.025 to 0.05 inch while operating in air.
    d. The minimum radius of influence shall be seven (7) inches.
    e. The length of the vibrator head shall be nearly equal to the depth of the layer of concrete placed.
5. When the reinforcing steel is coated with epoxy, internal vibrators with heads of rubber or other resilient material shall be used. Rubber covers securely fastened over steel heads shall be acceptable.
6. For consolidation of concrete used in concrete bridge decks, the following additional requirements shall apply:
    a. Only internal vibration shall be used.
    b. Internal vibrators shall all be of the same type and size.
    c. The configuration of the internal vibrators shall meet the requirements of Subsection 907-804.03.6.2.3.

907-804.03.6.2.2--Operation of Internal Vibration. Mechanical vibrators used for internal vibration shall be operated as follows:

1. Vibrators shall not be dragged or moved laterally through the concrete to transport concrete. Vibrators shall not be used in such a manner that the concrete segregates or forms pockets of grout. Vibrators shall not be applied directly or through the reinforcement to sections or layers of concrete which have taken initial set.
2. Vibrators shall only be inserted into the concrete while operating and at the point of placement to consolidate the concrete for such a length of time that there is a general cessation in the escape of large entrapped air bubbles at the surface.
3. Vibrators shall be inserted slowly into the concrete and allowed to penetrate into the concrete under their own weight.
4. Vibrators shall be inserted into the concrete while they are in a vertical position with enough flexibility to work themselves around the reinforcing steel.
5. The head of the vibrator shall be completely submerged in the concrete for a time of consolidation between 3 and 15 seconds prior to removal, unless otherwise defined by the Engineer.
6. For consolidation of two or more layers of concrete, the vibrator shall be inserted into the bottom most layer at least six (6) inches. The vibrator shall be manipulated in a series of up-and-down motions to knit the layers together.
7. Vibrators shall be removed slowly from the concrete after the consolidation has been accomplished. However, once the head of the vibrator has become only partially immersed in the concrete, vibrators shall be removed rapidly.
8. The insertions of the vibrators shall be systematically spaced such that the entire surface of the concrete comes under the influence of the vibrator during consolidation. This

includes areas around the reinforcing steel, imbedded fixtures, the corners and angles of forms, and any irregular areas. The distance between insertions shall not exceed 1.5 times the radius of influence such that the area visibly affected by the vibrator overlaps the adjacent, just-vibrated area.

9. For additional information, refer to ACI 309-07, Chapter 7, Sections 7.1 through 7.3

907-804.03.6.2.3--Method of Consolidation. It is anticipated the Contractor will accomplish consolidation by internal vibration using one of the following two methods: vibrators mounted on a mechanical device or an orchestrated effort utilizing personnel. Regardless of the chosen method, the method shall be included in the QCP in accordance with Subsection 907-804.02.12.1.1.5 and shall only receive tentative approval until the method is demonstrated as effectively meeting the requirements of Subsection 907-804.03.6.2.

907-804.03.6.3--Discontinuance of Placing. When placing is temporarily discontinued, the concrete, after becoming firm enough to retain its form, shall be cleaned of laitance and other objectionable material to a sufficient depth to expose sound concrete. To avoid visible joints insofar as possible upon exposed faces, the top surface of the concrete adjacent to the forms shall be smoothed with a trowel. Where a "feather edge" might be produced at a construction joint, such as in the sloped top surface of a wing wall, an inset form work shall be used in the preceding layer to produce a blocked out portion that will provide an edge thickness of at least six inches (6”) in the succeeding layer. Work shall not be discontinued within 18 inches of the top of any face unless provision has been made for a coping less than 18 inches thick. In this case and if permitted by the Engineer, the construction joint may be made at the underside of the coping.

Immediately following the discontinuance of placing concrete, all accumulations of mortar splashed on the reinforcement and the surface of forms shall be removed. Dried mortar chips and dust shall not be puddled into the unset concrete. If the accumulations are not removed prior to the concrete becoming set, care shall be exercised not to break or injure the concrete-steel bond at and near the surface of the concrete while cleaning the reinforcement. After initial set the forms shall not be jarred, and no strain shall be placed on the ends of projecting reinforcement until the concrete has sufficiently set to ensure against any damage by such jarring or strain.

907-804.03.6.4--Placing Bridge Concrete. The method and sequence of placing concrete shall conform to the provisions and requirements set forth for the particular type of construction.

907-804.03.6.4.1--Foundations and Substructures. Concrete seals shall be placed in accordance with Subsection 907-804.03.9. All other concrete for foundations shall be poured in the dry unless otherwise stipulated or authorization is given in writing by the Engineer to do otherwise. Concrete shall not be placed in foundations until the foundation area has been inspected and approved.

Unless otherwise specified, the placement of concrete in the substructure shall be in accordance with the general requirements of Subsection 907-804.03.6.

Unless otherwise directed, concrete in columns shall be placed in one continuous operation, and shall be allowed to set at least 12 hours before the caps are placed.

907-804.03.6.4.2--Superstructure. For simple spans, concrete shall preferably be deposited by beginning at the center of the span and working toward the ends. For continuous spans, concrete shall be deposited as shown on the plans. Concrete in girders shall be uniformly deposited for the full length of the girder and brought up evenly in horizontal layers. Concrete in areas below the bridge deck but being deposited at the same time as concrete for the bridge deck, like a diaphragm, shall be placed and consolidated sufficiently ahead of placing the concrete for the bridge deck such that the placing, consolidating, finishing, and curing of concrete for the bridge deck shall not be impeded or slowed.

Unless otherwise permitted by the Engineer, concrete shall not be placed in the superstructure until the column forms have been stripped sufficiently to determine the character of the concrete in the columns. Unless otherwise permitted by the Engineer, the load of the superstructure shall not be placed on pile bents until the caps have been in place at least seven (7) days and shall not be placed on other types of bents until the bents have been in place at least 14 days.

In placing concrete around steel shapes, it shall be placed on one side of the shape until it flushes up over the bottom flange of the shape on the opposite side, after which it shall be placed on both sides to completion.

Concrete in girder haunches less than three feet (3') in height shall be placed at the same time as that in the girder stem. Whenever a haunch or fillet has a height of three feet (3') or more at the abutment or columns, the haunch and the girder shall be poured in three successive stages: first, up to the lower side of the haunch; second, to the lower side of the girder; and third, to completion.

Except when intermediate construction joints are specified, concrete in slab, T-beam, or deck-girder spans shall be placed in one continuous operation for each span.

The floors and girders of through-girder superstructures shall be placed in one continuous operation unless otherwise specified, in which case special shear anchorage shall be provided to ensure monolithic action between girder and floor.

Concrete in box girders shall be placed as shown on the plans.

Concrete shall not be chuted directly into the forms of the span and shall be placed continuously with sufficient speed to be monolithic and to allow for finishing before initial set.

907-804.03.6.4.3--Bridge Deck. When using the Transverse Method in accordance with Subsection 907-804.03.19.7.3, the period of time between concrete placement and completion of the final curing shall be kept to a minimum, as directed by the Engineer.

907-804.03.7--Pneumatic Placing. Pneumatic placing of concrete will be permitted only if specified in the contract or if authorized by the Engineer. The equipment shall be so arranged that no vibrations result which might damage freshly placed concrete.

Where concrete is conveyed and placed by pneumatic means the equipment shall be suitable in kind and adequate in capacity for the work. The machine shall be located as close as practicable to the place of deposit. The position of the discharge end of the line shall not be more than 10 feet from the point of deposit. The discharge lines shall be horizontal or inclined upwards from the machine. At the conclusion of placement the entire equipment shall be thoroughly cleaned.

907-804.03.8--Pumping Concrete. Placement of concrete by pumping will be permitted only if specified in the contract or if authorized in writing by the Engineer. If used, the equipment shall be arranged so that no vibrations result which might damage freshly placed concrete.

Where concrete mixture is conveyed and placed by mechanically applied pressure (pumping), the equipment shall be suitable in kind and adequate in capacity for the work. The Contractor shall select concrete mixture proportions such that the concrete mixture is pumpable and placeable with the selected equipment.

The pumping equipment shall be thoroughly cleaned prior to concrete placement. Excess form release agent shall be removed from the concrete pump hopper. The Contractor shall prime the pump at no additional cost to the Department by pumping and discarding enough concrete mixture to produce a uniform mixture exiting the pump. At least 0.25 cubic yard of concrete mixture shall be pumped and discarded to prime the pump. Only concrete mixture shall be added directly into the concrete pump hopper after placement has commenced. If anything other than concrete mixture is added to the concrete pump hopper, all concrete mixture in the concrete pump hopper and pump line shall be discarded and the pump re-primed at no additional cost to the Department.

The discharge end of the pump shall be of such a configuration that the concrete does not move in the pump line under its own weight. The intent of this requirement is to ensure that entrained air in the concrete mixture remains entrained during pumping and depositing the concrete mixture. This shall be accomplished with one or both of the following:

- a minimum 10-foot flexible hose attached to the discharge end of a steel reducer having a minimum length of three (3) feet and a minimum reduction in area of 20% which is attached to the discharge end of the pump line, or
- a flexible reducing hose to the discharge end of the pumpline with a minimum reduction in area of 20% over a minimum 10-foot hose length.

Regardless of the configuration chosen, the Contractor shall ensure that the concrete is pumped and does not free-fall more than five (5) feet within the entire length of pump line and after discharge from the end of pump line.

The Contractor shall not have any type of metal elbow, metal pipe, or other metal fitting within five (5) feet of any person during discharge of concrete mixture.

Boom pumps shall have a current Concrete Pump Manufacturers Association's ASME/ANSI B30.27 certification. Equipment added to the boom and pump line shall meet the pump

manufacturer's specifications and shall not exceed the manufacturer's maximum recommended weight limit for equipment added to the boom and pump line.

The operation of the pump shall be such that a continuous stream of concrete without air pockets is produced. When pumping is completed, the concrete remaining in the pipe line, if it is to be used, shall be ejected in such a manner that there will be no contamination of the concrete or separation of the ingredients. After this operation, the entire equipment shall be thoroughly cleaned.

The use of aluminum pipe as a conveyance for the concrete will not be permitted.

907-804.03.9--Depositing Concrete Under Water. Concrete shall not be deposited in water except with the approval of the Engineer.

Concrete deposited under water shall be Class S.

Concrete deposited under water shall be carefully placed in a compact mass in its final position by means of a tremie, a bottom dump bucket, or other approved method and shall not be disturbed after being deposited. Special care shall be exercised to maintain still water at the point of deposit. No concrete shall be placed in running water and all form work designed to retain concrete under water shall be water-tight. The consistency of the concrete shall be carefully regulated, and special care shall be exercised to prevent segregation of materials.

Concrete seals shall be placed continuously from start to finish, and the surface of the concrete shall be kept as nearly horizontal as practicable at all times. To ensure thorough bonding, each succeeding layer of a seal shall be placed before the preceding layer has taken initial set.

When a tremie is used, it shall consist of a tube having a diameter of at least 10 inches and constructed in sections having flanged couplings fitted with gaskets. The means of supporting the tremie shall be such as to permit the free movement of the discharge over the entire top surface of the work and to permit it to be lowered rapidly when necessary to choke off or retard the flow of concrete. The discharge end shall be closed at the start of the work so as to prevent water entering the tube and shall be entirely sealed. The tremie tube shall be kept full to the bottom of the hopper. When a batch is dumped into the hopper, the flow of concrete shall be induced by slightly raising the discharge end, always keeping it in the deposited concrete. The flow is then stopped by lowering the tremie. The flow shall be continuous until the work is completed.

Depositing of concrete by the drop bottom bucket method shall conform to the following: The top of the bucket shall be open. The bottom doors shall open freely downward and outward when tripped. The bucket shall be completely filled and slowly lowered to avoid backwash. It shall not be dumped until it rests on the surface upon which the concrete is to be deposited and when discharged shall be withdrawn slowly until well above the concrete.

Dewatering may proceed when the concrete seal is sufficiently hard and strong. As a general rule, this time will be 48 hours for concrete made with high-early-strength cement and three days for concrete made with other types of cement. All laitance and other unsatisfactory material

shall be removed from the exposed surface by scraping, chipping, or other means which will not injure the surface of the concrete.

907-804.03.10--Construction Joints.

907-804.03.10.1--General. Unless otherwise approved by the Engineer, construction joints shall be made only where located on the plans or shown in the pouring schedule. If not detailed on the plans, or in the case of emergency, construction joints shall be placed as directed by the Engineer. Shear keys or inclined reinforcement shall be used where necessary to transmit shear or to bond the two sections together.

For continuous spans, bridge deck concrete shall be deposited as shown on the plans. Deviation from the pouring schedule shown in the plans is not permitted.

907-804.03.10.2--Bonding. Before depositing new concrete on or against concrete which has hardened, the forms shall be retightened. The surface of the hardened concrete shall be roughened as required by the Engineer and in a manner that will not leave loosened particles of aggregate or damaged concrete at the surface. It shall be thoroughly cleaned of foreign matter and laitance and saturated with water. When directed by the Engineer, the cleaned and saturated surfaces, including vertical and inclined surfaces, shall first be thoroughly covered with a coating of mortar or neat cement grout against which the new concrete shall be placed before the grout has attained its initial set.

The placing of concrete shall be carried continuously from joint to joint. The face edges of all joints which are exposed to view shall be carefully finished, true to line and elevation.

In order to bond successive courses suitable depressed or raised keys of the designated size shall be constructed. Raised keys shall be monolithic with the concrete of the lower course.

907-804.03.11--Concrete Exposed to Seawater. Unless otherwise specifically provided, concrete for structures exposed to seawater shall be Class AA concrete as referenced in Subsection 907-804.02.10. The clear distance from the face of the concrete to the nearest face of reinforcing steel shall be at least four inches. The mixing time and the water content shall be carefully controlled and regulated so as to produce concrete of maximum impermeability. The concrete shall be thoroughly compacted, and stone pockets shall be avoided. No construction joints shall be formed between the levels of extreme low water and extreme high water as determined by the Engineer. Between these levels, seawater shall not come in direct contact with the new concrete until at least 30 days have elapsed. The surface concrete as left by the forms shall be left undisturbed.

907-804.03.12--Blank.

907-804.03.13--Falsework. The Contractor shall submit to the Engineer four copies of structural design analysis and detail drawings, which show the method of falsework or centering. These designs and detail plans shall be prepared and bear the seal of a Registered Professional Engineer with experience in falsework design.

Falsework plans shall include falsework elevations together with all other dimensions and details which is considered necessary for the construction. Other pertinent data needed is size and spacing of all falsework members and minimum bearing requirements for false piles.

Upon completion of falsework erection, the Registered Professional Engineer shall certify that the erected falsework is capable of supporting the load for construction.

Falsework piling shall be spaced and driven so that the bearing value of each pile is sufficient to support the load that will be imposed upon it. The bearing value of the piles should be calculated according to the appropriate formula given in Section 803.

For designing falsework and centering, a weight of 150 pounds per cubic foot shall be assumed for green concrete. All falsework shall be designed and constructed to provide the necessary rigidity and to support the loads without appreciable settlement or deformation. The Contractor may be required to employ screw jacks or hardwood wedges to take up slight settlement in the falsework either before or during the placing of concrete. An allowance shall be made for anticipated compressibility of falsework and for the placement of shims, wedges, or jacks to produce the permanent structural camber shown on the plans. If during construction, any weakness develops and the falsework shows any undue settlement or distortion, the work shall be stopped, the part of the structure affected removed, and the falsework strengthened before work is resumed. Falsework which cannot be founded on a satisfactory footing shall be supported on piling, which shall be spaced, driven, and removed, as referenced in Subsection 907-804.03.15, in a manner approved by the Engineer.

All structures built across a public street or highway on which maintenance of traffic is required, shall have falsework so arranged that a vertical clearance of at least 12' 6" is provided. Unless otherwise specified, a horizontal clearance of at least the width of the traveled way shall be provided at all times. If the vertical clearance is less than 13' 6" or the horizontal clearance is less than the full crown width of the roadway, the Contractor shall install and maintain appropriate safety devices, clearance signs and warning lights, and shall notify the Engineer sufficiently in advance of restricting the clearance for the Engineer to advise both the Traffic Engineering and the Maintenance Divisions. All traffic control and safety devices shall be in accordance with the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).

907-804.03.14--Forms.

907-804.03.14.1--General. Forms shall be wood, metal, or other material approved by the Engineer. All forms shall be built mortar-tight and sufficiently rigid to prevent distortion due to pressure of the concrete and other loads incident to the construction operations. Forms shall be constructed and maintained so as to prevent warping and the opening of joints due to shrinkage. The forms shall be substantial and unyielding and shall be so designed that the finished concrete will conform to the proper dimensions and contours. The design of the forms shall take into account the effect of vibration of concrete as it is placed.

Minimum requirements for slab overhang forms shall be 3/4-inch plywood supported on 2-inch x 6-inch S4S wood timbers placed flatwise on 16-inch centers.

Adjustable brackets for support of slab overhang forms shall be spaced at a maximum distance of 3' 0" center to center unless specifically approved otherwise. Grade points for forms shall coincide with the location of the adjustable form brackets.

Forms for surfaces exposed to view shall be of uniform thickness with a smooth inside surface of an approved type. Joints in forms for exposed surfaces shall be closely fitted to eliminate fins, stone pockets, or other variations in the surface of the concrete which would mar a smooth and uniform texture.

Forms shall be filleted at all sharp corners and shall be given a bevel or draft in the case of all projections, such as girders and copings, to ensure easy removal.

Metal ties or anchorages within the forms shall be so constructed as to permit their removal, without injury to the concrete, to a depth of at least the reinforcing steel clearance shown on the plans. In case ordinary wire ties are permitted, all wires, upon removal of the forms, shall be cut back at least 1/4 inch from the face of the concrete with chisels or nippers. Nippers shall be used for green concrete. All fittings for metal ties shall be designed so that upon their removal the cavities which are left will be the smallest practicable size. The cavities shall be filled with cement mortar and the surface left sound, smooth, even, and uniform in color.

Forms shall be set and maintained to the lines designated until the concrete is sufficiently cured for form removal. Forms shall remain in place for periods which shall be determined as hereinafter specified. If forms are deemed to be unsatisfactory in any way, either before or during the placing of concrete, the Engineer will order the work stopped until the defects have been corrected.

The shape, strength, rigidity, water-tightness, and surface smoothness of reused forms shall be maintained at all times. Warped or bulged lumber shall be resized before being reused. Forms which are unsatisfactory in any respect shall not be reused.

Access to the lower portions of forms for narrow walls and columns shall be provided for cleaning out extraneous material immediately before placing the concrete.

All forms shall be treated with an approved oil or saturated with water immediately before placing the concrete. For rail members or other members with exposed faces, the forms shall be treated only with an approved oil to prevent the adherence of concrete. Any material which will adhere to or discolor the concrete shall not be used.

When metal forms are used they shall be kept free from rust, grease, or other foreign matter which will discolor the concrete. They shall be of sufficient thickness and so connected that they will remain true to shape and line, and shall conform in all respects as herein prescribed for mortar tightness, filleted corners, beveled projections, etc. They shall be constructed so as to ensure easy removal without injury to concrete. All inside bolt and rivet heads shall be countersunk.

All chamfer strips shall be dressed, straight, and of uniform width and shall be maintained as such at all times.

907-804.03.14.2--Stay-In-Place Metal Forms. Stay-in-place (SIP) metal forms are corrugated metal sheets permanently installed between the supporting superstructure members. After the concrete has cured, these forms shall remain in place as permanent, non-structural members of the bridge.

Pay quantities for deck concrete will be computed from the dimensions shown in the Contract Plans with no allowance for changes in deflection and /or changes in dimensions necessary to accommodate the SIP metal forms.

There will be no direct payment for the cost of the forms and form supports, or any material, tools, equipment, or labor incidental thereto, but the cost shall be considered absorbed in the contract unit price for concrete.

Before fabricating any material, three (3) complete sets of SIP metal form shop drawings and design calculations, bearing the Design Engineer's Seal, shall be submitted to the Director of Structures, State Bridge Engineer, through the Engineer, for review. The Contractor's SIP metal form Design Engineer shall be a MS Registered Professional Engineer who is knowledgeable in the field of structural design.

In no case shall additional dead load produced by the use of SIP metal forms overstress any bridge component. Design calculations shall indicate any additional dead load from SIP metal form self-weight, form support hangers, concrete in flutes, concrete due to form deflection, etc. not included in the Contract Plans. The additional dead loads shall be clearly labeled and tabulated on the shop drawings. Bridge Division will evaluate the additional load for overstress of the bridge components. In the event that the additional dead load produces an overstress in any bridge component, Bridge Division will reject the Contractor's design. Deflection and loads produced by deflection of the SIP metal forms shall be considered and indicated in the design calculations.

The cambers and deflections provided in the Contract Plans do not consider the effects of SIP metal forms. The Contractor's Engineer shall take into account the weight of the forms and any additional dead load when developing the "Bridge Superstructure Construction Plan".

For the purpose of reducing any additional dead load produced by the SIP metal forms, the flutes of SIP metal forms may be filled with polystyrene foam. When polystyrene foam is used to fill the forms, the form flutes shall be filled completely; no portion of the polystyrene foam shall extend beyond the limits of the flutes. The Contractor shall ensure that the polystyrene foam remains in its required position within flutes during the entire concrete placement process. The Contractor shall not use reinforcing steel supports or other accessories in such a manner as to cause damage to the polystyrene foam. All damaged polystyrene foam shall be replaced to the satisfaction of the Engineer. All welding of formwork shall be completed prior to placement of polystyrene foam.

For bridges not located in horizontal curves, the Contractor may reduce the additional dead load by matching the flute spacing with the transverse steel spacing of the bottom layer. The bottom longitudinal layer of steel shall have one (1) inch of minimum concrete cover measured from the

bottom of the reinforcing to the top of the flute. The Contractor will not be allowed to vary the reinforcing steel spacing or size from the Contract Plans for the purpose of matching flute spacing.

907-804.03.14.2.1--Materials. SIP metal forms and supports shall meet the requirements of ASTM Designation: A653 having a coating designation G165. Form materials that are less than 0.03-inch uncoated thickness shall not be allowed.

907-804.03.14.2.2--Certification. The Contractor shall provide written certification from the manufacturer stating the product meets the requirements of this specification to the Engineer along with the delivery of the coated forms to the job site.

907-804.03.14.2.3--Polystyrene Foam. The polystyrene foam shall be comprised of expanded polystyrene manufactured from virgin resin of sufficient density to support the weight of concrete without deformation. The polystyrene foam shall be extruded to match the geometry of the flutes and provide a snug fit. The polystyrene foam shall have a density of not less than 0.8 pounds per cubic foot. The polystyrene foam shall have water absorption of less than 2.6% when tested according to ASTM Designation: C272. The Contractor shall provide written certification from the manufacturer stating the polystyrene foam product meets the requirements of this specification to the Engineer along with the delivery of the coated forms to the job site.

907-804.03.14.2.4--Design. The design of the SIP metal forms shall meet the following criteria.

1. The maximum self-weight of the stay in place metal forms, plus the weight of the concrete or expanded polystyrene required to fill the form flutes (where used), shall not exceed 20 psf.

2. The forms shall be designed on the basis of dead load of form, reinforcement, and plastic concrete plus 50 pounds per square foot for construction loads. The design shall use a unit working stress in the steel sheet of not more than 0.725 of the specified minimum yield strength of the material furnished, but not to exceed 36,000 psi.

3. Deflection under the weight of the forms, reinforcement, and plastic concrete shall not exceed 1/180 of the form span or 1/2 inch, whichever is less, for form spans of 10 feet or less, or 1/240 of the form span or 3/4 inch, whichever is less, for form spans greater than 10 feet.

4. The design span of the form shall equal the clear span of the form plus two (2) inches. The span shall be measure parallel to the form flutes.

5. Physical design properties shall be computed in accordance with requirements of the AISI Specifications for the Design of Cold Formed Steel Structural Members, latest published edition.

6. The design concrete cover required by the plans shall be maintained for all reinforcement.

7. The plan dimensions of both layers of primary deck reinforcement from the top surface of the concrete deck shall be maintained.

8. The SIP metal form shall not be considered as lateral bracing for compression flanges of supporting structural members.

9. SIP metal forms shall not be used under closure pours or in bays where longitudinal slab construction joints are located. SIP metal forms shall not be used under cantilevered slabs such as the overhang outside of fascia members.

10. Forms shall be secured to the supporting members by means other than welding directly to the member. Welding to the top flanges of steel stringers and/or girders shall not be allowed. Alternate installation procedures shall be submitted addressing this condition.

907-804.03.14.2.5--Construction. SIP metal form sheets shall not rest directly on the top of the stringer of floor beam flanges. Sheets shall be fastened securely to form supports, and maintain a minimum bearing length of one (1) inch at each end for metal forms. Form supports shall be placed in direct contact with the flange of the stringer or floor beam. All attachments for coated metal forms shall be made by bolts, clips, screws, or other approved means.

907-804.03.14.2.6--Form Galvanizing Repairs. Where forms or their installation are unsatisfactory in the opinion of the Engineer, either before or during placement of the concrete, the Contractor shall correct the defects before proceeding with the construction work. The cost of such corrective work shall be at the sole expense of the Contractor. Minor heat discoloration in areas of welds shall not be touched up.

907-804.03.14.2.7--Concrete. The Contractor shall ensure concrete placement does not damage the SIP metal forms. Approved pouring sequences shall be used. The completed SIP metal form system shall be sufficiently tight to prevent leakage of mortar or concrete. The concrete shall be consolidated to avoid honeycomb and voids, especially at construction joints, expansion joints, valleys, and ends of form sheets. Calcium chloride or any other admixture containing chloride salts shall not be used in the concrete.

907-804.03.14.2.8--Inspection. The Engineer will observe the Contractor's method of construction during all phases of the construction of the bridge deck slab, including the installation of the SIP metal form system; location and fastening of the reinforcement; composition of concrete items; mixing procedures, concrete placement, and vibration; and finishing of the bridge deck. Should the Engineer determine that the procedures used during the placement of the concrete warrant inspection of the underside of the deck, at least one section of the metal forms shall be removed in each span for this purpose. This shall be done as soon after placing the concrete as practical in order to provide visual evidence that the concrete mix and the procedures are obtaining the desired results. An additional section shall be removed in any span if the Engineer determines that there has been any change in the concrete mix or in the procedures warranting additional inspection.

If, in the Engineer's judgment, inspection is needed to check for defects in the bottom of the deck or to verify soundness, the SIP metal forms shall be sounded with a hammer after the deck

concrete has been in place a minimum of two days. If sounding discloses areas of doubtful soundness to the Engineer, the SIP metal forms shall be removed from such areas for visual inspection after the concrete has attained adequate strength. The SIP metal bridge deck forms shall be removed at no expense to the State.

At locations where sections of the metal forms have been removed, the Engineer will not require the Contractor to replace the metal forms. The adjacent metal forms and supports shall be repaired to present a neat appearance and to ensure their satisfactory retention. As soon as the form is removed, the Engineer will examine the concrete surfaces for cavities, honeycombing, and other defects. If irregularities are found and the Engineer determines that these irregularities do not justify rejection of the work, the concrete shall be repaired as directed by the Engineer. If the Engineer determines that the concrete where the form is removed is unsatisfactory, additional metal forms as necessary shall be removed to inspect and repair the slab, and the Contractor's method of construction shall be modified as required to obtain satisfactory concrete in the slab. All unsatisfactory concrete shall be removed and replaced as directed at no expense to the State.

If the method of construction and the results of the inspections as outlined above indicate that sound concrete has been obtained throughout the slabs, the amount of sounding and form removal may be reduced when approved by the Engineer.

The Contractor shall provide a safe and convenient means of conducting of the inspection.

907-804.03.15--Removal of Falsework, Forms, and Housing. In the determination of the time for the removal of falsework, forms, and housing and the discontinuance of heating, consideration shall be given to the location and character of the structure, the weather and other conditions influencing the setting of the concrete, and the materials used in the mix. No forms or supports shall be removed prior to approval by the Engineer. During cold weather, removal of housing and the discontinuance of heating shall be in accordance with Subsection 907-804.03.16.1.

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. It is important that falsework be removed as evenly as possible to prevent excessive deflection stresses in the spans.

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. The facilities shall include an approved concrete testing machine of sufficient capacity and calibrated by an acceptable commercial laboratory. Tests shall be conducted in the presence of a Department representative to witness and record strengths obtained on each break or performed by a Department certified technician in an approved testing laboratory.

The cylinders shall be cured under conditions which are not more favorable than those existing for the portions of the structure which they represent.

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

For bridges, non-SIP metal forms for bridge deck slabs overhead and bridge deck slabs between beams shall be removed with the approval of the Engineer, between two weeks and four weeks after the removal of the wet burlap applied in accordance with Subsection 907-804.03.17.1, or application of liquid membrane applied in accordance with Subsection 907-804.03.17.2.

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

Methods of form removal likely to cause overstressing of the concrete shall not be used. Forms and supports shall be removed in a manner that will permit the concrete to uniformly and gradually take the stresses due to its own weight. Centers shall be gradually and uniformly lowered in a manner that will avoid injurious stresses in any part of the structure.

As soon as concrete for railings, ornamental work, parapets and vertical faces which require a rubbed finish has attained a safe strength, the forms shall be carefully removed without marring the surfaces and corners, the required finishing performed, and the required curing continued.

Prior to final inspection of the work, the Contractor shall remove all falsework, forms, excavated material or other material placed in the stream channel during construction. Falsework piles may be cut or broken off at least one foot below the mudline or ground line unless the plans specifically indicate that they are to be pulled and completely removed from the channel.

907-804.03.16--Cold or Hot Weather Concreting.

907-804.03.16.1--Cold Weather Concreting. In cold weather, the temperature of the concrete when delivered to the job site shall conform to the temperature limitations of "Temperature Limitations on Concrete when Delivered to Job Site" listed in Table 8 below. Cold weather is defined as three consecutive days when there is a probability that the daily average of the highest and lowest ambient temperatures is expected to be less than 40°F. This three-day forecast shall be based on the latest information available from the National Weather Service.

When the Contractor proposes to place concrete during seasons when there is a probability of ambient temperatures lower than 40°F, the Contractor shall have available on the project the approved facilities necessary to enclose uncured concrete and to keep the temperature of the air inside the enclosure within the ranges and for the minimum periods specified herein.

When there are indications of temperatures of less than 40°F during the first four days after placement of the concrete, the concrete shall be protected from cold temperatures by maintaining a temperature between 50°F and 100°F for at least four days after placement and between 40°F and 100°F for at least three additional days. The Contractor shall use such heating equipment

such as stoves, salamanders, or steam equipment as deemed necessary to protect the concrete. When dry heat is used, means of maintaining atmospheric moisture shall be provided.

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.

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

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

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

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

The Contractor shall assume all risk and added cost connected with the placing and protecting of concrete during cold weather. Permission given by the Engineer to place concrete during such time will in no way relieve the Contractor of responsibility for satisfactory results. Should it be determined at any time that the concrete placed under such conditions is unsatisfactory, it shall be removed and replaced with satisfactory concrete by the Contractor without extra compensation.

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

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

907-804.03.16.2--Hot Weather Concreting. The manufacture, placement, and protection of concrete during hot weather requires special attention to ensure that uniform slump ranges and satisfactory placement qualities are maintained, that surface cracking is held to a minimum, and that design strengths are produced.

907-804.03.17--Curing Concrete. Curing is defined as all actions taken to ensure the moisture and temperature conditions of freshly placed concrete exist so the concrete may develop its potential properties. Curing shall take place from the time of placement until its potential properties have developed. The Contractor shall use the guidance in ACI 308R-01 to:

a) cure the concrete in such a manner as to prevent premature moisture loss from the concrete,
b) supply additional moisture to the concrete as required in order to ensure sufficient moisture within the concrete, and
c) maintain a concrete temperature beneficial to the concrete.

Curing in accordance with the requirements in either Subsection 907-804.03.17.1 or Subsection 907-804.03.17.2 shall be completely established within 20 minutes after finishing, except as noted for bridge decks. Finishing is complete when the pan drag, burlap drag, or other finishing method is complete.

When stay-in-place (SIP) metal forms are used in accordance with Subsection 907-804.03.14.2 in conjunction with the Transverse Method in accordance with Subsection 804.03.19.7.3, if the concrete mixture contains lightweight aggregate (LWA) meeting the requirements of Subsection 907-703.19.2 and an internal curing water content of 8.0 pounds or greater per 100 pounds of total cementitious materials, curing shall be accomplished in accordance with either Subsection 907-804.03.17.1 or Subsection 907-804.03.17.2. The minimum amount of LWA shall be established following the information in the Department's *Concrete Field Manual*, Paragraph 5.5.5. If the concrete mixture does not meet or exceed this internal curing water content, curing shall be accomplished in accordance with Subsection 907-804.03.17.1.

When SIP metal forms are not used or used in conjunction with the Longitudinal Method in accordance with Subsection 804.03.19.7.2, curing shall be accomplished in accordance with either Subsection 907-804.03.17.1 or Subsection 907-804.03.17.2.

The length of time for curing shall be maintained in accordance with either of the following:

1. **Prescribed Length of Time:**
   a) Curing following the requirements of Subsection 907-804.03.17.1 shall continue uninterrupted for at least 14 days.
   b) Curing following the requirements of Subsection 907-804.03.17.2 shall continue uninterrupted for at least 10 days.

OR

2. **Length of Time Defined by Development of Compressive Strength:**
   Curing following the application requirements of Subsection 907-804.03.17.1 or Subsection 907-804.03.17.2 shall continue uninterrupted for each day's production until the compressive strength of the concrete exceeds 75% of the 28-day compressive strength submitted as the Basis of Proportioning per Subsection 907-804.02.10.1. Therefore, if an area is being cured in accordance with Subsection 907-804.03.17.1, the curing by wet burlap shall continue until the concrete in that area has attained a minimum of 75% of the 28-day compressive strength submitted as the Basis of Proportioning per Subsection 907-804.02.10.1. Likewise, if an area is being cured in accordance with Subsection 907-804.03.17.2, the curing by liquid membrane shall continue until the concrete in that area has attained a minimum of 75% of the 28-day compressive strength submitted as the Basis of Proportioning per Subsection 907-804.02.10.1.

   The compressive strength of the concrete may be determined by the use of maturity meter in accordance with Subsection 907-804.03.15.

907-804.03.17.1--Water With Waterproof Cover. All burlap shall be completely saturated and wet prior to placing it on the concrete. The burlap shall have been fully soaked in water for a minimum of 12 hours prior to placement on the concrete.

For bridge decks, the Contractor shall apply one (1) layer of saturated burlap within 20 minutes of the initial strike-off for bridges without a skew and 25 minutes of the initial strike-off for bridges with a skew. For all other concrete, the Contractor shall apply one (1) layer of saturated burlap within 20 minutes of completing finishing.

For bridge decks, following the first layer of burlap, the Contractor shall apply a second layer of saturated burlap within five (5) minutes of applying the first layer.

The applied burlap shall completely cover all exposed concrete surfaces. In areas where the burlap may not be directly applied due to the concrete surface, for example, in areas where reinforcing steel protrudes thru the concrete surface, like in the areas of a bridge deck where the bridge railing will be constructed at a later time, the saturated burlap shall be draped over the steel. The concrete surface shall not be allowed to dry after strike-off or at any time during the curing period.

The Contractor shall maintain the burlap in a fully wet condition using powered fogging equipment capable of producing a fog spray of atomized droplets of water until the concrete has gained sufficient strength to allow foot traffic without the foot traffic marring the surface of the concrete.

Burlap shall not be maintained in the fully wet condition using equipment which does not produce a fog spray of atomized droplets of water or by use of manually pressurized sprayers.

For bridge decks, once the concrete has gained sufficient strength to allow foot traffic which does not mar the surface of the concrete, soaker hoses shall be placed on the burlap. The soaker hoses shall then be supplied with running water continuously to maintain continuous saturation of all burlap and the entire concrete surface.

If there is a delay in the placement of the first layer of saturated burlap outside the time limit, the struck-off and finished concrete shall be kept wet by use of the powered fogging equipment used to keep the burlap wet.

White polyethylene sheets shall be placed on top of the wet burlap and, as applicable, soaker hoses, covering the entire concrete surface as soon as practical and not more than 12 hours after the placement of the concrete. White polyethylene sheets of the widest practical width shall be used, overlapping adjacent sheets a minimum of six inches (6") and tightly sealed with an adhesive like pressure sensitive tape, mastic, glue, or other approved methods to form a complete waterproof cover of the entire concrete surface. White polyethylene sheets which overlap a minimum of two feet (2') may be held in place using means other than an adhesive. The white polyethylene sheets shall be secured so that wind will not displace them. The Contractor shall immediately repair the broken or damaged portions or replace sections that have lost their waterproof qualities.

If burlap and/or white polyethylene sheets are temporarily removed for any reason during the curing period, the Contractor shall keep the entire exposed area continuously wet. The saturated burlap and white polyethylene sheets shall be replaced, resuming the specified curing conditions, as soon as possible.

The Contractor shall inspect the bridge deck surface once every eight (8) hours for the entirety of the curing period, so that all areas remain wet for the entire curing period and all curing requirements are satisfied and document the inspection in accordance with Subsection 907-804.03.17.1.1.

At the end of the curing period, one coating of liquid membrane shall be applied following the requirements of Subsection 907-804.03.17.1.2. The purpose of the coating of liquid membrane is to allow for slow drying of the concrete. The application of liquid membrane to any area shall be complete within 30 minutes of the beginning of removal of the white polyethylene sheets, soaker hoses, and burlap from this area.

907-804.03.17.1.1--Documentation for Bridge Decks. The Contractor shall provide the Engineer with a daily inspection report that includes:

- documentation that identifies any deficiencies found (including location of deficiency);
- documentation of corrective measures taken;
- a statement of certification that all areas are wet and all curing material is in place on the entire bridge deck;
- documentation showing the time and date of all inspections and the inspector's signature;

- documentation of any temporary removal of curing materials including location, date and time, length of time curing was removed, and means taken to ensure exposed area was kept continuously wet.

907-804.03.17.1.2--Liquid Membrane. At the end of the 14-day wet curing period the wet burlap and polyethylene sheets shall be removed and within 30 minutes, the Contractor shall apply white liquid membrane to the deck. The liquid membrane shall be thoroughly mixed within the time recommended by the liquid membrane producer but no more than an hour before use. If the use of liquid membrane results in a streaked or blotched appearance, the method shall be stopped and water curing applied until the cause of defective appearance is corrected.

The liquid membrane shall be applied when no free water remains on the surface but while the surface is still wet. The liquid membrane shall be applied according to the manufacturer's instructions with a minimum spreading rate per coat of one (1) gallon per 200 square feet of concrete surface. If the concrete is dry or becomes dry, the Contractor shall thoroughly wet it with water applied as a fog spray by means of approved equipment.

The application of liquid membrane shall be accomplished by the use of power applied spray equipment using nozzles and other equipment recommended by the liquid membrane producer. Manually pressurized or manual pump-up type sprayers shall not be used to apply the first application of liquid membrane.

As a visual guide, the color of concrete covered with the required amount of liquid membrane should be indistinguishable from a sheet of commercially available standard "letter" size white copier paper placed on top of it when viewed from a distance of about five feet (5') away horizontally if standing on the same grade as the concrete. The appearance of the concrete does not supersede applying the minimum spreading rate.

The coating shall be protected against marring for at least seven (7) days after the application of the curing compound. The coating on bridge decks shall receive extra attention and may require additional protection as required by the Engineer. All membrane marred or otherwise disturbed shall be given an additional coating. Manually pressurized or manual pump-up type sprayers may be used for giving marred areas the required additional application of liquid membrane. Should the surface coating be subjected repeatedly to injury, the Engineer may require that the water curing method be applied at once.

The 7-day period during which the liquid membrane is applied and protected shall not be reduced even if the period of wet curing is extended past the required 14 days.

907-804.03.17.1.2.1--Liquid Membrane Documentation. The Contractor shall make available to the Engineer an application rate verification method and any information necessary during application of the liquid membrane to verify that the rate of application meets the prescribed rate for the various surfaces of the concrete, including, but not limited to, the top surface of the bridge deck and exposed sides of the bridge deck after any forms are removed. The Contractor shall submit this application verification method to the Engineer in accordance with Subsection 907-804.02.12.1.1.

One method of verifying the rate of application is as follows:

1. Determine the volume of liquid membrane in the container. For a container with a uniform cross-sectional area, for example a 55-gallon drum, determine the area of the cross-section. Determine the height of the surface of the liquid membrane from the bottom of the container. This may be accomplished by inserting a sufficiently long, clean dip-stick parallel with the axis of the container into the liquid membrane until the inserted end of the dip-stick contacts the bottom of the container. On removing the dip-stick, measure the length from the end which was inserted to the point on the dip-stick where the liquid membrane ceases to coat the dip-stick. Multiply the area of the cross-section by the height of the level of liquid membrane, maintaining consistent units, to determine the volume.
2. Perform step 1 prior to beginning applying the liquid membrane to establish the initial volume.
3. During the period of application, perform step 1 each 100 square feet of bridge deck.
4. In order to meet the required application rate of one (1) gallon per 200 square feet, the amount in the container shall be at least 0.5 gallon less than the previous volume in the previous 100 square feet. Other changes in volume may apply depending on the manufacturer's recommended application rate.
5. Additional applications to an area shall be applied until the required rate is satisfied. Areas which are not visually satisfactory to the Engineer shall have additional liquid membrane applied as directed by the Engineer.

The amount of liquid membrane applied shall be determined each day using the application verification method. This information shall be submitted to the Engineer within 24 hours of applying the liquid membrane.

907-804.03.17.2--Liquid Membrane Method. All surfaces on which curing is to be by liquid membrane shall be given the required surface finish prior to the application of liquid membrane. Concrete surfaces cured by liquid membrane shall receive two applications of white liquid membrane. Neither application shall be made from a position supported by or in contact with the freshly placed concrete. Both applications shall be applied perpendicularly to the surface of the concrete.

When using liquid membrane, the liquid membrane shall be thoroughly mixed within the time recommended by the liquid membrane producer but no more than an hour before use. If the use of liquid membrane results in a streaked or blotched appearance, the method shall be stopped and water curing applied until the cause of defective appearance is corrected.

The application of liquid membrane shall accomplished by the use of power applied spray equipment using nozzles and other equipment recommended by the liquid membrane producer. Manually pressurized or manual pump-up type sprayers shall not be used to apply the first two applications of liquid membrane.

The liquid membrane shall be applied when no free water remains on the surface but while the surface is still wet. The liquid membrane shall be applied according to the manufacturer's instructions with a minimum spreading rate per coat of one (1) gallon per 200 square feet of

concrete surface. If the concrete is dry or becomes dry, the Contractor shall thoroughly wet it with water applied as a fog spray by means of approved equipment.

The first application of the liquid membrane shall be made as the work progresses. For bridge decks, the first application shall be completed in each area of the deck, including the area in which the bridge railing will be later constructed, within 20 minutes of initial strike-off for bridges with no skew and within 25 minutes of initial strike-off for bridges with skew. For all other concrete, the first application of the liquid membrane shall be completed within 20 minutes of finishing.

The second application shall be applied within 30 minutes after the first application. The liquid membrane shall be uniformly applied to all exposed concrete surfaces.

As a visual guide, the color of concrete covered with the required amount of liquid membrane should be indistinguishable from a sheet of commercially available standard "letter" size white copier paper placed on top of it when viewed from a distance of about five feet (5') away horizontally if standing on the same grade as the concrete. The appearance of the concrete does not supersede applying the minimum spreading rate.

The Contractor shall make available to the Engineer an application rate verification in accordance with Subsection 907-804.03.17.1.2.1.

The coating shall be protected against marring for at least 10 days after the application of the curing compound. The coating on bridge decks shall receive extra attention and may require additional protection as required by the Engineer. All membrane marred or otherwise disturbed shall be given an additional coating. Manually pressurized or manual pump-up type sprayers may be used for giving marred areas the required additional application of liquid membrane. Should the surface coating be subjected repeatedly to injury, the Engineer may require that the water curing method be applied at once.

After the specified time for curing, but prior to constructing the bridge railing, all liquid membrane shall be removed from both the exposed surfaces of the reinforcing steel and the concrete surfaces on which bridge rail will be constructed. This removal of liquid membrane may be accomplish by high pressure washing or other methods approved by the Engineer.

907-804.03.18--Expansion and Fixed Joints, Bearings, Anchor Bolts, Plates, Castings, Pipes, Drains, Conduits, Etc. All joints shall be constructed according to details shown on the plans. The edges of the concrete at open or filled joints shall be chamfered or edged as indicated on the plans.

907-804.03.18.1--Open Joints. Open joints shall be placed in the locations shown on the plans and shall be constructed by the insertion and subsequent removal of a wood strip, metal plate, or other approved material. The insertion and removal of the template shall be accomplished without chipping or breaking the corners of the concrete. Reinforcement shall not extend across an open joint unless so specified on the plans.

907-804.03.18.2--Filled Joints. Poured expansion joints and joints to be sealed with premolded materials shall be constructed similar to open joints. When premolded types are specified, the filler shall be placed in correct position as the concrete on one side of the joint is placed. When the form is removed, the concrete on the other side shall be placed. Adequate water stops of metal, rubber, or plastic shall be carefully placed as shown on the plans.

907-804.03.18.3--Premolded and Preformed Joint Seals. When preformed elastomeric compressive joint seals are specified, the previously formed and cured open joint shall be thoroughly cleaned of all foreign matter, the required adhesive uniformly applied, and the seal installed in accordance with the recommendations of the manufacturer of the seal.

When premolded filler is used for the joints in the roadway slab, the tops shall be adequately sealed with poured joint filler in accordance with details on the plans. Premolded filler shall be permanently fastened to an adjacent concrete surface by appropriate use of copper wire, copper nails, or galvanized nails.

907-804.03.18.4--Steel Joints. The plates, angles, or other structural shapes shall be accurately shaped at the shop to conform to the section of the concrete floor. Fabrication and painting shall conform to the specifications covering those items. When called for on the plans or in the special provisions, the material shall be galvanized in lieu of painting. Care shall be taken to ensure that the surface in the finished plane is true and free of warping. Positive methods shall be employed in placing the joints to keep them in correct position during the placing of the concrete. The opening at expansion joints shall be that designated on the plans at normal temperature, and care shall be taken to avoid impairment of the clearance in any manner.

907-804.03.18.5--Water Stops. Adequate water stops of metal, rubber, or plastic shall be placed as shown on the plans. Where movement at the joint is provided for, the water stops shall be of a type permitting movement without injury. They shall be spliced, welded, or soldered to form continuous watertight joints.

907-804.03.18.6--Bearing Devices. Bearing plates, rockers, and other bearing devices shall be constructed according to details shown on the plans. Unless otherwise specified or set in plastic concrete, they shall be set in grout to insure uniform bearing. Structural steel and painting shall conform to the requirements of Sections 810 and 814. When specified, the material shall be galvanized in lieu of painting. The rockers or other expansion bearing devices shall be set, considering the temperature at the time of erection, so that the required position of the device is provided.

At all points of bearing contact, concrete members shall be separated from underlying members by dimensioned bearing pads or by methods and/or materials specified on the plans.

When not otherwise specifically provided, contact areas between concrete super-structures and substructures shall be separated by three layers of No. 15, Type I, roofing felt.

907-804.03.18.7--Friction Joints. Metal friction joints shall consist of plates as indicated on the plans and shall be securely anchored in correct position. All sliding surfaces shall be thoroughly

coated with an approved graphite grease. Movement shall not be impeded by the concrete in which the plates are embedded.

907-804.03.18.8--Placing Anchor Bolts, Plates, Castings, Grillage, Conduits, Etc. All anchor bolts, plates, castings, grillage, conduits, etc. indicated on the plans to be placed in or on the concrete shall be placed, set, or embedded as indicated or as directed. These items of the construction shall be set in portland cement mortar as referenced in Subsection 714.11.5, except that anchor bolts may, as permitted by the Engineer, be built into the masonry, set in drilled holes, or placed as the concrete is being constructed by inserting encasing pipe or oiled wooden forms of sufficient size to allow for adjustment of the bolts. After removal of the pipe or forms, the space around the bolts shall be filled with portland cement mortar completely filling the holes. The bolt shall be set accurately and perpendicular to the plane of the seat.

Anchor bolts which are to be set in the masonry prior to the erection of the superstructure shall be carefully set to proper location and elevation with a template or by other suitable means.

When bed plates are set in mortar, no superstructure or other load shall be placed thereon until this mortar has been allowed to set for a period of at least 96 hours, subject to the restrictions for cold weather concreting in Subsection 907-804.03.16.1. The mortar shall be kept well moistened during this period.

Weep hole drains shall be installed in abutments and retaining walls, and roadway drains or scuppers shall be installed in the roadway slabs in accordance with the details shown on the plans.

Where backfill is to be made at weep holes or openings in the structure, sand or stone chimneys or French drains shall be constructed as specified and shall extend through the portion of the backfill to be drained. Except as otherwise provided, the sand, stone, or slag used in this construction shall meet the requirements of Subsection 704.04.

907-804.03.19--Finishing Concrete Surfaces.

804.03.19.1--Classes of Finishes. Surface finishes of exposed concrete surfaces shall be classified as follows:

Class 1 - Ordinary Surface Finish
Class 2 - Rubbed or spray Finish
Class 3 - Tooled Finish
Class 4 - Sand-Blast Finish
Class 5 - Wirebrush or Scrubbed Finish
Class 6 - Floated Surface Finish

907-804.03.19.2--Class 1, Ordinary Surface Finish. Immediately following the removal of forms, all fins and irregular projections shall be removed from all surfaces except from those which are not to be exposed or not to be waterproofed. On all surfaces, the cavities produced by form ties and all other holes, honeycomb spots, broken corners or edges, and other defects shall be thoroughly cleaned, and after having been kept saturated with water for at least three hours

shall be carefully pointed and trued with a mortar of cement and fine aggregate mixed in the proportions used in the class of the concrete being finished. Mortar used in pointing shall be not more than one hour old. The mortar patches shall be cured as specified under Subsection 907-804.03.17. All construction and expansion joints shall be left carefully tooled and free of mortar and concrete. The joint filler shall be left exposed for its full length with clean and true edges.

The resulting surfaces shall be true and uniform. All surfaces which cannot be repaired to the satisfaction of the Engineer shall be given a Class 2 rubbed finish.

907-804.03.19.3--Class 2, Rubbed or Spray Finish.

907-804.03.19.3.1--Rubbed Finish. After removal of forms, the Class 1 finish shall be completed and the rubbing of concrete shall be started as soon as its condition will permit. Immediately before starting this work, the concrete shall be kept thoroughly saturated with water for at least three hours. Surfaces shall be rubbed with a medium course Carborundum stone using a small amount of mortar on its face. The mortar shall be composed of cement and sand mixed in the proportions used in the concrete being finished. Rubbing shall be continued until all form marks, projections, and irregularities have been removed, all voids are filled, and a uniform surface has been obtained. The paste produced by this rubbing shall be left in place at this time.

After all concrete above the surface being treated has been cast, the final finish shall be obtained by rubbing with a fine Carborundum stone and water. This rubbing shall continue until the entire surface is of a smooth texture and uniform color.

After the final rubbing is completed and the surface has dried, it shall be rubbed with burlap to remove loose powder and objectionable marks.

907-804.03.19.3.2--Spray Finish. Prior to the spray finish, the concrete shall be given a Class 1 finish in accordance with Subsection 907-804.03.19.2, supplemented if necessary with a grout meeting the requirements of Subsection 714.11 with fine aggregate modified to require 100 percent passing the No. 16 Sieve.

Grout shall be applied with burlap pads or float sponges, and as soon as the grout has dried the surface shall be brushed to remove all loose grout and the surface left smooth and free of air holes. Surfaces to be sprayed shall be free of efflorescence, flaking coatings, dirt, oil, and other foreign substances. Prior to application of the spray finish, the surfaces shall be free of moisture, as determined by sight and touch, and in a condition consistent with the manufacturer's published recommendations.

