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SM No. CSP1132000161

# PROPOSAL AND CONTRACT DOCUMENTS

## FOR THE CONSTRUCTION OF

12

Thin Lift Overlay on approximately 9 miles of SR 63 from Clara to SR 184 & approximately 2 miles of SR 184 from US 84 to SR 63, known as State Project Nos. SP-1132-00(016) / 109023301 & SP-2167-00(003) / 109023302 in Wayne County.

Project Completion: Flexible

**(STATE DELEGATED)**

### NOTICE

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

Electronic addendum updates will be posted on [www.gomdot.com](http://www.gomdot.com)

**SECTION 900  
OF THE CURRENT  
2017 STANDARD SPECIFICATIONS  
FOR ROAD AND BRIDGE CONSTRUCTION  
JACKSON, MISSISSIPPI**

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION  
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05/02/2024 04:45 PM

# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

## SECTION 901 - ADVERTISEMENT

Electronic bids will be received by the Mississippi Transportation Commission at 10:00 o'clock A.M., Wednesday, May 29, 2024, from the Bid Express Service and shortly thereafter publicly read on the Sixth Floor for:

Thin Lift Overlay on approximately 9 miles of SR 63 from Clara to SR 184 & approximately 2 miles of SR 184 from US 84 to SR 63, known as State Project Nos. SP-1132-00(016) / 109023301 & SP-2167-00(003) / 109023302 in Wayne County.

The attention of bidders is directed to the predetermined minimum wage rate set by the U. S. Department of Labor under the Fair Labor Standards Act.

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

The specifications are on file in the offices of the Mississippi Department of Transportation.

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

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

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

BRAD WHITE  
EXECUTIVE DIRECTOR

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENT TO NOTICE TO BIDDERS NO. 1**

**DATE: 06/08/2021**

**SUBJECT: Governing Specifications**

Change the web address at the end of the first paragraph to the following.

<https://shop.mdot.ms.gov/default.aspx?StoreIndex=1>

# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

**SECTION 904 - NOTICE TO BIDDERS NO. 1**

**CODE: (IS)**

**DATE: 03/01/2017**

**SUBJECT: Governing Specifications**

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

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

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

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SECTION 904 - NOTICE TO BIDDERS NO. 3**

**CODE: (SP)**

**DATE: 01/17/2017**

**SUBJECT: Final Clean-Up**

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

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

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

# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

**SECTION 904 - NOTICE TO BIDDERS NO. 13**

**CODE: (IS)**

**DATE: 03/01/2017**

**SUBJECT: Safety Edge**

Bidders are hereby advised that the Shoulder Wedge (Safety Edge) specified in Section 401, 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. Note that the shoulder dimensions in the bottom two drawings will be less than three feet (3').





# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

**SECTION 904 - NOTICE TO BIDDERS NO. 113**

**CODE: (SP)**

**DATE: 04/18/2017**

**SUBJECT: Tack Coat**

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

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

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SECTION 904 - NOTICE TO BIDDERS NO. 296**

**CODE: (SP)**

**DATE: 07/25/2017**

**SUBJECT: Reduced Speed Limit Signs**

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

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SECTION 904 - NOTICE TO BIDDERS NO. 445**

**CODE: (SP)**

**DATE: 10/10/2017**

**SUBJECT: Mississippi Agent or Qualified Nonresident Agent**

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

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SECTION 904 - NOTICE TO BIDDERS NO. 446**

**CODE: (SP)**

**DATE: 10/18/2017**

**SUBJECT: Traffic on Milled Surface in Urban Areas**

Bidders are hereby advised that when the main lanes of a roadway are fine milled, traffic will be allowed to run on a milled surfaces for up to five (5) calendar days. The Contractor will be assessed a penalty of **\$5,000 per calendar day** afterwards until the milled surfaces are covered with the next lift of asphalt. It shall be the Contractor's responsibility to ensure that the milling operations do not commence until such time as forecasted weather conditions are suitable enough to allow the placement of the asphalt pavement after the milling operations.

## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 516

CODE: (IS)

DATE: 11/28/2017

SUBJECT: Errata and