The spray finish material shall meet the requirements of Subsection 714.12 and shall be listed on of Approved Sources of Materials. The spray finish shall be applied with heavy duty spray equipment capable of maintaining a constant pressure as necessary for proper application. The material shall be applied as recommended by the manufacturer except the rate of application shall not be less than one gallon per 50 square feet of surface area without prior written approval of the Engineer.

The completed finish shall be tightly bonded to the structure and present a uniform appearance and texture equal to or better than a rubbed finish. If necessary, additional coats shall be sprayed to produce the desired surface texture and uniformity. Upon failure to adhere positively to the structure without chipping or cracking or to attain the desired surface appearance, the coatings shall be completely removed and the surface given a rubbed finish in accordance with 907-804.03.19.3.1, or other approved methods shall be used to obtain the desired surface finish to the satisfaction of the Engineer without additional cost to the State.

907-804.03.19.4--Classes 3, 4, and 5 Finishes. If required, specifications for these finishes will be contained in the special provisions.

907-804.03.19.5--Class 6, Floated Surface Finish. After the concrete has been deposited in place, it shall be consolidated and the surface shall be struck off by means of a strike board and floated with a wooden or cork float. An edging tool shall be used on edges and expansion joints. The surface shall not vary more than 1/8 inch under a 10-foot straightedge. The surface shall have a granular or matte texture which will not be slick when wet.

907-804.03.19.6--Required Finishes for Various Surfaces.

907-804.03.19.6.1--General. Unless otherwise specified, the top surface of sidewalks, the top horizontal surfaces of footings, and top slabs of box bridges, box culverts, or other structures shall be given a Class 6 finish. All formed concrete surfaces shall be given a Class 1 finish, except on surfaces which are completely enclosed, such as the inside surfaces of cells of box girders, the removal of fins and form marks and the rubbing of mortared surfaces to a uniform color will not be required.

In reference to finishing, exposed surfaces are surfaces or faces which may be seen after all backfill has been placed. Exposed surfaces requiring a Class 2 finish shall be finished at least one foot below the ground line or the low water elevation, whichever is higher.

The Class 2 finish shall be made upon a Class 1 finish. After the removal of forms the Class 1 finish shall be completed and the rubbing of concrete shall be started as soon as the condition of the concrete will permit.

Bridge floors shall be finished in accordance with Subsection 907-804.03.19.7.

907-804.03.19.6.2--Finishing Formed Concrete Surfaces of Box Bridges, Box Culverts, Pipe Headwalls, and Minor Structures. The exposed surfaces of wing walls and parapets of box bridges and box culverts to be used as vehicular or pedestrian underpasses shall be given a Class 2 finish. Exposed surfaces of other box culverts or box bridges, pipe culvert headwalls, and other minor structures shall be given a Class 1 finish unless otherwise indicated on the plans.

The exposed surfaces of retaining walls including copings and parapets shall receive a Class 2 finish.

907-804.03.19.6.3--Finishing Formed Concrete Surface of Bridges. All formed concrete bridge surfaces which are exposed shall have a Class 1 or 2 finish as set forth herein unless designated otherwise on the plans.

Bridges with designated surfaces for Class 2 finish are classified as follows:

Group A - Bridges over highways, roads and streets.
Group B - Bridges over waterways and railroads.
Group BB - Twin or adjacent bridges of Group B category.

When a Group B or BB bridge also spans a highway, road or street, exposed concrete surfaces shall be finished in accordance with Group A requirements.

(A) Superstructures. Concrete surfaces to be given a Class 2 finish shall be the exposed surfaces of wings and rails and other exposed surfaces indicated by a double line in Figures 804-1, 804-2, and 804-3.

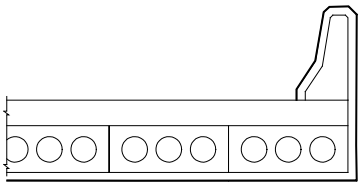
When a Group B or BB also spans a highway, road or street, the superstructure of spans over and extending one span in each direction beyond the lower level highway, road or street shall be given a Class 2 finish as shown for Group A.

(B) Substructures. Concrete surfaces to be given a Class 2 finish are as follows:

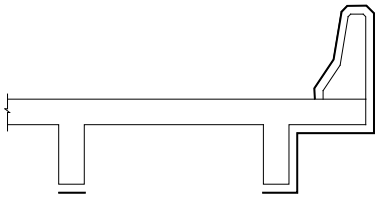
Group A. Exposed surfaces of abutments, end bents, end bent posts, wing walls, railing, retaining walls, parapets, copings, piers, columns, piles, caps, struts or walls between columns or piles, encasement of steel piles, arch rings and spandrel walls.

Group B and BB. Exposed surfaces of abutments, wing walls, end bent posts, railing, retaining walls, parapets and copings.

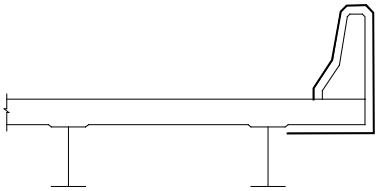
CONCRETE SLAB SPAN & HOLLOW SLAB SPAN



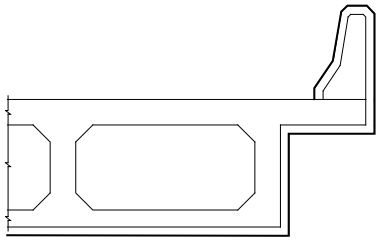
PRECAST HOLLOW SLAB SPAN



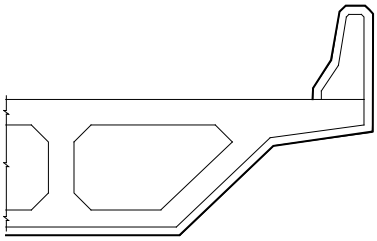
CONCRETE GIRDER SPAN



STEEL BEAM SPAN

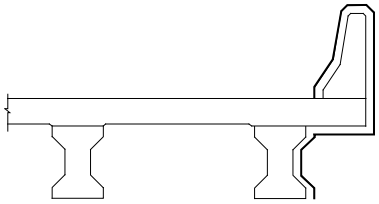


Vertical Face

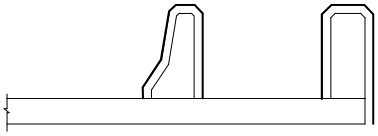


Slope Face

CONCRETE BOX GIRDER SPAN



PRESTRESSED CONCRETE BEAM SPANS



For Finishing On The Remainder Of Superstructure,
See The Appropriate Section On This Page.

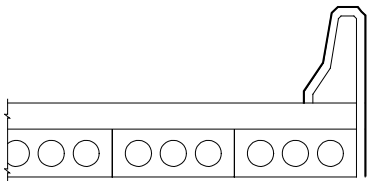
TYPICAL SIDEWALK SECTION

GROUP "A"

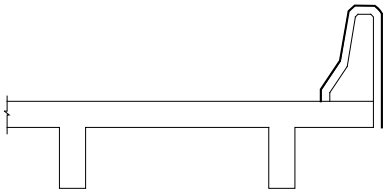
BRIDGES OVER HIGHWAYS, ROADS & STREETS

CLASS 2 FINISH - BRIDGE SUPERSTRUCTURES - FIG. 804-1

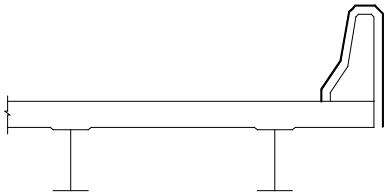
CONCRETE SLAB SPAN & HOLLOW SLAB SPAN



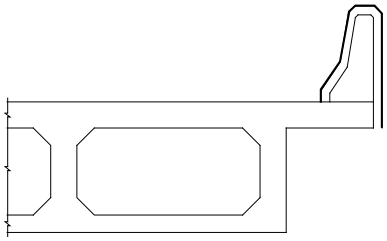
PRECAST HOLLOW SLAB SPAN



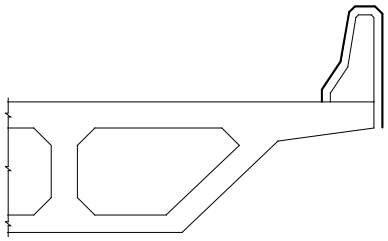
CONCRETE GIRDER SPAN



STEEL BEAM SPAN

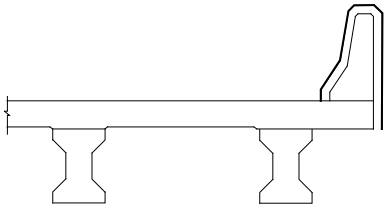


Vertical Face

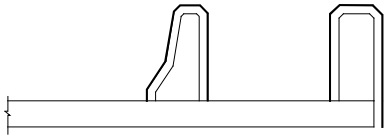


Slope Face

CONCRETE BOX GIRDER SPAN



PRESTRESSED CONCRETE BEAM SPANS



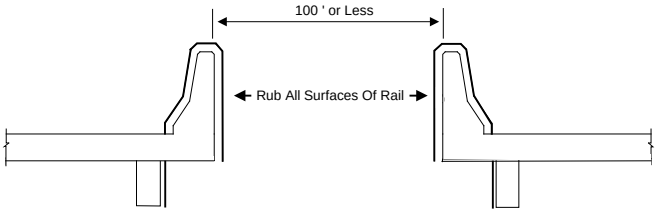
For Finishing On The Remainder Of Superstructure,
See The Appropriate Section On This Page.

TYPICAL SIDEWALK SECTION

GROUP "B"

BRIDGES OVER WATERWAYS AND BRIDGES OVER RAILROAD TRACKS

CLASS 2 FINISH - BRIDGE SUPERSTRUCTURES - FIG. 804-2



GROUP "B B" - ADJACENT BRIDGES

GROUP "B B"

TWIN or DUAL BRIDGES

CLASS 2 FINISH - BRIDGE SUPERSTRUCTURES - FIG. 804-3

907-804.03.19.7--Finishing Bridge Decks.

907-804.03.19.7.1--General. Concrete bridge decks shall be struck off and finished by the method(s) designated on the plans.

In the event a method is not designated, the Contractor may use either the longitudinal or transverse method subject to the requirements contained in these specifications.

Except when indicated otherwise on the plans, the finish of the bridge deck shall be either a belt finish, a broom finish, or one of the following drag methods: pan, double pan, burlap, or pan and burlap. Manual finishing of the bridge deck shall be performed only in areas inaccessible by the finishing equipment mounted to the strike-off screed, but shall not hinder the requirements for curing in accordance with Subsection 907-804.03.17.1. The surface texture specified and surface requirements shall be in accordance with the applicable requirements of Subsections 501.03.17 and 501.03.18 modified only as the Engineer deems necessary for bridge deck construction operations.

At no time shall water on the surface of the concrete from bleeding, fogging, curing, or other sources be worked into the concrete or used as an aid for finishing.

Regardless of the method of finishing selected, requirements for curing per Subsection 907-804.03.17 shall be completed within the specified time limits. If the requirements in Subsection 907-804.03.17 are not completed within the specific time limits, the Contractor shall cease operations, revise his operations up to and including acquiring new or additional equipment or additional personnel in order to satisfy the requirements in Subsection 907-804.03.17, and, on approval from the Engineer, resume operations

907-804.03.19.7.2--Longitudinal Method. The longitudinal method may be used for repairs to bridge decks or bridge widening projects. For bridge widening projects, curing in accordance with Subsections 907-804.03.17 shall be completed within 30 minutes of initial strike-off for bridges without skew and within 35 minutes of initial strike-off for bridges with skew.

The longitudinal method requires that the strike-off screed be supported on accurately graded and supported bulkheads or templates placed across the full width at the end(s) of the pour. Before the concrete is placed, approved fixed templates or wooden bulkheads of not less than 1¼-inch lumber shall be placed perpendicular to the centerline of the roadway, or in the case of skew bridges at the angle of skew. At least one dry run shall be made the length of each pour with a "tell-tale" device attached to the screed to assure the specified clearance to the reinforcing steel. The upper surface of the template or bulkheads shall be accurately set to conform to the required grade and crown.

Special attention shall be given to the gutter lines where the strike-off screed cannot reach. The gutters shall be finished by hand and tested with the straight edge. Floor drains shall be set lower than the finished gutter line and finished over. After initial set, the concrete shall be dished out and finished around the drains to form an outlet.

After the concrete has been deposited and rough graded, it shall be struck off by means of a strike-off screed resting on the bulkheads or fixed templates. The strike-off screed shall be of a type satisfactory to the Engineer and shall have sufficient strength to retain its shape under all working conditions. The final surface shall comply with the applicable requirements of Subsections 501.03.17.6 and 501.03.18, and unless otherwise specified in the contract, the final finish under this method shall be the belt finish.

In general, the overall strike-off screed should be trussed, with bracing heavy enough to support the weight of a man without deflecting, and should be adjustable for camber and correction of sag.

The strike-off screed will ride on the bulkheads or fixed templates at the ends of the section being finished. Care shall be taken to see that the bulkhead or fixed template elevations are accurately set since the entire span surface will be controlled by them. The manipulation of the screed shall be such that neither end is raised from the bulkheads or templates during the process.

The concrete shall be struck off by beginning at one curb and proceeding entirely across the span. A slight excess of concrete shall be kept in front of the cutting edge at all times. This operation shall be repeated at least three times. In each case, the strike-off screed shall be picked up and carried back to the point of beginning. No backward strokes will be allowed. The strike-off screed shall be moved along the bulkheads or fixed templates with a combined longitudinal and transverse motion. This operation may be manual or mechanical. Standing or walking in the fresh concrete ahead of the strike-off screed will not be permitted.

907-804.03.19.7.3--Transverse Method. The transverse method requires that the screeding equipment be supported on accurately graded and supported rails placed beyond the gutter lines and parallel with the centerline of the bridge.

The machine shall be so constructed and operated as to produce a bridge deck of uniform density with minimum manipulation of the fresh concrete and achieved in the shortest possible time. Manual transverse methods of screeding will not be permitted.

The finishing machine shall be supported on vertically adjustable rails set a sufficient distance from the gutter line to allow free movement of the screed from gutter line to gutter line. Satisfactory means of load distribution with minimum rail deflection shall be provided. The screed rails for a deck pour shall be completely in place for the full length of the pour and shall be firmly secured prior to placing concrete. The screed rails shall be adjusted as necessary to compensate for settlement and deflection occurring during the screeding operations. Supports for the screed rail shall be located directly over slab overhang support brackets as referenced in Subsection 907-804.03.14.1.

At least one dry run shall be made the length of each pour with a "tell-tale" device attached to the screed carriage to assure the specified clearance to the reinforcing steel.

The screed shall be equipped with a metal cutting edge or other approved mechanical means for accurately fine grading the plastic concrete to the required grade and surface smoothness and shall be supported by a bridging structure sufficiently rigid and heavy to perform operations

satisfactorily on concrete of minimum slump without vibration, distortion, and wrecking of forms. The screed shall be mechanically actuated to deliver the screeding action and for travel in a longitudinal direction at a uniform rate along the bridge deck.

The screed shall complete sufficient passes to strike off all of the excess concrete with ample mortar along the entire leading edge to assure filling of low spots. Care shall be taken to remove all objectionable material from the gutters where final hand finishing will be required.

The selection of the transverse method may require the Contractor to furnish bridge deck concrete which contains an approved water-reducing set-retarding admixture in the quantities approved by the Engineer at no additional cost to the State. See Subsection 713.02 for more information.

Other finishing requirements shall be in accordance with the general requirements in Subsection 907-804.03.19.7.1 and as specified on the plans.

907-804.03.19.7.4--Acceptance Procedure for Bridge Deck Smoothness. After the bridge decks and bridge end slabs are completed and preferably before the construction of the bridge railing, they shall be tested for ride quality using a Contractor furnished profilograph. Profile Index Values shall be determined in accordance with Department SOPs and these specifications. The profilograph shall meet the requirements of Subsection 907-804.03.19.7.5. Profiles will be obtained in the wheel paths of the main thru lanes and, where conditions allow, in the wheel paths of any auxiliary lanes or tapers. Profile Index Values for bridge decks and bridge end slabs shall be obtained for all state roads with four lanes or more, on state roads three lanes or less where the current traffic count is 2000 ADT or higher, or as designated on the plans. Ride quality tests will begin at a point where the rearmost wheel of the profilograph is as close to the beginning of the bridge end slab as possible and shall proceed forward across the remainder of the bridge end slab, across the bridge deck and continue across the next bridge end slab to a point where the front-most wheel of the profilograph reaches the far-most edge of the bridge end slab. Bridges and bridge end slabs not requiring a ride quality test must meet a 1/8 inch in 10-foot straightedge requirement in longitudinal and transverse directions. Bridges in horizontal curves having a radius of less than 1000 feet at the centerline and bridges within the superelevation transition of such curves are excluded from a test with the profilograph.

The Profile Index Value for bridge decks including the bridge end slabs shall be averaged for the left and right wheel path for each lane and where applicable, each auxiliary lane and taper, and shall not exceed 65 inches per mile for each lane. 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. In addition, individual bumps or depressions exceeding 0.3 of an inch, when measured from a chord length of 25 feet, shall be corrected and the surface shall meet a 1/8 inch in 10-foot straightedge check made transversely across the deck or slab.

Bridge decks and bridge end slabs not meeting the preceding requirements shall be corrected. Corrective work shall be done at no additional cost to the Department. Corrective work shall consist of grinding the bridge deck in accordance with this specification. All corrective work shall precede final surface texturing. After completion of final surface texturing, all surface

areas corrected by grinding shall be sealed with a nonstaining 40% minimum alkylalkoxysilane penetrating sealant applied per the manufacturer's directions.

In case the bridge end slabs are to be constructed on a future project, the bridge deck(s) alone shall be tested for ride quality using the acceptance procedure outlined above, except that the ride quality test will begin at a point where the rearmost wheel of the profilograph is as close to the beginning of the bridge as possible and shall proceed forward across the bridge deck to a point where the front-most wheel of the profilograph reaches the far-most edge of the bridge.

Expansion joint installation shall be delayed and the joint temporarily bridged to facilitate operation of the profilograph and grinding equipment across the joint wherever feasible.

It shall be the Contractor's responsibility to schedule profilograph testing. The Contractor shall notify the Department at least five (5) days in advance of profilograph testing. The Contractor shall ensure that the area to be tested has been cleaned and cleared of all obstructions. Profilograph testing of bridge decks and bridge end slabs shall be performed by the Contractor under supervision of the Engineer. All profilograph testing shall be performed at no additional cost to the Department. The Contractor will be responsible for traffic control associated with this testing operation.

907-804.03.19.7.4.1--Grinding Bridge Decks.

907-804.03.19.7.4.1.1--Equipment. The grinding equipment shall be a power driven, self-propelled machine that is specifically designed to smooth and texture portland cement concrete pavement with diamond blades. The effective wheel base of the machine shall not be less than 12.0 feet. It shall have a set of pivoting tandem bogey wheels at the front of the machine and the rear wheels shall be arranged to travel in the track of the fresh cut pavement. The center of the grinding head shall be no further than 3.0 feet forward from the center of the back wheels.

The equipment shall be of a size that will cut or plane at least 3.0 feet wide. It shall also be of a shape and dimension that does not encroach on traffic movement outside of the work area. The equipment shall be capable of grinding the surface without causing spalls at cracks, joints, or other locations.

907-804.03.19.7.4.1.2--Grinding. The grinding areas will be determined by the Contractor and approved by the Engineer. The Contractor shall develop and submit to the Engineer for approval a Grinding Plan. The Contractor shall allow up to 45 days for the Department to review the Plan prior to starting any grinding operations. This plan shall include as a minimum:

1) Name of the project superintendent in responsible charge of the grinding operation.
2) List and description of all equipment to be used.
3) Maximum depth of each pass allowed by the grinding equipment.
4) Maximum width of each pass allowed by the grinding equipment.
5) Details of a sequence of the grinding operation.
6) Complete data from Profilograph runs, based on a 0.3 inch bump height, for each wheel path over the entire bridge including bridge end slabs, which shall include profile index, bump locations (in stations), bump heights and proposed final cross-slopes. When a

computerized profilograph is used, a complete printout of the profile including the header information for each wheel path will be required.

7) Data showing reinforcing steel clearance in all areas to be ground.
8) A detailed drawing of the deck showing areas to be ground with station numbers and grinding depths clearly indicated.
9) A description of grinding in areas where drains are in conflict with grind areas.
10) Details of any changes in deck drainage, anticipated ponding, etc.

The Engineer will evaluate the grinding plan for conformance with the plans and specifications, after which the Engineer will notify the Contractor of any additional information required and/or changes that may be needed. Any part of the plan that is unacceptable will be rejected and the Contractor shall submit changes for reevaluation. All approvals given by the Engineer shall be subject to trial and satisfactory performance in the field, and shall not relieve the Contractor of the responsibility to satisfactorily complete the work.

The construction operation shall be scheduled and proceed in a manner that produces a uniform finished surface. Grinding will be accomplished in a manner that eliminates joint or crack faults while providing positive lateral drainage by maintaining a constant cross-slope between grinding extremities in each lane. Auxiliary or ramp lane grinding shall transition as required from the mainline edge to provide positive drainage and acceptable riding surface.

The operation shall result in a finished surface that conforms as close as possible to the typical cross-section and the requirements specified in Subsection 907-804.03.19.7.4.1.3.

The Contractor shall establish positive means for removal of grinding residue. Residue shall not be permitted to flow across lanes used by public traffic or into gutters or drainage facilities.

907-804.03.19.7.4.1.3--Final Surface Texture. The grinding process shall produce a finish surface that is as close as possible to grade and uniform in appearance with a longitudinal line type texture. The line type texture shall contain parallel longitudinal corrugations that present a narrow ridge corduroy type appearance. The peaks of the ridges shall be approximately 1/16 inch higher than the bottoms of the grooves with approximately 53 to 57 evenly spaced grooves per foot. Grinding chip thickness shall be a minimum of 0.080 inches thick.

The finished bridge decks and bridge end slabs shall be retested for riding quality using a Contractor furnished profilograph meeting the requirements of Subsection 907-804.03.19.7.5. The finished results shall meet the following conditions:

(a) Individual bumps or depressions shall not exceed 0.3 inches when measured from a chord length of 25 feet.
(b) The final index value for the bridge deck and bridge end slabs shall be an average of both the right and left wheel paths of each lane and shall not exceed 65 inches per mile.

The final profilogram will be furnished to the Engineer for informational purposes.

907-804.03.19.7.5--Profilograph Requirements. The smoothness of the bridge deck will be determined by using a California Profilograph to produce a profilogram (profile trace) at each

designated location. The surface shall be tested and corrected to a smoothness index as described herein with the exception of those locations or specific projects that are excluded from a smoothness test with the profilograph.

The profilograph, furnished and operated by the Contractor under supervision of the Engineer, shall consist of a frame at least 25 feet in length supported upon multiple wheels having no common axle. The wheels shall be arranged in a staggered pattern so that no two wheels will simultaneously cross the same bump. A profile is to be recorded from the vertical movement of a sensing mechanism. This profile is in reference to the mean elevation of the contact points established by the support wheels. The sensing mechanism, located at the mid-frame, may consist of a single bicycle-type wheel or a dual-wheel assembly consisting of either a bicycle-type (pneumatic tire) or solid rubber tire vertical sensing wheel and a separate bicycle-type (pneumatic tire) longitudinal sensing wheel. The wheel(s) shall be of such circumference(s) to produce a profilogram recorded on a scale of one (1) inch equal to 25 feet longitudinally and one (1) inch equal to one (1) inch (full scale) vertically. Motive power may be provided manually or by the use of a propulsion unit attached to the center assembly. In operation, the profilograph shall be moved longitudinally along the pavement at a speed no greater than 3 MPH so as to reduce bounce as much as possible. The testing equipment and procedure shall comply with the requirements of Department SOP.

The Contractor may elect to use a computerized version of the profilograph in lieu of the standard profilograph. If the computerized version of the profilograph is used, it shall meet the requirements of Subsection 907-804.03.19.7.5.1.

907-804.03.19.7.5.1--Computerized Profilograph.

907-804.03.19.7.5.1.1--General The computerized profilograph, furnished and operated by the Contractor under the supervision of the Engineer, shall be equipped with an on-board computer capable of meeting the following conditions.

Vertical displacement shall be sampled every three (3) inches or less along the bridge deck. The profile data shall be bandpass filtered in the computer to remove all spatial wavelengths shorter than two (2) feet. This shall be accomplished by a third order, low pass Butterworth filter. The resulting band limited profile will then be computer analyzed according to the California Profilograph reduction process to produce the required inches per mile index. This shall be accomplished by fitting a linear regression line to the length of bridge. This corresponds to the perfect placement of the blanking band bar by a human trace reducer. Scallops above and below the blanking band are then detected and totaled according to the California protocol. Bump/Dip analysis shall take place according to the California Profilograph reduction process.

The computerized profilograph shall be capable of producing a plot of the profile and a printout which will give the following data: Stations every twenty five (25) feet, bump/dip height and bump/dip length of specification (3/10 of an inch and 25 feet respectively), the blanking band width, date of measurement, total profile index in inches per mile for the measurement, total length of the measurement, and the raw inches for each segment.

907-804.03.19.7.5.1.2--Mechanical Requirements. The profilograph shall consist of a frame

twenty five (25) feet long supported at each end by multiple wheels. The frame shall be constructed to be easily dismantled for transporting. The profilograph shall be constructed from aluminum, stainless steel and chromed parts. The end support wheels shall be arranged in a staggered pattern such that no two wheels cross a transverse joint at the same time. The relative smoothness shall be measured by the vertical movement of an eight (8) inch or larger diameter sensing wheel at the midpoint of the 25-foot frame. The horizontal distance shall be measured by a twenty (20) inch or larger diameter pneumatic wheel. This profile shall be the mean elevation referenced to the twelve points of contact with the pavement established by the support wheels. Recorded graphical trace of the profile shall be on a scale of one inch equals one inch (full scale) vertical motion of the sensing wheel and one inch equals 25 feet horizontal motion of the profilograph.

907-804.03.19.7.5.1.3--Computer Requirements. The computer shall have the ability to produce output on sight for verification. The computerized output shall indicate the profile index for each specified section of bridge deck. Variable low and high pass third-order Butterworth filtering options shall be available. The printout shall be capable of showing station marks automatically on the output. Blanking band positioning for each specified section of the bridge deck shall be placed according to the least squares fit line of the collected data. Variable bump and dip tests shall be available to show "must correct" locations on the printout. The computer must have the ability to display on screen "must correct" conditions and alert the user with an audible warning when a "must correct" location has been located. The computer must have the ability to store profile data for later reanalysis. The measurement program must be menu driven and PC compatible. User selected options, identification, calibration factors, and time and date stamps shall be printed at the top of each printed report for verification. The control software must be upgradeable. A power source shall be included for each profilograph and be capable of supplying all power needs for a full days testing.

907-804.03.19.8--Finishing Horizontal Surfaces of Footings or Top Slabs of Box Bridges, Culverts, or Other Structures. The finishing of horizontal surfaces of footing or top slabs of box bridges, culverts, or other structures shall be achieved by placing an excess of material in the form and removing or striking off the excess with a template, forcing the coarse aggregate below the mortar surface. After the concrete has been struck off the surface shall be given a Class 6 finish.

907-804.03.19.9--Finishing Exposed Surfaces of Sidewalks. After the concrete has been deposited in place it shall be consolidated and the exposed surface shall be given a Class 6 finish. An edging tool of the required radius shall be used on all edges and at all expansion joints. The surface shall have a granular texture which will not be slick when wet.

Sidewalk surfaces shall be laid out in blocks with an approved grooving tool as shown on the plans or as directed.

907-804.03.20--Opening Bridges.

907-804.03.20.1--Public Traffic. Unless otherwise specified, concrete bridge decks shall be closed to public highway traffic for a period of at least 21 days after placing concrete.

907-804.03.20.2--Construction Traffic. Unless otherwise specified, concrete bridge decks shall be closed to construction traffic for the time required for curing in Subsection 907-804.03.17 and the minimum required compressive strength for the concrete placed is obtained.

907-804.03.21--Final Cleanup. Upon completion of the work all equipment, surplus materials, forms, and waste material shall be removed, the bridge cleaned, and the site of the work given a final cleanup.

907-804.03.22--Precast-Prestressed Concrete Bridge Members.

907-804.03.22.1--General. All installations and plants for the manufacture of precast-prestressed bridge members shall be PCI (Precast / Prestressed Concrete Institute) Certified. Bridge members manufactured in plants or installations not so approved will not be accepted for use in the work. The Contractor or other manufacturer shall employ a technician skilled in the adopted system of prestressing to supervise the manufacturing operations. This technician shall be certified according to the guidelines of this specification. The Contractor shall develop and implement a Quality Control Program as per Division I of PCI Quality Control Manual, 4th Edition. The Quality Control Program shall be submitted to the District Materials Engineer for approval.

907-804.03.22.2--Stressing Requirements. The jacks for stressing shall be equipped with accurate calibrated gauges for registering the jacking pressure. Means shall be provided for measuring elongation of strands to at least the nearest 1/16 inch.

Prior to beginning work, the Contractor or manufacturer shall have all jacks to be used, together with their gauges, calibrated by an approved laboratory. All jacks and gauges shall have an accuracy of reading within two percent. The testing agency shall furnish the Engineer a statement certifying that the jacks and gauges meet this requirement. During the progress of the work, if a gauge appears to be giving erratic results or if the gauge pressure and elongations indicate materially differing stresses, recalibration will be required.

Calibration of jacks and gauges shall be repeated at intervals deemed necessary by the Engineer. These intervals for calibration shall not exceed one year.

Shop drawings of prestressed beams, including an erection plan, shall be submitted in duplicate to the Bridge Engineer for approval prior to manufacture of members.

907-804.03.22.2.1--Methods. Plans for the particular bridge members will show prestressing by one of the following methods:

(A) Pretensioning. The prestressing strands are stressed initially. After the concrete is placed, cured, and has attained the compressive strength shown on the plans, the stress is transferred to the member. The method used for pretensions shall be in accordance to Division V of PCI Quality Control Manual, 4th Edition.

(B) Posttensioning. The posttensioning tendons are installed in voids or ducts and are stressed and anchored after development of the compressive strength specified on the plans. The voids or ducts are then pressure grouted.

(C) Combined Method. Part of the reinforcing is pretensioned and part posttensioned. Under this method all applicable requirements for the two methods specified shall apply to the respective stressing elements being used.

907-804.03.22.2.2--Alternate Details for Prestressed Members. In the event that the Contractor / Manufacturer desires to use materials or methods that differ in any respect from those shown on the plans or described in these specifications, the Contractor shall submit for approval full plan details on acceptable tracings suitable for reproduction and specifications which shall become the property of the Department. In order for alternate materials and/or methods to be considered, they will be required to comply fully with the following:

A. Provisions equal to those stipulated in these specifications.
B. Current AASHTO Specifications.
C. Recommendations of materials manufacturer.
D. Camber tolerance of beams and spans shown on plans.

Note: Alternate materials and methods will not be authorized on Federal-Aid Projects.

The Engineer shall be the sole judge as to the adequacy and propriety of any variation of materials or methods.

907-804.03.22.2.3--Stressing Procedure.

(A) General. Stressing shall be performed by suitable jacks working against unyielding anchorages and capable of maintaining the required stress for an indefinite period without movement or yielding. Strands may be stressed singularly or in a group.

The tension to be applied to each strand shall be as shown on the plans. The tension shall be measured by both jacking gauges and elongations in the strands and the result shall check within close limits.

It is anticipated that there will possibly be a difference in indicated tension between jack pressure and elongation of about five (5) percent. In this event, the discrepancy shall be placed on the side of slight overstress rather than understress.

In the event of an apparent discrepancy between gauge pressure and elongation of as much as five (5) percent, the entire operation shall be carefully checked, and the source of error determined before proceeding further.

Elongation is to be measured after the strands have been suitably anchored, and all possible slippage at the anchorages has been eliminated.

In all stressing operations, the stressing force shall be kept as nearly symmetrical about the vertical axis of the member as practicable.

(B) Pretensioning. All strands to be prestressed shall be brought to a uniform initial tension prior to being given their full pretensioning. This uniform initial tension of approximately 1000 to 2000 pounds shall be measured by suitable means such as a dynamometer so that its value can be used as a check against elongation computed and measured.

After the initial tensioning, the strand or group shall be stressed until the required elongation and jacking pressure is within the limits specified.

When the strands are stressed in accordance with the plan requirements and these specifications and all other reinforcing is in place, the concrete shall be placed in the prepared forms.

Strand stress shall be maintained until the concrete between anchorages has attained the required compressive strength as determined by cylinder tests, after which the strands shall be cut off flush with the ends of column members, and cut as shown on the plans for beams, girders, etc. Strands shall be cut or released in such a manner that eccentricity of prestress will be kept to a minimum and no damage to the member will result. The strand cutting pattern shall be as shown on the plans or as approved by the Bridge Engineer.

(C) Posttensioning. For all posttensioning tendons/bars the anchor plates shall set exactly normal in all directions to the axis of the tendon/bar. Parallel wire anchorage cones shall be recessed within the beams. Tensioning shall not take place until the concrete has reached the compressive strength shown on the plans.

Elongation and jacking pressures shall make appropriate allowance for all possible slippage or relaxation of the anchorage. Posttensioning tendons/bars shall be stressed in the order and manner shown on the plans.

The units shall be tensioned until the required elongations and jacking pressures are attained and reconciled within the limits specified in Subsection 907-804.03.22.2.3(A) with such overstresses as approved by the Engineer for anchorage relaxation.

Independent references shall be established adjacent to each anchorage to indicate any yielding or slippage that may occur between the time of initial stressing and final release of the strands.

Straight tendons/bars may be tensioned from one end. Unless otherwise specified, curved tendons shall be stressed by jacking from both ends of the tendons.

(D) Combined Method. In the event that girders are manufactured with part of the reinforcement pretensioned and part posttensioned, the applicable portions of the requirements listed herein shall apply to each type.

907-804.03.22.3--Manufacture.

907-804.03.22.3.1--Forms. The forms used for precast-prestressed bridge members shall meet the requirements of Division II of the PCI Quality Control Manual, 4th Edition.

907-804.03.22.3.2--Placing and Fastening Steel. Placing and fastening of all steel used for precast-prestressed bridge members shall meet the requirements of Division V of the PCI Quality Control Manual, 4th Edition.

907-804.03.22.3.3--Holes for Prestressing Tendons/Bars. Holes provided in girders for prestressing tendons/bars shall be formed by means of inflatable rubber tubing, flexible metal conduit, metal tubing, or other approved means.

907-804.03.22.4--Placing and Curing Concrete.

907-804.03.22.4.1--Placing. The placing of concrete shall meet the applicable requirements of Division III of PCI Quality Control Manual, 4th Edition.

907-804.03.22.4.2--Curing. Initial and accelerated curing of all members shall meet the applicable requirements of Division IV of PCI Quality Control Manual, 4th Edition except for the following listed requirements.

The source of heat for accelerated cure shall be steam. Calibrated thermocouples shall be implanted into the concrete members to monitor areas expected to have maximum and minimum heat. Curing methods and procedures listed in the prestress producer's PCI Quality System Manual shall be approved by the Department before their implementation.

907-804.03.22.4.3--Removal of Side Forms. Side forms may be removed after the concrete has attained sufficient strength to maintain a true section. In order to obtain "sufficient strength", it may be necessary to cure members for 12 hours or more as prescribed in Subsection 907-804.03.22.4.2, or to attain a minimum compressive strength of 1000 psi.

If high-early-strength concrete is obtained by use of low slump (0 to 1.5-inch) concrete, vacuum process, or other approved methods, side forms may be removed earlier; however, approval of the methods and revision from normal schedules will be made only after inspections by the District Materials Engineer and Materials Division have determined that satisfactory results will be attained by the methods and schedules proposed.

907-804.03.22.4.4--Grouting. The holes through posttensioned members in which the tendons are installed shall be equipped with approved grouting vents. All prestressing tendons to be bonded shall be free of dirt, loose rust, grease, or other deleterious substances. Before grouting, the ducts shall be free of water, dirt, and other foreign substances. The ducts shall be blown out with compressed air until no water comes through the ducts. For long members with draped tendons an open tap at low points may be necessary. After completion of stressing, the annular space between sides of tendon and sides of hole shall be grouted as set in the following paragraphs.

With the grouting vent open at one end of the core hole, grout shall be applied continuously under moderate pressure at the other end until all entrapped air is forced out through the open

grout vent, as evidenced by a steady stream of grout at the vent. Whereupon, the open vent shall be closed under pressure. The grouting pressure shall be gradually increased to a refusal of at least 75 psi and held at this pressure for approximately 10 seconds, and the vent shall then be closed under this pressure.

Portland cement grout shall consist of a mixture of:

1	part Type 1 portland cement
1/4	part fly ash
3/4	part washed sand *
4 to 6	gallons of water per bag of cement.

* all passing No. 16 sieve and not more than 5% retained on No. 30

Water-reducing admixtures, subject to approval by the Engineer, shall be used in accordance with the manufacturer's recommendations.

The grout shall be mixed in a mechanical mixer, shall have the consistency of heavy paint, and shall be kept agitated until placed.

Members shall not be moved before the grout has set, ordinarily at least 24 hours at 80°F or higher.

907-804.03.22.5--Finishing and Marking. Units shall be given a Class 1 finish at the plant and shall be given a Class 2 finish after erection when required.

Recesses in girders at end of diaphragm bars, holes left by form ties, and other surface irregularities shall be carefully cleaned and patched with an approved non-shrink commercial grout or a non-shrinkage mortar of the following composition:

1 part Type 1 portland cement
1 1/2 to 2 parts fine sand
1/2 to 3/4 ounces aluminum powder per bag of cement
Approved admixture per Subsection 713.02.
Sufficient water to produce a workable but rather stiff mix.

The units shall be clearly marked in accordance with Department's *Materials Division Inspection, Certification and Testing Manual*.

907-804.03.22.6--Handling, Storage, and Installation. Posttensioned members may be handled immediately after completion of stressing and grout has set. Pretensioned members may be handled immediately after release of tensioning. In either case, the members shall have developed a minimum compressive strength of 4000 psi prior to handling. In the event stressing is not done in a continuous operation, members shall not be handled before they are sufficiently stressed, as determined by the Engineer, to sustain all forces and bending moments due to handling. In the handling, storage, and transporting of beams or girders, they shall be maintained in an upright position (position as cast) at all times and shall be picked up from points within

distance from beam ends equal to beam depth or at pick-up points designated on the plans. Disregard of this requirement and dropping of units may be cause for rejection, whether or not injury to the unit is apparent. Piles shall be picked up and loaded for shipment at points shown by the suspension diagram on the plans. Extreme care shall be used in handling and storing piles to prevent damage. The dropping of a pile may be cause for rejection of same, whether or not there is apparent injury to the member.

Care shall be exercised during the storage, hoisting, and handling of precast units to prevent damage. Damaged units shall be replaced by the Contractor at no additional costs to the State.

When members are stacked for storage, each layer shall be supported at or near the pick-up points. Supports shall be carefully placed in a vertical line in order that the weight of any member will not stress an underlying member. To prevent damage in moving members it is suggested that rigid supports be covered with a cushion of wood or other resilient material.

Members shall not be transported until at least one day after the concrete has reached a compressive strength of 5000 psi or greater strength when shown on the plans.

Piles used in salt water shall not be driven until concrete is seven days old, and air-entrained concrete shall be used in such piles.

After prestressed concrete voided slab units are set, doweled and bolted in their final position the keyways and dowel holes shall be filled with an approved non-shrink grout. Traffic shall not be permitted on the spans for 24 hours after grouting, and heavy construction equipment exceeding 15 tons will not be permitted on the spans for a period of 72 hours after grouting.

Adjacent slab units that mismatch more than one-fourth inch shall be adjusted prior to grouting of the shear keys. The maximum deviation from cross-section and grade (exclusive of camber) at any point shall not exceed one-fourth inch; and when the surface is checked with a ten-foot straightedge applied both parallel and perpendicular to the centerline, the variance shall not exceed one-fourth inch.

In addition to the requirements set out in this section, the applicable requirements of Section 803 shall apply.

907-804.03.22.7--Tolerances for Accepting Precast Prestressed Concrete. Member shall meet the dimension tolerances set by Division VII of PCI Quality Control Manual, 4th Edition.

907-804.03.22.8--Testing of Materials. Concrete and aggregate testing shall meet the requirements of Division VI of PCI Quality Control Manual, 4th Edition, except that the concrete mixture design shall meet the requirements of Subsection 907-804.02.10. Also, in addition to concrete compressive tests samples made for detensioning and 28-day strength, test samples shall be made and tested in order to prove compliance to the requirements of Subsection 907-804.03.22.6 for handling and shipping prestressed members. Compressive strength test cylinders for detensioning, handling and shipping shall receive the same type curing as the prestressed members for which they represent. Compressive strength samples shall be made each day for each prestress casting bed.

907-804.03.22.9--Testing Personnel. Technicians testing portland cement concrete used in the production of precast-prestressed members shall be PCI Quality Control Technician/Inspector Certified. Each producer of precast-prestressed members shall have at least one PCI Level II certified technician on site during production for Department projects.

907-804.03.22.10--Documentation. The Precast-Prestressed Producer for each precast-prestressed concrete bridge member shall maintain documentation as set forth in the Department's *Materials Division Inspection, Certification and Testing Manual*. Testing and inspection record forms shall be approved by the Central Laboratory and as a minimum contain information listed in Division VI of PCI Quality Control Manual, 4th Edition.

907-804.03.22.11--Use in the Work. Before any precast-prestressed member is incorporated into the work, documentation as described in Subsection 907-804.03.22.10 is required along with visual inspection of the member at the bridge construction site. Project Office personnel as per the Department's *Materials Division Inspection, Certification and Testing Manual* will make visual inspection of the precast-prestressed member at the bridge construction site.

Mississippi Department of Transportation

TECHNICAL REQUIREMENTS

Improvements to Interstate 55
Hinds County, Mississippi

Project Number
DB/IM-0055-02(244)/106023-305000

March 5, 2015

1.0 INTRODUCTION

This section of the RFP provides the technical requirements for design and construction of the Project. Initially capitalized terms used herein shall have the meaning as set forth in Special Provision No. 907-101-1 DB or Subsection 101.02 of Mississippi Standard Specifications for Road and Bridge Construction

Wherever in this document there is a reference to FHWA, AASHTO or other technical standards it is intended to refer to the list of contract required technical documents listed in Section 18.

1.1 Project Description

The Project Scope is defined as indicated in Section 904 – Notice to Proposers No. 2618 DB.

1.2 Plan Set Development

The development of the construction drawings for the Project shall follow MDOT's standard format for construction plans. The Released for Construction drawings each shall be prepared so that the Released for Construction drawings will form a portion of the overall Project set of drawings.

2.0 DESIGN AND CONSTRUCTION RESPONSIBILITIES

2.1 Design Criteria

It shall be the responsibility of the Contractor to design the Project using English units in accordance with the design criteria contained in these Technical Requirements.

The Contractor shall provide a completed set of construction plans with each sheet signed and sealed by a Professional Engineer licensed by the State of Mississippi.

Construction plans will be developed in Microstation Version 8.1 or later and GeoPak or as agreed to by MDOT and the Contractor.

2.2 Design Review

2.2.1 Design Review Requirements

Contractor shall submit the number of copies shown in Table 2.2-1 for preliminary and final design in accordance with the MDOT Project Engineer's instructions. Each submittal by the Contractor shall also contain PDF of all drawing and PDF copies of all reports and other submittal items. PDF drawings shall be black and white (22 inches X 36 inches) and 300 DPI. Cross sections shall be submitted with final design submittal.

Table 2.2-1
Required Quantities—Construction Plan Sets

Commission Use	Number of Plan Sets
11" x 17" plans	20
Specifications	20
Reports	6
Calculations	6

Responses to MDOT's comments shall be returned within 14 Calendar days after the comments have been provided.

2.2.2 Preliminary Design Phase (Minimum 30% Plans)

The preliminary design may be broken down into packages (i.e. roadway, individual bridge and retaining walls, drainage, and other plan submittals) as determined by the Contractor. Preliminary design shall include roadway plan and profile, bridge and retaining wall layouts (foundation plan, elevation view, and typical cross section), drainage, erosion control, major signs, pavement marking, traffic control plans, traffic signals, and ITS. MDOT will review preliminary design submittals within fourteen (14) days of the submittal. MDOT will provide any review comments.

Due to the potential complexity of the design computations and plans of retaining walls, a single submittal is limited to one (1) retaining wall. For submittals involving retaining walls, MDOT will review each submittal within fourteen (14) days of receiving the submittal; however, the fourteen (14)-day review period of each subsequent retaining wall submittal will not begin until the review of the previous

retaining wall submittal is complete and comments have been provided to the Contractor. The Contractor may specify the priority order in which they prefer the review to proceed.

The Contractor shall submit a certification that the submittal complies with the Design Quality Control Plan.

The Contractor shall schedule a meeting to be held after the review period with MDOT to review the comments. The Contractor shall incorporate the comments into the final design submittal to MDOT's satisfaction, unless an explanation satisfactory to MDOT is provided explaining why a comment has not been addressed in the final design.

2.2.3 Optional Design Review

At the request of the Contractor, MDOT will provide optional design reviews on design packages. MDOT, as appropriate, will review optional design Submittals within fourteen (14) days. MDOT will provide any review comments.

Due to the potential complexity of the design computations and plans of retaining walls, a single submittal is limited to one (1) retaining wall. For submittals involving retaining walls, MDOT will review each submittal within fourteen (14) days of receiving the submittal; however, the fourteen (14)-day review period of each subsequent retaining wall submittal will not begin until the review of the previous retaining wall submittal is complete and comments have been provided to the Contractor. The Contractor may specify the priority order in which they prefer the review to proceed.

The Contractor may schedule a meeting with MDOT to be held after the review period to review the comments. The Contractor shall incorporate the comments into the plans and specifications to MDOT's satisfaction, unless an explanation satisfactory to MDOT is provided explaining why a comment has not been addressed in the final design.

2.2.4 Final Design Review Phases (100% Plans)

After completion of the preliminary design, the final design may be broken down into packages (i.e. roadway, portions of bridge and retaining walls, drainage, and other plan submittals) as determined by the Contractor. Following completion of the design of a package, the Contractor shall prepare and submit a final design submittal for each package for review by MDOT. MDOT, as appropriate, will review the final design submittals within fourteen (14) days. MDOT will provide any review comments.

Due to the potential complexity of the design computations and plans of retaining walls, a single submittal is limited to one (1) retaining wall. For submittals involving retaining walls, MDOT will review each submittal within fourteen (14) days of receiving the submittal; however, the fourteen (14)-day review period of each subsequent retaining wall submittal will not begin until the review of the previous retaining wall submittal is complete and comments have been provided to the Contractor. The Contractor may specify the priority order in which they prefer the review to proceed.

The Contractor shall schedule a meeting to be held after the review period with MDOT to review the comments. The Contractor shall incorporate the comments into the plans and specifications to MDOT's satisfaction, unless an explanation satisfactory to MDOT is provided explaining why a comment has not been addressed in the final design.

The final design submittal and any re-submittals required shall include drawings, details, specifications, computations, and supporting data to establish fully the intent of all construction to be accomplished.

Final design submittals for all retaining walls shall include an independent check of calculations. All material shall be prepared under the supervision of and stamped by an engineer(s), surveyor(s), or architect, as appropriate, licensed to practice in the State of Mississippi.

The Contractor shall submit a certification that the submittal complies with the Design Quality Control Plan.

2.2.5 Released for Construction Documents

Following the incorporation of MDOT's comments from the final design review phase, the Contractor shall prepare and submit a Release for Construction (RFC) submittal to MDOT for MDOT's final review and Released for Construction stamp. Two (2) full size reproducible sets, two (2) half scale sets of plans, two (2) sets of Project specifications, two (2) sets of all reports and quantities for civil construction shall be submitted to MDOT. The Contractor shall have a Professional Engineer licensed in the State, stamp and sign each sheet of the plans. MDOT shall either stamp the plans and specifications "Released for Construction" and return one (1) full size reproducible set to the Contractor or return comments within seven (7) days. Once plans/specifications are Released for Construction, the Contractor shall provide twenty (20) copies of half scale sets of plans to MDOT within seven (7) days.

The Contractor shall submit a certification that the submittal complies with the Design Quality Control Plan.

MDOT's stamping of drawings as "Released for Construction" does not substantiate the adequacy or acceptability of the design or relieve the Contractor of its obligation to comply with all provisions of the Contract.

2.2.6 Request for Information (RFI) Process

Any questions concerning clarification of the plans or specifications, substitutions or alternate concepts shall be submitted to the Engineer of Record on the MDOT approved RFI form for response.

The Engineer of Record is responsible for providing the RFI response to the Contractor's request.

The Engineer of Record will include any clarifying comments and provide a response on the RFI form and forward the RFI form to the MDOT Project Engineer. The MDOT Project Engineer will provide a comment on the RFI form to the Engineer of Record and Contractor within three (3) business days of receipt of the RFI (hard copy or scanned hard copy) and associated documents (if any). The MDOT Project Engineer will provide either an RFI response or a schedule of when an RFI response will be submitted.

If the Engineer of Record agrees to a substitution or alternate concept, then the RFI becomes a Request for Revision (RFR) and follows the process detailed below.

The Contractor shall use the RFI form attached at the end of this section or similar document unless an alternate form is provided by the MDOT Project Engineer.

2.2.7 Request for Revision (RFR) Process

Any revisions to the plans and specifications desired by Contractor or to correct deficiencies in the construction documents after the Submittal has been Released for Construction will require a Request for

Revision (RFR). The Contractor shall submit a Request for Revision to MDOT. These shall be resubmitted to MDOT for review and re-release according to Section 2.2.5.

All Requests for Revision shall include the following: justification narrative, copies of pertinent correspondence, jurisdictional sign-off as necessary, any additional governmental approvals, index of impacted agencies with review comments and/or acknowledgements, preliminary drawings, engineering calculations and specifications, as necessary.

MDOT may accept or reject any Request for Revision. If MDOT accepts an RFR, the Contractor shall finalize all pertinent documentation, including final design drawings and specifications for final review and Release for Construction.

In no event shall the RFR process be used to change the Contract scope.

2.2.8 As-Built Drawings and Records

1. Contractor Responsibilities. In addition to those documents set forth above, the Contractor shall provide to MDOT thirty (30) days after completion of a portion of the Project a complete set of record plans. Record drawings consist of the final design documents listed as follows: design plan CADD (Microstation) drawings, Geopak files and PDF files that incorporate all changes, including any adjustments, plan and profiles of relocated utilities, additions and deletions that occurred during construction of this and the previous project. The Contractor shall certify that the record drawings are a true and correct representation of the Work as constructed.

2. Plan Revision Box. Information regarding major revisions to the plans shall be noted in a revision box on the plans. The information listed in the revision box shall include: the initiator of the revision, date, and a brief explanation of the nature of the revision.

3. Contents. In addition to the revisions that incorporated changes during construction, the record drawings shall include the following information gathered during construction:

    a. The final profile of the I-55 Bridges over McDowell Road and the Elton Road Bridge over I-55. The profile shall include the elevation along the centerline and a line three feet inboard of each gutter line. Points on the profile shall be taken at no greater than 25-foot intervals and shall include the beginning and end of each span.

    b. If any structure has pile foundations, information concerning the pile driving operation shall be listed to include pile and driving equipment data, final pile bearing, elevation of pile tip when plan bearing was obtained, final pile tip elevation, penetration into the ground, and pile driving analysis or wave evaluation analysis program data. This information shall be entered on each footing sheet, or be included as a new sheet inserted immediately following the pertinent sheet.

    c. If any structure has drilled shaft foundations, information concerning the installation of the shaft shall be listed to include the drilled shaft report. This information shall be entered on each footing sheet, or be included as a new sheet inserted immediately following the pertinent sheet.

    d. The verification of the final location of all relocated utility lines and electrical conduit lines & structures that are within the Project Right-of-Way.

e. The final location of all pipes, culverts, drainage structures and permanent ditch treatment.

f. All shop drawings in hard copy and PDF format.

4. Submission Requirements. Record drawings shall be submitted as follows:

a. One half-scale (Roadway and Bridge/Retaining Walls) (18" x 12") bond paper copy.

b. One copy on compact disc in PDF format set up to print full size. Specific instructions are provided in the Roadway Design Memo "Electronic Plan Delivery," dated August 25, 2010. This memo may be found on MDOT's website:

http://sp.mdot.ms.gov/Roadway%20Design/Lists/Design%20Memos/AllItems.aspx

c. Microstation CADD (Right-of-Way, roadway and bridge) drawings shall conform to MDOT standard levels and symbology used to develop the design drawings for the Project.

2.3 Project Management

The Contractor shall be responsible for ensuring that the Project is constructed in conformance with the Contract, all referenced documents and specifications, and applicable Laws.

The Contractor shall provide Project management services sufficient to supervise the activities of its subcontractors. The Contractor shall provide a sufficient number of persons on Site to provide for the construction management of the Project.

The Contractor shall attend meetings when requested by MDOT. The meetings shall include the Contractors Project Director or his designee, the Construction Manager and the project superintendent.

All meetings between MDOT and the Contractor shall have meeting minutes prepared by the Contractor. The meeting minutes shall be completed and sent to MDOT for concurrence within 5 days of the meeting.

Without relieving the Contractor of any of its responsibilities under the Contract, the Project Director shall have full authority to make the final decisions on behalf of the Contractor and have responsibility for communicating these decisions directly to MDOT.

Without relieving the Contractor of any of its responsibilities under the Contract, the Construction Manager or an approved designee must be present on Site, or within close proximity, fulltime as the Work is performed.

Without relieving the Contractor of any of its responsibilities under the Contract, MDOT will provide representatives assigned to the Project to monitor the Project progress and provide necessary coordination between MDOT and the Contractor. MDOT and Federal Highway Administration (FHWA) representatives will have full and complete access to the Project, the Work in progress, the Daily Diaries, and to other technical documents and Project records associated with design, construction, materials, quality control, materials installation, and testing. MDOT representatives shall be given seventy-two (72) hours advance notice and have the opportunity to participate in any meetings that may be held concerning the Project or the relationship between the Contractor and their consultants and subcontractors when such meetings are associated with technical matters, progress, or quality of the Project. As used in this paragraph, "notice" shall require actual written notice to the Engineer.

All correspondence to MDOT from the Contractor shall be accompanied by a transmittal using a sequential document number. Each transmittal will be addressed to the Engineer and will list the Project name and Project number. This will be followed by a subject reference that will be used as the document name. All correspondence is to be signed by the Project Director. Any other form of correspondence will not be considered as binding. Emails to various team members will also be entered into document control but will not be considered as official correspondence for purposes of direction unless backed up with a signed hard copy.

The Contractor shall provide a monthly status report with the monthly pay estimate, on all design submittals, Requests for Information and Requests for Revision.

2.4 Key Personnel

The Contractor shall maintain a directory of Key Personnel and contact numbers and shall provide at least one copy to MDOT and maintain a copy on-site. Key Personnel will include:

a. **Project Director** – The Project Director shall be the primary person in charge of and responsible for delivery of the Project in accordance with the contract requirements. The Project Director shall have full authority to make the final decisions on behalf of the Responder. During the procurement and pre-construction phases, the Project Director shall have responsibility for communicating these decisions directly to MDOT as the Proposer's main point of contact during these phases.

b. **Lead Design Engineer** – The Lead Design Engineer shall be in charge of and responsible for all aspects of the design of the Project.

c. **Construction Manager** – The Construction Manager reports directly to the Project Director and shall be responsible for the overall coordination of the Project including design and construction. The Construction Manager must be present at the site full-time. During the construction phase of the Project, the Construction Manager shall be the Contractor's main point of contact with MDOT.

d. Each **Construction Superintendent** should have a minimum of five (5) years of experience in supervising projects of similar scope and magnitude.

e. The **Project Surveyor** of the construction team should have a minimum of five (5) years of experience and demonstrate experience in roadway and bridge survey, layout, and construction staking work. The Project Surveyor is required to be a Professional Surveyor licensed in the State of Mississippi. Mississippi registration is not required to propose on the Project but is required prior to commencing the work.

f. **Environmental Manager** – The Environmental Manager should be responsible for adherence to all environmental requirements and commitments, including but not limited to erosion control inspections as required by the National Pollutant Discharge Elimination System (NPDES), the terms of the Storm Water Permit, if any, and other environmental rules and regulations. The Environmental Manager should be on-site and conduct all necessary reviews and inspections to ensure the Project is in compliance.

g. The **Safety Officer** should demonstrate knowledge of current OSHA requirements and at a minimum have completed the OSHA 10-Hour Construction Training.

h. **Traffic Control Manager -** The Traffic Control Manager shall be available on a twenty-four (24) hour per day basis throughout construction and be prepared to coordinate response to the Project upon notification of an emergency situation.

i. **Geotechnical Engineer -** The Geotechnical Engineer shall be responsible for all aspects of geotechnical engineering and evaluation for the project, including but not limited to retaining wall foundations, evaluation of potentially unstable soils, slope and embankment stability, settlement, and geotechnical earthwork considerations. He shall be available, as needed, during construction for earthwork and geotechnical project questions.

j. **Quality Control Manager** – The Quality Control Manager shall be responsible for assuring that the design, all workmanship, and materials, inspections, and testing are in compliance with the contract requirements. The Quality Control Manager shall report directly to the Project Director. The Quality Control Manager shall not be employed by the construction firm.

The Contractor shall not change or substitute any such Key Personnel except due to retirement, death, disability, incapacity or voluntary or involuntary termination of employment, or as otherwise approved by MDOT. Modifications to Key Personnel could result in poor performance evaluations at project closeout.

In order to obtain MDOT approval of a change to Key Personnel, a written request shall be delivered to MDOT's Authorized Representative. The request shall include:

a) The nature of the desired change,
b) The reason for the desired change, and
c) A statement of how the desired change will meet the required qualifications for the position/responsibility.

No such modification will be made without prior written approval from MDOT.

2.5 Deliverables

At a minimum, the Contractor shall submit the following to MDOT:

Deliverable	Review and Comment	Schedule	Reference Section
Preliminary Design Submittal	✔	At the end of Preliminary Design	2.2.2
Final Design Submittal	✔	Upon completion of Final Design	2.2.4
Release for Construction Submittal	✔	Prior to Construction	2.2.5
Request for Information		As Needed	2.2.6

Request for Revisions	✔	As Needed	2.2.7
Governmental Approvals and Permits		Seven (7) days after any correspondence is sent or received	II.D.2 of Section 902
Monthly Status Report	✔	Monthly	2.3

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

REQUEST FOR INFORMATION

State Project No.:	**RFI Number:**
Engineer of Record:	**Date Received by EOR:**
MDOT Project Engineer:	**Date Response Required:**
Contractor:	**Date Responded by EOR:**
Specification No.:	**Page No.:**
Plan Sheet No.:	**Detail:**

INFORMATION REQUESTED:

PROPOSED SOLUTION (If applicable):

By:	**Signature of Contractor:**	**Date:**

RESPONSE:

By:	**Signature (EOR):**	**Date:**

RESPONSE:

By:	**Signature (MDOT P.E.):**	**Date:**

3.0 QUALITY CONTROL/QUALITY ASSURANCE (QC/QA)

The Contractor shall prepare and submit a Design Quality Control Plan and a Construction Quality Control Plan.

3.1 Design Quality Control Requirements

The Contractor shall prepare and submit for MDOT's review and approval a Design Quality Control Plan (DQCP) for the Work. The DQCP shall be submitted to MDOT within seven (7) days from issuance of Notice to Proceed (NTP). The DQCP shall contain complete procedures for implementation. The DQCP shall include the requirements specified below. No submittal for design review shall be made to MDOT until the applicable sections of the DQCP have been approved by MDOT.

1. Design Quality Control Manager: The Design Quality Control Manager's responsibilities shall be limited to administering contracts with the independent firms, managing and ensuring Contractor compliance with the DQCP, resolution of quality related issues and certifying submittals comply with the Design Quality Control Plan. Note: These responsibilities cannot be delegated to another person.

2. Documentation: The Contractor shall maintain records of all independent checking of calculations and independent plan checking performed. These records shall be under the physical control of the Design Quality Control Manager in a form acceptable to MDOT. Bridge design and checking shall be completed in accordance with MDOT's policies.

3. Reporting Functions: The Design Quality Control Manager shall furnish to MDOT a monthly quality report. This monthly report shall include, as a minimum:

   - Summary of QC activities during the month; and
   - Quality problems and resolutions.

3.2 Contractor Construction Testing Requirements

The Contractor is required to conduct Quality Control sampling and testing for asphalt and structural concrete mixtures in accordance with Mississippi Standard Specifications for Road and Bridge Construction Sections 907-401.02.5 and 907-402.02.5 Contractor's Quality Management Program, Section 907-804.02.12 Contractor's Quality Control, and MDOT Special Provisions for all portions of the Work under these Sections. All test results shall be provided to MDOT in accordance with the Standard Specification for Road and Bridge Construction. The cost of these activities will be borne by the Contractor. MDOT will provide Inspection and Job Acceptance Testing of materials for all other items of work. MDOT's Inspection and Job Acceptance Testing does not relieve the Contractor of any requirements for component materials or the finished product required by the Contract; however, the Contractor will not be required to provide Quality Control testing.

The Contractor shall also provide the Pile Dynamic Analysis (PDA) monitoring and analysis for all test piles.

3.3 MDOT Inspection and Job Acceptance

MDOT will perform or cause to be performed Job Acceptance Testing and Inspection.

All materials and every part of the Work shall be subject to MDOT's Job Acceptance inspection and testing, as well as independent assurance testing by MDOT. MDOT, FHWA and all duly Authorized Representatives shall be allowed access to all parts of the Work and shall be furnished with information and assistance by the Contractor, as required, to make complete and detailed inspections and to do any testing that such representatives deem appropriate. All inspections and all tests conducted by MDOT and/or its duly authorized representatives that meet the acceptance standards constitute acceptance of the materials or work tested or inspected.

All sampling and testing will be in accordance with existing AASHTO, ASTM, or test methods used by MDOT. The Contractor shall cooperate with MDOT to allow the necessary testing to be conducted prior to proceeding to the next operation.

In addition, MDOT may perform additional tests to ensure that proper sampling and testing procedures are being followed and that testing equipment is functioning properly. This testing may consist of observing Contractor and MDOT personnel, as well as taking split samples for the purposes of comparison testing.

The minimum sampling frequency shall be as defined in the Contract and MDOT Standard Operating Procedure TMD 20-04-00-0000.

3.4 Contractor's Obligation to the Quality of Work

MDOT's testing in no way relieves the Contractor of its obligation to comply with the Contract requirements. All materials incorporated into the Project shall meet or exceed Contract requirements and specifications. Further, any testing by MDOT will not relieve the Contractor of any of its warranty obligations.

The Contractor shall be responsible for the items listed below.

1. Construction Quality Control Plan (CQCP): The Contractor shall submit a CQCP that outlines how the Contractor will address quality issues that occur during construction. These quality issues may be related to substandard test results or workmanship. The initial CQCP shall be submitted to MDOT for review and approval at least thirty (30) days prior to the beginning of any new construction. The CQCP shall be updated as necessary prior to the start of any specific construction operation. The CQCP shall include a list of personnel responsible for management of the Project, and define the authority of each individual. The CQCP shall also address the procedure for addressing any nonconforming work which may include correction of failing materials or poor workmanship.

2. Construction Quality Control Manager: The Construction Quality Control Manager's responsibilities shall include but not be limited to managing and ensuring Contractor compliance with the CQCP, the Contract documents, submission of the summary of quantities of materials placed on the Project to date, and resolution of any quality issues that might occur on the Project. Quantities are needed monthly to determine the frequency of materials sampling and testing for quality control referenced in Special Provision subsection 907-109.01.

3. The Construction Quality Control Manager shall be responsible for fully documenting the resolution of any nonconforming work. Nonconforming work shall be documented by a Nonconforming Work Report (NCR). The NCR process shall generally conform to the following:

    - Problem Identification – Nonconforming work identified by inspection or testing shall be fully documented using an established NCR form detailed in the CQCP. The NCR form should be copied to the Contractor, the Lead Design Engineer for the Project, and MDOT.

- Proposed Corrective Action – The Lead Design Engineer and the Contractor shall propose corrective action to address the NCR. The Contractor and the Lead Design Engineer may solicit MDOT input on the proposed action. The proposed corrective action shall be supported by engineering calculations supporting the recommendation and, if necessary, revised plan details fully describing the repair. The Construction Quality Control Manager shall forward the proposed corrective action to MDOT for concurrence or rejection.
- The agreed upon corrective action shall be completed by the Contractor in accordance with the NCR. The Construction Quality Control Manager shall observe the corrective action, record the completion and date on the NCR form.
- All completed corrective action by the Contractor is subject to inspection and testing by MDOT. Once the corrective action for the nonconforming work is complete, a completed NCR should be submitted to MDOT for final acceptance. All NCRs must be resolved prior to project closeout.

3.5 Uncovering, Removal and Correction of Work

MDOT reserves the right to direct the Contractor to remove and/or uncover portions of the Work for examination. After examination by MDOT, the Contractor shall restore the Work to the standard required by the RFC documents and the Contract. Should exposed Work fail to meet such standards, the Contractor shall continue exposing Work until the extent of the nonconforming work has been determined to MDOT's satisfaction. Any identified nonconforming Work shall be addressed by the above NCR process. All costs associated with removal and/or uncovering portions of the Work for examination, shall be at the Contractor's expense. No additional contract time will be granted for any uncovering, removing and restoring of the Work.

3.6 Deliverables

At a minimum, the Contractor shall submit the following to MDOT for review or comments:

Deliverable	Review and Approve	Schedule	Reference Section
Design Quality Control Plan	✔	Seven (7) days following NTP	3.1
Construction Quality Control Plan	✔	At least thirty (30) days prior to construction of new work	3.4
Monthly Design Quality Reports		Monthly	3.1
Summary of Quantities of Materials Reports		Monthly	3.4

4.0 NOT USED

5.0 ENVIRONMENTAL COMPLIANCE

5.1 Compliance with Environmental Commitments

The Contractor shall comply with all environmental commitments and requirements in the NEPA Approval including, but not limited to, the following:

1. The provisions of all environmental permits applicable to the Project, including any restrictions and agreements specifically agreed to or entered into by MDOT in obtaining permits for the Project.

2. Those stipulations and conditions under which the Mississippi Transportation Commission and/or MDOT received the NEPA Approval and any modifications resulting from the re-evaluation of the document.

3. Applicable Laws and regulations relating to potential or actual Hazardous Material that may be encountered in the course of carrying out the Contract.

4. Carrying out all necessary environmental commitments and permitting requirements required by regulatory authorities in the course of the construction.

5. Updating or extending approved permits obtained by the Contractor.

5.2 Design Phase

All plans and designs are to be prepared in accordance with all of the environmental commitments/requirements outlined in the Special Provisions and Notice to Proposers of this Contract and all environmental commitments in the Environmental Assessment (EA)/Finding of No Significant Impact (FONSI). The Lead Design Engineer shall assure MDOT that all plans and designs have been prepared in accordance with all of the environmental commitments/requirements by certified letter at the RFC submittal.

5.3 Preconstruction Conference(s)

The Contractor shall conduct one (or more, if appropriate) pre-construction conference(s) prior to any construction activity to discuss environmental and permitting issues, which conference shall include all subcontractors, and to the extent feasible, representatives from the U.S. Army Corps of Engineers, U.S. Fish & Wildlife Service, the Mississippi Department of Wildlife Fisheries and Parks, the Mississippi Department of Environmental Quality, the FHWA, the Contractor, MDOT, and others as deemed necessary.

5.4 Construction Phase(s)

The Contractor shall be responsible for compliance with all of the environmental commitments/requirements outlined in the Special Provisions and Notice to Proposers as provided in environmental commitments contained within the EA/FONSI. The commitments/requirements shall be complied with during all phases of the construction activities. Upon completion of the Construction Work, the Contractor shall certify that all construction activities have complied with all of the environmental commitments/requirements. MDOT will have the authority to suspend all Work for non-compliance with the environmental commitments/requirements.

5.5 Protection of Archaeological and Paleontological Remains and Materials

1. If archaeological or paleontological remains are uncovered, the Contractor shall immediately halt operation in the area of the discovery and notify MDOT.

2. Archaeological remains consist of any materials made or altered by man which remain from historic or prehistoric times (*i.e.* older than 50 years). Examples include old pottery fragments, metal, wood, arrowheads, stone implements or tools, human burials, historic docks, structures or not recent (*i.e.* older than 100 years) vessel ruins. Paleontological remains consist of old animal remains, original or fossilized, such as teeth, tusks, bone, or entire skeletons.

3. MDOT will have the authority to suspend the Work for the purpose of preserving, documenting, and recovering the remains and materials of archaeological and paleontological importance for the State. The Contractor shall carry out all instructions of MDOT for the protection of archaeological or paleontological remains, including steps to protect the Site from vandalism and unauthorized investigations, from accidental damage and from dangers such as heavy rainfall or runoff.

5.6 Wetlands and Water Quality Mitigation

1. The Contractor shall fulfill the terms and conditions of both the Clean Water Act Section 404 permit and the Section 401 Water Quality Certification, as required by the U.S. Army Corps of Engineers and the Mississippi Department of Environmental Quality respectively.

2. The Contractor shall maintain the natural low flow characteristics of all stream crossings, including temporary crossings as required in the approved permits.

5.7 Regulatory Compliance

The Contractor shall be responsible for all fines and penalties that may be assessed by an agency with jurisdiction in connection with the Contractor's failure to comply with applicable Environmental Laws or Environmental Approvals/Permits. Further, it shall be the Contractor's responsibility to correct, at its own expense, any violations caused by the Contractor, subcontractor, or any of its agents. Immediately upon receiving a written notice of violation or similar notification, the Contractor shall notify MDOT and provide all correspondence and details of the resolution of these warnings and/or violations.

5.8 Hazardous Material

5.8.1 Contractor Responsibilities

The Contractor is responsible for handling, storage, remediation, or disposal of any materials, wastes, substances and chemicals deemed to be hazardous under applicable state or federal law, (hereinafter "Hazardous Substances") encountered at the site which were known or should have been known at the time of submission of the remediation plan or introduced to the site by the Contractor or any of its agents. Upon encountering any Hazardous Substances, the Contractor shall stop work immediately in the affected area and duly notify MDOT and, if required by state or federal law, all government or quasi-government entities with jurisdiction over the Project or site.

5.8.2 Commission Responsibilities

Upon receiving notice of unidentified Hazardous Substances, the Commission will take necessary measures required to ensure that the Hazardous Substances are remediated or rendered harmless. Such necessary measures will include the Commission either (i) retaining qualified independent firm or (ii) negotiating a supplemental agreement with the Contractor.

5.8.3 Resuming Work

The Contractor shall resume work at the affected area of the Project only after written notice from MDOT in the case of Hazardous Substances unidentified in the remediation plan that the (i) Hazardous Substances have been removed or rendered harmless and (ii) all necessary approvals have been obtained from all government and quasi-government entities having jurisdiction over the Project.

5.8.4 Contractor's Hazardous Materials

The Contractor is responsible for Hazardous Materials actually brought to the Project by Contractor, Contractor's design consultants, subcontractors and suppliers or anyone for whose acts they may be or are liable. The Contractor is responsible for negligent or willful acts by the Contractor, Contractor's design consultants, subcontractors and suppliers or anyone for whose acts they may be responsible or are liable relating to Hazardous Substances found at the site.

5.9 Deliverables

If there are modifications to the project footprint or project design that warrant additional permits, permit modifications, and/or mitigation, the Contractor shall provide the following list of deliverable items:

Deliverables	Review and Comment	Schedule	Reference Section
Wetland and stream mitigation engineering drawings	✔	With final design plan submittal	5.6
Copy of Permit Applications		If Permit is submitted	5.6
Copy of Approved Permits		If Permit is approved	5.6
Certification of Completed Mitigation		If Certificate is received	5.6

6.0 NOT USED

7.0 UTILITIES

7.1 Commission's Responsibilities

The Commission has relocated all known utilities to accommodate the plans provided by MDOT. The Commission and MDOT have no further utility relocation responsibility for this Contract.

7.2 Contractor's Responsibility

As part of the Project Scope, the Contractor shall have the responsibility of coordinating the Project construction with all utilities that may be affected, including all known utilities as listed in Notice to Proposers 2382 DB. Any utilities conflicting with the design and construction of this Project shall be the responsibility of the Contractor. Furthermore, the Contractor shall be responsible for identifying the utility affected, coordinating an appropriate relocation, and shall use either the utility's own forces to complete the work or shall complete the work utilizing a contractor approved by the utility. The Contractor will be responsible for management and coordination of any utility relocation, including the submission of new or revised permit application(s) and any required mitigation. Contractor shall include the cost of utility management in his lump sum Contract Price.

Should the Contractor encounter a utility not listed in Notice to Proposers 2382 DB, the Contractor shall notify Commission in writing immediately. The contractor shall then prepare a cost estimate in the form of utility agreement and submit the cost estimates to MDOT for review and approval by MDOT prior to work commencing on any relocation. Relocation of any utility not listed in Notice to Proposers 2382 DB shall be considered Extra Work. For those utilities requiring relocation, the Contractor shall conform with Commission's "A Policy for Accommodating Utilities on Highway Rights of Way" and the Code of Federal Regulations, Title 23, Chapter 1, Subchapter G, part 645, subparts A and B.

7.3 Resolution of Conflicts

The resolution of any conflicts between utility companies and the construction of the Project shall be the responsibility of the Contractor. No additional compensation (time or dollars) will be allowed for any delays, inconveniences, damage sustained by Contractor or its subcontractors due to interference from utilities or the operation of relocating utilities for those utilities listed in Notice to Proposers 2382 DB. If the Contractor experiences delays with the Utility companies, MDOT shall be promptly notified and will cooperate and assist with reasonable requests from the Contractor in resolving the disputes between the parties.

7.4 Utility Avoidance and Losses

The Contractor shall design the Project to avoid conflicts with utilities where possible, and minimize impacts where conflicts cannot be avoided. Contractor will be responsible for all wastewater discharges and for water loss that occur in association with construction within the right-of-way during the term of the Contract.

7.5 Parallel Service

Contractor will maintain parallel service throughout any utility relocation construction. Contractor will ensure that service interruptions in excess of 24 hours are avoided.

7.6 Coordination

The Contractor shall initiate early coordination with all affected utilities and provide the utility companies with design plans for their use in developing Relocation Sketches as soon as the plans have reached a level of completeness adequate to allow the companies to fully understand the Project impacts. If a party other than the utility company prepares Relocation Sketches, there shall be a concurrence box on the plans where the utility company signs and accepts the Relocation Sketches as shown.

7.7 Documentation

The Contractor shall be responsible for collecting and submitting to Commission the following from each utility company that is located within the Project limits:

1. New or revised permit application(s) for relocation and any required mitigation;

2. Relocation Sketches;

3. Utility Agreements including cost estimate and relocation plans for all affected utilities in accordance with the terms of the executed MOAs;

4. Letters of "no conflict" where the company's facilities will not be impacted by the Project.

The Contractor shall assemble the information included in the Utility Agreements and Relocation Sketches in a final and complete form and in such a manner that MDOT may approve the submittals with minimal review. The Contractor shall ensure that there are no conflicts with the proposed highway improvements, or between each of the utility companies' relocation plans. The Contractor shall not begin their relocation work until authorized in writing by MDOT.

7.8 Certification

At the time the Contractor notifies MDOT that the Project has reached Final Completion, the Contractor shall certify to MDOT that 1) all utilities have been identified 2) that the utilities have been relocated as necessary, and 3) any related claims have been satisfied or will be satisfied by the Contractor.

7.9 Utility As-Builts

The Contractor shall accurately show the final location plan and profile of all utilities on the as-built drawings for the Project.

7.10 Deliverables

The Contractor shall provide the following list of deliverable items:

Deliverables	Review and Comment	Schedule	Reference Section
Permit Application(s) and any required mitigation, Utility Relocation Sketches and Utility Agreements	✔	As available	7.7
Utility Certification		Final Completion	7.8
As-Built Drawings	✔	30 days after completion of a portion of the Project	2.2.8

8.0 RIGHT-OF-WAY

8.1 New Right-of-Way

The Project shall be designed and constructed within the existing right-of-way.

9.0 SURVEY

9.1 Project Survey Coordination

The Contractor shall designate a Professional Surveyor licensed in the State of Mississippi as the responsible person in charge of all Contractor survey activities on the Project. The Contractor shall comply with the most recent and applicable Laws.

9.2 Contractor Supplied Survey

The Contractor shall survey the Project utilizing standard surveying practices as required to prepare preliminary plans, and final plans, and construct in accordance with applicable standards. The Contractor shall use the same survey control provided by MDOT. It is the Contractor's responsibility to verify the control for accuracy. MDOT is not responsible for the survey control if it has been disturbed.

9.3 Preservation of Survey Control Monuments

The Contractor shall verify and preserve all provided survey control monuments and any governmental defined land corners located on or within MDOT right-of-way. The Contractor shall notify MDOT as soon as it becomes known that a monument is in a position that will interfere with new construction or with Contractor operations.

9.4 Permission to Enter Property

The Contractor shall notify property owners before entering any private property and each property owner shall be contacted by the Contractor and asked to sign the MDOT Survey Notification form. An explanation of the purpose, nature, and approximate duration of the proposed work may be given to the property owner, but personnel should refrain from outlining any plans or policies that might be misconstrued. If the landowner lives out of state or cannot be physically contacted, the form should be mailed to the property owner. Contractor shall record all contacts carefully and accurately for future use. At a minimum, the record shall include the names of persons contacted, identifying them as owners or tenants, the date and time of conversation, telephone numbers and a summary of the conversation.

9.5 Right of Way Marker

The Contractor shall locate and preserve all Right-of-Way markers.

9.6 Deliverables

At a minimum, the Contractor shall submit the following to MDOT for review and comment:

Deliverable	Review and Comment	Schedule	Reference Section
Permission to enter property		As needed	9.4

10.0 GEOTECHNICAL

The Contractor shall determine the need for geotechnical information and conduct investigations as necessary to complete the analyses, design and construction in accordance with the latest edition of the AASHTO LRFD Bridge Design Specifications.

10.1 Geotechnical Planning Report

The Contractor shall prepare a Geotechnical Planning Report for the Project, including all Phases, and submit the Geotechnical Planning Report to MDOT within thirty (30) working days from NTP for review and written comment. The Geotechnical Planning Report shall include a detailed method statement describing the general philosophy and methods of design and construction and the rationale for selection of the proposed construction methods for all geotechnical and foundation aspects of the Project. The method statement shall indicate how material and design details are chosen to match selected construction methods and details, soil conditions, and groundwater environment.

The Geotechnical Planning Report shall define the engineering and design approach that will be followed in order to develop technically and environmentally acceptable and durable retaining structures, foundations, and all geotechnical designs for the project. The Geotechnical Planning Report shall discuss all aspects of the required geotechnical effort and design analysis.

The Geotechnical Planning Report shall outline the number and location of borings to be completed, the anticipated testing requirements, tests and frequency that will be necessary to implement during construction in order control the material placement on the project.

MDOT will review the Geotechnical Planning Report within fourteen (14) days of the submittal and will provide any review comments.

10.2 Geotechnical Exploration

10.2.1 General

The frequency, spacing, and depth of soil test borings shall be presented in the Geotechnical Planning Report. The Contractor shall obtain soil test borings needed to meet the requirements detailed in the Geotechnical Planning Report. The Contractor shall locate (station and offset and GPS coordinates) and establish ground line elevation at all soil test borings taken by the Contractor. The Contractor is solely responsible for the adequacy of the geotechnical information for this Project. An electronic copy of the final boring logs completed at the time of the preliminary design submittal, shall be submitted with the preliminary Geotechnical Report to MDOT in PDF or Microstation format.

The soil borings and laboratory data located in ProjectWise are Informational Documents. The Contractor assumes all liability/responsibility for the interpretation and use of this data for this Project.

10.2.2 Retaining Walls

Retaining wall borings shall be performed at the intervals shown in Table 10.4.2.1 of the AASHTO LRFD Bridge Design Specifications. Continuous flight auger borings are not acceptable. Sampling and testing shall be performed in accordance with Section 10.4- Soil and Rock Properties in the AASHTO LRFD Bridge Design Specifications.

10.2.3 Laboratory Testing

The Contractor shall perform laboratory soils tests of sufficient numbers and type to classify and ascertain the shear strength, conditions of stability, and consolidation characteristics of the materials encountered.

10.2.4 Geotechnical Report

The Contractor shall prepare a preliminary and final geotechnical report for all retaining walls and any other structures constructed for this Project, including the Initial Phase and any subsequent Phase. The preliminary geotechnical report shall provide the preliminary recommendations for the design of the selected structure foundations, reproductions of the field boring logs and a generalized soil profile along the alignment. The final geotechnical report shall summarize subsurface soils, foundation design recommendations including design earth and water pressures for retaining walls, laboratory testing results; provide a reproduction of the field boring logs and a generalized soil profile containing the location of all soil borings. In addition, the report shall indicate any special treatments of subgrades to be performed before paving. Each report shall be submitted to MDOT along with the final or preliminary plan submittal. The review of the report will be performed in accordance with the structure submittal plan review process. In addition, after construction of the foundations is complete, the Contractor shall provide a supplement to the report containing the actual field conditions encountered and as-built foundation data and information.

10.3 Geotechnical Design Criteria

10.3.1 Retaining Wall Foundations

Geotechnical design of retaining walls shall be performed in accordance with the latest edition of the AASHTO LRFD Bridge Design Specifications. Retaining walls shall be designed for at-rest earth pressure loads, at a minimum. Additional horizontal loads due to the presence of high volume change soils, sloping backfill, etc. shall be included if applicable. Deep foundations used for support of retaining walls shall be designed for axial compression, dragdown, uplift due to expansive soils, and lateral loading. The upper two feet of soil below the base of the retaining wall shall not be considered in the calculation of passive resistance for the determination of safety factors against overturning or sliding.

All retaining walls shall be designed for global stability in addition to internal stability.

10.3.2 Temporary Slopes

All temporary slopes shall be designed for stability. Slope stability analyses of all temporary slopes shall be completed by the Contractor. Temporary slopes shall be designed for a minimum factor of safety of 1.20.

10.4 Deep Foundation Verification

10.4.1 Driven Piles for Support of Retaining Walls

The Contractor shall monitor at least one pile at each retaining wall location with the PDA. The PDA piles may be production piles. PDA testing requires signal matching and determination of nominal resistance shall be made from a restrike. The first pile driven for each structure shall be the verification

pile. The Contractor shall submit the pile verification results including driving criteria and pile lengths within two (2) days after the completed driving of the verification test pile.

Pile driving criteria shall include calculations showing that the driving stresses will not exceed the allowable stresses. Driving criteria shall include the maximum stroke of the hammer and the pile cushion material.

10.4.2 Drilled Shafts for Support of Retaining Walls

The Contractor shall prepare inspection logs documenting each shaft construction activity, including casing installation, excavation, shaft bottom inspection, reinforcement installation and concrete placement. The logs shall fully document the work performed with frequent reference to date, time and casing/excavation elevation. In addition, the Contractor shall prepare and submit the logs documenting any subsurface investigation borings or rock core holes performed for the Contract at drilled shaft foundation locations.

Records for temporary or permanent casing shall include at least the following information: diameter and wall thickness of the casing; dimensions of any casing reinforcement; top and bottom elevations for the casing; method and equipment used for casing installation; any problems encountered during casing installation; and the name of the inspector.

The shaft excavation log shall contain at least the following information: identification number, location, and surface elevation of the shaft; description and approximate top and bottom elevation of each soil or rock material encountered; seepage or groundwater conditions; type and dimensions of tools and equipment used, and any changes to the tools and equipment; type of slurry used, if any, and the results of the slurry tests; any problems encountered; elevation of any changes in the shaft diameter; and the name of the inspector and any changes in the inspector.

Concrete placement records shall include at least the following information: concrete mix used; time of start and end of concrete placement; volume and start/end time for each truck load laced; concrete test results; concrete surface elevation and corresponding tremie tip elevation periodically during concrete placement; concrete yield curve (volume versus concrete elevation, actual and theoretical); and the name of the inspector.

A full set of shaft inspection logs for an individual drilled shaft shall be submitted within 2 days of the completion of concrete placement at the shaft.

10.5 Deliverables

At a minimum, the Contractor shall submit the following to MDOT for review and comment:

Deliverable	Review and Comment	Schedule	Reference Section
Geotechnical Planning Report	✔	Thirty (30) days after NTP1	10.1
Preliminary Geotechnical Report	✔	Submit during Preliminary Design Phase	10.2.4
Final Geotechnical Report	✔	Submit with Final Design Documents	10.2.4
Supplement to Final Geotechnical Report – As-Built	✔	Within One (1) Week of	10.2.4

Foundation Data and Information		Completion of Foundation Element	
Deep Foundation Verification – For PDA Test Piles Only	✔	Two (2) days after completion of the PDA verification pile	10.4.1

11.0 SIGNING, PAVEMENT MARKING, TRAFFIC SIGNALS, AND ITS

11.1 Signing

Signage shall be designed and constructed by Contractor to include all regulatory, warning, route marker, guide and information signs, and trailblazer signs.

Design plans shall include a permanent signing plan, overhead signing details, and directional sign details.

All regulatory, warning, route marker, guide and information signs, mounting requirements and vertical and horizontal clearances shall conform to the MUTCD (latest edition) and MDOT Standard Plans, and the requirements specified herein. Design and placement of signs shall consider future roadway widening.

All signs placed within Project Right-of-Way shall conform to all MDOT design policy, criteria, standards and specifications.

Sign posts and structures shall be designed and constructed in accordance with MDOT design policy, specifications and standards, and AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals. Sign structures shall be constructed utilizing structural steel.

The Contractor's design shall address modifications to permanent signing outside the Project Right-of-Way that are made inaccurate, ineffective, confusing or unnecessary by the Project.

All existing sign panels that require modification shall be replaced with new sign panels and supports.

11.2 Pavement Marking

11.2.1 Permanent Pavement Marking

Pavement markings shall be designed in accordance with the MUTCD (latest edition) and MDOT Standard Drawings. The permanent pavement marking system on MDOT owned roadways shall be according to Table 11.2.1, except that the frontage roads and local roads shall require thermoplastic. Rumble strips will be required on the interstate. Permanent raised pavement markers will be required.

11.2.2 Temporary Pavement Marking

Temporary pavement markings on I-55, including ramps, shall be 40-mil thermoplastic; however, temporary paint will be allowed if the next asphalt lift is to be placed within ten (10) days. Temporary pavement markings on frontage roads and local roads can be temporary paint. Temporary raised pavement markers are required on both I-55 and the frontage roads.

Table 11.2.1

MDOT Pavement Marking Policy 1/4/2010

	ASPHALT			OPEN GRADED FRICTION COURSE			CONCRETE		
	ADT < 2000	ADT 2000 - 30k	ADT > 30k	ADT < 2000	ADT 2000 - 30k	ADT > 30k	ADT < 2000	ADT 2000 - 30k	ADT > 30k
EDGE LINES	Rumble Stripe Paint (waterborne or high build) or Thermoplastic	Rumble Stripe Thermoplastic	Rumble Stripe Thermoplastic (90 mils) (Double-Drop)	Paint (waterborne or high build) or Thermoplastic	Thermoplastic	Thermoplastic (90 mils) (Double-Drop)	Paint (waterborne or high build), Thermoplastic, High Performance Cold Plastic Tape or Inverted Profile Thermoplastic or approved equal	Thermoplastic (90 mils)(Double-Drop), High Performance Cold Plastic Tape or Inverted Profile Thermoplastic or approved equal	Thermoplastic (90 mils)(Double-Drop), High Performance Cold Plastic Tape or Inverted Profile Thermoplastic or approved equal
CENTERLINES & LANELINES	Paint (waterborne or high build) or Thermoplastic & RPM's	Thermoplastic & RPM's	Thermoplastic (90 mils) (Double-Drop) & RPM's	Paint (waterborne or high build) or Thermoplastic & RPM's	Thermoplastic & RPM'S	Thermoplastic (90 mils) (Double-Drop) & RPM's	Paint(waterborne or high build), Thermoplastic, High Performance Cold Plastic Tape or Inverted Profile Thermoplastic or approved equal & RPM's	Thermoplastic (90 mils)(Double-Drop)High Performance Cold Plastic Tape or Inverted Profile Thermoplastic or approved equal & RPM's	Thermoplastic (90 mils)(Double-Drop)High Performance Cold Plastic Tape or Inverted Profile Thermoplastic or approved equal & RPM's
SYMBOLS	Paint (waterborne or high build) or Thermoplastic	Thermoplastic	Thermoplastic (120 mils)	Paint (waterborne or high build) or Thermoplastic	Thermoplastic	Thermoplastic (120 mils)	Paint (waterborne or high build), Thermoplastic, High Performance Cold Plastic Tape	Thermoplastic (120 mils)(Double-Drop), High Performance Cold Plastic Tape	Thermoplastic (120 mils)(Double-Drop), High Performance Cold Plastic Tape

NOTES:

1) Rumble Strips are required on the shoulders of new concrete pavement and open graded friction courses.
2) Rumble Stripe and Rumble Strips may be omitted from residential or business areas within the corporate limits of a city, or where curb and gutter gutter is present.
3) In places where two (2) foot paved shoulders cannot be provided, Rumble Stripes and Rumble Strips will not be required.
4) The District has the option to require the Double-Drop Bead system on routes with ADT < 30k.
5) If lane widths are less than 11 feet, rumble stripe is not required.
6) The use of any product that is not listed above shall require Chief Engineer approval, otherwise options are at the discretion of the District Engineer.
7) For concrete bridges and pavements, a minimum of two (2) products shall be cometetively bid against each other if thermoplastic or paint is not used.

Larry L. Butch Brown — Date
Executive Director

AR Hughes 1/19/10
Andrew Hughes — Date
FHWA Division Administrator

11.3 Traffic Signals

Design of traffic signal plans will include layout of traffic signal poles and controllers, type of poles to be used, geometric roadway changes if necessary, surveys, equipment and component design and recapitulation of quantities, and design of interconnected traffic signal systems and design/method of interconnection.

Signal system phase times, cycle lengths and intersection offsets will be developed using MDOT approved timing analyses software at the direction of the Roadway Design Division Engineer, while in consultation with the Traffic Engineering Division. Timing information will be reduced to spreadsheet format to facilitate data entry by, or under the direction of, the Traffic Engineering Division.

11.4 Intelligent Transportation Systems

ITS plans shall consist of plan layout sheets of the proposed roadway within the roadway project limits and aerial layout sheets outside of the roadway project limits that include ITS elements. The ITS design shall include CCTV cameras providing full coverage of the roadway (maximum two mile spacing), detection devices spaced approximately one mile apart, Dynamic Message signs at the locations identified in Notice to Proposers No. 2618 DB (Project Scope), a fiber optic communications system, and all related equipment and appurtenances.

Fiber design shall be provided by the Contractor to add new fiber and establish communication from field devices to MDOT's statewide Traffic Management Center (TMC) in accordance with MDOT's existing fiber allocation plan. The fiber network and field devices shall be IP compatible throughout the network and interface to existing OTN network nodes outside the project limits. All networking and fiber equipment necessary shall be included.

ITS plans shall include but are not limited to the following: sheet index, aerial layout or plan sheets and special detail sheets.

The Contractor shall submit the final plans with all special provisions, general construction notes and quantities for ITS elements.

All field devices shall require software integration into the existing MDOT Statewide Traffic Management Center located at 2567 N. West St. Jackson, Mississippi 39216.

Field maintenance and operations training is required for all ITS field devices installed on this contract.

11.5 Deliverables

Deliverable	Review and Comment	Schedule	Reference Section
Preliminary Plans (30%)	✔	According to Contractor's Schedule	2.2.2
Final Plans (100%)	✔	Prior to Request for Release for Construction	2.2.4
Shop Drawings Prior to Fabrication of Signs	✔	According to Contractor's Schedule	

Release for Construction Plans	✔	According to Contractor's Schedule	2.2.5
ITS Submittals	✔	According to Contractor's Schedule	
As-Built Drawings and Records	✔	30 days after Completion of Construction	2.2.8

12.0 DRAINAGE

12.1 Drainage Criteria

The Project shall include all Work for the design and construction of drainage facilities including temporary and permanent erosion control measures. Project design will be in compliance with the MDOT Roadway Design Manual Chapter 7. All pipe culverts shall meet the requirements of MDOT Pipe Culvert Material Design Criteria.

12.2 Coordination with Other Agencies

The Contractor shall coordinate all drainage issues with affected regulatory agencies that have interest or jurisdiction over the Project.

The Contractor shall copy MDOT on all correspondence, promptly advise of any direct contact and give advance notice of any meetings and/or hearings with affected regulatory agencies.

12.3 Hydraulic Design of Structures

Hydraulic design and analysis is required for all drainage structures and shall be in conformance with the MDOT Roadway Design Manual, AASHTO Drainage Manual, AASHTO LRFD Bridge Design Specifications, FHWA Hydraulic Engineering Circulars and Publications, 23 CFR 625, 630 and 650, 44 CFR Part 59-78, the Floodplain Management Regulations for the State of Mississippi (Chapter 5, General Laws of 1979, 1st Extraordinary Session of the State, as amended and supplemented from time to time), National Flood Insurance Program (NFIP) regulations, and Federal Emergency Management Agency (FEMA) regulations and any other applicable Laws.

For structures with drainage areas less than 1000 acres, the design flood for encroachments by through lanes of Interstate highways shall not be less than the flood with a 2 percent chance of being exceeded in any given year per 23 CFR 650.115. Further design flood classifications and standards are specified in the Roadway Design Manual, Chapter 7 Drainage. The Contractor shall conduct the operations and maintain the work in such condition to provide adequate drainage at all times. The Contractor shall not obstruct existing functioning storm sewers, gutters, ditches, and other run-off facilities.

The structure at Station 858+58 shall be designed, so that there is no increase in the flow rate of water at Timber Ridge Townhouse Apartment Complex.

Hydraulic design of culverts shall be based on the applicable FHWA Circulars and Publications as well as the MDOT Roadway Design Manual. This may include but is not limited to Hydraulic Design of Highway Culverts (HDS-5), FHWA Publication, Urban Drainage Design Manual, and Hydraulic Engineering Circular No. 22 (HEC-22).

The Contractor shall submit to MDOT a copy of final structure recommendations, all hydraulic computations, supporting data and documentation, including but not limited to:

1) FINAL STRUCTURE RECOMMENDATIONS: The Hydraulic Structure Recommendations shall be on the appropriate MDOT forms as required. Design data for culverts shall be recorded and provided on the Culvert Hydraulic Design Summary Table as stated in the MDOT Roadway Design Manual, see Figure 7-3A. The table shall be included with the plans.

12.4 Deliverables

The Contractor shall provide the following list of deliverable items:

Deliverables	Review and Comment	Schedule	Reference Section
Final Structure Recommendations	✔	With Preliminary Design	12.3
Structure Hydraulic Design Computations and Supporting Data for all culverts, box bridges and bridges	✔	With Preliminary Design	12.3

13.0 ROADWAYS AND PAVEMENTS

13.1 Roadway Design Criteria

The design on I-55 will be in compliance with the MDOT Roadway Design Manual, freeway conditions, rolling terrain and urban setting. The design of roadways will be in accordance with Table 13.9-1. Table 2-7B of the MDOT Roadway Design Manual shall be revised as detailed in Table 13.9-1.

13.2 Horizontal Alignment

The existing horizontal alignment of the mainline interstate will remain.

The vertical alignment shall meet the requirements shown in Table 13.9-1 of the MDOT Roadway Design Manual.

13.3 Earthwork and Grading

Roadway earthwork and grading design and construction will conform to the typical sections and the following specific requirements:

The minimum embankment slopes, outside of the clear zone in areas with no barriers, will be constructed using normal 3:1 slopes unless flatter slopes are determined to be necessary. Embankments will be constructed with suitable material acquired from either onsite excavation or hauled from offsite borrow pits or a combination of both. Embankment material shall be placed and compacted in accordance with the contract documents. Slopes behind barriers protecting traffic from steep slopes can be as steep as 2:1. In areas protected by barriers, slopes steeper than 2:1 may be used if permanent stability is achieved, and with the approval of the Engineer. Any fill slopes on the frontage road steeper than 3:1 need to be protected by/with guard rail.

Safety barriers shall be used to protect motorists from obstructions.

The Contractor shall perform excavation and undercut of the roadway, side slopes, ditches and channels, structures, and all other items necessary for the construction of this Project. Excavation shall include all materials above the subgrade and undercut and the disposal of all materials not suitable for re-use in construction. Undercut shall be 3’ deep (measured from top of subgrade) and is required from BOP to EOP on the mainline interstate, including acceleration and deceleration lanes. The undercut shall extend from ditch line to ditch line. If unstable material is encountered at the base of the undercut, the Contractor is responsible for processing, chemically treating, or undercutting additional depth until stability is achieved. Stability will be determined by the Project Engineer. Backfill material for undercut sections and all fill material for the Project shall be Class B9-6 with a maximum allowed Volume Change (VC) of 50%, or Class B-15 Borrow.

The Contractor shall be responsible for locating and obtaining all borrow material required for this Project, including all approvals, permits, and fees required for obtaining and hauling the borrow material.

Grading of excavated areas, embankments and other areas disturbed by construction shall meet all erosion and sedimentation control requirements. More than routine BMP measures can be expected along areas where there is limited space between mainline embankments and existing frontage roads and limited right of way on the outside of frontage roads.

13.4 Mainline Pavement Design

Pavement design shall be as follows:

Reconstructed Mainline & Accel/Decel Lanes (BOP to 750+00), and Inside Shoulder (566+50 to 750+00)

1.00” Asphalt Pavement, OGFC (9.5 mm Mix) (1@1)*
1.50” Asphalt Pavement, SMA (9.5 mm Mix) (1@1.5)*
2.00” Asphalt Pavement, SMA (12.5 mm Mix) (1@2)
2.25” Asphalt Pavement, HT (19 mm Mix) (1@2.25)
3.00” Asphalt Pavement, HT (19 mm Mix) (1@3)
3.00” Asphalt Pavement, ST (19 mm Mix) (1@3)
6.00” Chemically Treated Granular Material (9/C)
18.75” Structure Thickness
6.00” Chemically Treated Subgrade

Reconstructed Mainline, Inside Shoulder & Accel/Decel Lanes (750+00 to EOP)
1.00” Asphalt Pavement, OGFC (9.5 mm Mix) (1@1)*
1.50” Asphalt Pavement, SMA (9.5 mm Mix) (1@1.5)*
2.00” Asphalt Pavement, SMA (12.5 mm Mix) (1@2)
3.25” Asphalt Pavement, HT (19 mm Mix) (1@3.25)
3.00” Asphalt Pavement, HT (19 mm Mix) (1@3)
3.00” Asphalt Pavement, ST (19 mm Mix) (1@3)
6.00” Chemically Treated Granular Material (9/C)
19.75” Structure Thickness
6.00” Chemically Treated Subgrade

Inside Shoulder (BOP to 566+50)
1.50” Asphalt Pavement, SMA (9.5 mm Mix) (1@1.5)*
2.00” Asphalt Pavement, SMA (12.5 mm Mix) (1@2)
2.25” Asphalt Pavement, HT (19 mm Mix) (1@2.25)
6.00” Untreated Granular Material (9/C) or Crushed Limestone
6.00” Chemically Treated Granular Material (9/C)
17.75” Structure Thickness
6.00”Chemically Treated Subgrade

Outside Shoulder (BOP to 750+00)
1.50” Asphalt Pavement, ST (9.5 mm Mix) (1@1.5)*
2.00” Asphalt Pavement, ST (12.5 mm Mix) (1@2)
2.25” Asphalt Pavement, ST (19 mm Mix) (1@2.25)
3.00” Asphalt Pavement, ST (19 mm Mix) (1@3)
3.00” Asphalt Pavement, ST (19 mm Mix) (1@3)
6.00” Chemically Treated Granular Material (9/C)
17.75” Structure Thickness
6.00” Chemically Treated Subgrade

Outside Shoulder (750+00 to EOP)
1.50” Asphalt Pavement, ST (9.5 mm Mix) (1@1.5)*
2.00” Asphalt Pavement, ST (12.5 mm Mix) (1@2)
3.25” Asphalt Pavement, ST (19 mm Mix) (1@3.25)
3.00” Asphalt Pavement, HT (19 mm Mix) (1@3)
3.00” Asphalt Pavement, ST (19 mm Mix) (1@3)
6.00” Chemically Treated Granular Material (9/C)

18.75” Structure Thickness
6.00” Chemically Treated Subgrade

* To be placed after opening to 6-lane traffic.

13.5 Interchange Ramp, Loop and Frontage Road Pavement Designs

Newly constructed sections of interchange ramps and loops shall have the same pavement design of the adjacent mainline section, except for the 1” OFGC, which will be omitted from the ramps.

Mill and Overlay of existing ramps and loops
2.00” Cold Milling
1.50” Asphalt Pavement, SMA (9.5 mm Mix) (1@1.5)
2.00” Asphalt Pavement, SMA (12.5 mm Mix) (1@2)

The existing vertical and horizontal alignments of the frontage roads may remain unchanged. The portions of the frontage roads that are not reconstructed shall be milled 1.5,” and a 1.5” overlay consisting of HT asphalt pavement (9.5-mm Mix) is required. Full depth replacement of failed areas is required.

Reconstructed West Frontage Road (Station 775+00 to Station 788+00)
1.50” Asphalt Pavement, HT (9.5 mm Mix) (1@1.5)
2.00” Asphalt Pavement, HT (12.5 mm Mix) (1@2)
2.50” Asphalt Pavement, ST (19 mm Mix) (1@2.5)
3.00” Asphalt Pavement, ST (19 mm Mix) (1 @3)
6.00” Crushed Limestone (3/4” & down) Base w/ Geotextile Stabilization, Type V, non-woven
15.00” Structure Thickness

13.6 Crushed Limestone Base

Some areas may require the use of Crushed Limestone base in lieu of chemically treated granular material. This substitution will only be allowed in areas such as temporary connections to interchange ramps for traffic control phasing. In those areas a 9.00” Crushed Limestone base is required to replace the 6” chemically treated granular material. Use of the Crushed Limestone base will not be allowed if proper drainage of the subgrade is not provided.

13.7 Roadway Safety

All roadway guardrail and roadside barriers shall be designed according to design speed using current MDOT standards and shall meet requirements for NCHRP 350 TL-3. All permanent concrete barriers shall be cast-in-place. All roadway pavement sections on the Project shall incorporate rumble strips along the inside and outside shoulders.

Bridge piers shall be protected with LRFD concrete barriers.

Table 13.9-1 Typical Roadway Section Criteria

	Interstates (Mainline)	Ramps
Functional Classification	Freeway	N/A
Design Speed	60 mph	45 MPH
Control of Access	Full (type 1)	Full (Type 1)
Number of Through Lanes	6	1 See Note 1
Lane Width	12 ft.	16 ft.
Outside Shoulder Width, Usable	14 ft.	10 ft.
Outside Shoulder Width, Surfaced	12 ft./14 ft. See Note 10	8 ft.
Median Shoulder Width, Usable	14 ft.	6 ft.
Median Shoulder Width, Surfaced	11 ft.	3 ft.
Auxiliary Lane Width	12 ft.	
Auxiliary Lane Shoulder Width	10 ft. surfaced 12 ft. useable	
Median Type	Concrete median barrier	
Median Minimum Width	26 ft.	
Cross Slope Travel Lane	2% See Note 11	2%
Cross Slope Shoulder	4 %	4%
Total (Final) Bridge Minimum Width	Existing	
Minimum Clear Span	Per Section 15.3.1	
Roadside Clear Zone (Obstruction)	30 ft.	See Note 6
Cut Foreslope (Within Clear Zone)	6:1	6:1
Depth of Ditch	4 ft.	4 ft.
Cut Backslope	3:1	3:1
Safety Slope (Within clear Zone)	6:1	6:1
Fill Slope (Outside Clear Zone)	3:1 See Note 12	3:1 See Note 12
Stopping Sight Distance (AASHTO)	570 ft.	360 ft.
Minimum Radius for Horizontal Curves	existing	540 ft.
Superelevation Rate	See table 3-4 A (e_{max} =0.10)	See Note 8
Maximum Grade	4%	6.5%
Vertical Curve K Factor (Crest) (MDOT)	192	80
Vertical Curve K Factor (Sag) (AASHTO)	136	79

Notes for Table 13.9-1

1. All interchange ramps are 1 lane except SB exit at Siwell Rd. SB exit ramp at Siwell Rd is 2 lanes at gore, and transitions to 3 lanes. Multilane ramp lane widths are 12 ft.

2. The minimum vertical clearance for all bridges over highways and streets shall be per Section 15.3.1.

3. Horizontal Sight Distances- See Subsection 3.50 in the MDOT Roadway Design Manual for applicable criteria.

4. T.W. refers to the travel way or the total lane width.

5. Approach Roadway width is defined by the total lane width plus the total useable shoulder.

6. Clear zone to be based upon speed, side slope and traffic volume.

7. Where auxiliary lanes are used along the mainline, clear zone is measured for the outside edge of the auxiliary lane.

8. The superelevation rate for new curves shall be designed with e_{max} =0.10.

9. Vertical curve K factors do not apply near the ramp tie-in where the profiles are controlled by the cross slope of the tie-in roadway.

10. Outside paved shoulder width are 12 ft. in areas with no barrier present and 14 ft. in areas with barrier.

11. Cross slope of 2.5 % required beyond the 2nd lane in each direction.

12. 2:1 slopes allowed behind barrier.

13.8 Deliverables

At a minimum, the Contractor shall submit the following to MDOT for review or comment:

Deliverable	Review and Comment	Schedule	Reference Section
Preliminary Plans (30%) and Cross Sections	✔	According to Contractor's Schedule	2.2.2
Final Plans (100%) and Cross Sections	✔	Prior to Request For Release for Construction	2.2.4
Release for Construction Plans and Cross Sections	✔	According to Contractor's Schedule	2.2.5
As-Built Drawings	✔	30 days after Completion of Construction	2.2.8

14.0 ROADWAY LIGHTING

Roadway lighting shall be included in the project. The Contractor shall design and build continuous freeway lighting and complete interchange lighting throughout the project. This shall include the roadway and interchanges to the No Access limit. The frontage roads will not be lit.

The Contractor shall determine the most effective means of lighting the roadway to achieve the lighting levels required by AASHTO and FHWA. The plans shall show the location of the proposed lighting assemblies and provide information for MDOT's review. Height of poles, number of luminaries, type of lamps, location and size of wire, foundation design and any special features required shall be indicated on the plans. The Contractor shall ensure that the proposed layout satisfies the AASHTO and FHWA requirements for the type of roadway being lit.

Lighting plans shall include lighting layouts; legend; lighting notes; summary of quantities; estimated quantities; special design sheets and special provisions. The Contractor may utilize the already installed equipment and whatever he is provided that he determines will meet his requirements. The Contractor must provide all warranties and guarantees required in the Standard Specifications.

The Contractor may also be requested to review and approve submittals and shop drawings, design calculations, any other supplemental contract drawings and details reasonably associated with construction projects and/ or equipment proposed for installation on this project. The Contractor shall be available to answer questions concerning technical aspects of the project (i.e. electrical, lighting, etc.) when requested by the Project Manager.

14.1 Deliverables

At a minimum, the Contractor shall submit the following to MDOT for review or comment:

Deliverable	Review and Comment	Schedule	Reference Section
Preliminary Plans (30%)	✔	According to Contractor's Schedule	2.2.2
Final Plans (100%)	✔	Prior to Request For Release for Construction	2.2.4
Release for Construction Plans	✔	According to Contractor's Schedule	2.2.5
As-Built Drawings	✔	30 days after Completion of Construction	2.2.8

15.0 EXISTING STRUCTURES

The following applies to all modifications to existing structures to be designed by the Contractor. The existing structures are those listed below:

I-55 Bridges over McDowell Road
Daniel Lake Blvd Bridge over I-55
Savanna Street Bridge over I-55
Elton Road Bridge over I-55
Old Byram Road Bridge over I-55
Siwell Road Bridge over I-55

15.1 Design Methodology

All existing structures' structural components shall be designed by the AASHTO *Standard Specifications for the Design of Highway Bridges* methodology.

15.2 Loads and Forces

The existing structures' structural components contained in this Project shall be proportioned for loads and forces in accordance with the latest edition of AASHTO *Standard Specifications for the Design of Highway Bridges*.

15.2.1 Live Loads

Live loads for all existing structures' components shall be calculated in accordance with AASHTO Standard Specifications for the Design of Highway Bridges. Vehicular live loading on the roadway of bridges or incidental structures shall be HS20-44.

15.3 General Requirements for Bridges

15.3.1 Bridge Superstructures

1. For the I-55 Bridges over McDowell Road, the bridge slab removal lines shall be located 2'-0" from slab edge at joint. At the removal lines, the existing concrete bridge deck shall be saw cut to a depth of 1 inch below the top of deck to provide a neat construction joint surface.

2. For the I-55 Bridges over McDowell Road, at the locations where the bridge decks are to be repaired, the existing bridge end pavements shall be removed and replaced in accordance to the Attachments to the Technical Requirements.

3. For the I-55 Bridges over McDowell Road, the bridge deck slope shall match the existing bridge cross slope.

4. Vertical Clearance for the bridges over I-55 shall not be less than:

    a. Daniel Lake Blvd. Bridge over I-55 - 16.19 ft.

    b. Savanna Street Bridge over I-55 – 16.11 ft.

c. Elton Road Bridge over I-55 – 16.12 ft.

d. Old Byram Road Bridge over I-55 – 16.03 ft.

e. Siwell Road Bridge over I-55 – 16.96 ft.

5. Minimum Clear Span for the bridges over I-55 shall not be less than:

   a. Daniel Lake Blvd. Bridge over I-55 - 54.95 ft.

   b. Savanna Street Bridge over I-55 – 54.91 ft.

   c. Elton Road Bridge over I-55 – 58.98 ft.

   d. Old Byram Road Bridge over I-55 – 58.98 ft.

   e. Siwell Road Bridge over I-55 – 80.11 ft.

6. For the I-55 Bridges over McDowell Road, the bridge deck joints shall be open type and match the size and location of the existing bridge joints and shall be sealed in accordance to details on the Attachments to the Technical Requirements.

7. For the I-55 Bridges over McDowell Road, final surface texture of the bridge decks and bridge end pavements shall match the finish of the existing bridge decks and bridge end pavements.

15.3.2 Bridge Substructures

For the I-55 Bridges over McDowell Road, repairs to bridge abutment end walls shall be reinforced concrete components. End walls that are to be repaired shall be removed to the top of paving bracket.

For bridges over I-55, concrete pier protection is required when the horizontal clearance from the edge of travel way to bridge piers is less than 30'. Pier protection shall utilize a cast-in-place concrete barrier with footing and shall be designed in accordance with Section 13.7 of the Technical Requirements.

15.3.3 Debris Removal

All portions of the bridge(s) to be removed shall become the property of the Contractor and removed from the site.

15.4 Bridge Design Criteria

15.4.1 Concrete Design

15.4.1.1 Reinforced Concrete

All concrete shall be designed and produced in accordance with Mississippi Standard Specifications for Road and Bridge Construction Section 804 Table 3. Cement used in concrete shall meet the requirements of Section 701 of the Mississippi Standard Specifications for Road and Bridge Construction.

Cast-in-Place Concrete:

Class AA
f'c = 4,000 psi

15.4.1.2 Reinforcing Steel

1. Cast-in-place concrete shall be reinforced only with deformed bars conforming to AASHTO M31 (ASTM A 615) or A 706. Reinforcement to be welded shall conform to ASTM A 706. Reinforcing steel shall be Grade 60.

2. Cast-in-Place Concrete Clear Cover per AASHTO.

3. At the deck and abutments, the existing reinforcing steel shall be made continuous by the use of lap splices or mechanical couplers.

4. Mechanical couplers may not be used in any case in which the resulting clear cover over the newly installed coupler is less than 1 inch.

5. Existing bridge decks that have a clear cover of less than 1 inch shall use a non-contact lap splice.

15.4.1.3 Allowable Stress, Deflection and Strength Considerations

1. Reinforced concrete structures shall be designed by the Load Factor Design Method in accordance with AASHTO Article 8.16, Serviceability Requirements.

2. Flexural members shall be checked for serviceability in accordance with AASHTO Article 8.16.8.

15.4.2 Bridge Railings

All barriers shall be New Jersey Shape concrete barrier which meets NCHRP Report 350 TL-4 criteria. The surface of the bridge rails shall be given a spray finish in accordance with Mississippi Standard Specifications for Road and Bridge Construction, Section 804.03.19.3.2 Spray Finishes**.**

15.4.3 Expansion Joints

Expansion joints shall be provided to accommodate the movement of the bridge. All existing bridge joints at the I-55 Bridge over McDowell Road and at the Elton Road Bridge that have not been repaired shall be repaired. Existing bridge joint expansion device shall be removed, the concrete repaired and the full transverse joint width sealed as per details shown in the Attachments to the Technical Requirements.

Cellular or modular joints shall not be used.

15.4.4 Cranes on Existing Bridges

Cranes may be placed on existing bridges provided that the Lead Design Engineer has determined that the existing structure can safely support the proposed crane at an inventory rating. Crane mats shall be placed over the portion of the bridge deck that the crane will cross or set up on. Contractor shall submit stamped

calculations and supporting documentation to MDOT demonstrating that the existing bridge can safely carry the crane load.

Any damage to the bridge or bridge deck shall be immediately repaired by the Contractor and approved by MDOT.

15.4.5 Not Used

15.4.6 Temporary Concrete Traffic Barriers

Temporary concrete traffic barriers which meet the NCHRP Report 350 TL-3 criteria shall be used on the bridge deck to separate the work area from the traffic. When the temporary concrete traffic barriers are to be placed less than eight (8) ft. from an open edge of bridge deck, the barriers shall be safely attached to the bridge deck. The bridge deck attachments shall be designed to carry the TL-3 loading. When the temporary concrete traffic barriers are removed from the bridge deck, the attachments shall be completely removed and the deck repaired with a non-shrink grout. Design calculations and plan sheets shall be submitted to MDOT for review in the Final Design Review Phase (Section 2.2.4).

15.5 Deliverables

At a minimum the Contractor shall submit the following to MDOT:

Deliverable	Review and Comment	Schedule	Reference Section
Preliminary Design	✔	According to Contractor's Schedule	2.2.2
Final Design	✔	Prior to RFC Submittal	2.2.4
RFC Documents	✔	Prior to Construction of the designed portion of Project	2.2.5
As-Built Drawings and Records	✔	30 days following Construction of the designed portion of Project	2.2.8
Temporary Concrete Traffic Barrier Details and Calculations	✔	At the Final Design Review Phase	15.4.6

16.0 RETAINING WALL SYSTEMS

The following applies to all new retaining wall systems, partially constructed retaining wall systems, and structural components designed by the Contractor per Section 904 – Notice to Proposers No. 2618 DB (Project Scope). Geotechnical design shall be in accordance with the Geotechnical Section of these Technical Requirements.

16.1 Design Methodology

All structural components of the Project shall be designed by the AASHTO Load and Resistant Factor Design (LRFD) methodology.

16.2 Loads and Forces

The structures contained in this Project shall be proportioned for loads and forces in accordance with the latest edition of AASHTO LRFD Bridge Design Specifications.

16.2.1 Live Loads

Live loads shall be calculated in accordance with AASHTO LRFD Bridge Design Specification (HL-93).

16.2.2 Thermal Movement

Thermal movement shall be calculated in accordance with the latest edition of AASHTO LRFD Bridge Design Specifications.

16.3 General Requirements

1. All retaining wall systems with components visible to traffic shall have an architectural finish (such as architectural panels, architectural form liners, decorative coping, etc.) All architectural finishes will be subject to MDOT approval.

2. Exposed portions of drilled shaft and steel piling systems are required to be completely covered with a concrete architectural finish and will not be allowed to be painted and remain visible.

3. All Retaining wall systems are required to have an architectural coping system at the top with a system for draining groundwater to the ends of the wall.

4. Cast-in-Place retaining wall systems requiring over-excavation and replacement of select backfill material shall contain a drainage system to drain water within the retained soil to the ends of the wall system.

5. Retaining wall systems constructed from the top down, requiring little or no excavation of the retained soil do not require a drainage system to drain the water within the retained soil. In this case, the retaining wall system shall be designed for a high water table.

6. Shallow foundation wall systems (such as MSE and Soil Nails) are not acceptable.

7. Temporary shoring, if required, shall be designed by the Contractor in accordance with the current AASHTO LRFD Bridge Design Specifications.

8. All concrete faces that contain architectural finishes shall have the clear cover distance measured from the concrete reinforcing steel layer to the deepest portion of the architectural treatment. Minimum clear cover distances shall be per Section 16.4.1.2 of the Technical Requirements.

9. Tie back walls systems are not acceptable (including those used with deep foundations).

10. Timber retaining wall systems are not acceptable.

16.4 Design Criteria

16.4.1 Concrete Design

16.4.1.1 Reinforced Concrete

All concrete shall be designed and produced in accordance with MDOT Standard Specifications Section 804 Table 3. Cement used in concrete shall meet the requirements of Section 701 of the Mississippi Standard Specifications for Road and Bridge Construction.

Cast-in-Place Concrete:
Class B
f'c = 3,500 psi

Drilled Shaft Concrete:
Class DS
f'c = 4,000 psi

Precast Concrete:
Class B
f'c = 3,500 psi

16.4.1.2 Reinforcing Steel

1. Cast-in-place/precast concrete shall be reinforced only with deformed bars conforming to AASHTO M31 (ASTM A 615) or A 706. Reinforcement to be welded shall conform to ASTM A 706. Reinforcing steel shall be Grade 60.

2. Cast-in-Place/Precast Concrete Clear Cover -

   i. Drilled Shafts – 6” to the main reinforcing steel
   ii. Footings – Bottom Mat – 4”
   iii. Footings – Top Mat – 3”
   iv. Pedestals and Columns – 3”
   v. All other reinforcing steel per AASHTO

16.4.1.3 Prestressing Steel

1. Prestressing Steel shall conform to AASHTO M 203 (ASTM A 416). Prestressing Strand shall be weldless in accordance with AASHTO 203, subsection 8.1.4.

16.4.1.4 Allowable Stress, Deflection and Strength Considerations

1. Reinforced concrete structures shall be designed in accordance with AASHTO LRFD Bridge Design Specifications.

16.4.1.5 Special Considerations Concrete Retaining Systems

1. Architectural finishes and the portion of concrete that contains the finish shall not be considered as contributing to the structural capacity of the wall system.

2. The minimum stem thickness of all cast-in-place cantilever wall systems shall be twelve (12) inches.

3. All expansion/contraction joint locations, both horizontal and vertical shall contain a continuous water stop. Vertical expansion joints shall contain dowel bars extending into adjacent panel sections. Dowels shall be in contact with the concrete (fixed) in one panel and unbonded with the concrete (free) in the adjacent panel. Vertical keyed contraction joints with continuous water stops are required every 20 feet to 24 feet along the length of the retaining wall.

16.4.1.6 Prestressed Concrete

All concrete shall be designed and produced in accordance with MDOT Standard Specifications Section 804 Table 3. Cement used in concrete shall meet the requirements of Section 701 of the Mississippi Standard Specifications for Road and Bridge Construction.

Prestressed Concrete	
Class Fx range	
From a minimum of	f'c = 5,000 psi
To a maximum of	f'c = 8,500 psi

16.4.2 Structural Steel Design

Steel structures shall be designed in accordance with AASHTO LRFD Bridge Design Specifications.

16.4.2.1 Materials

Structural steel for primary members shall conform to the requirements of AASHTO M 270 Grade 50/50W (Weathering) or Grade HPS 70W. Structural steel for secondary members shall conform to the requirements of AASHTO M 270 Grade 50/50W. Steel with a design yield strength greater than seventy (70) ksi will not be permitted. High strength bolts shall be ASTM A 325, designed for values as specified in AASHTO Subsection 6.13.2.8 with Class B contact surfaces. All field connections shall use 7/8” minimum diameter bolts. Direct tension indicators (DTIs) shall be the only acceptable method for verifying proper bolt installation.

16.4.2.2 Design and Details

1. All bolted connections shall be designed as slip critical connections having Class B contact surfaces.

2. Electroslag welding will not be permitted.

16.4.2.3 Fasteners for Structural Steel

If weathering steel is used, nuts, bolts and washers shall meet the ASTM requirements for weathering steel.

1. High Strength Bolts shall meet the requirement of ASTM. A 325, Type 1, and shall be hot dip galvanized in accordance with the requirements of ASTM A 153, Class C Coating or galvanized by the mechanical process in accordance with the requirements of ASTM B 695, Class 50 Coating. Maximum hardness for high strength bolts shall be 33 Rockwell C (RC).

2. Nuts for high strength bolts shall be heavy hex and meet the requirements of ASTM A 563, Grade DH galvanized.

3. Hardened steel washers shall meet the requirements of ASTM F 436, galvanized.

4. Direct tension indicators shall meet the requirements of ASTM F 959 and shall be galvanized by the mechanical process meeting the requirements of ASTM B 695, Class 50 Coating.

5. Nuts for high strength bolts shall be tapped oversize the minimum amount required for proper assembly and lubricated with an acceptable lubricant containing a dye of any color that contrasts with the color of galvanizing.

6. High strength bolts, nuts, or direct tension indicators shall not be reused after tightening.

7. Mill test reports, certified test reports, and certificates of compliance are required for high strength bolts, nuts, hardened washers and direct tension indicators.

16.4.3 Paint System

All structural steel, except for expansion joints, rail plates, steel piles, sheet piles, pipe piles, and weathering steel shall be painted in accordance with Section 814 of the Mississippi Standard Specifications for Road and Bridge Construction.

16.4.4 Deep Foundation Design

All retaining wall systems shall be constructed with deep foundations consisting of piles, drilled shafts or footings supported by piles or drilled shafts.

Deep foundations are required to extend a minimum of fifteen (15) feet below any compacted fill. Additionally, foundations founded in the Yazoo Clay formation or other expansive clays should be tipped at a sufficient depth into the un-weathered clay. At a minimum, design of foundations in these areas should consider desiccation and the shrink/swell potential of the weathered clay when determining the minimum tip elevation of the foundation.

All retaining wall systems that contain steel piles that are not filled with or covered with concrete shall have the pile section thickness increased to account for future section loss.

16.4.5 Expansion and Contraction Joints

Expansion joints shall be provided to accommodate the movement of the retaining wall system.

16.5 Deliverables

At a minimum the Developer shall submit the following to MDOT:

Deliverable	Review and Comment	Schedule	Reference Section
Preliminary Design	✔	According to Contractor's Schedule	2.2.2
Final Design	✔	Prior to RFC Submittal	2.2.4
RFC Documents	✔	Prior to Construction of the designed portion of Project	2.2.5
As-Built Drawings	✔	30 days following Construction of the designed portion of Project	2.2.8

17.0 MAINTENANCE OF TRAFFIC DURING CONSTRUCTION

Existing traffic control devices are in place. It shall be the Contractor's responsibility to maintain traffic under the existing Maintenance of Traffic (MOT) Plan until his own MOT plan is submitted and approved by MDOT.

The Contractor shall develop and submit a MOT Plan for MDOT approval prior to altering any existing traffic control. The MOT Plan shall identify the Contractor's strategy to provide for the safe and efficient movement of people, goods and services while minimizing impacts to local residents, businesses and commuters; its approach to developing detailed Traffic Control Plans (TCP); Contractor shall describe the MOT Plan with reasonable and measurable tasks and milestones.

All regulatory, warning, route marker, guide and information signs, mounting requirements and vertical and horizontal clearances shall conform to the MUTCD (latest edition) and MDOT Standard Plans, and the requirements specified herein. Design and placement of signs shall consider future roadway widening.

17.1 Traffic Control Plans

The Contractor shall develop and submit Traffic Control Plans (TCPs) for each phase of construction that shows the Contractor's proposed construction phasing and proposed traffic control devices consistent with the MOT Plan. The TCP shall be submitted for approval to MDOT at least seven (7) days prior to construction of the Work shown in the TCP. Major revision to a TCP shall also be submitted to MDOT for its approval. The TCPs shall include, at a minimum, the following:

1. A detailed diagram showing the location of all traffic control devices.

2. An access maintenance plan for all properties requiring access during construction. The plan shall also indicate the areas where equipment will be stored and vehicles parked if within the Project Right-of-Way.

3. A plan for maintaining and controlling pedestrian, bicycle and other non-vehicular traffic.

17.2 Temporary Pavement Marking

Temporary raised pavement markers are required for temporary lane shifts, on both the centerline and edge lines of the interstate.

17.3 Construction Requirements

1. The Contractor shall maintain two (2) eleven (11)-foot lanes on I-55 at all times in each direction except under bridges and approaching bridges.

2. The Contractor shall notify MDOT of any lane closures necessary to perform work prior to instituting or changing such traffic control measures. This notification shall be submitted at least 48 hours prior to the construction. Total road closures will not be permitted.

3. The Contractor shall notify MDOT of any vertical clearance reduction that provides less than 16.0' clearance, any load capacity reductions, or any width reduction that results in a restriction of less than 20' wide a minimum of 20 days prior to such restriction.

4. The Contractor shall provide a paved surface for all detours or bypasses.

5. The Contractor's placement of construction equipment, materials and vehicles shall comply with MUTCD (latest edition).

6. If detours are necessary for wide loads, the Contractor shall prepare the necessary detour plan and provide all detour signing and maintenance throughout use.

17.4 Not Used

17.5 Deliverables

At a minimum, the Contractor shall submit the following to MDOT for review or comment:

Deliverable	Review and Comment	Schedule	Reference Section
Maintenance of Traffic Plan	✔	Maintain traffic under existing MOT plan until new MOT plan is submitted and approved	17
Traffic Control Plans	✔	At least 3 days prior to construction of the Work shown in the TCP submittal	17.1

18.0 TECHNICAL STANDARDS, DATA, AND REPORTS

The following standards, data, or reports are Contract Documents. These standards apply unless otherwise described in Sections 1-17 of the Technical Requirements. In case of conflict, the order of precedence of these documents shall be as listed in the order presented below.

Availability Legend:

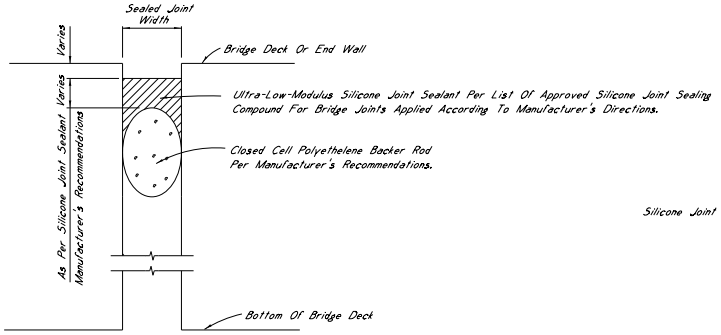
- IS = Industry standard, not provided by MDOT
- PR = Provided by MDOT
- GoMDOT = Provided by MDOT via Internet
- W = Available via the Internet, not provided by MDOT

Originator	Title	Availability
MDOT	Standard Specifications for Road and Bridge Construction, 2004 Edition	GoMDOT
MDOT	Stormwater Management Program	PR
MDOT	Field Manual for Concrete	GoMDOT
MDOT	Field Manual for Hot Mix Asphalt (HMA)	GoMDOT
MDOT	Pipe Culvert Material Design Criteria	GoMDOT
MDOT	Roadway Design Manual, 2001 Version	GoMDOT
MDOT	CADD Standards	GoMDOT
MDOT	Roadway Design Memos	GoMDOT
MDOT	Special Design Sheets	GoMDOT
MDOT	Roadway Design Standard Drawings	GoMDOT
AASHTO	All Standards/Manuals	IS
ADA	ADA Accessibility Guidelines	IS
American Railway Engineering and Maintenance of Right-of-Way Association (AREMA)	Manual for Railway Engineering	IS

Originator	Title	Availability
ASTM	Standards	IS
Electronics Industries Alliance (EIA)	Standards	IS
FHWA	All Standards/Manuals	IS
FHWA	Manual on Uniform Traffic Control Devices (latest edition)	W
Illuminating Engineering Society of North America	Roadway Lighting, ANSI Approved RP-8-00	IS
ISO	ISO 9000	IS
ISO	ISO 9001	IS
National Electrical Manufacturers Association (NEMA)	Standards	IS
National Fire Protection Agency (NFPA)	Life Safety Code	IS
National Fire Protection Agency (NFPA)	National Electric Code	IS
National Transportation Communications for ITS Protocol Standards (NTCIP)	Standards	IS
Telecommunications Industries Association (TIA)	All standards and publications	IS
Transportation Research Board	Highway Capacity Manual	IS
US Army Corp of Engineers	Publications	www.usace.army.mil/publications

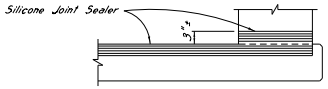
STATE	PROJECT NO.
MISS.	

NOTE: Joints In Newly Constructed Bridge Decks Shall Be Protected From Damage Until Accepted For Maintenance By The State. Damaged Joints Shall Be Repaired At No Cost To The State.



TYPICAL SECTION

SILICONE SEALED JOINT



ELEVATION AT END OF SPAN

NOTE: The Contractor Should Be Aware That The Joint Opening (Width) Can Change At Temperatures Higher Or Lower Than The 60°F Design Width. Installation Of The Joint Sealer Material Shall Be In Accordance With Manufacturer's Recommendations.

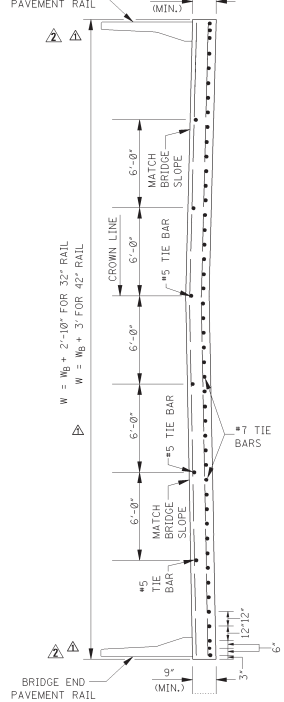
NOTE: Seal All Open Joints As Shown On The Layout Sheet. Width Of Joint Is Shown In End Bent And Span Details. Seal Joint When It Is At Or Near Its Design Width. A Representative Of The Joint Sealant Manufacturer Shall Be Present At The Time Joint Sealing Begins To Ensure That The Contractor Is Properly Schooled In The Installation Of The Joint Material.

GENERAL NOTES:
All Concrete In Span And Railing Shall Be Class "AA", Unless Otherwise Noted.
Chamfer All Edges ¾", Unless Otherwise Noted.
See Layout Sheet For Finishing Of Concrete Surfaces.
Placing Dimensions For Reinforcing Steel To Concrete Surfaces Are Clear Distances.

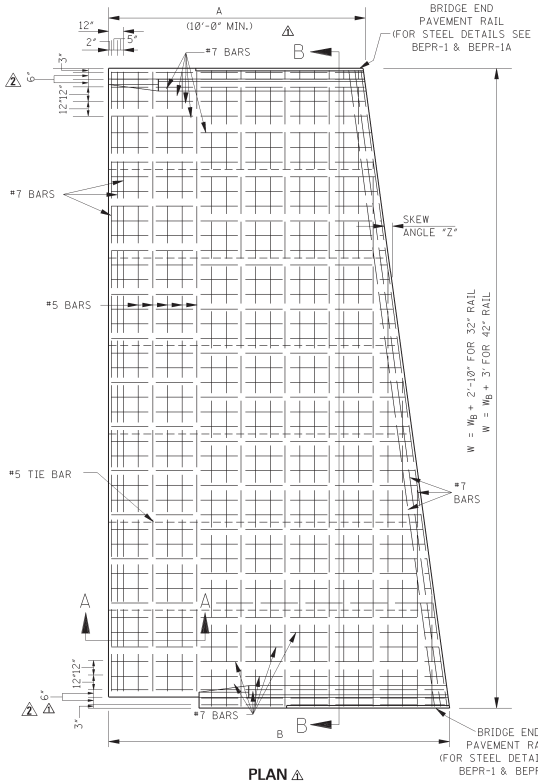
REVISIONS	BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION	
		PROJECT	
		COUNTY	WORKING NUMBER
DATE		DESIGNED ____ DETAILED ____ TRACED ____ CHECKED ____ ISSUED ____ DATE ____	SHEET NUMBER

Attachment to the Technical Requirements No. 2

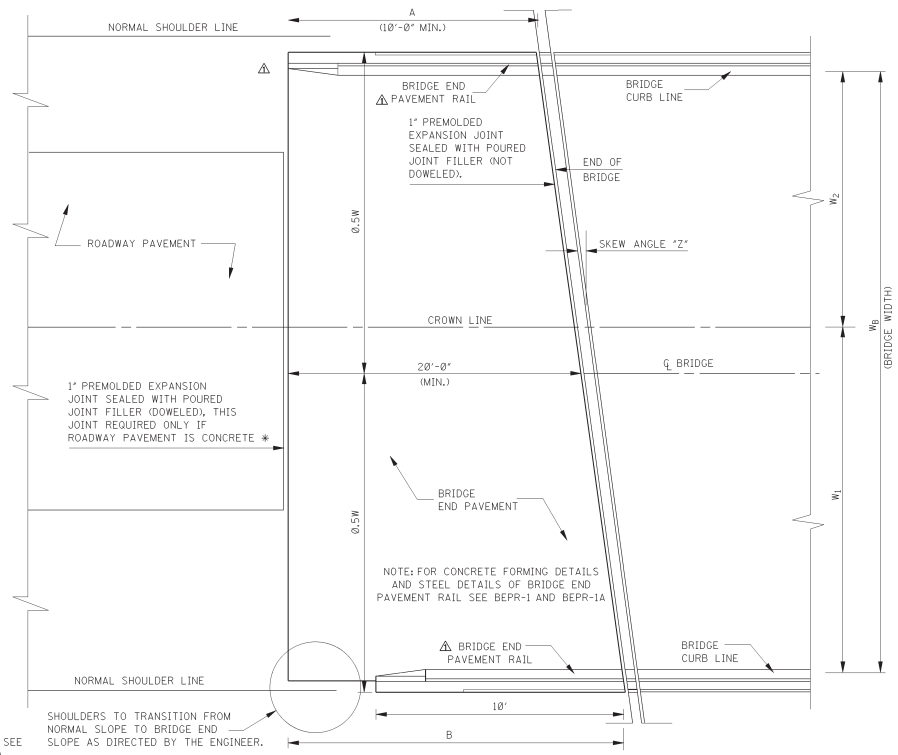
STATE	PROJECT NO.
MISS.	



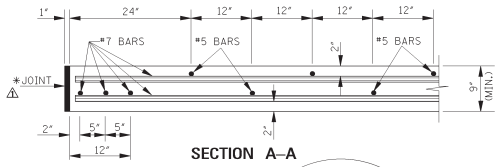
SECTION B–B



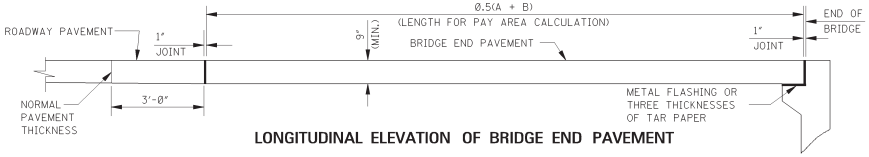
PLAN



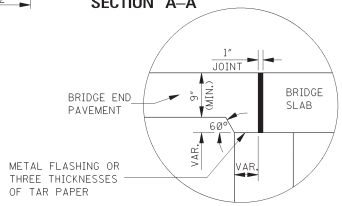
PLAN AT BRIDGE END



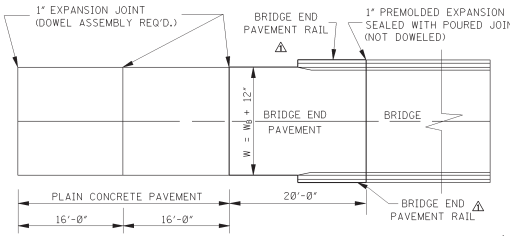
SECTION A–A



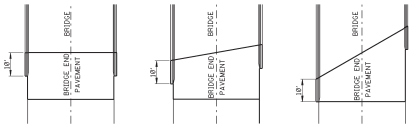
LONGITUDINAL ELEVATION OF BRIDGE END PAVEMENT



DETAIL SHOWING METHOD OF SEATING BRIDGE END PAVEMENT ON BRIDGES WITH NO PAVING BRACKET



PLAN OF EXPANSION JOINTS AND BRIDGE END PAVEMENT



BRIDGE WITH NO SKEW

BRIDGE WITH SKEW AND 'A' MORE THAN 10'

BRIDGE WITH SKEW AND 'A' EQUAL TO 10'

GENERAL NOTES:

1. IF BRIDGE END PAVEMENT IS CONSTRUCTED IN MORE THAN ONE SECTION, LONGITUDINAL CONSTRUCTION JOINTS WITH TIE BARS WILL BE USED. TIE BARS WILL BE #5 BARS, 30" LONG AND SPACED 30" O.C. SUCH CONSTRUCTION WILL BE USED WHERE INDICATED ON PLANS.
2. DIMENSIONS "A" & "B" ARE BASED ON A MID-LENGTH OF 20'-0". EXCEPT IN NO CASE SHALL "A" BE LESS THAN 10'-0".
3. SEE QUANTITY SECTION OF PLANS FOR DIMENSIONS "W", "W_1", "W_2", "A", "B", SKEW ANGLE "Z" AND QUANTITIES.
4. SPACING OF OUTER LONGITUDINAL EDGE BARS AND TIE BARS MAY BE ADJUSTED TO MEET VARIOUS WIDTHS ("W") OF BRIDGE END PAVEMENT. SPACINGS SHOWN ARE FOR A BRIDGE WIDTH OF 40'-0".
5. REINFORCEMENT (DEFORMED) MAY BE FURNISHED FULL LENGTH OR MAY BE LAPPED. IF BARS ARE LAPPED THEY SHALL BE LAPPED NOT LESS THAN 30 DIAMETERS.

DATE	REVISION	BY
1-5-00	REVISED DIMENSIONS & RAIL DRAWINGS	S.WG
4-1-07	ADDED RAIL AND BE-48 PART RAIL	S.WG

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

BRIDGE END PAVEMENT WITH RAIL

WORKING NUMBER BE-1A

SHEET NUMBER

FILENAME: BR END PAVEMENT.DGN

DESIGN TEAM SPELL CHECKED REEVES DATE 4-01-07

PLAN
ROADWAY DESIGN DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/15/2009 9:52 AM BR END PAVEMENT.DGN

Mississippi Department of Transportation

Section 905
Proposal

Improvements to Interstate 55
Hinds County, Mississippi

Project Number:
DB/IM-0055-02(244)/106023-305000

March 5, 2015

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 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 Special Provisions and Notice(s) to Proposers 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 Specifications, including the Special Provisions and Notice(s) to Proposers, herein, and have personally examined the site of the Work. On the basis of the Specifications, Special Provisions, Notice(s) to Proposers and Contract Documents, I (we) will furnish all necessary items to successfully complete the Project.

Attached hereto is a certified check, cashier's check or Proposal Guaranty Bond in the amount as required in the Advertisement (or, by law).

I (We) further propose to perform all "force account or extra work" that may be required of me (us) on the basis provided in the Specifications and to give such work my (our) personal attention in order to see that it is economically performed.

I (We) further propose to execute the attached Contract 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 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 price proposed** 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 (proposal guarantee 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.

Proposer acknowledges receipt of and has added to and made a part of the Proposal and Contract documents the following addendum (addenda):

TOTAL ADDENDA: _____
(Must agree with total addenda issued prior to opening of bids)

Number Description

Respectfully Submitted,

DATE _____

_____
Contractor

BY _____
Signature

TITLE _____

ADDRESS _____

CITY, STATE, ZIP _____

PHONE _____

FAX _____

EMAIL_____

(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

SECTION 905
PROPOSAL (Sheet 2-1)

Improvements to Interstate 55,
Hinds County
DB/IM-0055-02(244)/106023-
305000

Design-Build for Improvements to Interstate 55 in Hinds County from Byram to McDowell Road, as per Section 904 – Notice to Proposers No. 2618 DB (Project Scope).

I (We) agree to complete the entire Project within the contract time specified in Contractor's Schedule Certificate.

***** SPECIAL NOTICE TO PROPOSERS ******

BIDS WILL NOT BE CONSIDERED UNLESS BOTH UNIT PRICES AND ITEM TOTALS ARE ENTERED

BIDS WILL NOT BE CONSIDERED UNLESS THE BID CERTIFICATE LOCATED AT THE END OF THE BID SHEETS IS SIGNED

BID SCHEDULE

REF NO	PAY ITEM NO.	ADJ CODE	APPROX QUANTITY	UNIT	DESCRIPTION	UNIT PRICE		ITEM TOTAL	
						DOLLAR	CENT	DOLLAR	CENT
			1	Lump Sum	Design-Build for Improvements to Interstate 55 in Hinds County, Mississippi	$XXXXXXXXXXXX	XX	$	

SECTION 905

SECTION 905
PROPOSAL (Sheet 2-2)

TOTAL BID……..CONTRACT PRICE…….. ……$_____

COMPLETE ITEM NOS. 1, 2, AND/OR 3 AS APPROPRIATE. SEE NOTICE TO PROPOSERS NO. 5266 DB AND SUPPLEMENT.

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 Proposer: Small Business (DBE) _____ Small Business (WBE) _____

3. A joint venture with a Small Business (DBE/WBE): Yes _____

4. All requirements of the RFP have been included in the Total Bid.

***** SIGNATURE STATEMENT *****

PROPOSER ACKNOWLEDGES THAT HE/SHE HAS CHECKED ALL ITEMS IN THIS PROPOSAL FOR ACCURACY AND CERTIFIED THAT THE FIGURES SHOWN THEREIN CONSTITUTE THEIR OFFICIAL BID.

_____
PROPOSER’S SIGNATURE

_____
PROPOSER’S COMPANY

_____
PROPOSER'S TAX ID NUMBER/DUNS NUMBER

Certification with regard to the Performance of Previous Contracts or Subcontracts subject to the Equal Opportunity Clause and the filing of Required Reports

The Proposer ____, proposed Subproposers ____, hereby certifies that it/they/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 it 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 Proposers 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

DEBARMENT

CERTIFICATION
(Execute in duplicate)

State of Mississippi

County of _____

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 _____

_____, Proposer
(Name of Firm, Partnership, or Corporation)

on Project No. _____,

in _____ 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 proposing 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 Proposer responsibility. Providing false information may result in criminal prosecution or administrative sanctions.

The Proposer 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 Proposer 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 Proposer 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

(11/23/92F)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DEBARMENT

CERTIFICATION
(Execute in duplicate)

State of Mississippi

County of _____

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 _____

_____, Proposer
(Name of Firm, Partnership, or Corporation)

on Project No. _____,

in _____ 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 proposing 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 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 Proposer 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

(11/23/92F)

PROPOSAL GUARANTY/BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____
Contractor

_____
Address

_____
City, State ZIP

as Principal, hereinafter called the Principal, and _____
Surety

a corporation duly organized under the laws of the state of _____

as Surety, hereinafter called the Surety, are held and firmly bound unto **State of Mississippi, Jackson, Mississippi**

As Obligee, hereinafter called Obligee, in the sum of **Five Per Cent (5%) of Amount Bid**

Dollars ($ _____)

for the payment of which sum will and truly to be made, the said Principal and said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for Project No. DB/IM-0055-02(244)/106023-305000

NOW THEREFORE, the condition of this obligation is such that if the aforesaid Principal shall be awarded the contract, the said Principal will, within the time required, enter into a formal contract and give a good and sufficient bond to secure the performance of the terms and conditions of the contract, then this obligation to be void; otherwise the Principal and Surety will pay unto the Obligee the difference in money between the amount of the bid of the said Principal and the amount for which the Obligee legally contracts with another party to perform the work if the latter amount be in excess of the former, but in no event shall liability hereunder exceed the penal sum hereof.

Signed and sealed this _____ day of _____ , 20___

_____
(Principal) (Seal)

_____ By: _____
(Witness) (Name) (Title)

_____
(Surety) (Seal)

_____ By: _____
(Witness) (Attorney-in-Fact)

_____
MS Agent

_____
Mississippi Insurance ID Number

OCR-485
REV. 3/13

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
OFFICE OF CIVIL RIGHTS
JACKSON, MISSISSIPPI

LIST OF FIRMS SUBMITTING QUOTES

I/we received quotes from the following firms on Project No: DB/IM-0055-02(244)/106023-305000
County: _____

Disadvantaged Business Enterprise (DBE) Regulations as stated in 49 CFR 26.11 require the Mississippi Department of Transportation (MDOT) to create and maintain a comprehensive list of all firms quoting/bidding subcontracts on prime contracts and quoting/bidding subcontracts on federally-funded transportation projects. For every firm, we require the following information:

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

_____
SUBMITTED BY (Signature)

_____
FIRM NAME

Submit this form to **Contract Administration as a part of your bid package**. If at least one copy of this form is not **signed** and included as part of the bid packet, your bid will be deemed irregular. Question regarding this form shall be directed to www.gomdot.com under the current letting webpage. Please make and add copies of this form when needed or attach additional sheets containing the information required by this form and add these sheets to the bid package.

Mississippi Department of Transportation

Section 902
Contract and Exhibits

Improvements to Interstate 55
Hinds County, Mississippi

Project Number
DB/IM-0055-02(244)/106023-305000

March 5, 2015

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CONTRACT FOR DB/IM-0055-02(244)/106023-305000
LOCATED IN THE COUNTY OF HINDS
STATE OF MISSISSIPPI,
COUNTY OF HINDS

THIS CONTRACT IS EXECUTED BY AND BETWEEN THE MISSISSIPPI TRANSPORTATION COMMISSION, A BODY CORPORATE OF THE STATE OF MISSISSIPPI, ("COMMISSION') AND THE UNDERSIGNED CONTRACTOR, AN ENTITY DULY AUTHORIZED TO DO BUSINESS IN THE STATE OF MISSISSIPPI, ("CONTRACTOR") EFFECTIVE AS OF THE DATE OF LATEST EXECUTION BELOW.

WITNESSETH:

THAT WHEREAS, the people of the State of Mississippi will benefit from the construction of the said Improvements on I-55, in Hinds County, Mississippi (hereinafter referred to as "the Project"); and

WHEREAS, the Commission, desires the completion of this Project, as it is in the best interest of the people of the State of Mississippi; and

WHEREAS, the Commission, working with the people, the federal government, and other agencies of the State of Mississippi, has devised an innovative plan to allow the commencement and completion of the Project in a timely and cost-effective manner; and

WHEREAS, the Commission is authorized under the provision of Section 65-1-85, Miss. Code Ann. (1972) to utilize the design/build method of procurement to design and construct the Project; and

WHEREAS, after a competitive process, Contractor has been selected to participate in this venture by designing and building the Project; and

WHEREAS, the Commission desires to avail itself of and rely upon Contractor's expertise and proven track record in designing and constructing such projects, on time and within budget; and

WHEREAS, the Contractor wishes to provide that expertise and to participate in this venture for the good of the people of the State of Mississippi;

NOW THEREFORE, for and in consideration of the mutual promises and covenants hereinafter set forth, the Commission and the Contractor mutually agree as follows:

I. CONTRACT DOCUMENTS

The Contract shall be composed of all items (listed A through M) below, and any amendments thereto. Each of these documents below are an essential part of the Contract. The documents are intended to be complementary and are intended to be read as a complete Contract. In case of conflict, ambiguity or inconsistency the order of precedence, from highest to lowest, of the Contract documents shall be:

A. Section 902
B. Exhibits to Section 902
   Exhibit 1 – Environmental Document (Environmental Assessment/Finding of No Significant Impact)
   Exhibit 2 – Permits
   Exhibit 3 – Erosion Control Standard Drawings
C. Section 904
   Supplements to Notice to Proposers
   Notice to Proposers
D. Section 905
E. Section 906
   Supplement to Form FHWA-1273
      Minimum Hourly Wage Rates
   Federal-Aid Construction Contracts (Form FHWA-1273)
   Notice of Requirements for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246)
F. Section 907
   Supplements to Special Provisions
   Special Provisions
G. Contractor's Proposal – Contractor's Technical Proposal – Volume 1 – (Only those items that are a higher standard than the Technical Requirements.)
H. Technical Requirements for Design and Construction
I. Final Design Documents (provided by Contractor)
J. Section 903
   Contract Bond
K. Contractor's Proposal - Contractor's Technical Proposal - Volume 1 (Except those items that are a higher standard than the Technical Requirements.)
L. Request for Proposals and Addenda, if any
M. Proposer's (Contractor's) Statement of Qualifications

II. PROJECT SCOPE

A. Project Scope of Work

The Project Scope shall be as defined in Section 904 – Notice to Proposers No. 2618 DB.

III. CONTRACT PRICE/CONTRACT PAYMENTS

A. Contract Price

The "Contract Price" shall be the amount shown on Section 905 sheet 2-2.

In consideration for the Contract Price, Contractor shall perform all of its responsibilities under the Contract. The Contract Price shall include all work identified in Section 904 – Notice to Proposers No. 2618 DB (Project Scope).

B. Contract Price Adjustments

1. Allowable adjustments

The Contract Price may only be adjusted due to any of the following occurrences:

(a) Commission approved Scope changes, value engineering proposals, directives or authorized extra work.

(b) Acts or omissions by Commission or its duly appointed representative that unreasonably interfere with the Contractor's performance and cause delay of Work on the critical path of the Project.

(c) Changes in a legal requirement or regulation that becomes effective subsequent to the date of this Contract.

(d) Discovery of Hazardous Materials not discoverable from a reasonable investigation and analysis of the site prior to the submission of the Volume 2 – Contract Price Proposal.

(e) Discovery of archaeological or paleontological sites, as noted in Subsection 203.03.1 of the Standard Specifications that was not discoverable from a reasonable investigation and analysis of the Site prior to the Volume 2 – Contract Price Proposal Date.

Other than as provided above, the Contract Price shall not be increased for Contract price adjustments or claimed delay damages. The basis for any allowable price adjustment will be a negotiated amount or by Force Account in accordance with Section 109.04 of the Special Provisions.

2. Changes

(a) A "Change" shall be any deviation or variation from the Project Scope, the Design Criteria or the Construction Criteria of the Project as originally set forth in this Contract. No Change shall be implemented prior to execution of an appropriate Supplemental Agreement. A "Change" may be an "Additive Change" or a "Deductive Change".

(b) MDOT may initiate a Change by advising Contractor in writing of the change. Within seven (7) days, Contractor shall prepare and forward to MDOT an estimate of cost or savings, and the impact to the schedule resulting from the change. An independent cost estimate may or may not be performed by the Commission's duly authorized representative. Parties to the Contract will then

negotiate in good faith partnering efforts to agree on scope and cost impacts. MDOT will advise the Contractor in writing of its approval or disapproval of the change. If the Commission approves the change, the Contractor shall perform the Services as changed.

3. Construction Change Directive

A Construction Change Directive is a written order from MDOT directing a change prior to agreement with the Contractor on adjustment, if any, to the Contract Price or Contract Time.

4. Direct Costs for Construction Change Directive

For the purpose of a Contract Price Adjustment, "Direct Costs" shall be defined as:

(a) costs of labor, including social security, unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

(b) costs of labor for QC, surveying and erosion control or fees paid for this Work directly attributable to the change or event;

(c) costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;

(d) depreciated time value of machinery and equipment owned by Contractor or any affiliated or related entity exclusive of hand tools;

(e) actual costs paid for rental of machinery and equipment exclusive of hand tools;

(f) costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes;

(g) additional costs of supervision and field office personnel directly attributable to the change or event; and

(h) Costs incurred or fees paid for design work related to the change or event.

C. Contract Payments

Mobilization shall not exceed 5% of the Contract Price.

MDOT will make Contract Payments in accordance with Subsection 907-109.06 and 907-109.11 of the Special Provisions.

IV. CONTRACT COMPLETION DATES

The Contractor shall complete the said work by the dates shown on the Contractor's Schedule Certificate, which includes both the Final Completion Date and the Substantial Completion Date.

A. Final Completion Date

The Commission will assess liquidated damages against the Contractor for each calendar day beyond the **Contractor's Final Completion Date** until all items of work are complete. The assessment of liquidated damages shall not be considered a penalty; any damages assessed represent a reasonable estimate of fair compensation for the damage of delay that may reasonably be anticipated from the Contractor's failure to complete the Project by the Contractor's Final Completion Date. If the Contractor fails to complete all items of Work by the Contractor's Final Completion Date, the Commission will assess liquidated damages of **$50,000 per calendar day** until the date all items of Work are completed. The assessment of liquidated damages shall be deducted by the Commission from monies due the Contractor, if sufficient monies are available. Otherwise, the Contractor shall pay to the Commission the liquidated damages assessments within fifteen (15) calendar days of notice that payment is due.

B. Substantial Completion Date - Incentive/Disincentive

This project was awarded to the Best Value Proposer in which part of the best value determination was based upon the Contractor's Substantial Completion Date. The Commission desires to have the project completed by this date.

The Contractor will be awarded an incentive payment for the early Substantial Completion of the project in the amount of **$100,000.00 per calendar day** for each day in advance of December 31, 2016, up to a maximum of **$5,000,000.00**. The Contractor will be assessed a disincentive fine for the failure to complete the requirements of Substantial Completion of the Project in the amount of **$100,000.00 per calendar day** for each day past the Contractor's specified Substantial Completion Date.

The parties to this contract anticipate that delays may be caused by or arise from any number of events during the course of the Contract, including but not limited to work performed, work deleted, change orders, supplemental agreements, delays, disruptions, differing site conditions, utility conflicts, design changes/revisions or defects, extra work, right-of-way issues, permitting issues, action of suppliers, subcontractors or other contractors, actions by third parties, shop drawing approval process delays, plan review and approval process delays, weather, special events, holidays, suspension of Contractor's operations or other such events, force, or factors sometimes experienced in highway and bridge construction work. Such delays or events and their potential impact on performance by the Contractor are specifically contemplated and acknowledged by the parties in entering into this Contract and shall not extend the Contractor's Substantial Completion Date established by the Contractor or the December 31, 2016 date. Further, any and all costs or impacts whatsoever incurred by the Contractor in accelerating the Contractor's work to overcome or absorb such delays or event impacts in an effort to complete the requirements of Substantial Completion, as addressed in the Notice to Proposers entitled "Substantial Completion," regardless of whether the Contractor successfully does so or not shall be the sole responsibility of the Contractor in every instance.

If the Contractor cannot work due to right-of-way acquisition originally determined by MDOT, utility conflicts that the Contractor cannot design around, archaeological and/or paleontological remains or a catastrophic event or a work stoppage due to a court order occurs through no fault of the Contractor that

directly and substantially affects the Contractor's operations on the Contract, the Contractor shall provide any and all documentation to the Commission within fourteen (14) calendar days of the event. The Commission will have fourteen (14) calendar days to review the Contractor's request to extend the Substantial Completion Date. If the Contractor and Commission are unable to reach an agreement, the Commission shall unilaterally determine the number of calendar days to extend the Substantial Completion Date and the Contractor shall have no right whatsoever to contest such determination, save and except that the Contractor establishes that the number of calendar day determined by the Commission was arbitrary or without any reasonable basis.

The Contractor shall have no rights under the Contract to make any claim arising out of this Incentive/Disincentive provision except as is expressly set forth herein.

As conditions precedent to the Contractor's entitlement to an Incentive the Contractor must:

1. Actually complete the requirements of Substantial Completion as stated in the Contract, as determined by the Engineer, and obtain written verification of completion and acceptance from the Engineer.
2. The Contractor shall notify the Commission in writing within thirty (30) calendar days of receiving written verification of the Substantial Completion by the Engineer, that the Contractor elects to be paid the Incentive which the Contractor is eligible to be paid based upon the actual Substantial Completion Date, and such written notice shall constitute a full and complete waiver, release and acknowledgement of satisfaction by the Contractor of any and all claims, causes of action, issues, demands, disputes, matters or controversies, of any nature or kind whatsoever, known or unknown, against the Commission, its employees, officers, agents, representatives, consultants, and their respective employees, officers and representatives, the Contractor has or may have as to the work performed. Work deleted, change orders, supplemental agreements, delays, disruptions, differing site conditions, utility conflicts, design changes/revisions or defects, extra work, Right-of-Way issues, permitting issues, actions of suppliers, subcontractors or other Contractors, actions by third parties, shop drawing approval process delays, plan review and approval process delays, weather, special events, holidays, suspension of the Contractor's operations, extended or unabsorbed home office or job site overhead, lost profits, prime mark-up on subcontractor work, acceleration cost, any and all direct and indirect costs, and any other adverse impacts, events, conditions, circumstance or potential damages, on or pertaining to, or as to arising out of the Contract. This waiver, release and acknowledgement of satisfaction shall be all-inclusive and absolute, save any supplemental agreements that may be pending on the Substantial Completion Date, which will be resolved within thirty (30) calendar days and prior to the eligible payment to the Contractor of the Incentive.

The Contractor shall have no right to any payment whatsoever if:

1. the Contractor fails to complete the requirements of Substantial Completion, or
2. the Contractor fails to obtain written verification of Substantial Completion of the Project from the Engineer, or
3. the Contractor fails to timely request the Incentive for any reason including but not limited to the Contractor choosing not to fully waive, release and acknowledge satisfaction as set forth in item (2) above.

For Substantial Completion Date requirements, should the Incentive provision conflict with any other provision in the Contract, then the Contract shall be interpreted in accordance with this provision.

As to any Contract work, the Contractor will remain responsible for all such work and the continued maintenance thereof until such date as the Commission's final acceptance of all work in accordance with the Contract documents and without regard to whether the Commission provided written verification of completion or whether the Incentive was earned and elected hereunder.

V. FORCE MAJEURE

Delays or failures of performance shall not constitute breach of the Contract if and to the extent such delays or failures of performance are caused by severe and not reasonably foreseeable occurrences beyond the control of the Commission or the Contractor, including, but not limited to: Acts of God or the public enemy; expropriation or confiscation of facilities; compliance with any order of any governmental authority other than the Commission or a party in privity with it; Acts of War; rebellion or sabotage or damages resulting there from; fires, floods, hurricanes, explosions, or accidents that require stoppage of the entire Work, riots or nationwide strikes or other concerted acts of workman, whether direct or indirect, encountering rare or endangered species or any similar causes, which are not within the control of the Commission or the Contractor respectively, and which by the exercise of reasonable diligence, the Commission or the Contractor are unable to prevent. Any expense attributable to such occurrence shall not entitle the Contractor to an adjustment in the Contract Price. Dates by which performance obligations are scheduled to be met will be extended for a period of time equal to the critical path time lost due to any delay so caused.

VI. INDEMNITY

The Contractor shall indemnify and hold harmless the Commission and all its officers, agents and employees from any claim, loss, damage, cost, charge or expense arising out of any negligent act, actions, neglect or omission by the Contractor, its agents employees, or subcontractors during the performance of this Contract, whether direct or indirect, and whether to any person or property for which the Commission or said parties may be subject, except that neither the Contractor nor any of its agents or sub-contractors will be liable under this provision for damages arising out of the injury or damage to persons or property solely caused or resulting from the negligence of the Commission or any of its officers, agents or employees.

The Contractor’s obligation to indemnify, defend, and pay for the defense, or at the Commission’s option, to participate and associate with the Commission in the defense and trial or arbitration of any damage claim, lien or suit and related settlement negotiations shall be initiated by the Commission’s notice of claim for indemnification to the Contractor. The Contractor’s evaluation of liability, or its inability to evaluate liability, shall not excuse Contractor’s duty to defend. Only an adjudication or judgment after the highest appeal is exhausted specifically finding the Commission entirely responsible shall excuse performance of this provision by the Contractor. In such case, the Commission shall pay all costs and fees related to this obligation and its enforcement. Should there be a finding of dual or multiple liability, costs and fees shall be apportioned accordingly.

In conjunction herewith, the Commission agrees to notify the Contractor as soon as practicable after receipt or notice of any claim involving Contractor. These indemnities shall not be limited by reason of the listing of any insurance coverage or warranties elsewhere herein.

VII. RECORD RETENTION

The Contractor shall maintain all documents for a period of three (3) years after Payment of Final Voucher.

During the three (3) year retention period, the Commission, the FHWA or duly authorized representatives thereof will be granted access to those documents upon reasonable notice. At any time during the period, the Commission will have the option of taking custody of the documents. The Contractor shall obtain a written release from MDOT prior to destroying the records after the three (3) year retention period.

VIII. OWNERSHIP OF DOCUMENTS

Drawings, specifications, test data, inspection reports, QC documents, daily diaries, record drawings, shop drawings, engineering reports, survey control data, safety records and any other documents, including those in electronic form, prepared by Contractor or Contractor's consultants for the Project are "Project Documents." MDOT shall be the owner of the Project Documents. Upon the Effective Date of this Contract, MDOT grants Contractor and Contractor's consultants permission to reproduce and use the Project Documents for purposes of using, maintaining, upgrading, or adding to the Project. The Contractor shall provide hard copies and electronic copies to MDOT before Final Acceptance.

IX. RELATIONSHIP OF THE PARTIES

The relationship of the Contractor to the Commission is that of an independent contractor, and said Contractor, in accordance with its status as an independent contractor, covenants and agrees that it will conduct itself consistent with such status, that it will neither hold itself out as, nor claim to be, an officer or employee of the Commission by reason hereof. The Contractor will not by reason hereof, make any claim, demand or application or for any right or privilege applicable to an officer or employee of the Commission, including but not limited to workers' compensation coverage, unemployment insurance benefits, social security coverage, retirement membership or credit, or any form of tax withholding whatsoever.

The Commission executes all directives and orders through the Mississippi Department of Transportation. All notices, communications and correspondence between the Commission and the Contractor shall be directed to the Project Director and Commission designated agents shown in Section XI.

The terms "MDOT" and "Commission" as used in the Contract may be interchanged as appropriate.

X. ORGANIZATIONAL CONFLICTS OF INTEREST

Attention is directed to 23 CFR Section 636 Subpart A and specifically Subsection 636.116 regarding organizational conflicts of interest. Section 636.103 defines "organizational conflict of interest" as follows:

> "Organizational conflict of interest means that because of other activities or relationships with other persons, a person is unable or potentially unable to render impartial assistance or advice to the owner, or the person's objectivity in performing the contract work is or might be otherwise impaired, or a person has an unfair competitive advantage."

The Contractor agrees that, if an organizational conflict of interest is discovered, the Contractor must make an immediate and full disclosure to MDOT that includes a description of the action that the Contractor has taken or proposes to take to avoid or mitigate such conflict. If after award of the contract, an organizational conflict of interest is determined to exist, MDOT may, at its discretion, cancel the Design-Build contract for the Project at no additional cost. If the Contractor was aware of an organizational conflict of interest prior to the award of the contract and did not disclose the conflict to MDOT, then MDOT may terminate the contract for default.

XI. GENERAL PROVISIONS

A. Laws

This Contract shall be governed by and interpreted in accordance with the substantive laws of the State of Mississippi.

B. Headings and Titles

Headings and titles of the various parts of this Contract are for convenience of reference only and shall not be considered in interpreting the text of this Contract. Modifications or amendments to this Contract must be in writing and executed by duly authorized representatives of each party.

C. Severability

To the extent that this Contract may be construed as to any portion to be violative of any State, Federal or local ordinance, statute, law or executive order, now or in the future, the balance hereof shall remain in full force and effect.

D. Written Notices

All deliveries and notices pertaining to this Contract shall be in writing and, if to Commission, will be sufficient when sent registered or certified mail, or faxed with proof of receipt, to MDOT addressed to the MDOT Project/Resident Engineer.

Brian Ratliff, PE
Project/Resident Engineer

P.O. Box 6386

Pearl, MS 39288-6386

Fax: (601) 354-6326

All notices to Contractor shall be sufficient when registered or certified mail, or faxed with proof of receipt, to Contractor addressed as follows:

_____
Project Director

_____

_____

E. Understanding

The Contract Documents set forth the full and complete understanding of the parties as of the Effective Date defined herein, and supersede any and all agreements and representations made or dated prior thereto.

F. Failure to Enforce

In no event shall any failure by either party hereto to fully enforce any provision to this Contract be construed as a waiver by such party of its right to subsequently enforce, assert or rely upon such provision.

G. Contract Rights

Nothing in this Contract is intended to create any Contract rights for any party other than the Commission and Contractor, nor are any third-party beneficiary rights intended to be created hereby.

XII. AUTHORITY

We the undersigned do hereby certify that we have the authority to execute this Contract for and on behalf of the entity listed below.

WITNESS my signature in execution hereof, this the _____day of _____, 2015.

CONTRACTOR

_____

TITLE: _____

Attest: _____

WITNESS my signature in execution hereof, this the ____day of _____, 2015.

MISSISSIPPI TRANSPORTATION COMMMISSION,
BY AND THROUGH THE DULY AUTHORIZED
EXECUTIVE DIRECTOR OF THE MISSISSIPPI
DEPARTMENT OF TRANSPORTATION

_____
Melinda L. McGrath PE, Executive Director
Mississippi Department of Transportation

_____
Secretary to the Commission

Award authorized by the Mississippi Transportation Commission in session on the ____ day of _____, 20___, Book _____, Page_____

CERTIFICATION OF CONTRACTOR

I hereby certify that I am the duly authorized representative of the Contractor and that neither I nor the above Contractor has:

(a) employed or retained for a commission, percentage, brokerage, contingent fee, or other consideration, any firm or person (other than a bona fide employee working solely for me or the above Contractor) to solicit or secure this Contract;

(b) Agreed, as an express or implied condition for obtaining this Contract, to employ or retain the services of any firm or person in connection with carrying out the Contract, or

(c) paid, or agreed to pay, to any firm, organization or person (other than a bona fide employee working solely for me or the above Contractor) any fee, contribution, donation, or consideration of any kind for, or in connection with, procuring or carrying out the Contract except as here expressly stated (if any);

(d) 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 the submitted Proposal.

I acknowledge that this certificate is to be furnished to the Department, the Federal Highway Administration, and the U. S. Department of Transportation, and is subject to applicable State and Federal laws, both criminal and civil.

By: _____
Contractor

Date: _____

CERTIFICATION OF DIRECTOR

I hereby certify that I am the Executive Director of the Mississippi Department of Transportation (MDOT) of the State of Mississippi and that the above Contractor or its representative has not been required, directly or indirectly, as an express or implied condition in connection with obtaining or carrying out this Contract to:

(a) employ or retain, or agree to employ or retain, any firm or person,

or

(b) pay, or agree to pay, to any firm, person, or organization, any fee, contributions, donations, or consideration of any kind, except as here expressly stated (if any).

I acknowledge that this certificate is to be furnished to the Federal Highway Administration, and U. S. Department of Transportation, and is subject to applicable State and Federal laws, both criminal and civil.

By: _____
Melinda L. McGrath, PE
Executive Director

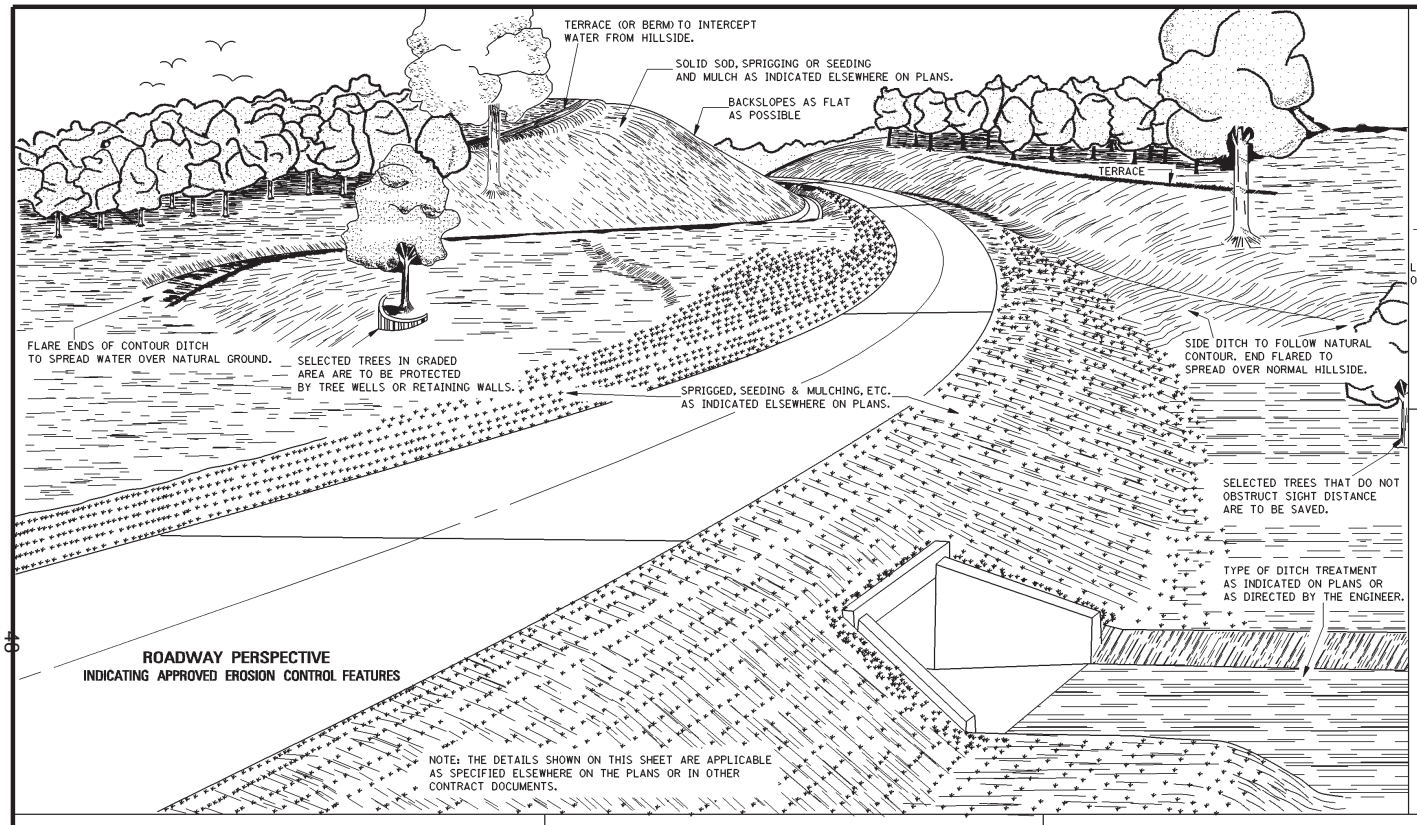
Date: _____

Exhibit 1
Environmental Document
(Provided on Design-Build and Special Projects Website)

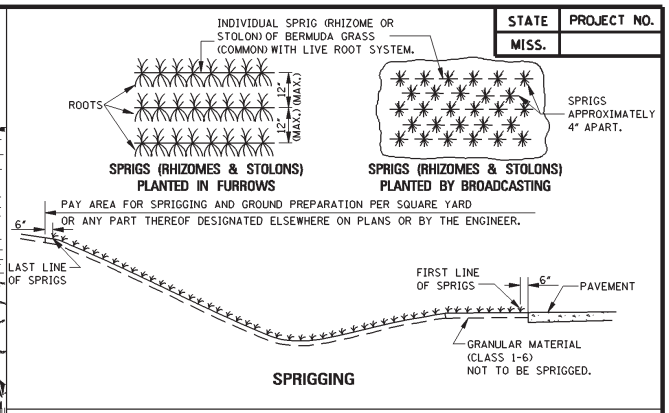
Exhibit 2
Permits
(Provided on Design-Build and Special Projects Website)

Exhibit 3
Erosion Control Standard Drawings

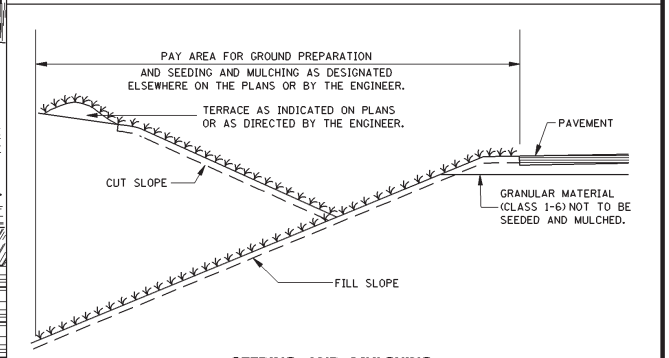
STATE	PROJECT NO.
MISS.	



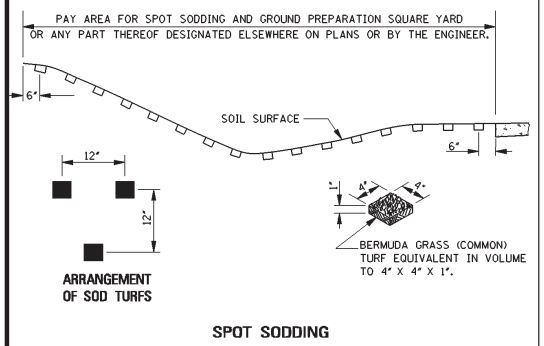
ROADWAY PERSPECTIVE
INDICATING APPROVED EROSION CONTROL FEATURES



SPRIGGING

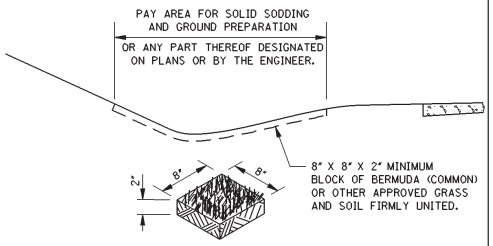


SEEDING AND MULCHING

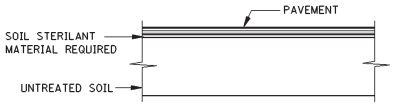


ARRANGEMENT OF SOD TURFS

SPOT SODDING



SOLID SODDING



SOIL STERILIZATION UNDER PAVED AREAS
(ISLANDS, MEDIANS OR SLOPE PAVEMENT)

GENERAL NOTE:

1. LONGITUDINAL AND TRANSVERSE MEASUREMENTS FOR THE PAY AREA SHALL BE TAKEN ALONG THE SLOPES.

DATE	REVISION	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION
STANDARD PLAN

EROSION CONTROL

ENGLISH

WORKING NUMBER EC-1

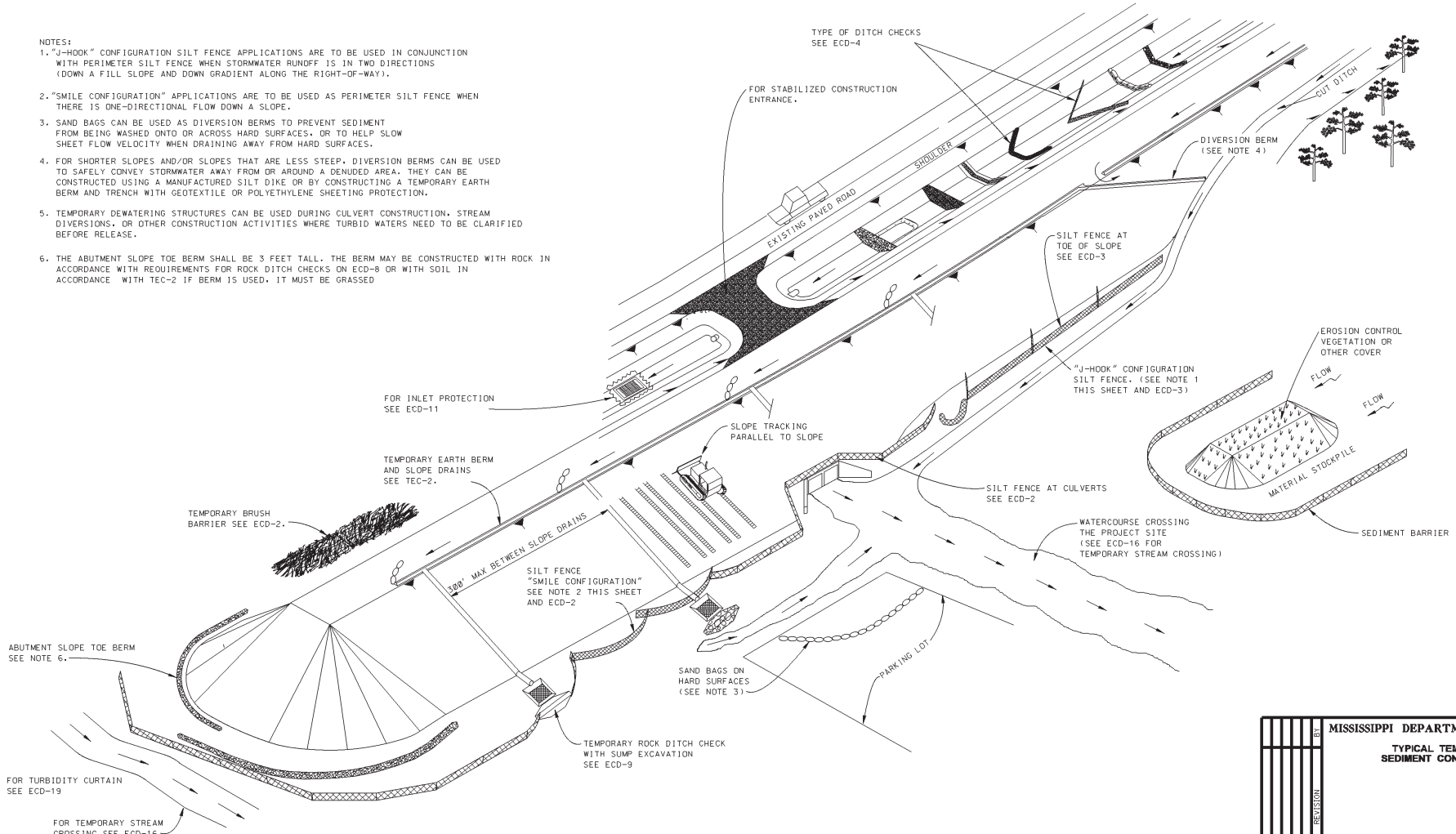
ISSUE DATE: OCTOBER 1, 1998

SHEET NUMBER 140

STATE	PROJECT NO.
MISS.	

NOTES:

1. "J-HOOK" CONFIGURATION SILT FENCE APPLICATIONS ARE TO BE USED IN CONJUNCTION WITH PERIMETER SILT FENCE WHEN STORMWATER RUNOFF IS IN TWO DIRECTIONS (DOWN A FILL SLOPE AND DOWN GRADIENT ALONG THE RIGHT-OF-WAY).
2. "SMILE CONFIGURATION" APPLICATIONS ARE TO BE USED AS PERIMETER SILT FENCE WHEN THERE IS ONE-DIRECTIONAL FLOW DOWN A SLOPE.
3. SAND BAGS CAN BE USED AS DIVERSION BERMS TO PREVENT SEDIMENT FROM BEING WASHED ONTO OR ACROSS HARD SURFACES, OR TO HELP SLOW SHEET FLOW VELOCITY WHEN DRAINING AWAY FROM HARD SURFACES.
4. FOR SHORTER SLOPES AND/OR SLOPES THAT ARE LESS STEEP, DIVERSION BERMS CAN BE USED TO SAFELY CONVEY STORMWATER AWAY FROM OR AROUND A DENUDED AREA. THEY CAN BE CONSTRUCTED USING A MANUFACTURED SILT DIKE OR BY CONSTRUCTING A TEMPORARY EARTH BERM AND TRENCH WITH GEOTEXTILE OR POLYETHYLENE SHEETING PROTECTION.
5. TEMPORARY DEWATERING STRUCTURES CAN BE USED DURING CULVERT CONSTRUCTION, STREAM DIVERSIONS, OR OTHER CONSTRUCTION ACTIVITIES WHERE TURBID WATERS NEED TO BE CLARIFIED BEFORE RELEASE.
6. THE ABUTMENT SLOPE TOE BERM SHALL BE 3 FEET TALL. THE BERM MAY BE CONSTRUCTED WITH ROCK IN ACCORDANCE WITH REQUIREMENTS FOR ROCK DITCH CHECKS ON ECD-8 OR WITH SOIL IN ACCORDANCE WITH TEC-2 IF BERM IS USED. IT MUST BE GRASSED



REVISION	BY	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

TYPICAL TEMPORARY EROSION/ SEDIMENT CONTROL APPLICATIONS

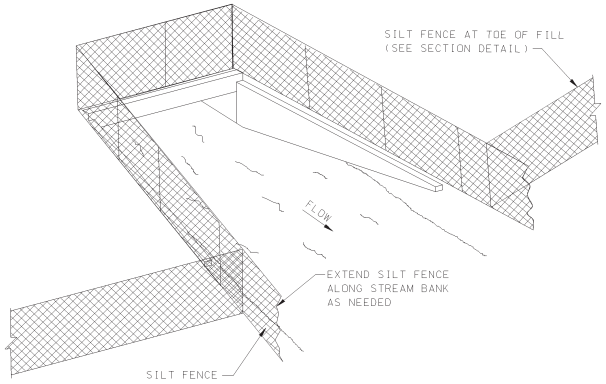
WORKING NUMBER
ECD-1
SHEET NUMBER

FILENAME: EROSION CONTROL\ECD-1.DGN
DESIGN TEAM _____ CHECKED _____ DATE _____

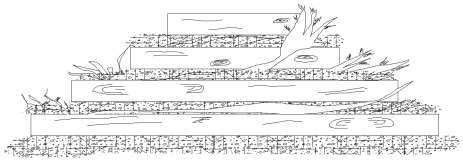
PLAN
FLORIDA DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/19/2010 12:18PM ECD-1.DGN

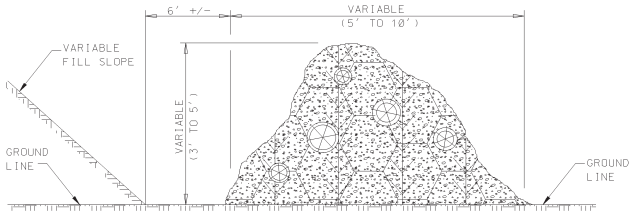
STATE	PROJECT NO.
MISS.	



SEDIMENT BARRIER AT CROSS DRAIN



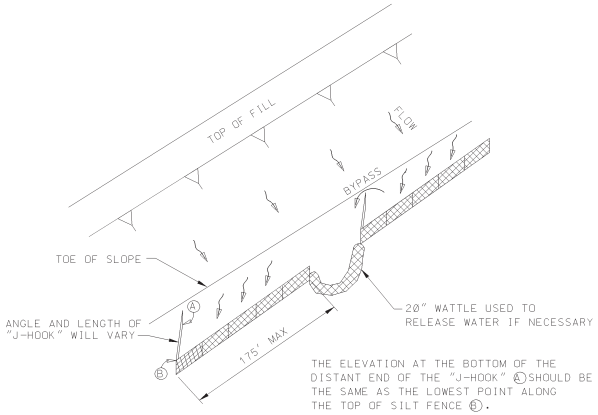
FRONT ELEVATION



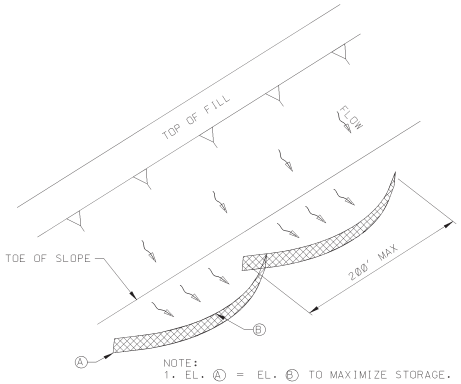
SIDE ELEVATION

TEMPORARY BRUSH BARRIER

NOTES:
1. BRUSH BARRIER MAY BE USED WHERE NATURAL GROUND IS LEVEL OR SLOPING AWAY FROM PROJECT.
2. PLACE BRUSH, LOG AND TREE LAPS APPROXIMATELY PARALLEL TO TOE OF FILL SLOPE WITH SOME OF THE HEAVIER MATERIALS BEING PLACED ON TOP TO PROPERLY SECURE THE BARRIER AS DETAILED AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED OR PERMITTED BY THE ENGINEER.
3. TO ALLOW WATER TO SEEP THROUGH BRUSH BARRIER, INTERMINGLE THE BRUSH, LOG AND TREE LAPS SO AS NOT TO FORM A SOLID DAM.
4. THE BRUSH BARRIER MAY BE CHOKED WITH FILTER FABRIC.
5. TEMPORARY BRUSH BARRIER WILL NOT BE MEASURED FOR SEPERATE PAYMENT



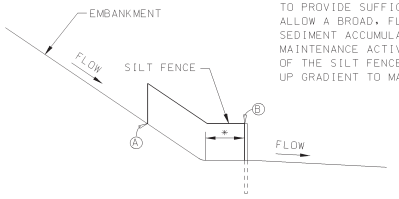
"J-HOOK" SILT FENCE APPLICATION



NOTE:
1. EL. (A) = EL. (B) TO MAXIMIZE STORAGE.

"SMILE-CONFIGURATION" SILT FENCE APPLICATION

NOTE:
1. ANCHOR AND INSTALL SILT FENCE PER DETAILS SHOWN ON ECD-3



* SILT FENCE SHOULD BE LOCATED AWAY FROM THE TOE OF THE SLOPE TO PROVIDE SUFFICIENT SPACE TO ALLOW A BROAD, FLAT AREA FOR SEDIMENT ACCUMULATION AND MAINTENANCE ACTIVITIES. THE ENDS OF THE SILT FENCE SHOULD BE TURNED UP GRADIENT TO MAXIMIZE STORAGE.

SILT FENCE SECTION AT TOE OF FILL

REVISION	BY	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DETAILS OF SEDIMENT BARRIER APPLICATIONS

WORKING NUMBER: ECD-2

SHEET NUMBER

FILENAME: EROSION CONTROL\ECD-2.DGN

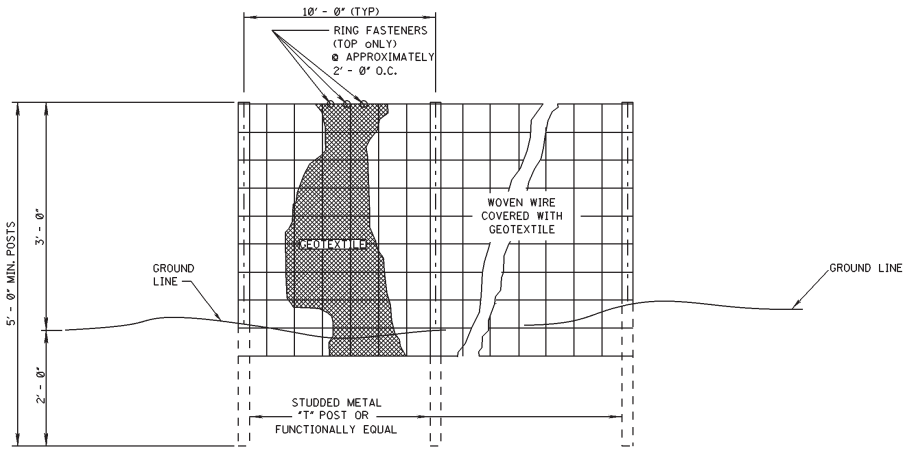
DESIGN TEAM _____ CHECKED _____ DATE _____

PLAN
PROJECT DEVELOPMENT DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

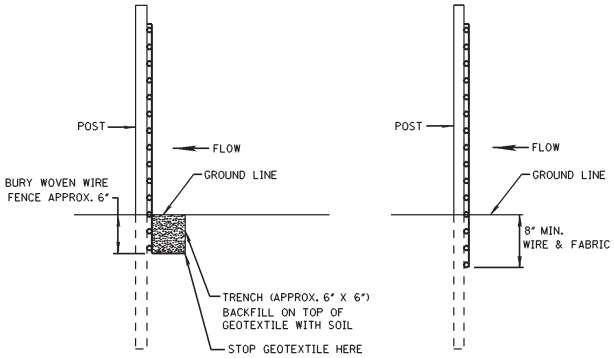
50

1/28/2010 8:54 AM ECD-2.DGN

STATE	PROJECT NO.
MISS.	



ELEVATION VIEW

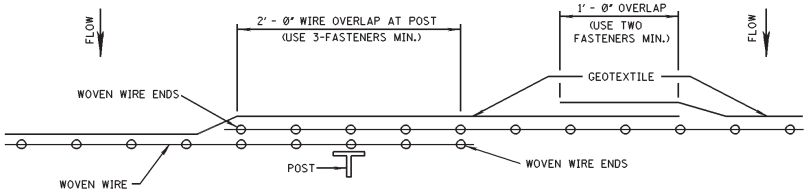


METHOD I

METHOD II
MECHANICAL INSTALLATION

SIDE VIEW

NOTES:
1. SILT FENCES SHALL BE USED IN AREAS WHERE FLOW IS NOT SEVERE.
2. SILT FENCES ARE TEMPORARY SEDIMENT CONTROL ITEMS THAT SHALL BE ERECTED OPPOSITE ERODIBLE AREAS SUCH AS NEWLY GRADED FILL SLOPES AND ADJACENT TO STREAMS AND CHANNELS.
3. SILT FENCE SHOULD BE PLACED WELL INSIDE RIGHT-OF-WAY AND ALONG EDGE OF CLEARING LIMITS. THIS WILL ALLOW ROOM FOR A BACK-UP FENCE IF FIRST FENCE BECOMES FULL.
4. WHEREVER POSSIBLE SILT FENCE SHALL BE CONSTRUCTED ACROSS A LEVEL AREA IN THE SHAPE OF A SMILE. THIS AIDS IN PONDING OF RUNOFF AND FACILITATES SEDIMENTATION.
5. THE CONTRACTOR MAY ELECT TO USE EITHER METHOD I OR METHOD II. COST TO BE LINEAR FEET OF SILT FENCE.
6. METHOD II INSTALLATION SHALL BE ACCOMPLISHED USING AN IMPLEMENT THAT IS MANUFACTUREED FOR THE APPLICATION AND PROVIDES A CONFIGURATION MEETING THE REQUIREMENTS OF THE DETAIL.
7. WIRE SHALL BE MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
8. GEOTEXTILE FABRIC MEETING THE TYPE II MATERIAL REQUIREMENTS AND INSTALLED ACCORDING TO SPECIFICATION MAY BE USED WITHOUT WIRE FENCE,



PLAN VIEW

REQUIRED LAPPING

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DETAILS OF SILT FENCE INSTALLATION

REVISION | BY | DATE

FILENAME: EROSION CONTROL\ECD-3.DGN

DESIGN TEAM ____ CHECKED ____ DATE ____

WORKING NUMBER: ECD-3

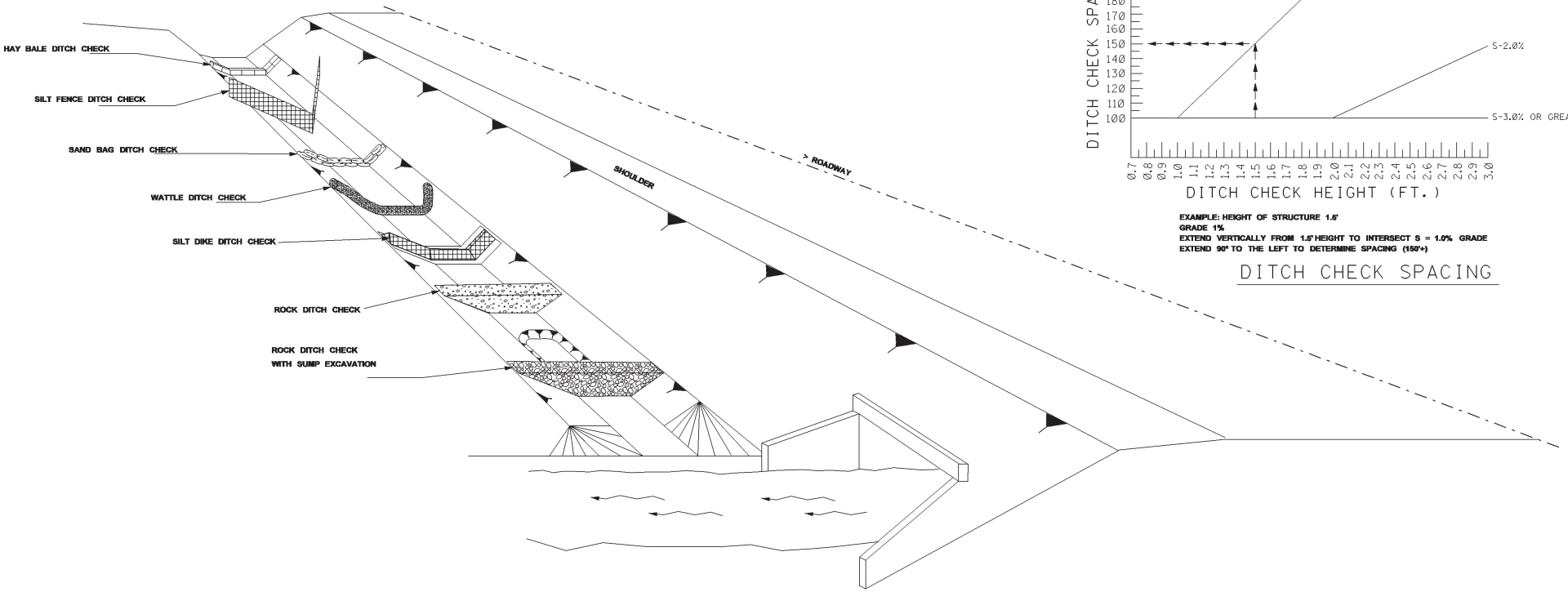
SHEET NUMBER

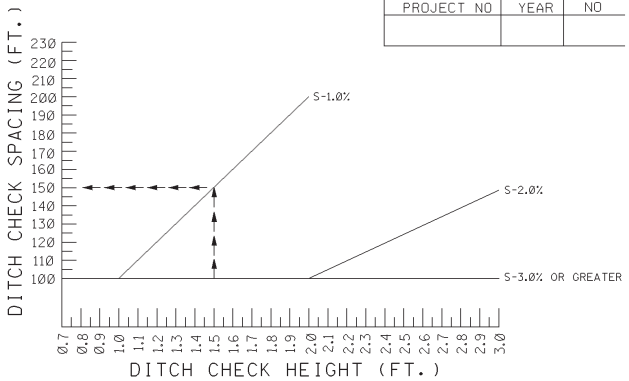
PLAN FLORIDA DIVISION MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/20/2010 8:09 AM ECD-3.DGN

STATE	PROJECT NO.
MISS.	

REFERENCE PROJECT NO	FISCAL YEAR	SHEET NO





EXAMPLE: HEIGHT OF STRUCTURE 1.5'
GRADE 1%
EXTEND VERTICALLY FROM 1.5' HEIGHT TO INTERSECT S = 1.0% GRADE
EXTEND 90° TO THE LEFT TO DETERMINE SPACING (150'+)

DITCH CHECK SPACING

NOTES:

1. THE DITCH CHECK PERSPECTIVE ILLUSTRATES A TOOL BOX OF TEMPORARY PRACTICES THAT MAY BE USED. DITCH CHECKS ARE INSTALLED TO CONTROL RUNOFF VELOCITY AND THUS REDUCE EROSION AND PROVIDE FOR TRAPPING OF SEDIMENTS.
2. SELECTION OF THE APPROPRIATE DITCH CHECK SHOULD BE A FUNCTION OF CONSTRUCTION PHASE, DRAINAGE AREA, DITCH GRADIENT, SOIL TYPE ECONOMY AND SAFETY.
3. DITCH CHECKS CAN BE REMOVED FOR MAINTENANCE AND/OR REPLACEMENT BUT MUST REMAIN IN PLACE UNTIL UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED. MAINTENANCE INCLUDES REMOVAL OF SEDIMENT BEGINNING WHEN SEDIMENT ACCUMULATION REACHES 1/3 THE CAPACITY OR HEIGHT OF THE STRUCTURE AND NEVER ALLOWING FOR SEDIMENT TO ACCUMULATE MORE THAN 1/2 THE VOLUME OR HEIGHT OF THE DITCH CHECK STRUCTURE.
4. HAY BALES ARE USED TO INTERCEPT LOW VOLUME FLOWS IN LOW TO MODERATE GRADIENT DITCHES.
5. SILT FENCE DITCH CHECKS ARE USED WHERE IT HAS BEEN DETERMINED THAT HAY BALE CHECKS ARE INADEQUATE. SILT FENCE DITCH CHECKS ARE USED TO INTERCEPT LOW VOLUME FLOWS IN LOW TO MODERATE GRADIENT DITCHES.
6. SAND BAG DITCH CHECKS ARE USED FOR VELOCITY REDUCTION AND MINIMAL SEDIMENT TRAPPING IN CONCRETE PAVED DITCHES OR IN DITCHES THAT HAVE ROCKY BOTTOMS.
7. WATTLE DITCH CHECKS ARE APPROPRIATE FOR VELOCITY REDUCTION AND CONTROL OF SEDIMENT TRANSPORT UNDER LOW TO MEDIUM FLOW CONDITIONS.
8. SILT DIKES CAN BE USED IN DITCHES WITH CONCENTRATED FLOWS WITHIN THE CLEAR ZONE WHERE RIPRAP CAN NOT BE USED. AS CONSTRUCTION PROGRESSES.
9. ROCK DITCH CHECK WITH SUMP EXCAVATION CAN BE PLACED IN DITCHES TO ASSURE ON-SITE SEDIMENT TRAPPING REQUIREMENTS ARE MET. DITCH CHECK WITH SUMP EXCAVATION IS USED WHEN DITCHES RECEIVE DRAINAGE FROM CUT OR FILL SLOPES OR OTHER CRITICAL AREAS WHERE SOIL EROSION IS EXPECTED. DRAINAGE AREA FOR A TEMPORARY SEDIMENT TRAP SHALL NOT EXCEED 3 ACRES. THEY CAN BE USED IN SERIES TO INCREASE ON-SITE SEDIMENT TRAPPING EFFICIENCY.
10. IN GENERAL, DITCH CHECKS SHOULD NOT BE PLACED IN LIVE STREAMS.
11. CONFIGURATION AND SPACING MAY BE ADJUSTED IF APPROVED BY THE ENGINEER TO ACCOMODATE TRAVELWAY SAFETY, WATER FLOW, OR SOIL AND INSTALLATION CHALLENGES.

DATE	REVISION	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DITCH CHECK STRUCTURES,
TYPICAL APPLICATIONS AND DETAILS

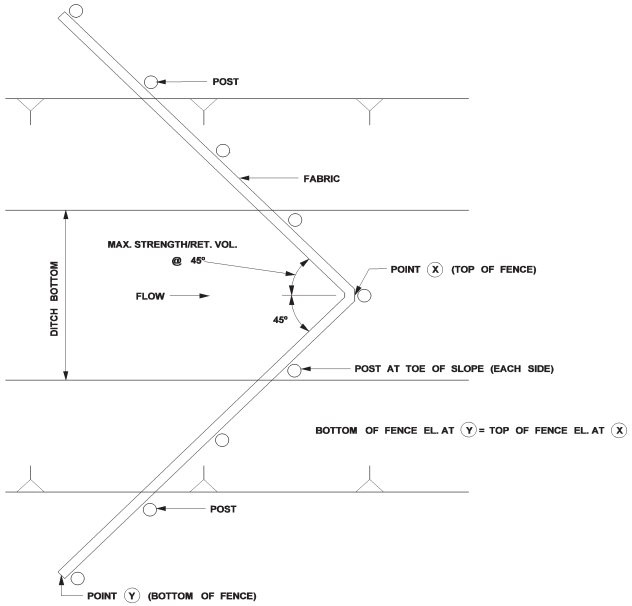
WORKING NUMBER
ECD-4
SHEET NUMBER

FILENAME: EROSION CONTROL\ECD-4.DGN
DESIGN TEAM _____ CHECKED _____ DATE _____

PLAN
PRODUCTION DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/20/2010 8:18 AM ECD-4.DGN

STATE	PROJECT NO.
MISS.	



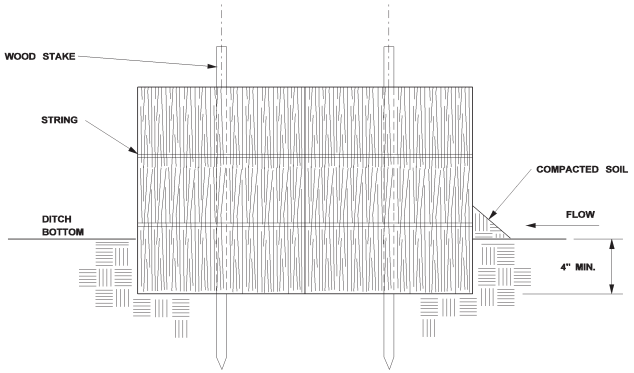
PLAN VIEW

NOTES:

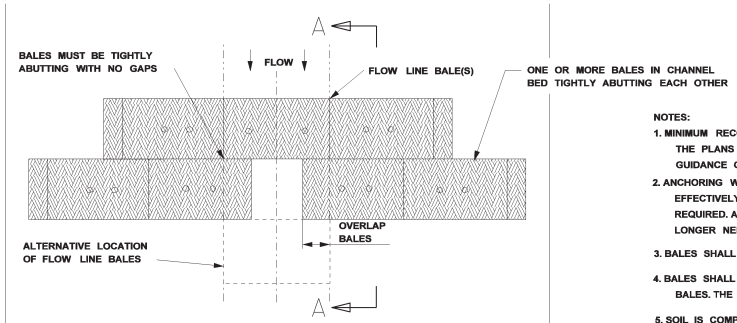
1. ANCHOR AND INSTALL PER DETAILS FOR SILT FENCE SPACING GUIDELINES ON ECD-4
2. A "W" SHAPE MAY BE USED FOR WIDER DITCHES.

SILT FENCE DITCH CHECK SELECTION GUIDELINES

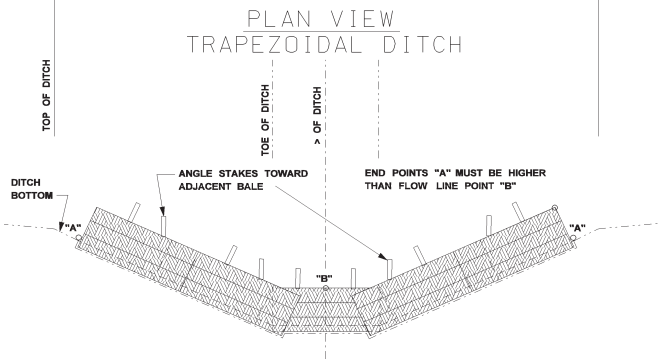
SILT FENCE DITCH CHECKS ARE USED WHERE IT HAS BEEN DETERMINED THAT HAY BALE CHECKS ARE INADEQUATE. SILT FENCE DITCH CHECKS ARE USED TO INTERCEPT LOW VOLUME FLOWS IN LOW TO MODERATE GRADIENT DITCHES.



SECTION A-A



PLAN VIEW
TRAPEZOIDAL DITCH



PROFILE VIEW
TRAPEZOIDAL DITCH

NOTES:

1. MINIMUM RECOMMENDED CHECK SPACING IS 100 FEET UNLESS SHOWN OTHERWISE ON THE PLANS OR EROSION CONTROL PLAN APPROVED BY THE ENGINEER, SEE SPACING GUIDANCE ON ECD-4.
2. ANCHORING WOOD STAKES SHALL BE SIZED, SPACED, AND BE OF A MATERIAL THAT EFFECTIVELY SECURES THE CHECK. A MINIMUM OF TWO STAKES PER BALE IS REQUIRED. ALL NON-DEGRADABLE MATERIALS SHALL BE REMOVED WHEN NO LONGER NEEDED.
3. BALES SHALL BE EMBEDDED IN THE SOIL A MIN. OF 4".
4. BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES. THE BALES SHALL BE PLACED WITH BINDINGS PARALLEL TO THE GROUND.
5. SOIL IS COMPACTED ALONG THE BASE OF THE UPSTREAM FACE TO PREVENT PIPING.
6. MULTIPLE ADJACENT ROWS OF BALES ARE REQUIRED AS SHOWN.

HAY BALE DITCH CHECK SELECTION GUIDELINES

HAY BALES ARE USED TO INTERCEPT LOW VOLUME FLOWS IN LOW TO MODERATE GRADIENT DITCHES.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES, SILT FENCE AND HAY BALE DITCH CHECKS

REVISION	BY	DATE

FILENAME: EROSION CONTROL\ECD-5.DGN

DESIGN TEAM _____ CHECKED _____ DATE _____

WORKING NUMBER: ECD-5

SHEET NUMBER

PLAN
PROJECT DEVELOPMENT DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION
53
1/28/2010 8:58 AM ECD-5.DGN

STATE	PROJECT NO.
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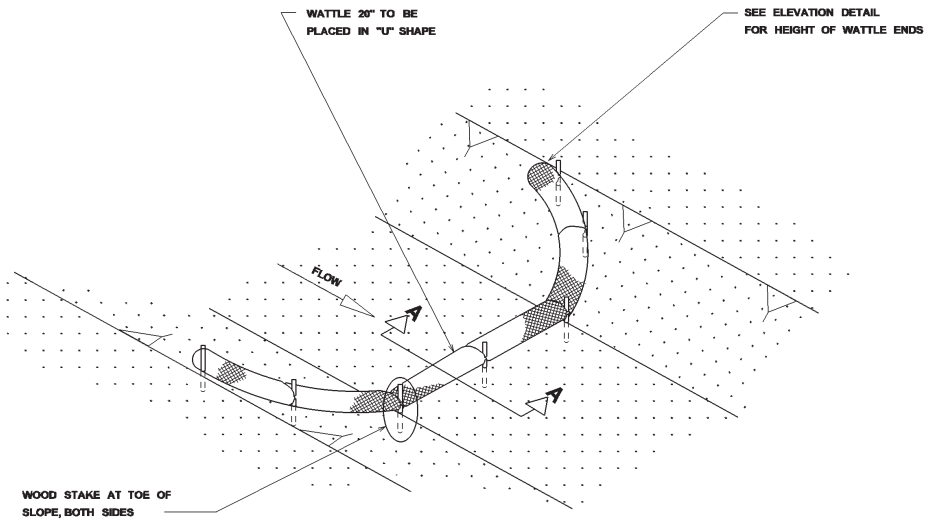
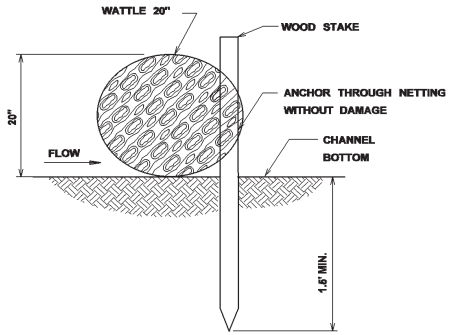


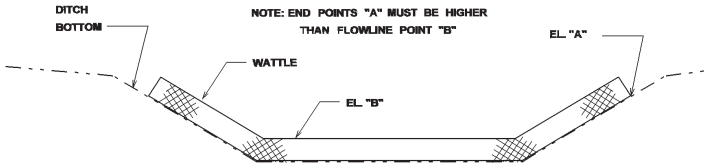
DETAIL (DITCH CHECK)



SECTION A-A

NOTES:

1. MINIMUM RECOMMENDED PLACEMENT INTERVAL BETWEEN WATTLE DITCH CHECK IS 100' UNLESS SHOWN OTHERWISE ON THE PLANS OR EROSION CONTROL PLAN APPROVED BY THE ENGINEER. SEE SPACING GUIDANCE ON ECD-4
2. ANCHORING WOOD STAKES SHALL BE SIZED, SPACED, DRIVEN, AND BE OF A MATERIAL THAT EFFECTIVELY SECURES THE CHECK. STAKE SPACING SHALL BE A MAXIMUM OF THREE FEET. ALL NON-DEGRADABLE MATERIALS SHALL BE REMOVED WHEN NO LONGER NEEDED.
3. TRENCHING OF WATTLES MAY BE NECESSARY IF PIPING BECOMES EVIDENT.
4. WATTLES SHOULD NOT BE USED IN HARD BOTTOM CHANNELS.



ELEVATION DETAIL

WATTLE DITCH CHECK SELECTION GUIDELINES

WATTLE DITCH CHECKS ARE APPROPRIATE FOR VELOCITY REDUCTION AND CONTROL OF SEDIMENT TRANSPORT UNDER LOW TO MEDIUM FLOW CONDITIONS.

DATE	REVISION	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DETAILS OF EROSION CONTROL
WATTLE DITCH CHECK

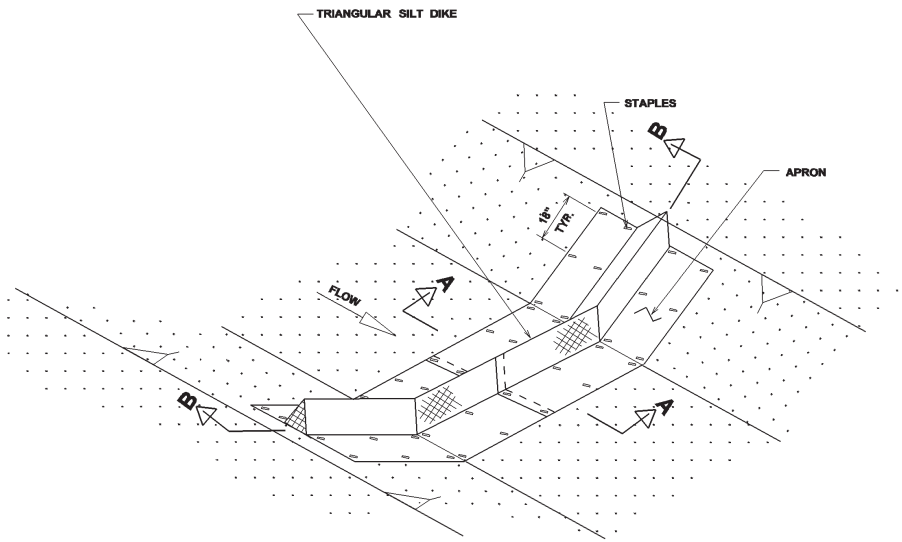
FILENAME: EROSION CONTROL\ECD-6.DGN
DESIGN TEAM ____ CHECKED ____ DATE ____

WORKING NUMBER
ECD-6
SHEET NUMBER

PLAN
PRODUCTION DESIGN DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/19/2010 12:21PM ECD-6.DGN

STATE	PROJECT NO.
MISS.	



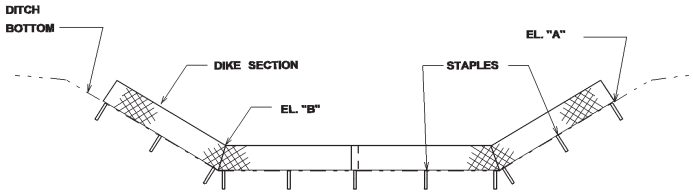
PLAN VIEW

SILT DIKE DITCH CHECK SELECTION GUIDELINES

SILT DIKES CAN BE USED IN DITCHES WITH CONCENTRATED FLOWS WITHIN THE CLEAR ZONE WHERE RIPRAP CAN NOT BE USED.

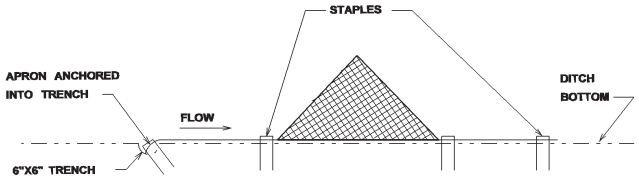
NOTE:

1. MINIMUM RECOMMENDED PLACEMENT INTERVAL BETWEEN SILT DIKE DITCH CHECK IS 100' UNLESS SHOWN OTHERWISE ON THE PLANS OR EROSION CONTROL PLAN APPROVED BY THE ENGINEER. SEE SPACING GUIDANCE ON ECD-4
2. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.



POINT "A" MUST BE HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS

SECTION B-B



NOTE: STAPLES SHALL BE PLACED WHERE THE UNITS OVERLAP AND IN THE CENTER OF THE UNIT

SECTION A-A

SILT DIKE INSTALLATION FOR ROADWAY DITCHES

REVISION	BY	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DETAILS OF EROSION CONTROL
SILT DIKE DITCH CHECK

FILENAME: EROSION CONTROL\ECD-7.DGN

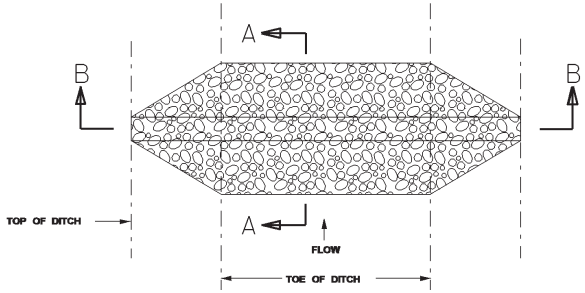
DESIGN TEAM _____ CHECKED _____ DATE _____

WORKING NUMBER
ECD-7
SHEET NUMBER

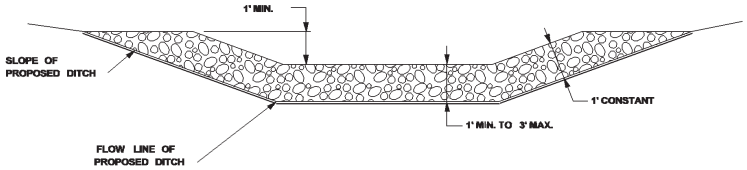
PLAN
PRODUCTION DESIGN DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/20/2010 8:11 AM ECD-7.DGN

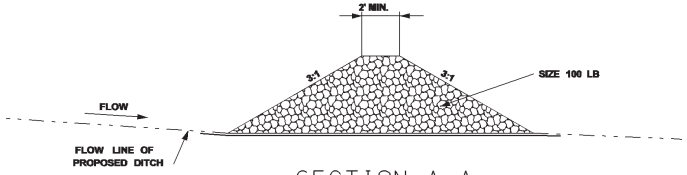
STATE	PROJECT NO.
MISS.	



PLAN VIEW
DETAIL FOR TRAPEZOIDAL DITCH

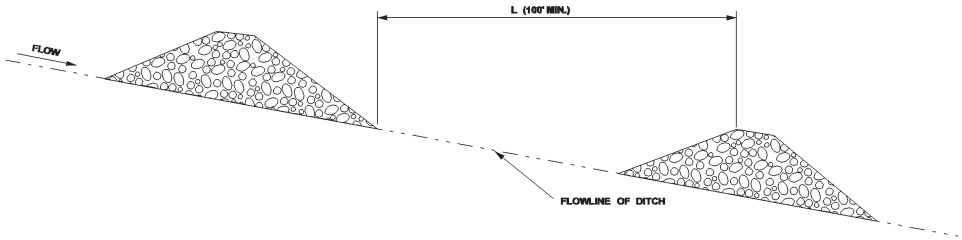


SECTION B-B



SECTION A-A

TEMPORARY ROCK DITCH CHECKS IN ROADSIDE DITCHES



DETAIL FOR SPACING BETWEEN DITCH CHECKS

NOTES:
1. MINIMUM SPACING FOR ROCK DITCH CHECKS SHALL BE 100 FEET OR EROSION CONTROL PLAN APPROVED BY THE ENGINEER. SEE SPACING GUIDANCE ON ECD-4
2. ROCK DITCH CHECKS MAY ALSO BE CHOKED WITH FABRIC.
3. SIZE 300 LB RIP RAP MAY BE USED FOR SPECIFED APPLICATIONS AS SHOWN ON EROSION CONTROL PLAN

DATE	REVISION	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
ROCK DITCH CHECK

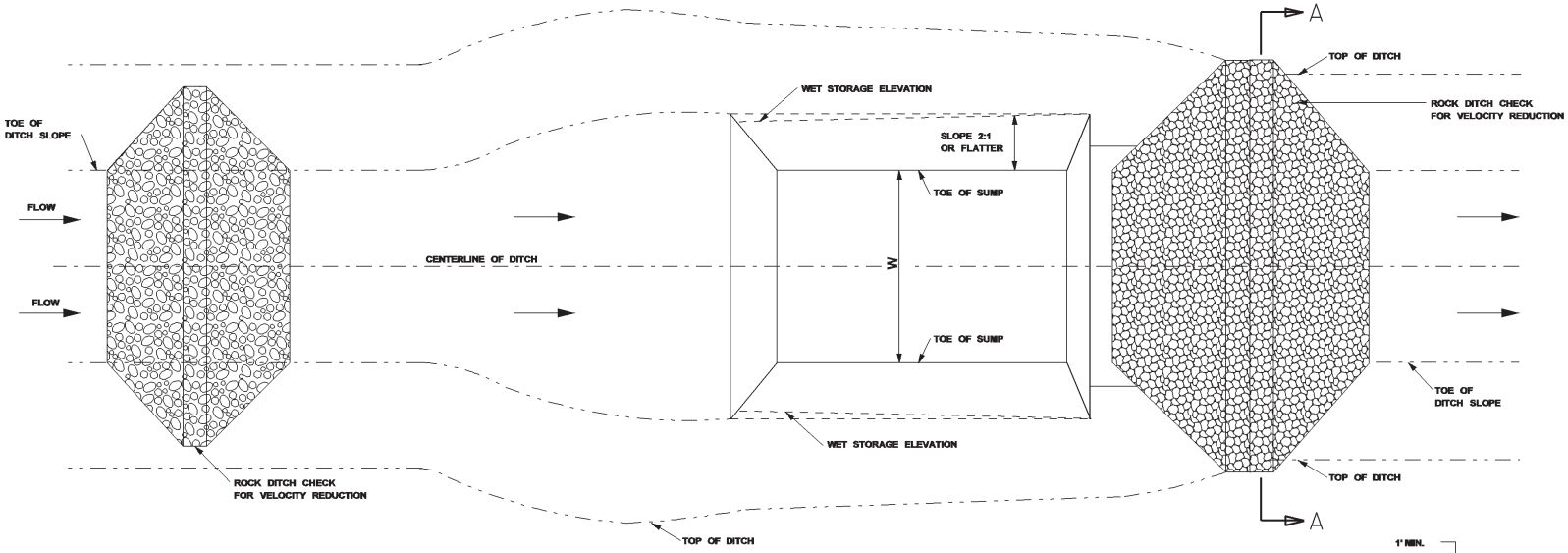
WORKING NUMBER
ECD-8
SHEET NUMBER

FILENAME: EROSION CONTROL\ECD-8.DGN
DESIGN TEAM ____ CHECKED ____ DATE ____

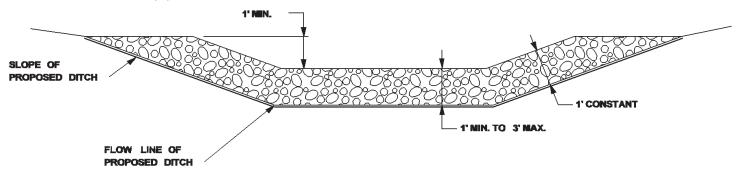
PLAN
FLORIDA AVENUE DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/19/2010 12:22PM ECD-8.DGN

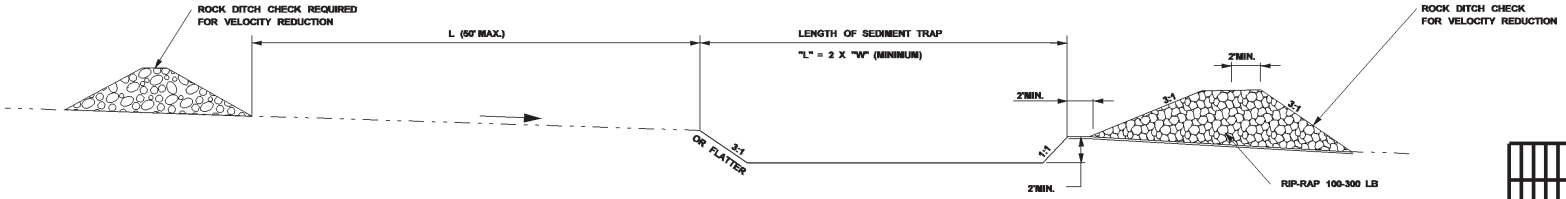
STATE	PROJECT NO.
MISS.	



PLAN VIEW



SECTION A-A



PROFILE VIEW

REVISION	BY	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

ROCK DITCH CHECK
WITH SUMP EXCAVATION

WORKING NUMBER
ECD-9
SHEET NUMBER

FILENAME: EROSION CONTROL\ECD-9.DGN
DESIGN TEAM ____ CHECKED ____ DATE ____

PLAN
FLORENCE & CO. DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/19/2010 12:23PM ECD-9.DGN

STATE	PROJECT NO.
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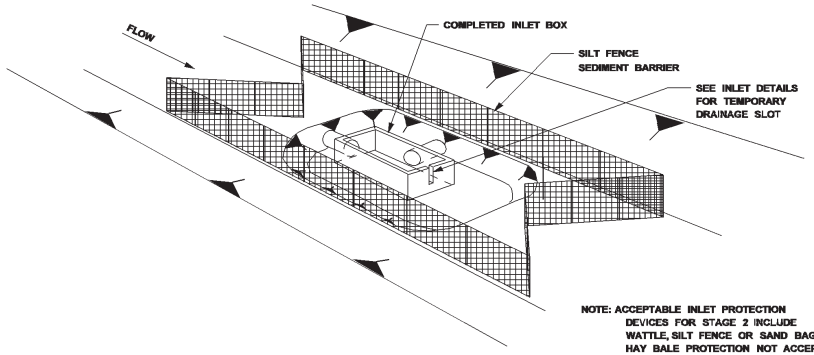
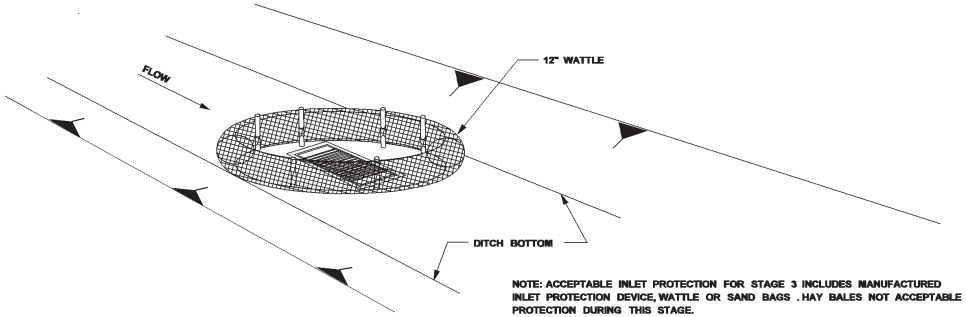


NOTE: ACCEPTABLE INLET PROTECTION DEVICES FOR STAGE 2 INCLUDE WATTLE, SILT FENCE OR SAND BAGS. HAY BALE PROTECTION NOT ACCEPTABLE DURING THIS PHASE.

STAGE 2

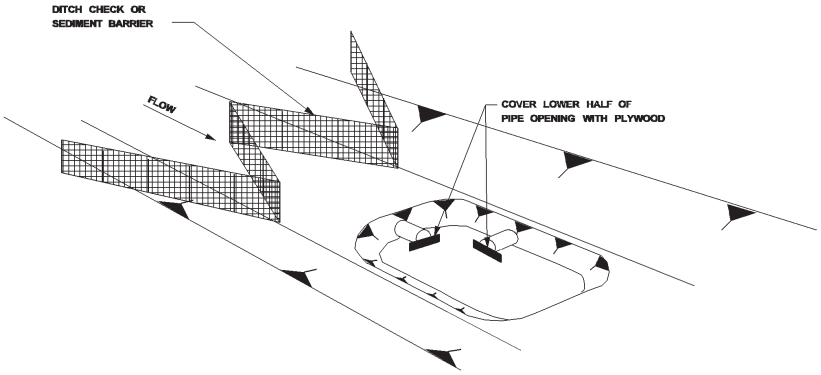
INLET/JUNCTION BOX CONSTRUCTED BUT NOT BACKFILLED



NOTE: ACCEPTABLE INLET PROTECTION FOR STAGE 3 INCLUDES MANUFACTURED INLET PROTECTION DEVICE, WATTLE OR SAND BAGS . HAY BALES NOT ACCEPTABLE PROTECTION DURING THIS STAGE.

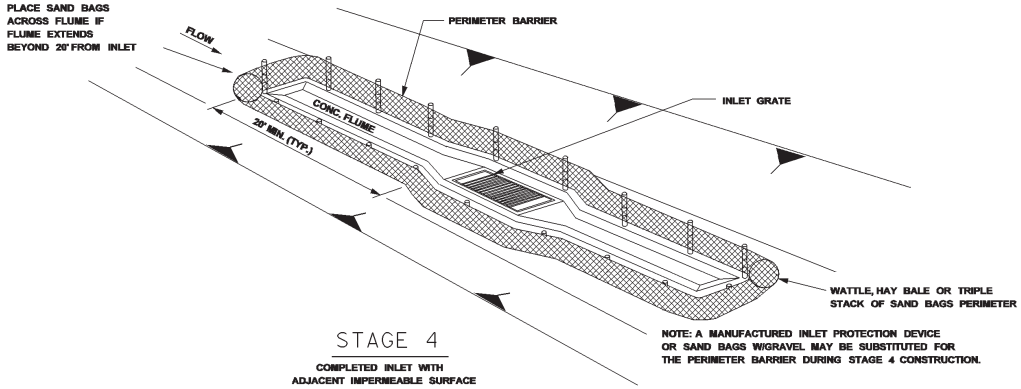
STAGE 3

INLET CONSTRUCTED AND BACKFILLED



STAGE 1

INLET/JUNCTION BOX LOCATION EXCAVATED



NOTE: A MANUFACTURED INLET PROTECTION DEVICE OR SAND BAGS W/GRAVEL MAY BE SUBSTITUTED FOR THE PERIMETER BARRIER DURING STAGE 4 CONSTRUCTION.

STAGE 4

COMPLETED INLET WITH ADJACENT IMPERMEABLE SURFACE

DITCH INLET CONSTRUCTION STAGES

NOTES:

1. FOUNDATION BACKFILL SHOULD BE PLACED IN STAGE 1 IMMEDIATELY AFTER PIPE INSTALLATION. INLET CONSTRUCTION SHOULD COMMENCE AS SOON AS POSSIBLE AND BE CONTINUOUS THROUGH COMPLETION.
2. CONFIGURATIONS MAY BE ADJUSTED WITH APPROVAL OF THE ENGINEER FOR TRAVELWAY SAFETY, WATER FLOW, SOIL OR INSTALLATION CHALLENGES.
3. DURING STAGE 1 AND STAGE 2, SILT FENCE MAY BE REQUIRED UPSLOPE OF THE INLET EXCAVATION AS DIRECTED BY THE ENGINEER.
4. IF SILT FENCING IS INSTALLED AROUND THE INLET EXCAVATION IT SHOULD BE PLACED IN A CONFIGURATION THAT WILL ALLOW INLET CONSTRUCTION.

DATE	REVISION	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

INLET PROTECTION
TYPICAL APPLICATIONS AND DETAILS

FILENAME: EROSION CONTROL\ECD-10.DGN

DESIGN TEAM _____ CHECKED _____ DATE _____

WORKING NUMBER
ECD-10
SHEET NUMBER

PLAN
FLORIDA AVE. DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/19/2010 12:24PM ECD-10.DGN

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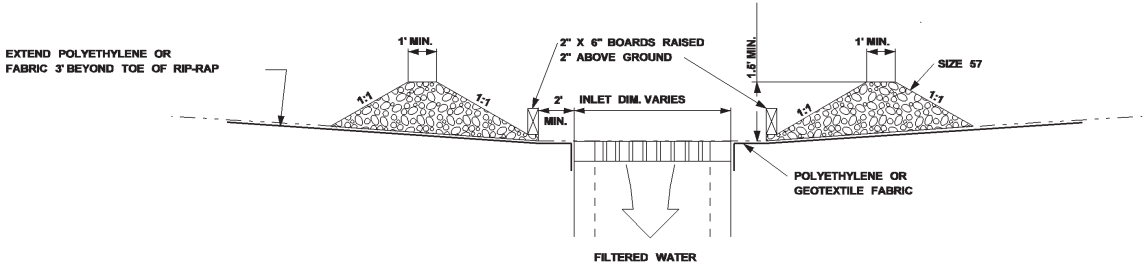
MISS.	



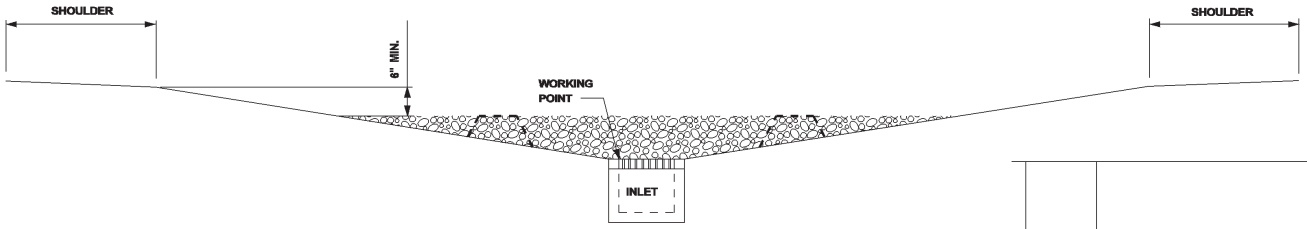
SECTION B-B

NOTES:

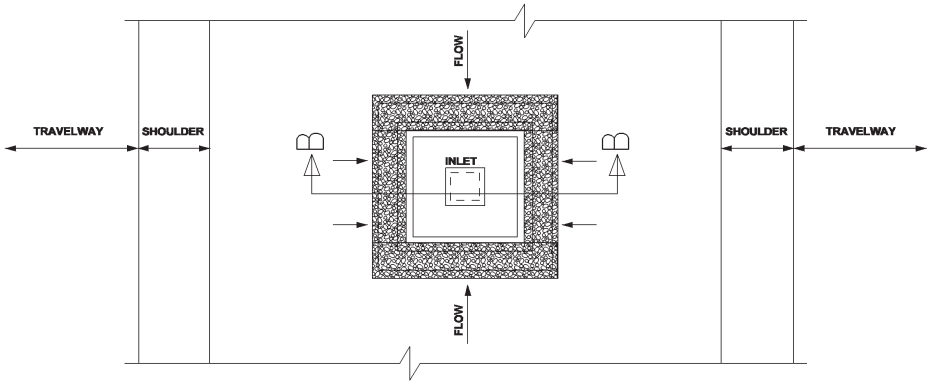
1. THE ELEVATION OF THE TOP OF THE REQUIRED STONE BERM SHALL BE A MINIMUM OF 1.5' ABOVE THE ELEVATION OF THE INLET WORKING POINT AND A MINIMUM OF 6" BELOW THE ELEVATION OF THE OUTSIDE EDGE OF THE INSIDE SHOULDER.

2. THIS COARSE AGGREGATE INLET PROTECTION SHALL NOT BE UTILIZED DURING STAGE 1 AND STAGE 2 INLET CONSTRUCTION. SEE INLET PROTECTION TYPICAL APPLICATIONS AND DETAILS)

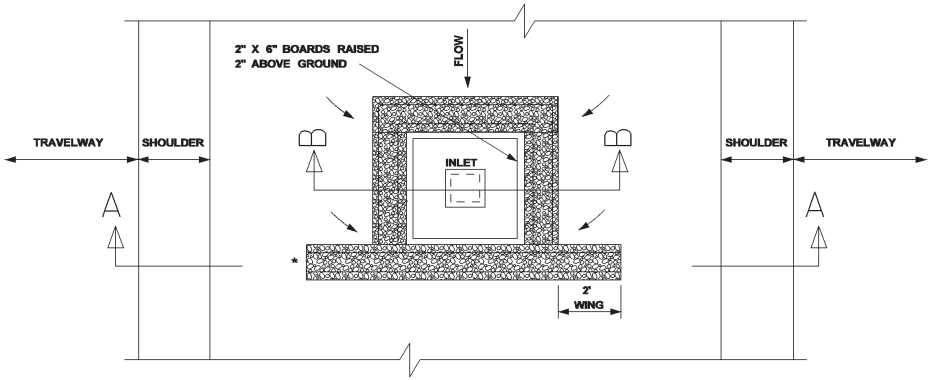
3. 2" X 6" BOARDS MAY BE REPLACED WITH WIRE MESH W/OPENINGS LESS THAN 1" X 1". COST IS ABSORBED.



SECTION A-A



PLAN - IN SAG



PLAN - ON GRADE

* CONSTRUCT WINGS TO PREVENT BYPASS

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

INLET PROTECTION
DETAILS FOR COARSE AGGREGATE
ON GRADES & SAGS

REVISION | BY | DATE

WORKING NUMBER
ECD-11

SHEET NUMBER

FILENAME: EROSION CONTRL\ECD-11.DGN

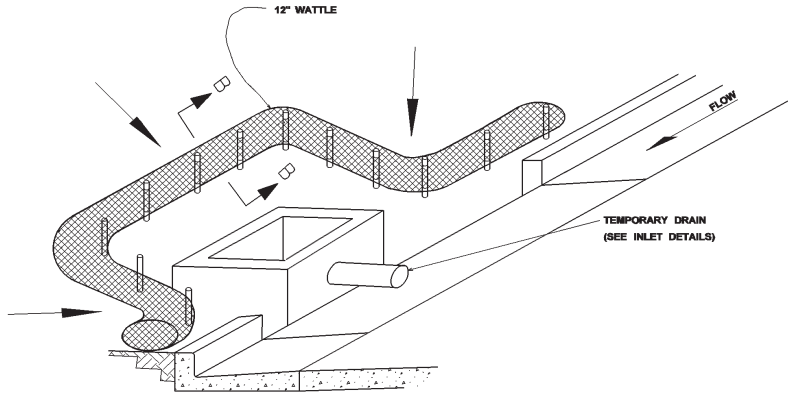
DESIGN TEAM _____ CHECKED _____ DATE _____

PLAN
MISSISSIPPI DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION

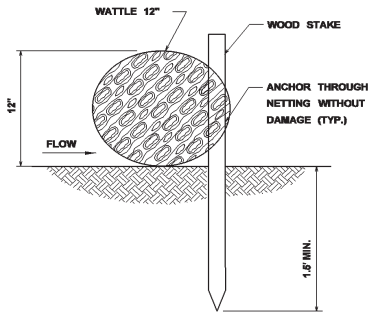
1/19/2010 12:25PM ECD-11.DGN

STATE	PROJECT NO.
MISS.	

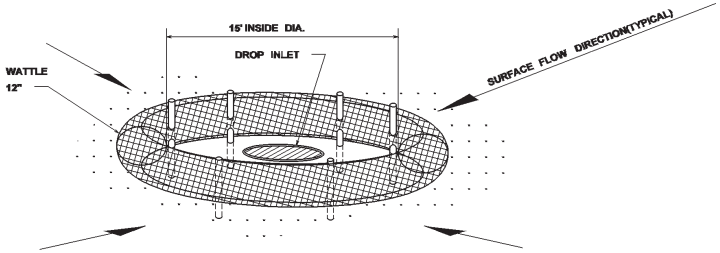
NOTE:
SILT FENCE OR SAND BAGS MAY ALSO BE USED FOR THIS APPLICATION.
HAY BALES NOT ACCEPTABLE DURING THIS STAGE.



CURB INLET PROTECTION (STAGE 2)
SINGLE OR DOUBLE WING INLET



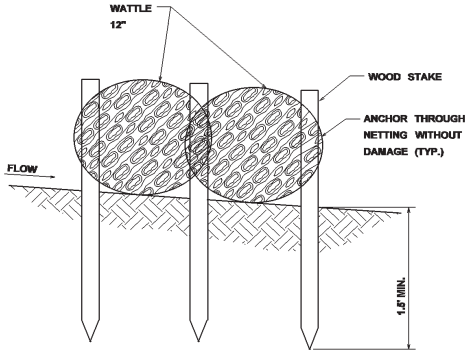
SECTION B-B



DROP INLET PROTECTION

NOTES:

1. ANCHORING STAKES SHALL BE SIZED, SPACED, AND BE OF A MATERIAL THAT EFFECTIVELY SECURES THE WATTLE. STAKE SPACING SHALL BE A MAXIMUM OF THREE FEET.
2. OVERLAP ENDS OF WATTLES PER MANUFACTURERS RECOMMENDATIONS (1'MIN.,3'MAX.).
3. TRENCHING OF WATTLES MAY BE NECESSARY IF PIPING BECOMES EVIDENT.



SECTION A-A

DATE	REVISION	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

INLET PROTECTION DETAILS
OF WATTLES

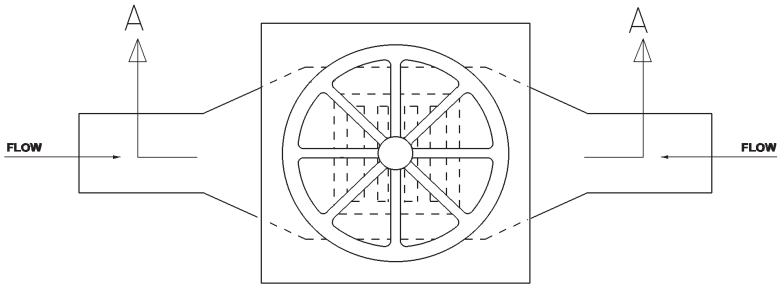
WORKING NUMBER
ECD-12
SHEET NUMBER

FILENAME: EROSION CONTROL\ECD-12.DGN
DESIGN TEAM ____ CHECKED ____ DATE ____

PLAN
FLORENCE & HAZLEHURST DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/19/2010 12:26PM ECD-12.DGN

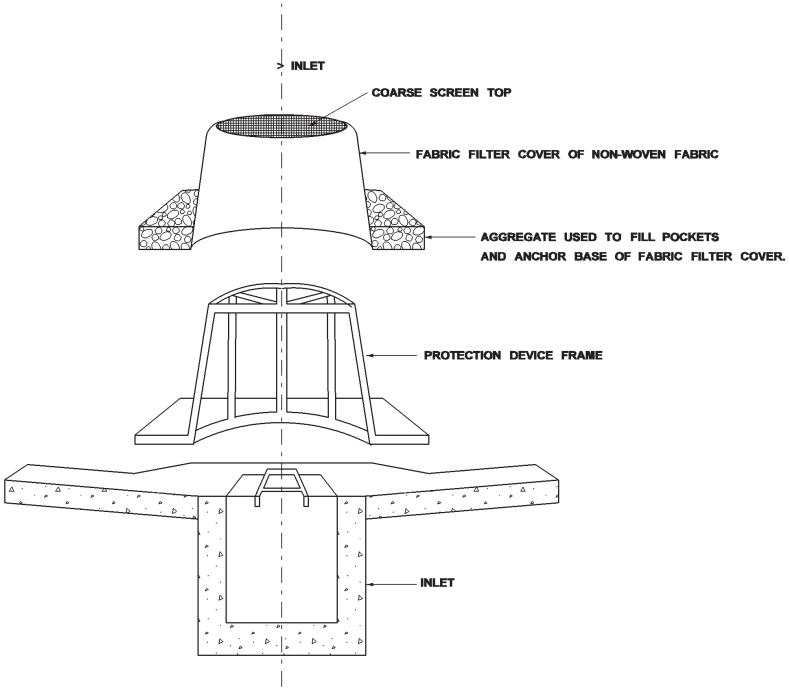
STATE	PROJECT NO.
MISS.	



PLAN

NOTES:

1. FRAMES WITH EITHER SQUARE OR CIRCULAR BASES MAY BE USED. SELECTED FRAME BASE SHOULD PROVIDE BEST SEAL AROUND INLET AS DIRECTED BY THE ENGINEER.
2. FILL POCKETS AROUND BASE OF FILTER COVER WITH #57 STONE OR SOIL. STONE IS REQUIRED WHEN ANCHORING THE MANUFACTURED INLET PROTECTION DEVICE OVER PAVED DITCH OR FLUME.
3. USE ONLY DURING STAGE 3 OR STAGE 4 INLET CONSTRUCTION.
4. FOR MEDIAN INLET PROTECTION, THE ELEVATION OF THE COARSE SCREEN TOP SHOULD BE A MINIMUM OF 6" BELOW THE ELEVATION OF THE OUTSIDE EDGE OF THE INSIDE SHOULDER.



SECTION "A-A"

REVISION	BY	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

INLET PROTECTION
DETAILS OF MANUFACTURED
INLET PROTECTION DEVICE

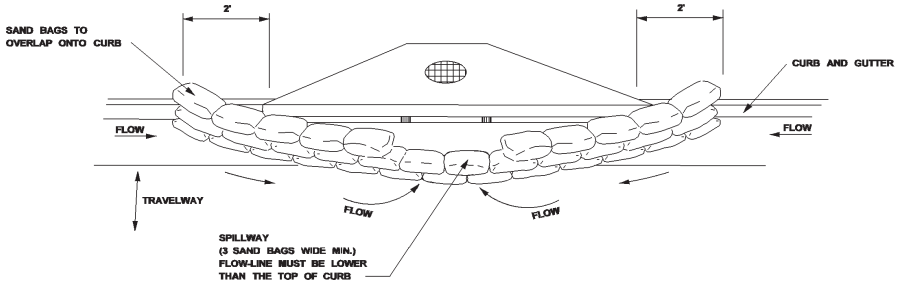
WORKING NUMBER
ECD-13
SHEET NUMBER

FILENAME: EROSION CONTROL\ECD-13.DGN
DESIGN TEAM _____ CHECKED _____ DATE _____

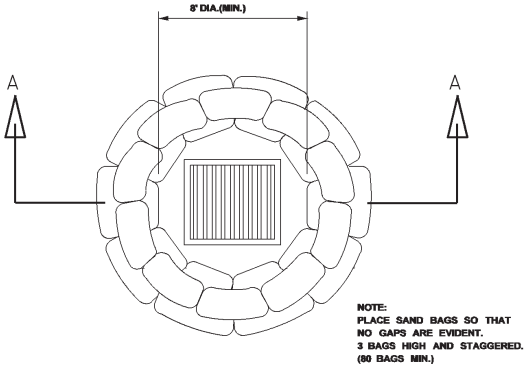
PLAN
PLANNING AND DEVELOPMENT DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/20/2010 9:32 AM ECD-13.DGN

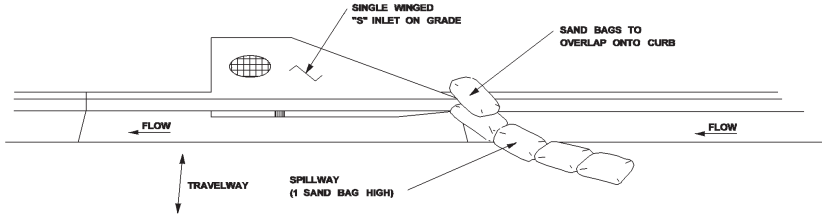
STATE	PROJECT NO.
MISS.	



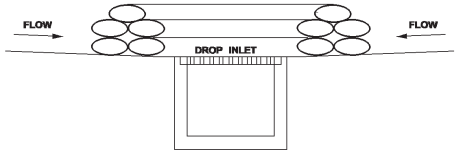
TYPICAL (SAND BAG) PROTECTION FOR INLET IN SAG



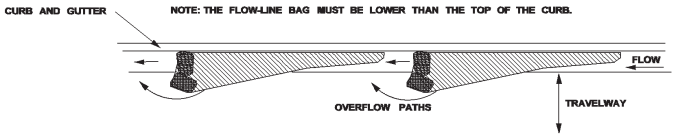
DROP INLET
PLAN VIEW



TYPICAL (SAND BAG) PROTECTION FOR INLET ON GRADE



SECTION A-A
SAND BAG BARRIER



CURB AND GUTTER SEDIMENT
CONTAINMENT SYSTEM

CURB INLET PROTECTION NOTES:

1. THIS CURB INLET PROTECTION METHOD CAN BE USED DURING ANY STAGE OF BASE AND PAVEMENT CONSTRUCTION.
2. BAG HEIGHT AND NUMBER OF BAGS SHOULD BE BASED ON CURB HEIGHT AND USE OF TRAVELWAY.
3. SEDIMENT SHOULD BE CONTROLLED PRIOR TO ENTERING GUTTER. GUTTER CHECKS AND INLET PROTECTION ARE FOR SECONDARY CONTROL.
4. REMOVE ACCUMULATED SEDIMENT AFTER EVERY RAINFALL. SWEEP SEDIMENT FROM HARD SURFACES AND DISPOSE OF APPROPRIATELY AWAY FROM INLETS AND/OR WATER BODIES.
5. IF DENUDED AREAS EXIST BEHIND THE INLET, A SEDIMENT BARRIER SHOULD BE INSTALLED AROUND IT'S PERIMETER TO CONTROL SEDIMENT.

REVISION	BY	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

INLET PROTECTION
DETAILS OF SAND BAG

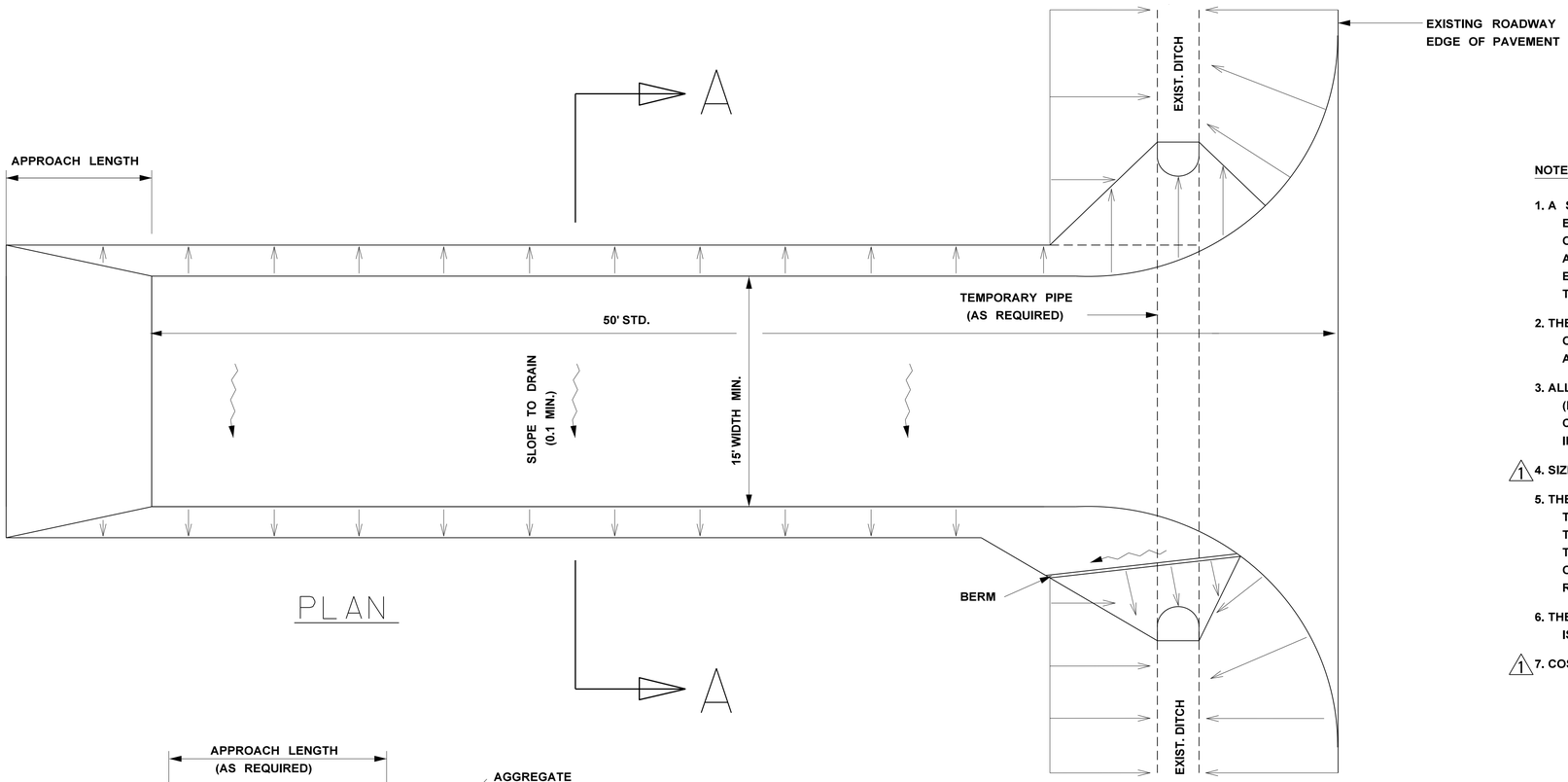
WORKING NUMBER
ECD-14
SHEET NUMBER

FILENAME: EROSION CONTROL\ECD-14.DGN
DESIGN TEAM _____ CHECKED _____ DATE _____

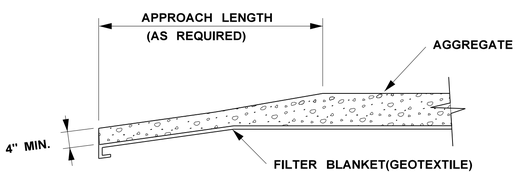
PLAN
FLORIDA PLANNING DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/20/2010 9:33 AM ECD-14.DGN

STATE	PROJECT NO.
MISS.	



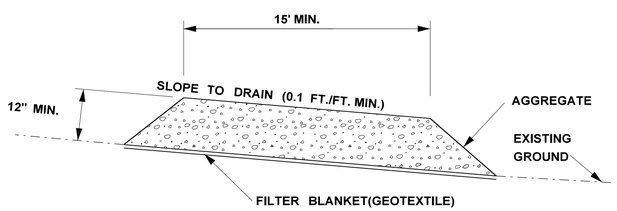
PLAN



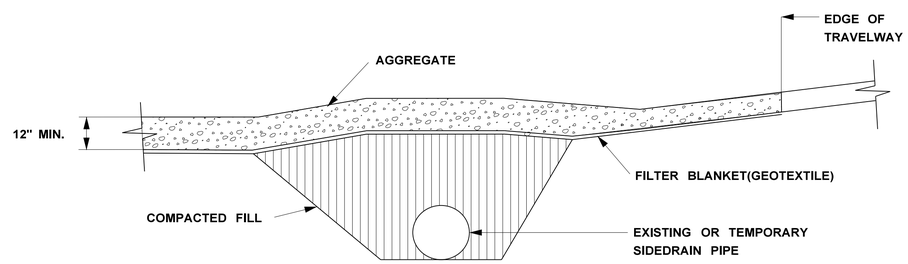
TRANSITION DETAIL

NOTES:

1. A STABILIZED CONSTRUCTION ENTRANCE SHALL BE CONSTRUCTED AT POINTS OF EGRESS FROM UNSTABILIZED AREAS OF THE PROJECT TO PUBLIC ROADS WHERE OFFSITE TRACKING OF MUD COULD OCCUR. TRAFFIC FROM UNSTABILIZED AREAS OF THE PROJECT SHALL BE DIRECTED THRU THE STABILIZED ENTRANCE. BARRIERS, FLAGGING, OR OTHER POSITIVE MEANS SHALL BE USED AS REQUIRED TO LIMIT AND DIRECT VEHICULAR EGRESS ACROSS THE STABILIZED ENTRANCE.
2. THE CONTRACTOR MAY PROPOSE AN ALTERNATIVE TECHNIQUE TO MINIMIZE OFFSITE TRACKING OF SEDIMENT. THE ALTERNATIVE MUST BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO ITS USE.
3. ALL MATERIALS SPILLED, DROPPED, OR TRACKED ONTO PUBLIC ROADS (INCLUDING THE STABILIZED CONSTRUCTION ENTRANCE AGGREGATE AND CONSTRUCTION MUD) SHALL BE REMOVED DAILY, OR MORE FREQUENTLY IF SO DIRECTED BY THE ENGINEER.
4. SIZE III STABILIZER AGGREGATE OR LARGER SHALL BE USED. (1)
5. THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL ALLOW IT TO PERFORM IT'S FUNCTION TO PREVENT OFFSITE TRACKING, THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE RINSED WHEN NECESSARY TO MOVE ACCUMULATED MUD DOWNWARD THRU THE STONE. ADDITIONAL STABILIZATION OF THE VEHICULAR ROUTE LEADING TO THE STABILIZED ENTRANCE MAY BE REQUIRED TO LIMIT THE MUD TRACKED.
6. THE NOMINAL SIZE OF A STANDARD STABILIZED CONSTRUCTION ENTRANCE IS 15' X 50' UNLESS OTHERWISE SHOWN IN THE EROSION CONTROL PLAN.
7. COSTS OF ALL ITEMS ON THIS SHEET ARE TO BE INCLUDED IN OTHER ITEMS BID. (1)



SECTION A-A



RURAL CONNECTION DETAIL

01/18/13	REVISED NOTE	JSS	1
DATE	REVISION	BY	

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

STABILIZED CONSTRUCTION ENTRANCE

WORKING NUMBER ECD-15

SHEET NUMBER

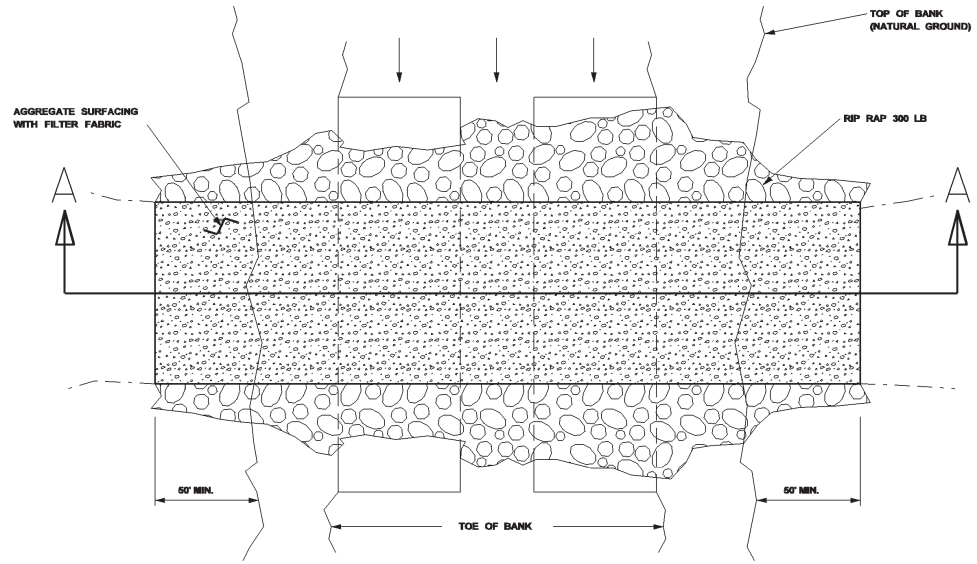
FILENAME: ECD-15.dgn

DESIGN TEAM ____ CHECKED ____ DATE 01/18/13

PLAN
ROADWAY DESIGN DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

2/8/2013 8:29 AM ECD-15 01-18-2013.DGN

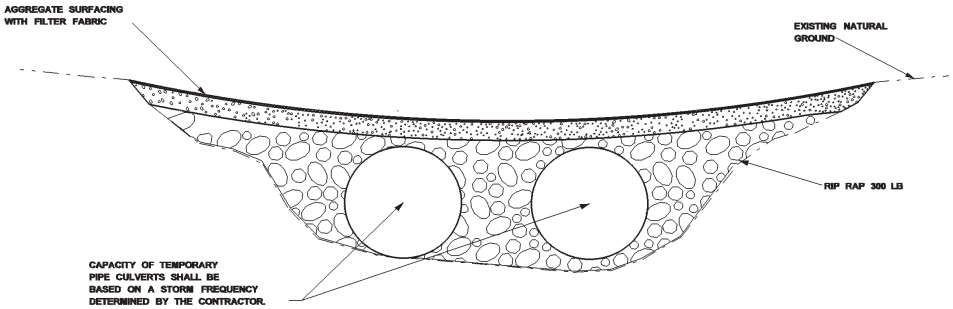
STATE	PROJECT NO.
MISS.	



PLAN VIEW

TEMPORARY CULVERT STREAM CROSSING

TEMPORARY CULVERT STREAM CROSSING



SECTION A-A

NOTES:

1. TEMPORARY CULVERT STREAM CROSSINGS PROVIDE A MEANS FOR VEHICLES AND EQUIPMENT TO SAFELY CROSS A WATERCOURSE WHILE MINIMIZING DAMAGE TO THE CHANNEL AND/OR BANKS.

2. TEMPORARY CULVERT STREAM CROSSINGS, WHEN PERMITTED BY THE ENGINEER, SHALL BE CONSTRUCTED TO SAFELY PASS EXPECTED MEAN WATER FLOW OF THE STREAM FOR THE TIME OF YEAR AND LENGTH OF TIME THAT THEY ARE INSTALLED.

3. TEMPORARY STREAM CROSSINGS SHALL BE DESIGNED TO ENSURE STRUCTURAL INTEGRITY AND STABILITY, AND MAINTAIN NORMAL DOWNSTREAM FLOWS. THE USE OF INSTREAM CROSSINGS AND INSTREAM AGGREGATE FILL SHALL BE MINIMIZED TO THE EXTENT PRACTICABLE.

4. A CONTINUOUS PROGRAM OF EFFECTIVE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED PRIOR TO AND CONCURRENT WITH ANY TYPE OF CONSTRUCTION ACTIVITY WITHIN THE BANKS OF A STREAM. WHEN A CROSSING IS NO LONGER NEEDED, THE STREAMBED AND STREAM BANKS SHALL BE RESTORED TO PRE-DISTURBANCE CONDITIONS, OR SUCH A CONDITION THAT PROVIDES SUBSTANTIALLY EQUIVALENT PROTECTION OF WATER QUALITY.

5. LOCATIONS OR TYPES OF TEMPORARY CULVERT STREAM CROSSINGS WILL NOT BE SHOWN ON THE PLANS AS REQUIRED ITEMS .

6. THE CONTRACTOR MAY PROPOSE OTHER OPTIONS FOR TEMPORARY STREAM CROSSINGS SUCH AS STEEL/TIMBER BRIDGE OR MATS.

7. THE DETAILS PROVIDED DEPICT A TYPICAL TEMPORARY CULVERT STREAM CROSSING.

8. TEMPORARY STREAM CROSSINGS WILL NOT BE MEASURED FOR SEPERATE PAYMENT. ALL COSTS FOR MATERIALS, LABOR, EQUIPMENT, CONSTRUCTION, REMOVAL AND MAINTENANCE SHALL BE ABSORBED IN OTHER ITEMS OF WORK

DATE	REVISION	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

TEMPORARY CULVERT
STREAM CROSSING

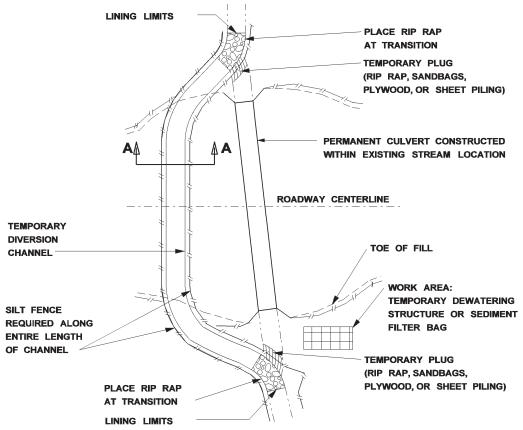
WORKING NUMBER
ECD-16
SHEET NUMBER

FILENAME: EROSION CONTROL\ECD-16.DGN
DESIGN TEAM _____ CHECKED _____ DATE _____

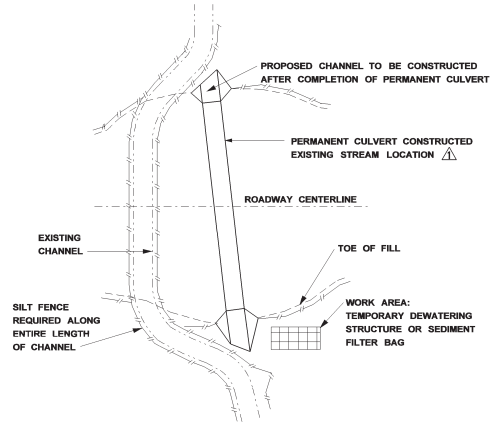
PLAN
FLORIDA DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/20/2010 9:34 AM ECD-16.DGN

STATE	PROJECT NO.
MISS.	



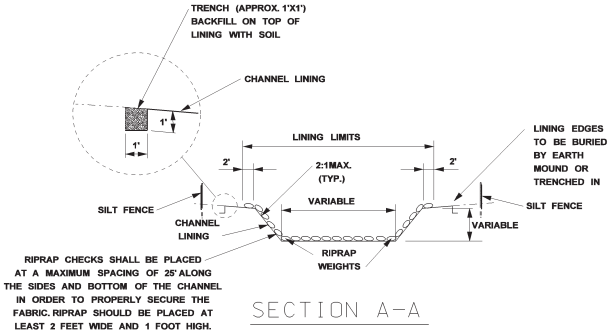
CULVERT CONSTRUCTED WITHIN EXISTING STREAM



CULVERT CONSTRUCTED OUTSIDE EXISTING STREAM

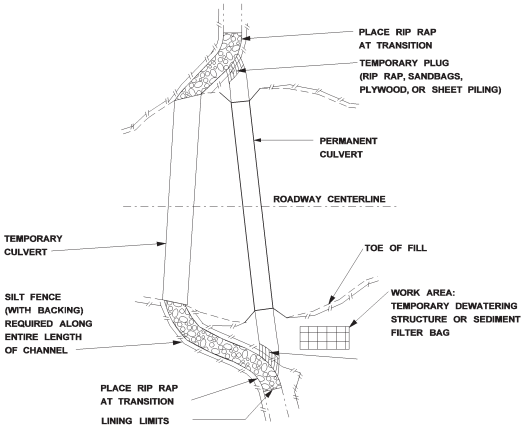
NOTES:

1. TEMPORARY DIVERSION CHANNELS MAY BE USED TO DIVERT NORMAL STREAM PATH FLOW FROM AN ERODIBLE AREA UNTIL SUCH AREAS CAN BE STABILIZED.
2. TYPE III FILTER FABRIC OR PRE-FAB DITCH LINER MAY BE USED FOR CHANNEL LINING.
3. RIP-RAP WITH FILTER FABRIC MAY BE USED FOR CHANNEL FLOW VELOCITIES OF 3.0 FPS TO 9.0 FPS. THE RIP-RAP SHALL BE SIZED 300 LB
4. LOCATIONS OR TYPES OF TEMPORARY DIVERSION WILL NOT BE SHOWN ON THE PLANS
5. DIVERSION CHANNEL SHALL BE STABILIZED AND INSPECTED BY THE ENGINEER BEFORE FLOW IS DIVERTED.
6. DURING CONSTRUCTION OF DIVERSION CHANNEL, DAMAGE TO THE EXISTING STREAM, CANOPY REMOVAL, AND DEPTH OF THE CHANNEL CONSTRUCTION SHALL BE MINIMIZED.
7. CONSTRUCTION OF THE CHANNEL RELOCATIONS AND CULVERTS SHALL PROCEED AS FOLLOWS:
   - 7.1. CONSTRUCT A MEANDERING TEMPORARY CHANNEL CHANGE ADJACENT TO THE PROPOSED CULVERT TO DIVERT WATER TEMPORARILY DURING THE CULVERT CONSTRUCTION. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
   - 7.2. RELOCATE CHANNEL AND CONSTRUCT CULVERT SIMULTANEOUSLY.
   - 7.3. SOD AND/OR RIP-RAP RECONSTRUCTED BANKS AT TRANSITIONS. THE UPPER CHANNEL PLUG IS TO REMAIN IN PLACE UNTIL SUBNOTE (7.1) THROUGH (7.4) UNDER THIS HEADING ARE COMPLETED TO INSURE THAT ALL CONSTRUCTION IS IN THE DRY.
   - 7.4. IF AN EARTH PLUG IS NECESSARY AT THE DOWNSTREAM END OF THE CHANNEL IT SHOULD BE REMOVED FIRST, THEN REMOVE THE UPPER PLUG TO RELEASE WATER INTO THE RECONSTRUCTED CHANNEL.
   - 7.5 PLUGS SHOULD REMAIN IN PLACE UNTIL PERMANENT STABILIZATION OF THE NEW WATER COURSE IS COMPLETED. REMOVAL OF PLUGS SHOULD ONLY BE PERFORMED FOLLOWING ACCEPTANCE OF ALL STABILIZATION WORK BY THE ENGINEER.
8. THE DETAILS PROVIDED DEPICT TYPICAL TEMPORARY DIVERSION CHANNELS.
9. THE CONTRACTOR MAY PROPOSE THE USE OF OTHER DIVERSION OPTIONS SUCH AS PIPING, PUMPING OR STAGED CONSTRUCTION.
10. THE EFFECTIVE AREA OF FLOW IN THE TEMPORARY CHANNEL OR CULVERT SHALL BE AT LEAST ONE-HALF THAT OF THE EXISTING STRUCTURE.



SECTION A-A

TEMPORARY DIVERSION CHANNEL WITH GEOTEXTILE FABRIC



TEMPORARY CULVERT USED DURING CONSTRUCTION

DATE	REVISION	BY
06/06/08	revised text	JSS

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

TEMPORARY STREAM DIVERSION

WORKING NUMBER ECD-17

SHEET NUMBER

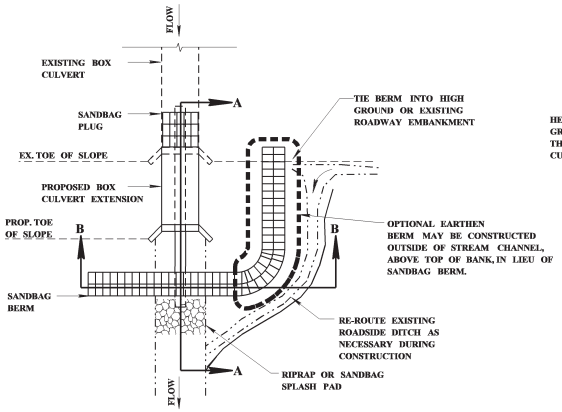
FILENAME: EROSION CONTROL\ECD-17.DGN

DESIGN TEAM _____ CHECKED _____ DATE _____

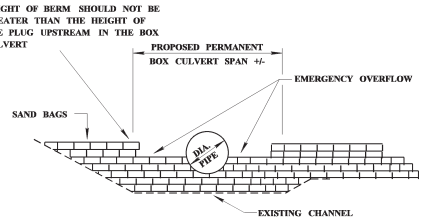
PLAN ROADWAY DIVISION MISSISSIPPI DEPARTMENT OF TRANSPORTATION

8/15/2010 9:19 AM ECD-17.DGN

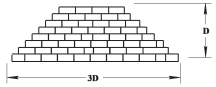
STATE	PROJECT NO.
MISS.	



PLAN VIEW

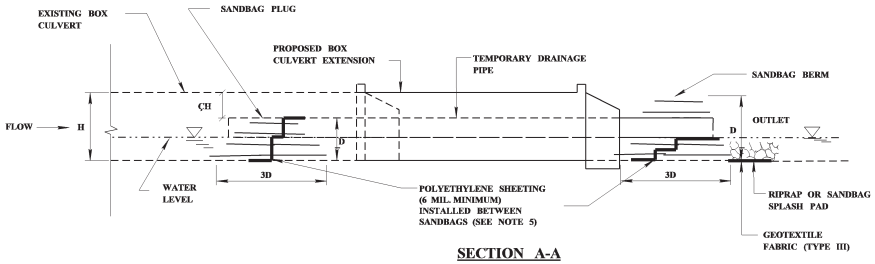


SECTION B-B



SAND BAG PLUG & BERM CROSS SECTION

(SEE NOTE 4)



SECTION A-A

MAXIMUM SPAN FOR PIPE SUPPORTS, FEET

DIAMETER OF PIPE (IN.)	STEEL THICKNESS (IN.)				
	0.064	0.079	0.109	0.138	0.168
	2" x 1/2" CORRUGATION				
24	13	15	20		
36	12	15	20	25	
48	11	14	19	25	30
60		14	19	24	29
72			18	24	29
	5" X 1" OR 3" X 1" CORRUGATION				
36	9	11			
48	9	11	15		
60	8	10	14	18	
72	8	10	14	18	22

FOR PIPE SIZES NOT SHOWN REFER TO NEXT LARGER SIZE

GENERAL NOTES

1 SUSPENDED PIPE DIVERSIONS MAY BE USED TO ALLOW BOX CULVERT EXTENSIONS TO BE CONSTRUCTED, WHILE SEPARATED FROM FLOWING WATER, THUS REDUCING SEDIMENTATION. OPTIONAL FLEXIBLE PIPE DIVERSION MAY BE UTILIZED ON STREAMS WITH INTERMITTENT FLOW WHERE THE DURATION OF CONSTRUCTION IS EXPECTED TO BE BRIEF.

2 EXCAVATION SLOPES FOR BOX CULVERT EXTENSIONS SHALL BE PROTECTED WITH TYPE III FILTER FABRIC PRIOR TO CONSTRUCTION OF THE BOX.

3 SUSPENDED PIPE DIVERSIONS MAY BE USED WHERE ADVERSE IMPACTS WILL NOT BE CAUSED BY WATER PONDED UPSTREAM OF THE PIPE.

4 THE SANDBAG PLUG AT THE UPSTREAM END OF THE SUSPENDED PIPE DIVERSION SHOULD BE CONSTRUCTED TO A HEIGHT EQUAL TO THREE QUARTERS OF THE RISE OF THE BOX CULVERT.

5 POLYETHYLENE SHEETING (6 MIL. MINIMUM) SHALL BE PLACED INSIDE THE SANDBAG PLUG IN THE BOX CULVERT AND IN THE SAND BAG BERM WITHIN THE CHANNEL IN ORDER TO PROVIDE THE BEST POSSIBLE SEAL. SANDBAGS ON THE DOWNSTREAM SIDE OF THE SHEETING SHOULD BE PLACED FIRST, AND THEN SHEETING PLACED ON THESE BAGS.AS MUCH AS POSSIBLE, THE SHEETING SHOULD BE FITTED AROUND THE PIPE. THE REMAINING SANDBAGS WOULD THEN BE PLACED ON THE SHEETING. WHERE MULTIPLE SHEETS ARE USED, THEY SHOULD OVERLAP A MINIMUM OF 18 INCHES.

6 THE PROPOSED CULVERT CONSTRUCTION SHALL BE SEALED FROM THE EXISTING STREAM BY MEANS OF A SANDBAG BERM WHICH SHOULD BE AT THE SAME HEIGHT AS THE PLUG INSIDE THE BOX CULVERT. THIS BERM SHALL BE TIED INTO EITHER HIGH GROUND ADJACENT TO THE CHANNEL OR THE EXISTING ROADWAY EMBANKMENT. IT SHALL BE PROVIDED WITH A SPILLWAY EQUAL IN WIDTH TO THE BOX CULVERT AND AT A HEIGHT LOWER THAN THE REST OF THE BERM.

7 THE TEMPORARY DRAINAGE PIPE SHALL BE SUPPORTED AT ALL JOINTS AND AT INTERVALS NOT TO EXCEED MAXIMUM VALUES SPECIFIED IN THE TABLE "MINIMUM SPAN FOR SUPPORTS." SUPPORTS MAY CONSIST OF SANDBAGS, CONCRETE BLOCKS, WOODEN FRAMES, OR ANY OTHER MATERIAL SUFFICIENT TO SUPPORT THE WEIGHT OF THE PIPE WHEN IT IS FLOWING FULL. SUPPORTS AT JOINTS SHALL BE A MINIMUM OF 18 INCHES IN LENGTH, ALONG THE TEMPORARY DRAINAGE PIPE AND CENTERED ON THE JOINT. SUPPORTS SHOULD "CRADLE" THE TEMPORARY DRAINAGE PIPE TO ENSURE THAT IT WILL NOT ROLL DURING CONSTRUCTION OF THE BOX CULVERT.

8 ALL PIPE JOINTS SHALL BE PROPERLY BANDED OR OTHERWISE PROVIDED WITH A REASONABLE SEAL AGAINST LEAKAGE.

9 THE OPTIONAL FLEXIBLE PIPE DIVERSION USING PUMPS MAY BE USED AS AN ALTERNATE FOR SUSPENDED PIPE DIVERSIONS (UPSTREAM AND DOWNSTREAM).

10 CONSTRUCTION SHALL PROCEED AS FOLLOWS:
10A. INSTALL TEMPORARY DRAINAGE PIPE ON ITS SUPPORTS INSIDE THE CULVERT TO BE EXTENDED.
10B. CONSTRUCT THE SANDBAG PLUG AT THE UPSTREAM END OF THE SUSPENDED PIPE DIVERSION.
10C. CONSTRUCT THE SANDBAG BERM AT THE DOWNSTREAM END OF THE SUSPENDED PIPE DIVERSION.
10D. ONCE THE BOX CULVERT EXTENSION HAS BEEN COMPLETED, REMOVE THE DOWNSTREAM SANDBAG STRUCTURE, EXCEPT FOR THOSE BAGS NEEDED TO SUPPORT THE END OF THE PIPE. THE UPSTREAM SANDBAG STRUCTURE SHOULD THEN BE REMOVED GRADUALLY, IN ORDER TO ALLOW THE UPSTREAM WATER LEVEL TO DRAW DOWN AT A SAFE RATE.
10E. REMOVE THE TEMPORARY DRAINAGE PIPE, SUPPORTS AND ANY REMAINING SANDBAGS.

11 TEMPORARY DRAINAGE PIPE, SANDBAG PLUGS, BERMS, AND SUPPORTS SHALL BE INSPECTED WEEKLY OR AFTER EVERY RAIN EVENT. ANY NEEDED REPAIRS SHALL BE DONE IMMEDIATELY. ANY DEBRIS WHICH HAS ACCUMULATED AT THE INLET OF THE SUSPENDED PIPE DIVERSION SHALL BE IMMEDIATELY REMOVED.

12 RIP RAP MAY BE SUBSTITUTED FOR SAND BAGS

REVISION	BY	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

TEMPORARY STREAM DIVERSION (BOX EXTENSIONS)

WORKING NUMBER ECD-18

SHEET NUMBER

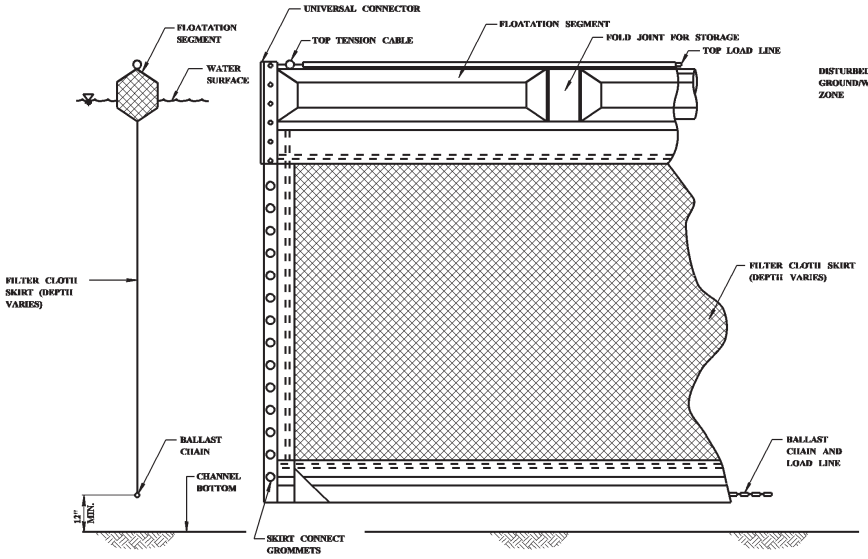
FILENAME: EROSION CONTROL\ECD-18.DGN

DESIGN TEAM _____ CHECKED _____ DATE _____

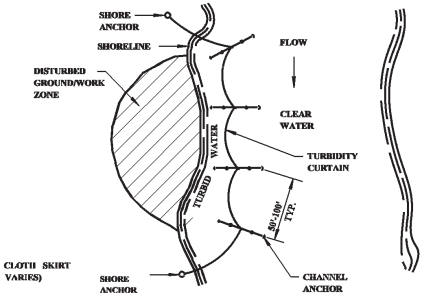
1/28/2010 9:14 AM ECD-18.DGN
99
PLAN
PROJECT DEVELOPMENT DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

STATE	PROJECT NO.
MISS.	

FLOATING TURBIDITY CURTAIN

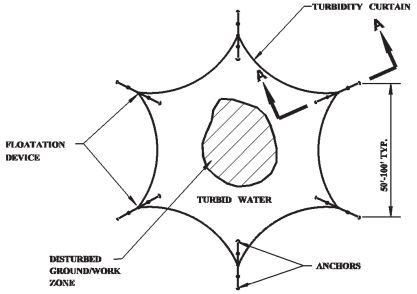


TYPICAL ANCHORING PLAN FOR SHORELINE/RIVER EDGE WORK



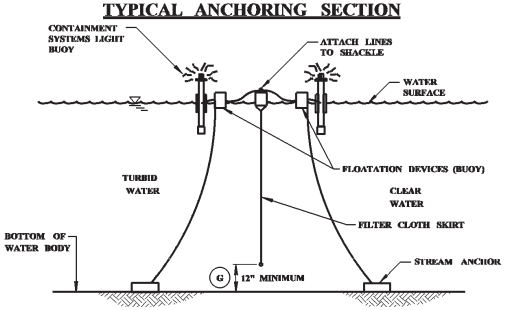
PLAN VIEW

TYPICAL ANCHORING PLAN FOR MID CHANNEL WORK (BRIDGE PIER, CAISSON, ETC.)



PLAN VIEW

TYPICAL ANCHORING SECTION



SECTION A-A

AUTOMATIC FLASHING LIGHT BUOY (ON AT DUSK-OFF AT DAWN) 100' ON CENTER SHALL BE USED IN NAVIGABLE CHANNELS ONLY

EROSION CONTROL PLAN LEGEND: FLOATING TURBIDITY CURTAIN

FLOATING TURBIDITY CURTAIN GENERAL NOTES

(A) FLOATING TURBIDITY CURTAINS (ALSO KNOWN AS TURBIDITY BARRIERS OR SILT CURTAINS) CREATE A BARRIER TO PREVENT TURBID WATER FROM ENTERING CLEAR WATER. FLOATING TURBIDITY CURTAINS SHOULD BE USED TO ISOLATE ACTIVE CONSTRUCTION AREAS WITHIN OR ADJACENT TO A BODY OF WATER TO MINIMIZE THE MIGRATION OF SILT LADEN WATER OUT OF THE CONSTRUCTION ZONE.

(B) TURBIDITY CURTAINS SHALL NOT BE INSTALLED PERPENDICULAR ACROSS THE MAIN FLOW OF A SIGNIFICANT BODY OF MOVING WATER.

(C) FLOATING TURBIDITY CURTAINS SHALL NO BE USED WHERE THE ANTICIPATED FLOW VELOCITIES WILL EXCEED 5 FT/SEC.

(D) TURBIDITY CURTAINS SHALL BE ANCHORED TO PREVENT DRIFT SHOREWARD OR DOWNSTREAM. ANCHORAGE SHALL BE INSTALLED ON BOTH SHORE AND STREAM SIDE. CURTAINS SHALL BE INSTALLED AS CLOSE TO PROJECT SITE AS POSSIBLE. BARRIERS SHOULD BE A BRIGHT COLOR (YELLOW OR "INTERNATIONAL" ORANGE ARE RECOMMENDED) THAT WILL ATTRACT THE ATTENTION OF NEARBY BOATERS.

(E) SHORE ANCHORS SHALL CONSIST OF A POST WITH DEADMAN OR APPROVED EQUAL. STREAM ANCHORS SHALL BE OF SUFFICIENT SIZE TO STABILIZE THE BARRIER WITH NUMBER AND SPACING DEPENDENT ON WATERWAY VELOCITIES AND MANUFACTURER'S RECOMMENDATIONS.

(F) IN SHALLOW WATER (2 FEET OF DEPTH OR LESS) A TURBIDITY CURTAIN MAY BE INSTALLED ON STAKES DRIVEN INTO THE BED OF THE WATER BODY.

(G) FABRIC SECTIONS SHALL BE CONNECTED END TO END WITH MINIMUM 6" DIAMETER POLYPROPYLENE ROPE. FABRIC SHALL BE SEAMED TOGETHER IN A MANNER THAT RETAINS THE OVERALL TENSILE STRENGTH.

(H) DESIGN OF CURTAIN AND ANCHORAGE SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. FILTER CLOTH SKIRT SHOULD BE ABLE TO WITHSTAND THE FORCES IMPARTED ON IT DUE TO THE EXPECTED WIND VELOCITY OR STREAM VELOCITY. FABRIC SHALL BE MADE OF A NON-DETERIORATING MATERIAL, SUCH AS PLASTIC OR NYLON, WHICH WILL ALLOW WATER TO PASS THROUGH WHILE STILL RETAINING SEDIMENT.

(I) THE TURBIDITY CURTAIN AND ADJACENT WORK AREAS SHALL NOT BE DISTURBED 12 HOURS PRIOR TO REMOVAL FROM WATER BODY. MAINTENANCE SHALL BE PERFORMED AS NEEDED. CONTRACTOR SHALL REMOVE THE CURTAIN AT COMPLETION OF WORK IN A MANNER THAT WILL PREVENT SILTATION OF THE WATERWAY. DURING REMOVAL, EXTREME CARE SHOULD BE TAKEN NOT TO DISTURB ANY SEDIMENT DEPOSITS.

(J) MAINTAIN 12" MINIMUM GAP BETWEEN SKIRT BOTTOM AND CHANNEL BOTTOM TO PREVENT ACCUMULATED SEDIMENT FROM PULLING TOP OF CURTAIN BELOW WATER SURFACE.

(K) IN WIND OR WAVE ACTION SITUATIONS, THE MAXIMUM DEPTH OF THE CURTAIN SHALL BE 12 FEET.

(L) CONCENTRATED FLOWS SHALL NOT DISCHARGE BEYOND FLOATING TURBIDITY CURTAIN. CURTAINS ARE NOT TO BE INSTALLED ACROSS FLOWING BODY OF WATER.

(M) WHEN INSTALLED IN A NAVIGABLE WATERWAY, BUOYS SHOULD BE LIT ACCORDING TO REGULATORY AGENCY STANDARDS.

(N) WHEN ESTIMATING THE LENGTH OF TURBIDITY CURTAIN, ALLOW 10 TO 20 PERCENT VARIANCE IN STRAIGHT LINE MEASUREMENT.

(O) PAYMENT FOR FLOATING TURBIDITY CURTAIN SHALL INCLUDE ALL MATERIAL AND LABOR NECESSARY FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TURBIDITY CURTAINS

(P) ONLY FLOATING TURBIDITY CURTAINS LISTED ON THE APPROVED PRODUCTS LIST MAY BE USED.

DATE	REVISION	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

FLOATING TURBIDITY CURTAIN

WORKING NUMBER: ECD-19

SHEET NUMBER

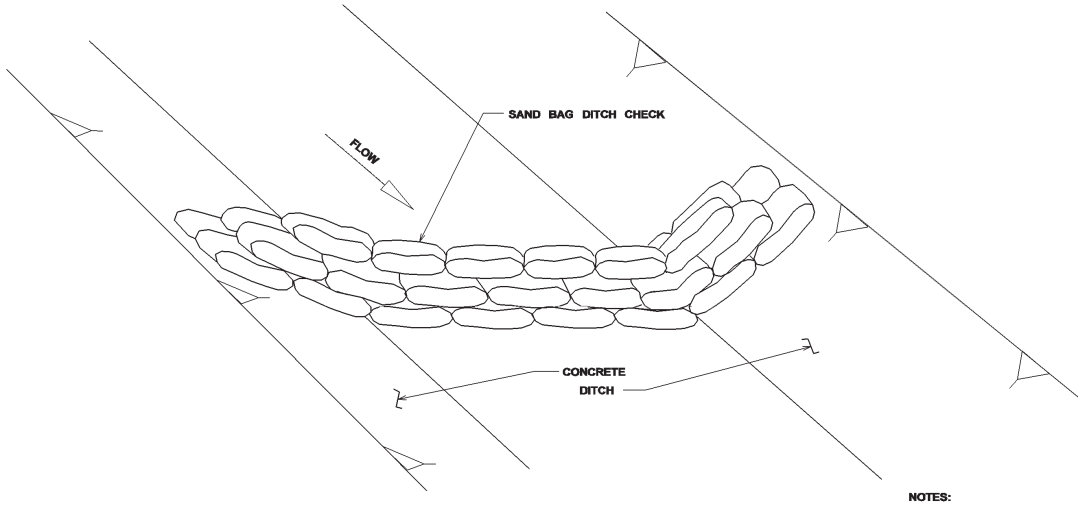
FILENAME: EROSION CONTROL\ECD-19.DGN

DESIGN TEAM ____ CHECKED ____ DATE ____

PLAN FLORIDA DIVISION MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/20/2010 9:49 AM ECD-19.DGN

STATE	PROJECT NO.
MISS.	



DETAIL (DITCH CHECK)

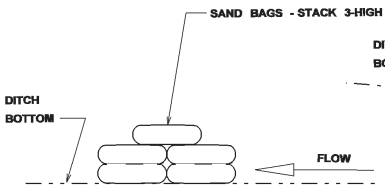
NOTES:

1. MINIMUM RECOMMENDED PLACEMENT INTERVAL BETWEEN SAND BAG DITCH CHECK IS 100' UNLESS SHOWN OTHERWISE ON THE PLANS OR APPROVED BY THE ENGINEER. SEE SPACING GUIDANCE ON ECD-4.

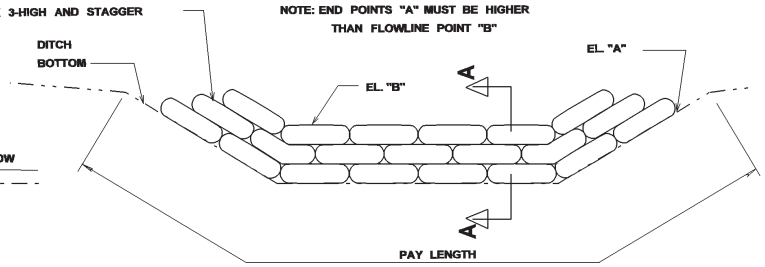
2. PREVENTING SEDIMENT FROM ENTERING A PAVED DITCH IS PREFERABLE TO CAPTURING SEDIMENT WITHIN PAVED DITCH.

SAND BAG DITCH CHECK SELECTION GUIDELINES

SAND BAG DITCH CHECKS ARE USED FOR VELOCITY REDUCTION AND MINIMAL SEDIMENT TRAPPING IN CONCRETE PAVED DITCHES OR IN DITCHES THAT HAVE ROCKY BOTTOMS.



SECTION A-A



ELEVATION DETAIL

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DETAILS OF EROSION CONTROL
SANDBAG DITCH CHECK

REVISION | BY | DATE

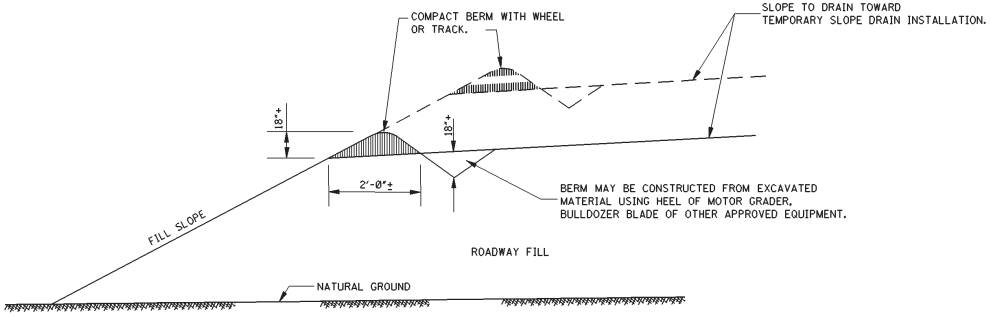
FILENAME: EROSION CONTROL\ECD-20.DGN
DESIGN TEAM _____ CHECKED _____ DATE _____

WORKING NUMBER
ECD-20
SHEET NUMBER

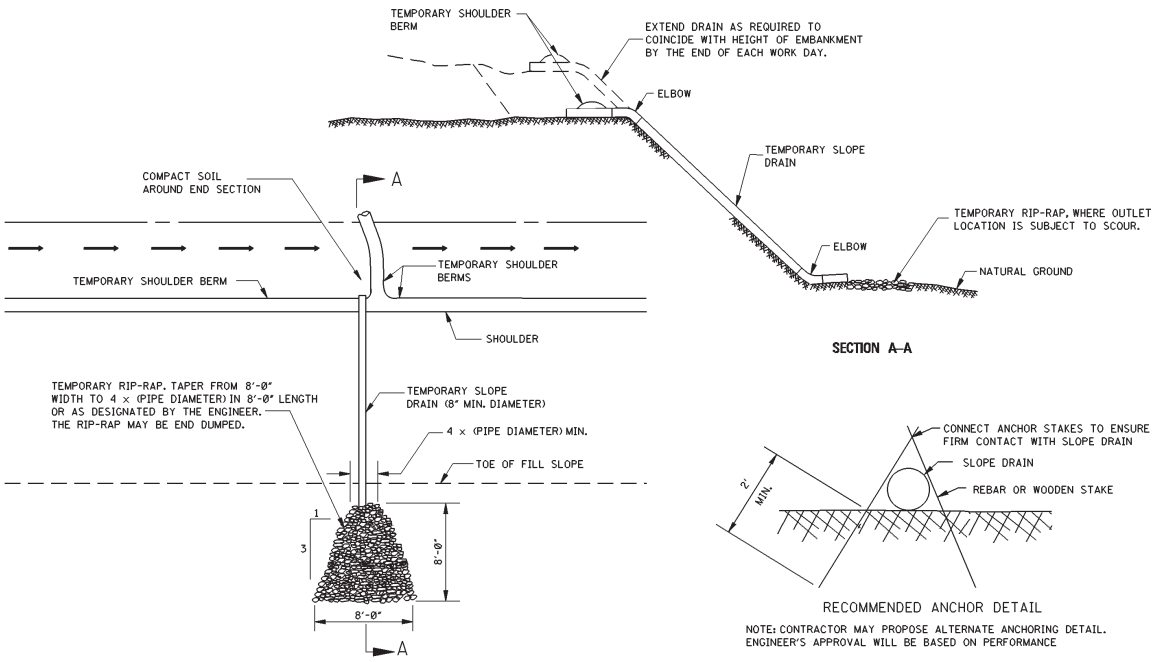
PLAN
PRODUCTION DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/20/2010 9:50 AM ECD-20.DGN

STATE	PROJECT NO.
MISS.	



TEMPORARY SHOULDER BERM



SECTION A–A

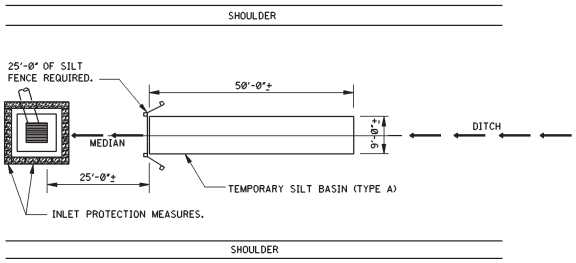
PLAN

RECOMMENDED ANCHOR DETAIL

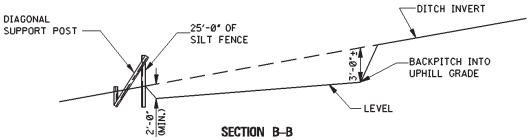
NOTE: CONTRACTOR MAY PROPOSE ALTERNATE ANCHORING DETAIL. ENGINEER'S APPROVAL WILL BE BASED ON PERFORMANCE

TEMPORARY SLOPE DRAIN

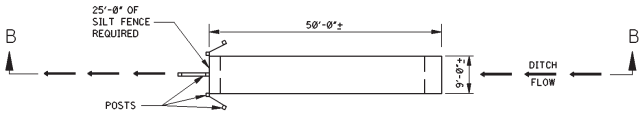
NOTE: TEMPORARY SLOPE DRAINS TO BE PLACED AT LOW POINT OF ALL SAG VERTICAL CURVES. INTERMEDIATE LOCATIONS TO BE PLACED AS DESIGNATED OR DEEMED APPROPRIATE BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.



TEMPORARY MEDIAN SILT BASIN (TYPE A)



SECTION B–B



PLAN

TEMPORARY SILT BASIN (TYPE A)

NOTE: TEMPORARY SILT BASIN (TYPE A) TO BE PLACED IN SURFACE DRAIN DITCHES AND SIDE DITCHES AT THE END OF CUT SECTIONS. IMMEDIATELY PRECEEDING DITCH INLETS AND JUST BEFORE THE WATER (RUNOFF) LEAVES THE RIGHT-OF-WAY OR ENTERS A WATER COURSE. LOCATION AND SIZE (OTHER THAN AS SHOWN) MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.

GENERAL NOTES:

1. THE CONTRACTOR SHALL BE REQUIRED TO FURNISH ALL MATERIALS AND PERFORM ALL WORK FOR THE PROPER INSTALLATION, MAINTENANCE AND REMOVAL OF TEMPORARY EROSION CONTROL MEASURES NECESSARY TO CONTROL SILTATION.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

TYPICAL TEMPORARY EROSION CONTROL MEASURES

(SLOPE DRAIN AND TYPE A SILT BASIN)

REVISION | BY | DATE

WORKING NUMBER: TEC-2

SHEET NUMBER

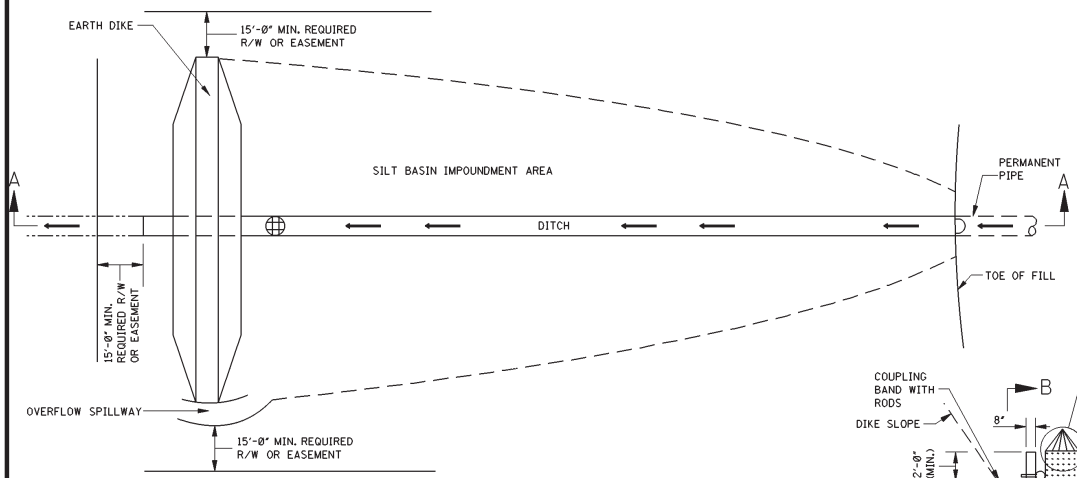
FILENAME: ERSOSION CONTROL\TEC-2.DGN

DESIGN TEAM ____ CHECKED ____ DATE ____

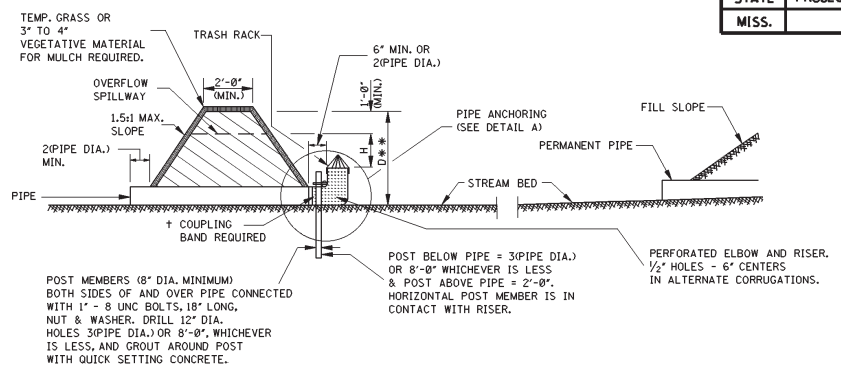
PLAN MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/20/2010 9:52 AM TEC-2.DGN

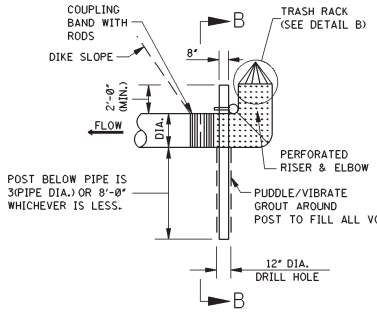
STATE	PROJECT NO.
MISS.	



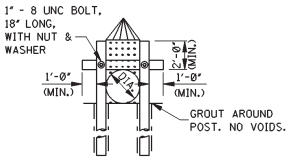
PLAN



SECTION A–A



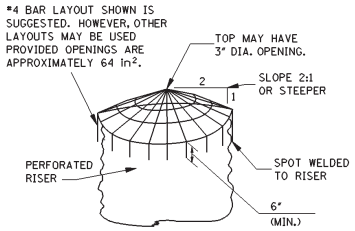
DETAIL A



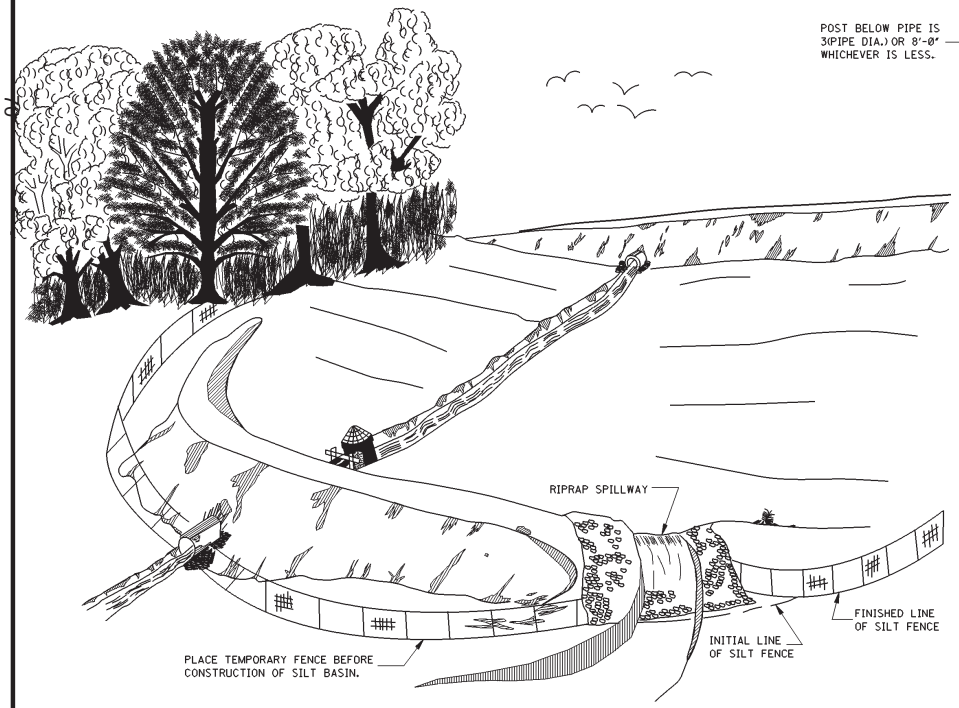
SECTION B–B

NOTE: POST MEMBERS MAY BE GREEN TIMBER AND MAY BE CUT OFF AT NATURAL GROUND REMOVAL. POST MUST BE 8" MINIMUM CLEAN DIAMETER.

PIPE ANCHORAGE



DETAIL B
TRASH RACK INSTALLATION



TEMPORARY SILT BASIN (TYPE B)

GENERAL NOTES:

1. PROVIDE OVERFLOW SPILLWAY IN NATURAL GROUND AT A MINIMUM OF 1'-0" BELOW TOP OF DIKE. CROSS-SECTIONAL AREA OF SPILLWAY IS EQUAL TO 1.5 TIMES THE AREA OF THE OUTLET PIPE MINIMUM. RIPRAP SHALL BE REQUIRED AT THE SPILLWAY. AFTER THE PURPOSE OF THE SILT BASIN HAS BEEN SERVED, THE DIKE AND RIPRAP MAY REMAIN IN PLACE AT THE DISCRETION OF THE ENGINEER, BUT THE DRAIN PIPE WITH RISER SHALL BE REMOVED AND THE NEWLY DISTURBED AREA REVEGETATED.
2. BASIN AND DIKE DIMENSIONS DO NOT REQUIRE CONSTRUCTION TO NEAT LINES.
3. THE SILT BASIN MAY BE CONSTRUCTED IN ANY SHAPE WITH THE DIKE EXTENDING ALONG ONE OR MORE SIDES AS LONG AS THE LENGTH MEASURED IN THE DIRECTION OF FLOW IS APPROXIMATELY TWICE THE WIDTH AND THE IMPOUNDMENT AREA AND DEPTH AT LEAST AS LARGE AS INDICATED.
4. MINIMUM DIMENSIONS FOR SILT BASIN (TYPE B) ARE AS FOLLOWS:

MIN. DIMENSIONS OF SILT BASIN (TYPE B)				† COUPLING BAND	
PIPE	** D (ft-in)	H (ft-in)	* AREA (ft²)	LENGTH (in)	COUPLING RODS/SIDE
15"	4'-0"	1'-0"	310	12"	2 & 2
18"	5'-0"	1'-0"	550	12"	2 & 2
24"	5'-0"	1'-0"	1100	12"	2 & 2
30"	6'-0"	1'-6"	1850	24"	3 & 3
36"	6'-0"	1'-6"	2800	24"	3 & 3
42"	7'-0"	2'-0"	4200	24"	3 & 3
48"	8'-0"	2'-0"	6200	24"	3 & 3

NOTES:
* 1. IMPOUNDMENT SURFACE AREAS ARE MEASURED AT ELEVATION OF TOP OF ELBOW RISER.
** 2. RISER REQUIRED WHERE MINIMUM "D" DIMENSION IS EXCEEDED. LENGTH OF RISER IS EQUAL TO THE AMOUNT THAT MINIMUM "D" DIMENSION IS EXCEEDED.
† 3. COUPLING RODS TO BE ½" DIAMETER MINIMUM WITH LUGS.

5. IN SELECTING BASIN SIZE, CONSIDERATION MUST BE GIVEN TO THE AREA DISCHARGING INTO THE BASIN OTHER THAN THAT WHICH COMES THROUGH THE PIPE UNDER THE ROADWAY. THIS WILL AT TIMES NECESSITATE A LARGER BASIN AND OUTLET PIPE SECTION.
6. THE DIKE SHALL BE CONSTRUCTED OF A MATERIAL SUITABLE FOR ROADWAY EMBANKMENT.
7. SILT BASIN (TYPE B) REQUIRED AT LOCATION(S) INDICATED ON PLANS.
8. THE CONTRACTOR SHALL BE REQUIRED TO FURNISH ALL MATERIALS AND PERFORM ALL WORK FOR THE PROPER INSTALLATION, MAINTENANCE AND REMOVAL OF TEMPORARY EROSION CONTROL MEASURES NECESSARY TO CONTROL SILTATION.
9. THE USE OF THE TEMPORARY EROSION CONTROL MEASURE SHOWN ON THIS SHEET WILL ONLY BE REQUIRED AND MEASURED FOR SEPARATE PAYMENT WHEN AN APPROPRIATE PAY ITEM IS INCLUDED IN THE BID SCHEDULE OF THE PROPOSAL.
10. RIPRAP AND TEMPORARY SILT FENCE, USED IN CONJUNCTION WITH TYPE B SILT BASINS AS SHOWN BY THE DETAILS ON THIS SHEET, WILL NOT BE MEASURED FOR SEPARATE PAYMENT. THEIR COST SHALL BE INCLUDED IN THE PRICE BID FOR TYPE B SILT BASIN.

DATE	REVISION	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION
STANDARD PLAN

TYPICAL TEMPORARY EROSION CONTROL MEASURES
(TYPE B SILT BASIN)

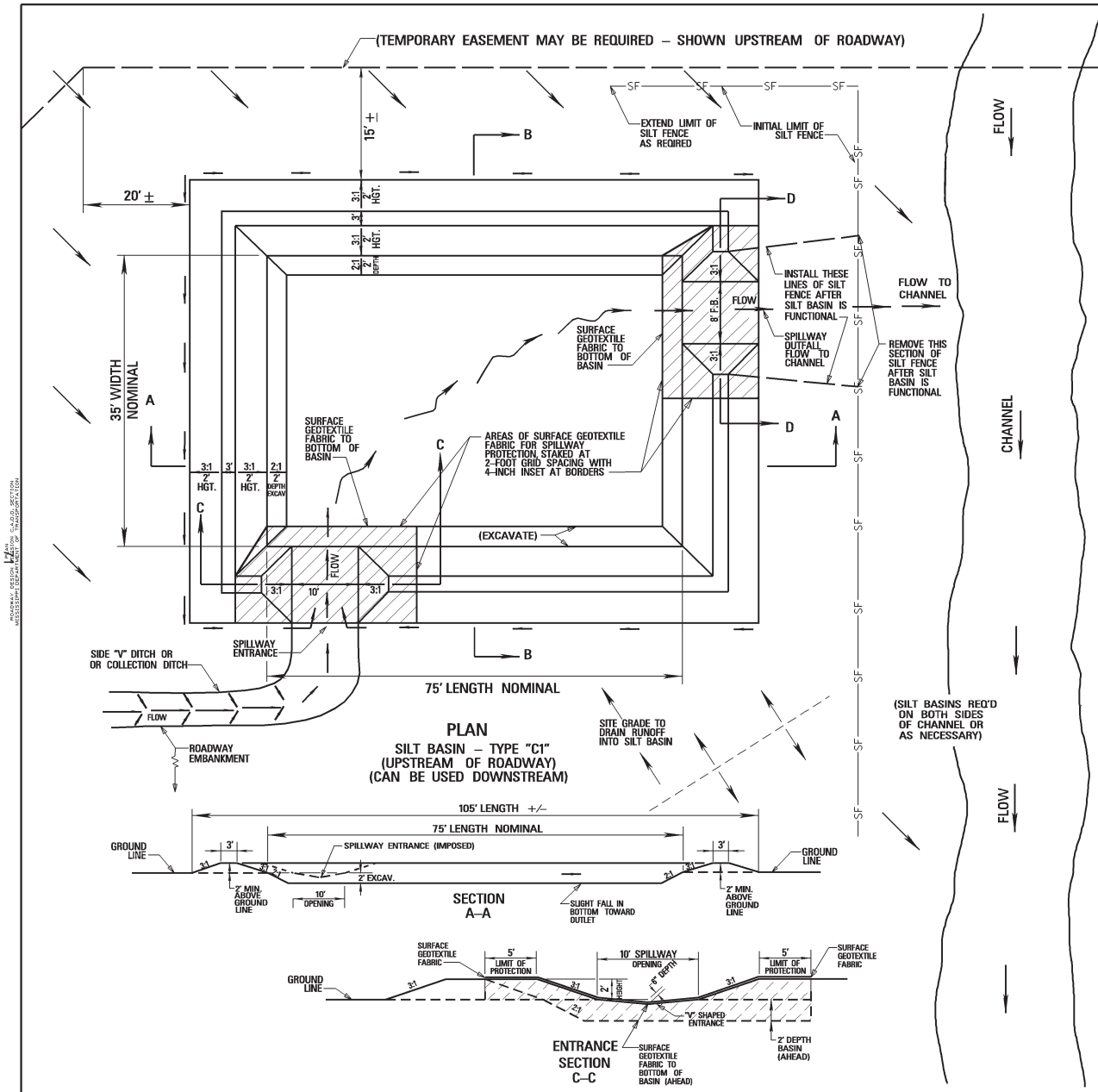
ENGLISH

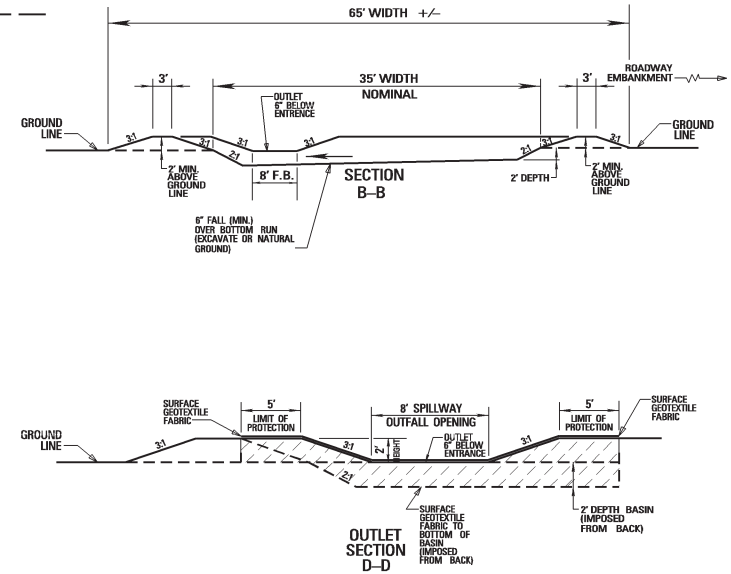
WORKING NUMBER TEC-3

ISSUE DATE: OCTOBER 1, 1998

SHEET NUMBER 144

STATE	PROJECT NO.
MISS.	





NOTES:

1. FOR UPSTREAM SIDE OF BRIDGE, BOX CULVERT, AND LARGER PIPE CULVERT CONSTRUCTION SITES OR AS REQUIRED (MAY BE DOWNSTREAM).
2. TYPE "C1" SILT BASIN SUBSTITUTED FOR TYPE "C2" SILT BASIN AS DIRECTED BY ENGINEER OR AS PER PLANS.
3. SEE TYPE "C2" SILT BASIN FOR DOWNSTREAM APPLICATION PRIMARILY (TEC–C2).
4. SURFACE GEOTEXTILE FABRIC FOR SPILLWAY PROTECTION SHALL BE THE SAME TYPE AS SILT FENCE.
5. THE SILT BASIN CAPACITY IS TO PROVIDE 67 CU. YD. PER ACRE OF DRAINAGE AREA RECEIVED, AND THIS VOLUME IS TO BE MAINTAINED BELOW THE ENTRANCE ELEVATION INTO THE SILT BASIN.
6. THE TEMPORARY EROSION CONTROL MEASURES SHOWN ON THIS SHEET WILL ONLY BE MEASURED FOR SEPERATE PAYMENT WHEN APPROPRIATE PAY ITEMS ARE INCLUDED IN THE BID SCHEDULE OF THE PROPOSAL.
7. THE ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES 1/3 TO 1/2 THE CAPACITY OF THE SILT BASIN. SILT SHALL BE DISPOSED OF PROPERLY AND SHALL NOT BE DISPOSED OF IN THE VICINITY OF THE EROSION CONTROL DEVICES.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

TYPICAL TEMPORARY EROSION CONTROL MEASURES (TYPE "C1" SILT BASIN) (UPSTREAM OF ROADWAY PRIMARILY CAN BE USED DOWNSTREAM)

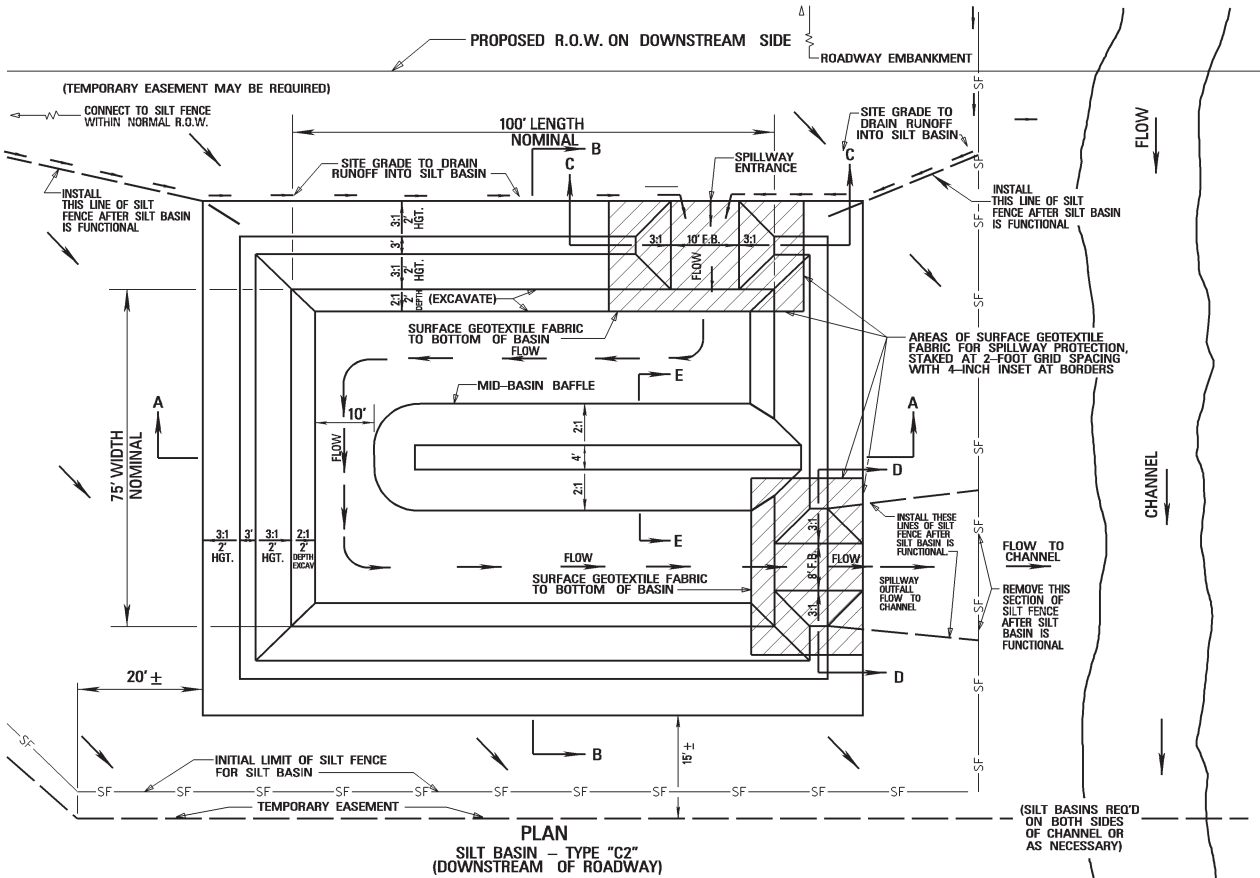
PROJ. NO.:
COUNTY:

WORKING NUMBER: TEC-C1
SHEET NUMBER

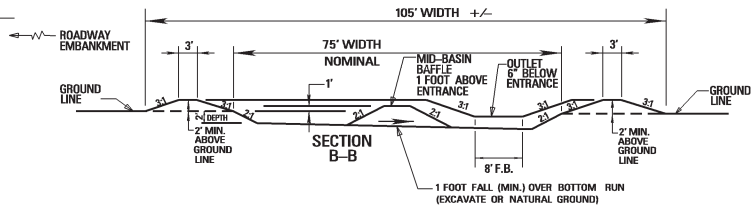
FILENAME: dgns/tec-c1.dgn
DESIGN TEAM ____ CHECKED ____ DATE ____

REVISION | BY | DATE

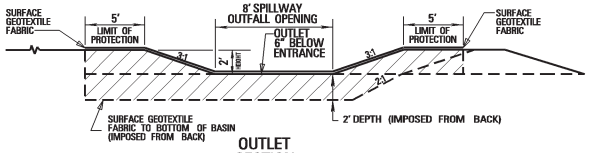
STATE	PROJECT NO.
MISS.	



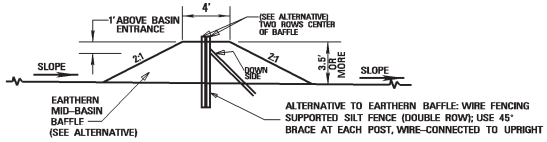
PLAN
SILT BASIN – TYPE "C2"
(DOWNSTREAM OF ROADWAY)



SECTION B–B



OUTLET SECTION D–D



MID-BASIN BAFFLE SECTION E–E

NOTES:

FOR DOWNSTREAM SIDE OF BRIDGE, BOX CULVERT, AND LARGER PIPE CULVERT, CONSTRUCTION SITES OR AS REQUIRED.

TYPE "C1" SILT BASIN SUBSITUTED FOR TYPE "C2" SILT BASIN AS DIRECTED BY ENGINEER OR AS PER PLANS.

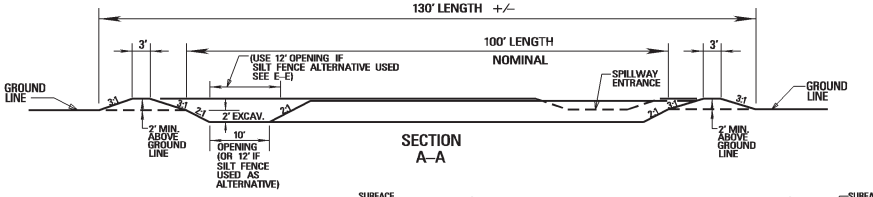
SEE TYPE "C1" SILT BASIN FOR UPSTREAM APPLICATION (TEC–C1) OR AS REQUIRED.

SURFACE GEOTEXTILE FABRIC FOR SPILLWAY PROTECTION SHALL BE THE SAME TYPE AS SILT FENCE.

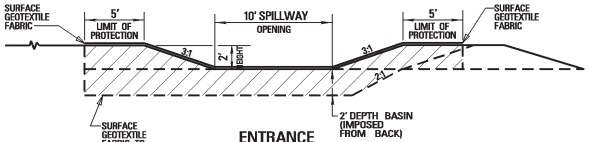
THE SILT BASIN CAPACITY IS TO PROVIDE 67 CU. YD. PER ACRE OF DRAINAGE AREA RECEIVED, AND THIS VOLUME IS TO BE MAINTAINED BELOW THE ENTRANCE ELEVATION INTO THE SILT BASIN.

THE ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES 1/3 TO 1/2 THE CAPACITY OF THE SILT BASIN. SILT SHALL BE DISPOSED OF PROPERLY AND SHALL NOT BE DISPOSED OF IN THE VICINITY OF THE EROSION CONTROL DEVICES.

THE TEMPORARY EROSION CONTROL MEASURES SHOWN ON THIS SHEET WILL ONLY BE MEASURED FOR SEPERATE PAYMENT WHEN APPROPRIATE PAY ITEMS ARE INCLUDED IN THE BID SCHEDULE OF THE PROPOSAL.



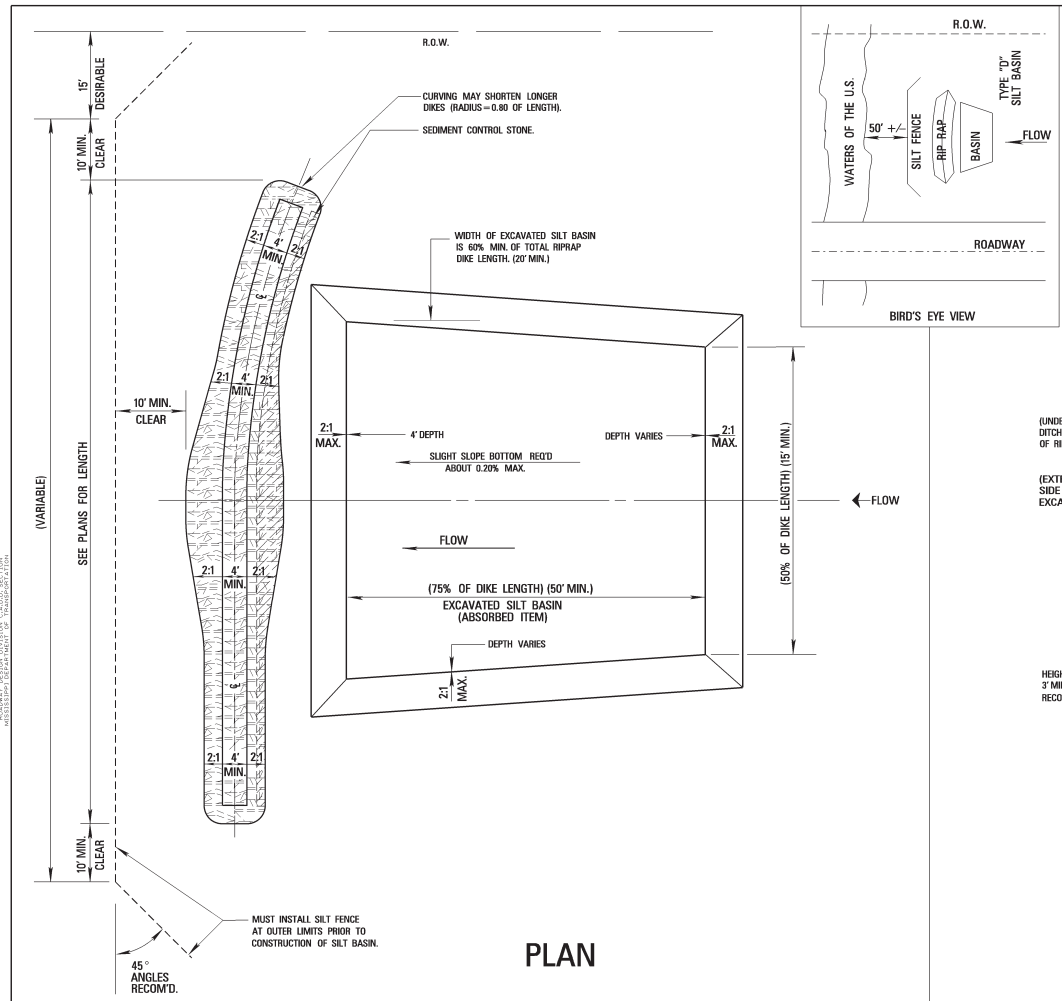
SECTION A–A



ENTRANCE SECTION C–C

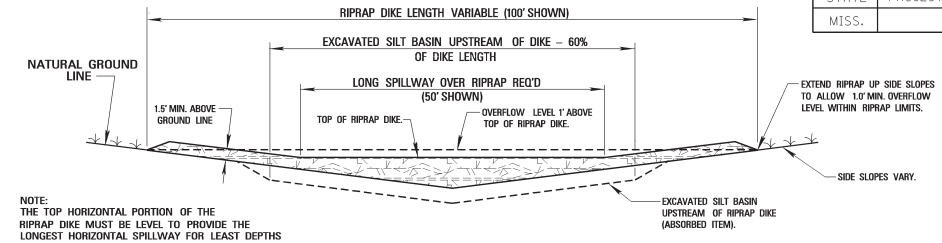
DATE	REVISION	BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION
			TYPICAL TEMPORARY EROSION CONTROL MEASURES
			(TYPE "C2" SILT BASIN DOWNSTREAM OF ROADWAY WITH BAFFLE)
			PROJ. NO.:
			COUNTY:
			WORKING NUMBER TEC-C2
			SHEET NUMBER
			FILENAME: dgns/tec-c2.dgn
			DESIGN TEAM ____ CHECKED ____ DATE ____

STATE	PROJECT NO.
MISS.	



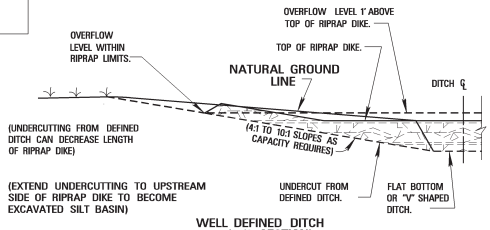
PLAN

BIRD'S EYE VIEW

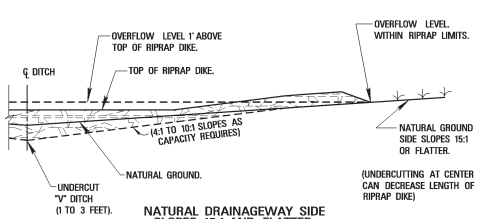


NOTE:
THE TOP HORIZONTAL PORTION OF THE RIPRAP DIKE MUST BE LEVEL TO PROVIDE THE LONGEST HORIZONTAL SPILLWAY FOR LEAST DEPTHS OF OVERFLOW (DO NOT MAKE A SPILLWAY NOTCH).

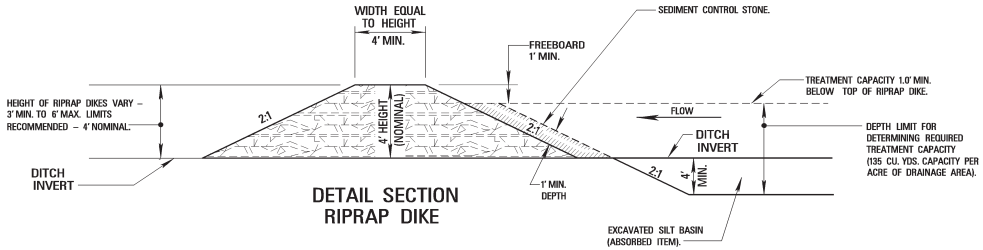
SECTION OF RIPRAP DIKE



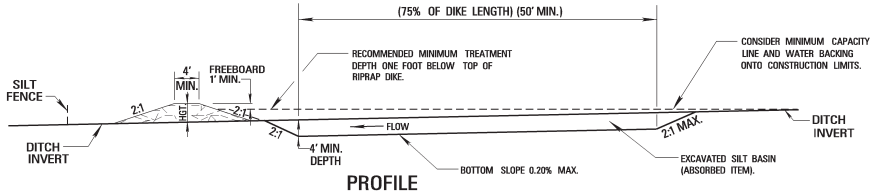
WELL DEFINED DITCH
(1/2 SECTION)



NATURAL DRAINAGEWAY SIDE SLOPES 15:1 AND FLATTER
(1/2 SECTION)



DETAIL SECTION RIPRAP DIKE



PROFILE

NOTES

1. THE REQUIRED SIZE / CAPACITY OF THE RIPRAP DIKE SILT BASIN IS TO PROVIDE AT LEAST 135 CUBIC YARDS OF VOLUME / CAPACITY PER ACRE OF DRAINAGE AREA RECEIVED. THE RIPRAP DIKE SILT BASIN MUST BE MAINTAINED AT ALL TIMES TO ASSURE THE INTENDED FUNCTION, REMOVING THE ACCUMULATED SILT ROUTINELY AND / OR WHEN APPROACHING A 50% MAXIMUM DECREASE FROM THE EFFECTIVE DESIGN CAPACITY, AND RESTORING THE BASIN TO ITS ORIGINAL EFFECTIVE DESIGN CAPACITY.

2. THE CONTRACTOR SHALL BE REQUIRED TO FURNISH ALL MATERIALS, PERFORM ALL WORK FOR THE PROPER INSTALLATION, MAINTENANCE, AND REMOVAL OF TEMPORARY EROSION CONTROL MEASURES NECESSARY TO CONTROL SILTATION.

3. AFTER THE PURPOSE FOR THE SILT BASIN HAS BEEN SERVED, THE POSTS AND SILT FENCE SHALL BE REMOVED. THE RIP RAP AND SEDIMENT STONE SHALL BE REMOVED AND PLACED AT A PIPE OUTLET. THE DISTURBED AREA SHALL BE SITE GRADED AND REVEGETATED AS DEEMED NECESSARY BY THE ENGINEER. ALL COSTS OF REMOVAL AND REPLACEMENT TO BE ABSORBED IN PAY ITEM FOR SILT BASIN.

4. RIPRAP FOR THE TYPE D SILT BASIN SHALL BE 300 LB RIPRAP AND SHALL BE PAID FOR – PER TON.

5. SEDIMENT CONTROL STONE SHALL BE SIZE NO. 57 STONE AND SHALL BE PAID FOR – PER TON.

6. THE TEMPORARY EROSION CONTROL MEASURES SHOWN ON THIS SHEET WILL ONLY BE MEASURED FOR SEPERATE PAYMENT WHEN APPROPRIATE PAY ITEMS ARE INCLUDED IN THE BID SCHEDULE OF THE PROPOSAL.

7. THE ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES 1/3 TO 1/2 THE HEIGHT OF THE CONTROL FEATURE. SILT SHALL BE DISPOSED OF PROPERLY AND SHALL NOT BE DISPOSED OF IN THE VINCINITY OF THE EROSION CONTROL DEVICES.

DATE	REVISION	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

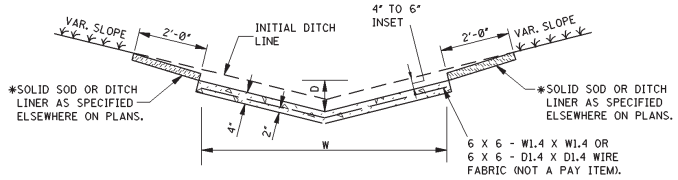
TYPICAL TEMPORARY EROSION CONTROL MEASURES (TYPE "D" SILT BASIN)
(RIPRAP DIKE SILT BASIN)
135 CU. YDS. CAPACITY PER ACRE OF DRAINAGE

PROJ. NO:
COUNTY:

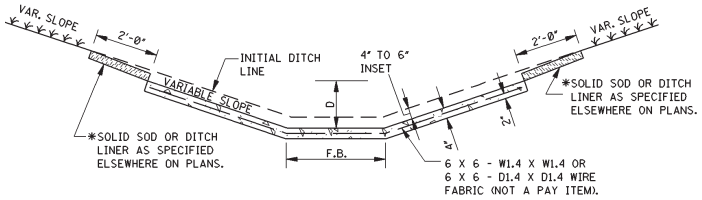
WORKING NUMBER: TEC-D
SHEET NUMBER

FILENAME: EROSION CONTROL\TEC-D135.DGN
DESIGN TEAM _____ CHECKED _____ DATE _____

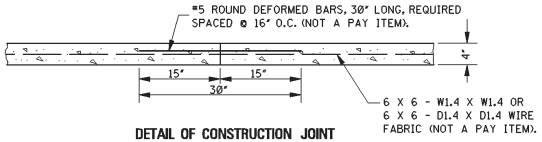
PLAN
PLANNED DESIGN - DIVISION 5 & D.O. SECTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION
74



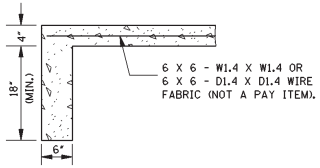
"V" TYPE SECTION



FLAT BOTTOM SECTION



DETAIL OF CONSTRUCTION JOINT



DETAIL OF TOE WALL

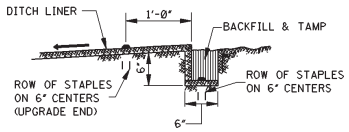
NOTE: TOE WALL REQUIRED UPSTREAM AND DOWNSTREAM.

CONCRETE PAVED DITCH

NOTES:

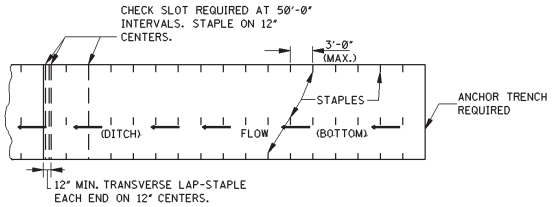
1. CONCRETE PAVED DITCHES SHALL BE GROOVED AT 20'-0" INTERVALS. THE GROOVES SHALL BE CUT TO A DEPTH OF NOT LESS THAN 1".
2. DIMENSIONS D & W ARE AS FOLLOWS:
   D(MINIMUM) = 6"
   D(NOMINAL) = 9"
   W(MINIMUM) = 24"
3. CHAIR SUPPORTS FOR THE WIRE MESH WILL NOT BE REQUIRED. HOWEVER, THE CONTRACTOR SHALL PLACE THE WIRE MESH IN A SATISFACTORY AND WORKMANLIKE MANNER TO ENSURE THAT THE FINAL POSITION IS REASONABLY NEAR THE POSITION INDICATED.

*4. CENTER ROW OF STAPLES MAY BE OMITTED ON DITCH LINER.

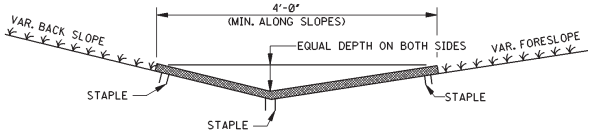


ANCHOR TRENCH DETAIL

NOTE: ANCHOR TRENCH REQUIRED AT THE BEGINNING AND ENDING OF EACH AREA TO BE COVERED, EXCEPT DOWNSTREAM END ADJOINING A STRUCTURE.



PLAN



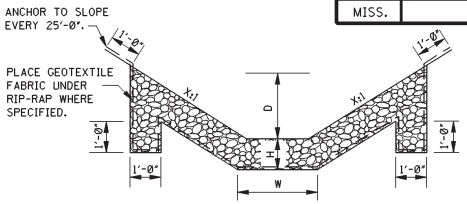
SECTION

DITCH LINER TREATMENT

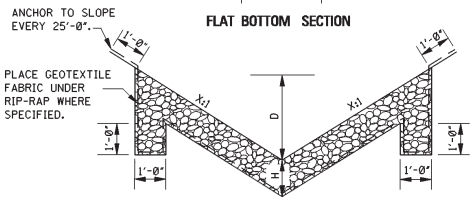
(EXCELSIOR BLANKET, JUTE MESH OR EROSION CONTROL FABRIC)

NOTE: DITCHES TREATED WITH DITCH LINER WILL BE VEGETATED PRIOR TO TREATMENT, UNLESS OTHERWISE INDICATED.

STATE	PROJECT NO.
MISS.	



FLAT BOTTOM SECTION



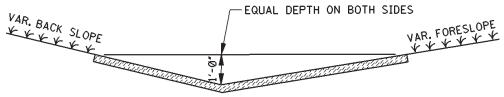
"V" TYPE SECTION

RIP–RAP TREATMENT

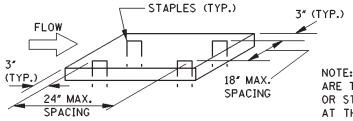
NOTES:

1. DIMENSIONS D, W AND X ARE VARIABLE AND ARE SHOWN ELSEWHERE ON THE PLANS.
2. THE RIP-RAP SIZE AND MINIMUM DEPTH "H" FOR RIP-RAP TREATMENT ARE AS FOLLOWS.

RIP-RAP SIZE & MINIMUM DEPTH "H"	
H (in)	RIP-RAP SIZE (lbs)
12"	100
18"	300



SOLID SOD TREATMENT



NOTE: SOLID SOD (STRIPS OR BLOCKS) ARE TO BE STAPLED, PINNED, PEGGED OR STAKED AT THE FOUR CORNERS OR AT THE MAXIMUM SPECIFIED SPACING.

GENERAL NOTE:

1. FOR LOCATION OF APPROPRIATE DITCH TREATMENTS, SEE PLAN SHEETS AS DENOTED BY THE FOLLOWING LEGEND OR AS DIRECTED BY THE ENGINEER:
   - DITCH LINER
   - SOLID SOD
   - CONCRETE PAVED DITCH
   - RIP-RAP

REVISION | BY | DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DETAILS OF TYPICAL DITCH TREATMENTS

WORKING NUMBER: DT-1

SHEET NUMBER

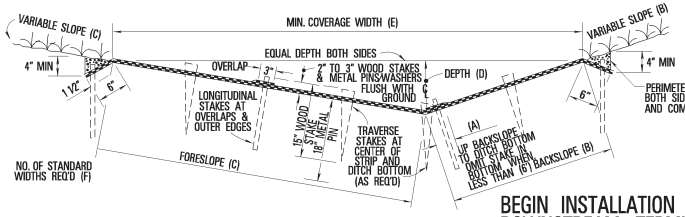
FILENAME: EROSION CONTROL\DT-1.DGN

DESIGN TEAM ____ CHECKED ____ DATE ____

PLAN
PRODUCTION DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

1/20/2010 9:53 AM DT-1.DGN

STATE	PROJECT NO.
MISS.	



TYPICAL DITCH SECTION

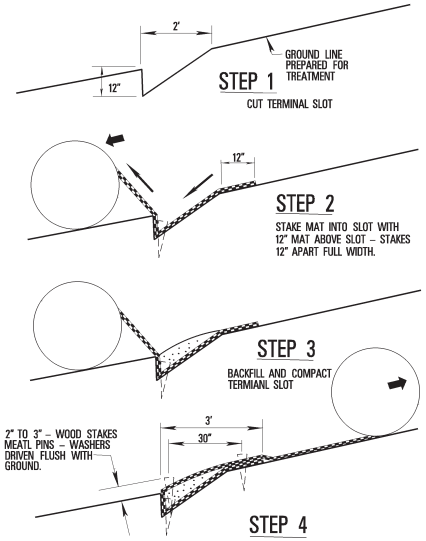
MAT PLACEMENT TABLE

DIMENSIONS OF MAT PLACEMENT IN DITCH (INDIVIDUAL 38" WIDTH ROLLS)					
ELEMENTS OF MAT PLACEMENT	SIDE SLOPE COMBINATIONS FORESLOPE – BACKSLOPE				
	3:1 & 3:1	4:1 & 3:1	6:1 & 3:1	6:1 & 4:1	6:1 & 6:1
(A) UP BACKSLOPE TO DITCH BOTTOM	1' – 7"	1' – 1"	0' – 4"	0' – 10"	0' – 1 1/2"
(B) BACKSLOPE	4' – 0"	3' – 6"	2' – 9"	3' – 3"	3' – 5 1/2"
(C) FORESLOPE	4' – 0"	4' – 6"	5' – 3"	4' – 9"	5' – 5 1/2"
(D) DEPTH OF COVERAGE	1' – 3"	1' – 1"	0' – 10"	0' – 9"	0' – 11"
(E) WIDTH OF COVERAGE	7' – 7"	7' – 8"	7' – 9"	7' – 10"	10' – 9"
(F) MINIMUM NUMBER OF STAND. WIDTH STRIPES	3	3	3	3	4
(B) + (C) TOTAL COVERAGE ON SLOPES	8' – 0"	8' – 0"	8' – 0"	8' – 0"	10' – 11"
SQ. YDS./LIN. FT.	0.89	0.89	0.89	0.89	1.22
MULTI – WIDTH WELDED SEAM MAT (WELDED 38" WIDTH STRIPS)					
(B) + (C) TOTAL COVERAGE MULTI-WIDTH ROLLS	8' – 3"	8' – 3"	8' – 3"	8' – 3"	11' – 3 1/2"
SQ. YDS./LIN. FT.	0.92	0.92	0.92	0.92	1.25

GENERAL INSTRUCTIONS

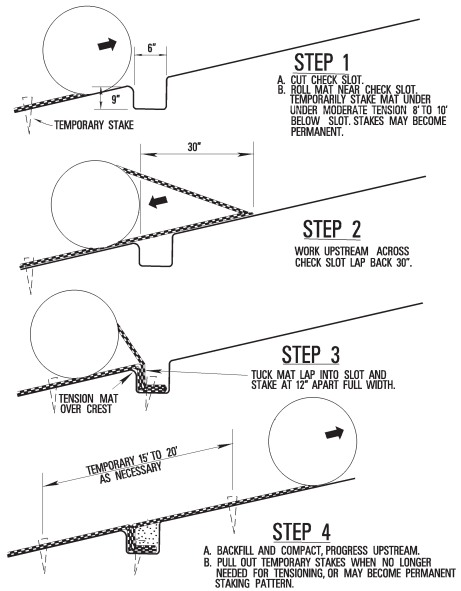
1. BEGIN INSTALLATION AT DOWNSTREAM TERMINAL AND PROGRESS UPSTREAM.
2. FIRST ROLL IS ALIGNED FROM DITCH BOTTOM UP BACKSLOPE (SEE MAT PLACEMENT TABLE) AND UNDER MODERATE TENSION TEMPORARILY STAKED TO MAINTAIN PROPER DESIGN COVERAGE ALIGNMENT.
3. WORKING OUTWARD FROM DITCH BOTTOM TO EDGES, SUBSEQUENT ADJACENT ROLLS FOLLOW IN STAGGERED SEQUENCE UNDER MODERATE TENSION.
4. OVERLAP MAT SEAMS 3 INCHES AND STAKE AT 3 FOOT INTERVALS WITH STAKES ALIGNED LONGITUDINALLY TO DITCH AND DIAGONAL EDGE OF STAKE TO THE UPSTREAM. OUTER EDGES (PERIMETER) OF MAT ARE STAKED SIMILARLY.
5. STAKE THE CENTER OF EACH MAT STRIP AND WHEN REQUIRED ALONG THE DITCH BOTTOM AT 6 – FOOT INTERVALS STAGGERED BETWEEN THE 3 – FOOT SPACING OF OVERLAP AND OUTER EDGE STAKES WITH THE BROADSIDE TO THE FLOW DIRECTION AND DIAGONAL EDGE TOWARD THE UPSLOPE.
6. USE 3 – FOOT OVERLAP AT END OF MAT ROLL SPLICES WITH UPGRADE STRIP ON TOP, STAKED IN TWO ROWS 30 INCHES APART, AND STAKES 18 INCHES APART ACROSS FULL WIDTH.
7. TRANSERSE CHECK SLOTS 6 – INCH WIDTH BY 9 – INCH DEPTH ARE EXCAVATED AT 25 – FOOT INTERVALS WITH STAKES 12 INCHES APART FULL WIDTH OF TREATMENT, WELDED SEAM MULTI-WIDTH MAT WILL HAVE SIMILAR TRANSVERSE CHECKS OMITTING EXCAVATED SLOT ONLY.
8. END INSTALLATION AT UPSTREAM TERMINAL TEMPORARILY STAKING MAY BE PLACED TO BECOME PART OF PERMANENT STAKING PATTERN.

BEGIN INSTALLATION AT DOWNSTREAM TERMINAL



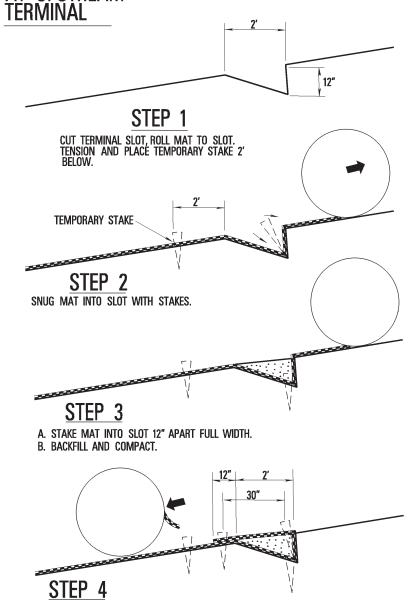
A. ROLL MAT UPSTREAM OVER BACKFILLED TERMINAL.
B. STAKE MAT DOWN TO ANCHOR TERMINAL, 18" APART ACROSS IN 2 ROWS.
C. PROGRESS UPSTREAM WITH ROLL.

25 – FOOT INTERVAL TRANSVERSE CHECK SLOT (FOR INDIVIDUAL ROLLS*)



* WHEN MULTI-WIDTH (WELDED SEAM) ROLLS ARE USED, OMIT EXCAVATED CHECK SLOT AND REPLACE WITH A ROW OF STAKES ONE (1) FOOT APART AT 25 – FOOT INTERVALS (SEE DETAILS). TEMPORARY STAKES NOT REQUIRED.

END INSTALLATION AT UPSTREAM TERMINAL

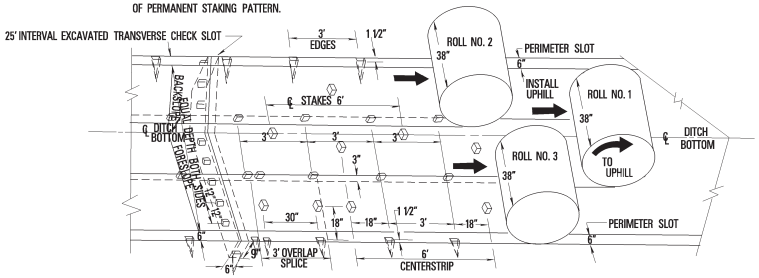


A. REVERSE MAT. ROLL DIRECTION TO OVERLAY SLOT BY 3 FEET.
B. STAKE MAT TO ANCHOR TERMINAL, 18" APART ACROSS IN 2 ROWS.
C. TEMPORARY STAKES MAY BE REMOVED OR DRIVEN TO REMAIN.
D. CUT ROLL OF MAT EVENLY FULL WIDTH.
E. ADJOINING DITCH TREATMENTS SHALL BE ANCHORED APPROPRIATELY.

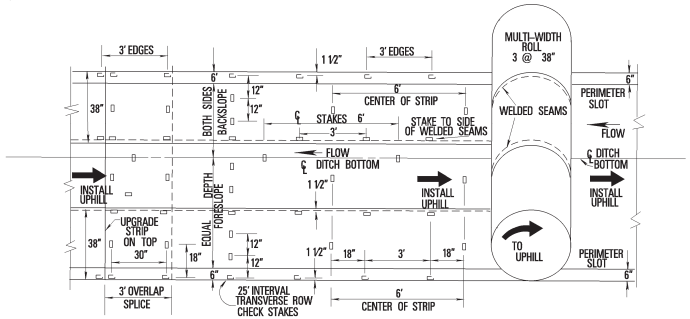
GENERAL NOTES

1. WHEN METAL PINS WITH WASHERS ARE PERMITTED IN PLACE OF WOOD STAKES, THE METAL PINS ARE DRIVEN TO ASSURE THAT THE WASHERS WITH MAT UNDERNEATH ARE FLUSH WITH THE GROUND LEAVING NO PROJECTION OF THE PINS ABOVE THE GROUND LINE.
2. SOIL REINFORCING MAT SHALL BE USED WHERE SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER. THE FOLLOWING DESIGNATION SHALL BE USED.

SOIL REINFORCING MAT



SEQUENTIAL ROLL RUN OUT IN DITCH WITH STAKING DETAIL



MULTI-WIDTH WELDED SEAM MAT RUN OUT IN DITCH WITH STAKING DETAIL

DATE	REVISION	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DITCH TREATMENT INSTALLATION DETAIL FOR SOIL REINFORCING MAT

WORKING NUMBER DT-1A

SHEET NUMBER

FILENAME: erosion control\dt-1a.dgn

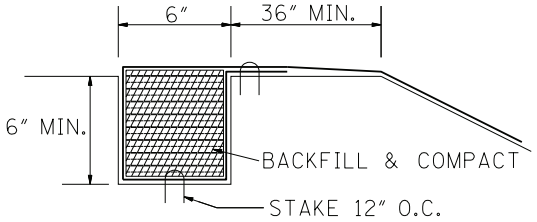
DESIGN TEAM b.w. CHECKED DATE

76

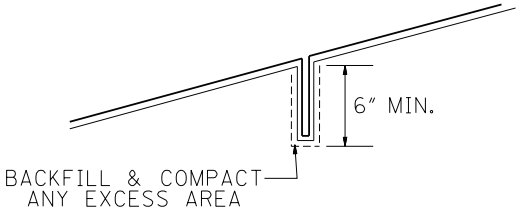
PLAN
ROADWAY PROJECT DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

8/18/2010 9:37 AM DT-1A.DGN

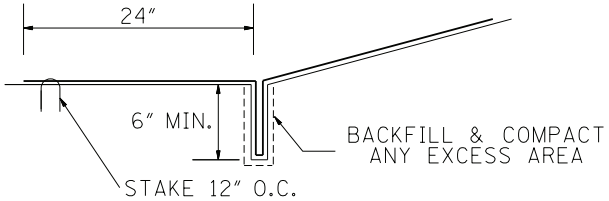
STATE	PROJECT NO.
MISS.	



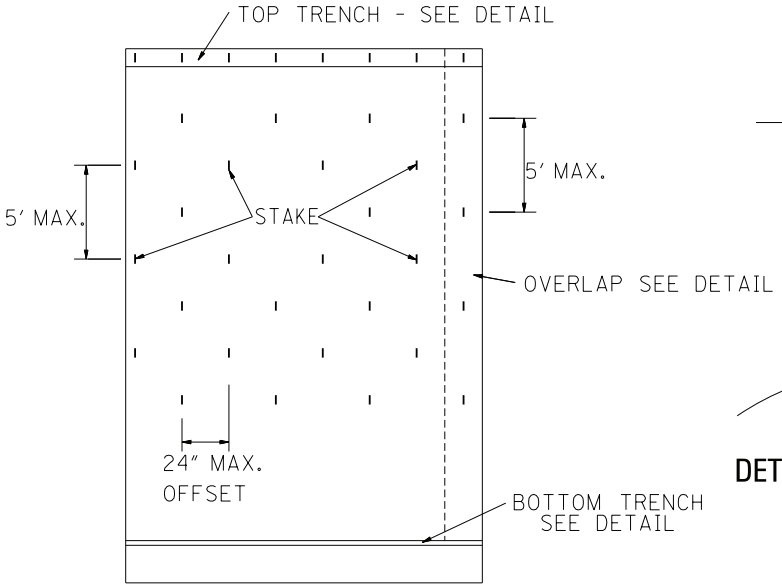
DETAIL OF TOP TRENCH



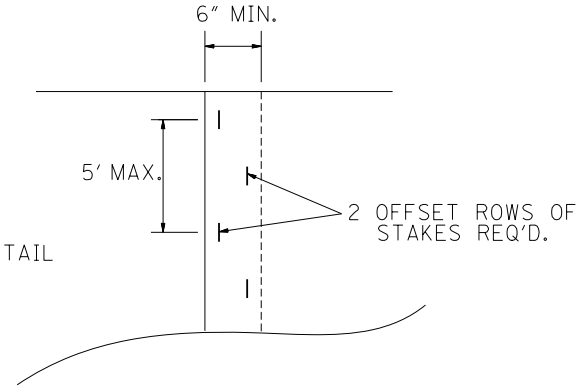
DETAIL OF INTERMEDIATE TRENCH



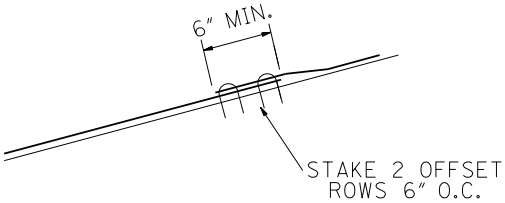
DETAIL OF BOTTOM TRENCH



DETAIL OF EROSION CONTROL BLANKET



DETAIL OF LONGITUDINAL OVERLAP



DETAIL OF TRANSVERSE OVERLAP

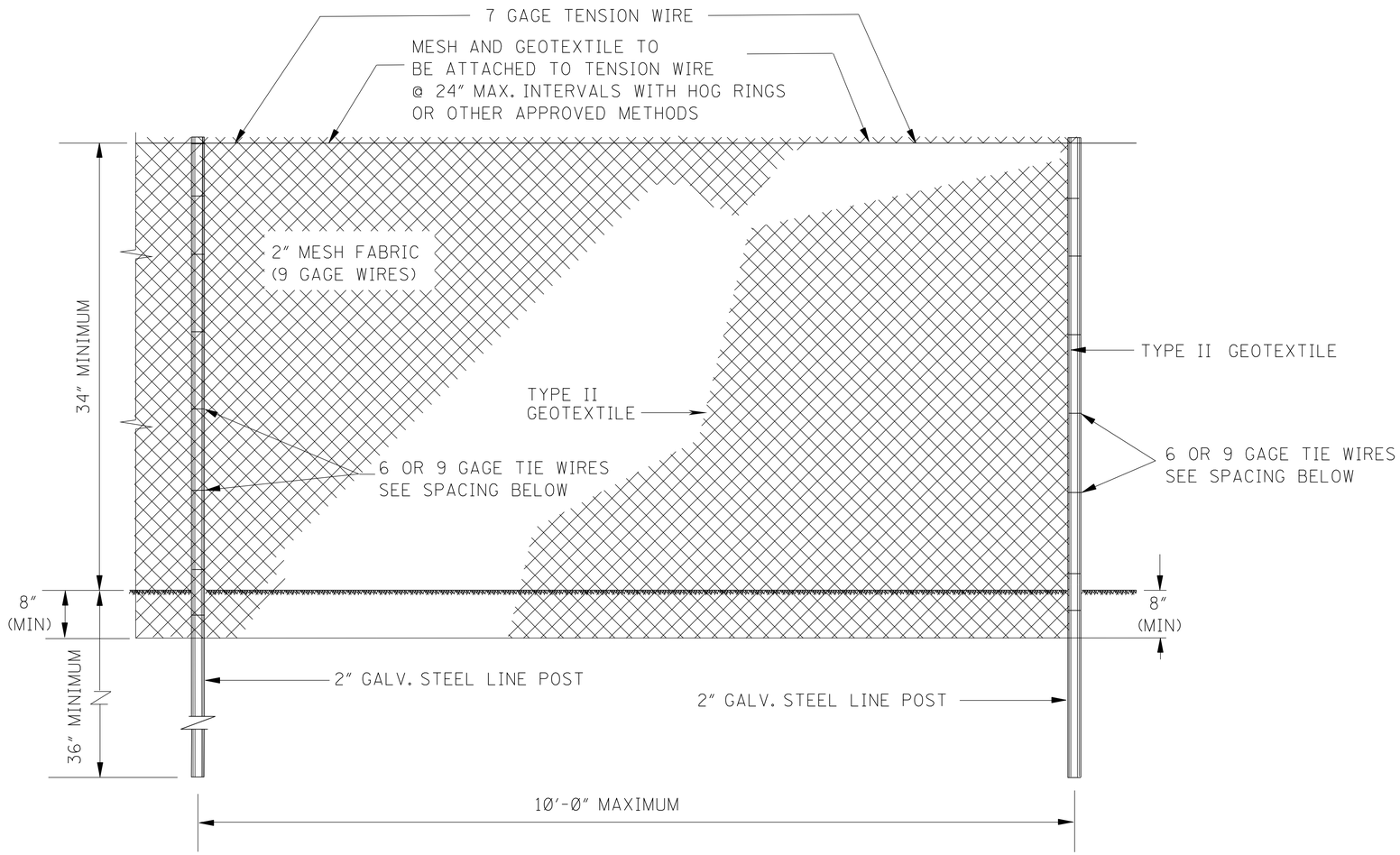
DATE	REVISION	BY	MISSISSIPPI DEPARTMENT OF TRANSPORTATION
			EROSION CONTROL BLANKET
			WORKING NUMBER
			SHEET NUMBER

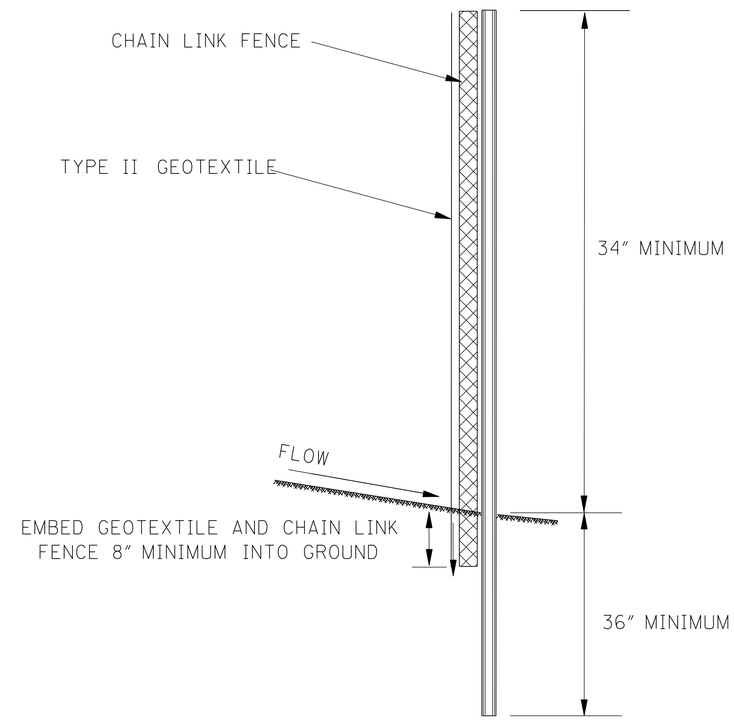
FILENAME: EROSION BLANKET.DGN
DESIGN TEAM _____ CHECKED _____ DATE 04/07/11

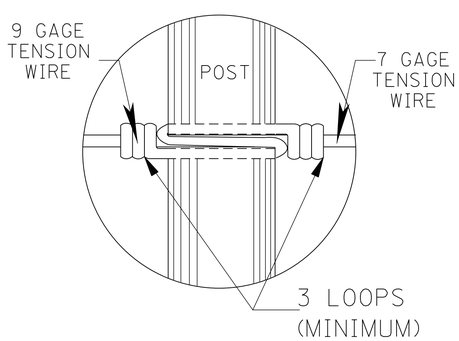
10/4/2011 9:29 AM EROSION BLANKET.DGN

PLAN
PROJECT DEVELOPMENT DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

STATE	PROJECT NO.
MISS.	







TENSION WIRE TIE DETAILS

6 OR 9 GAGE TIE WIRE SPACING	
TOTAL TEST LOAD (lbs)	TIE WIRE SPACING (C-C)
518	12"
475-517	11"
430-474	10"
387-429	9"
344-386	8"
301-343	7"
258-300	6"

REVISION	BY	DATE

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPER SILT FENCE

WORKING NUMBER SSF-1

SHEET NUMBER

FILENAME: SSF-1.DGN

DESIGN TEAM _____ CHECKED _____ DATE 5-13-11

PLAN
ROADWAY DESIGN DIVISION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

07/7/2011 10:56AM SSF-1.DGN

Mississippi Department of Transportation

Section 903
Performance and Payment Bond

Improvements to Interstate 55
Hinds County, Mississippi

Project Number
DB/IM-0055-02(244)/106023-305000

March 5, 2015

S E C T I O N 9 0 3
PERFORMANCE AND PAYMENT BOND

CONTRACT BOND FOR: _____

LOCATED IN THE COUNTY(IES) OF: _____

STATE OF MISSISSIPPI,

COUNTY OF HINDS

Know all men by these presents: that we, _____
(Contractor)

_____ Principal, a _____

residing at _____ in the State of _____

and _____
(Surety)

residing at _____ in the State of _____,

authorized to do business in the State of Mississippi, under the laws thereof, as surety, effective as of the contract date shown below, are held and firmly bound unto the State of Mississippi in the sum of _____

_____

($_____) Dollars, lawful money of the United States of America, to be paid to it for which payment well and truly to be made, we bind ourselves, our heirs, administrators, successors, or assigns jointly and severally by these presents.

The conditions of this bond are such, that whereas the said _____

_____

principal, has (have) entered into a contract with the Mississippi Transportation Commission, bearing the date of _____ day of _____ A.D. _____ hereto annexed, for the construction of certain projects(s) in the State of Mississippi as mentioned in said contract in accordance with the Contract Documents therefor, on file in the offices of the Mississippi Department of Transportation, Jackson, Mississippi.

Now therefore, if the above bounden _____

_____ in all things shall stand to and abide by and well and truly observe, do keep and perform all and singular the terms, covenants, conditions, guarantees and agreements in said contract, contained on his (their) part to be observed, done, kept and performed and each of them, at the time and in the manner and form and furnish all of the material and equipment specified in said contract in strict accordance with the terms of said contract which said plans, specifications and special provisions are included in and form a part of said contract and shall maintain the said work contemplated until its final completion and acceptance as specified in Subsection 109.11 of the approved specifications, and save harmless said Mississippi Transportation Commission from any loss or damage arising out of or occasioned by the negligence, wrongful or criminal act, overcharge, fraud, or any other loss or damage whatsoever, on the part of said principal (s), his (their) agents, servants, or employees in the performance of said work or in any manner connected therewith, and shall be liable and responsible in a civil action instituted by the State at the instance of the Mississippi Transportation Commission or any officer of the State authorized in such cases, for double any amount in money or property, the State may lose or be overcharged or otherwise defrauded of, by reason of wrongful or criminal act, if any, of the Contractor(s), his (their) agents or employees, and shall promptly pay the said agents, servants and employees and all persons furnishing labor, material, equipment or supplies therefor, including premiums incurred, for Surety Bonds, Liability Insurance, and Workmen's Compensation Insurance; with the additional obligation that such Contractor shall promptly make payment of all taxes, licenses, assessments, contributions, damages, any liquidated damages which may arise prior to any termination of said principal's contract, any liquidated damages

which may arise after termination of the said principal's contract due to default on the part of said principal, penalties and interest thereon, when and as the same may be due this state, or any county, municipality, board, department, commission or political subdivision: in the course of the performance of said work and in accordance with Sections 31-5-51 et seq. Mississippi Code of 1972, and other State statutes applicable thereto, and shall carry out to the letter and to the satisfaction of the Executive Director of the Mississippi Department of Transportation, all, each and every one of the stipulations, obligations, conditions, covenants and agreements and terms of said contract in accordance with the terms thereof and all of the expense and cost and attorney's fee that may be incurred in the enforcement of the performance of said contract, or in the enforcement of the conditions and obligations of this bond, then this obligation shall be null and void, otherwise to be and remain in full force and virtue.

_____	_____
(Contractor's) Principal	Surety
By _____	By _____
	(Signature) Attorney in Fact
	Address _____
	_____
Title _____	_____
(Contractor's Seal)	(Printed) MS Agent
	_____
	(Signature) MS Agent
	Address _____
	_____
	_____
	(Surety Seal)
	_____
	Mississippi Insurance ID Number

Revised 9/02/2014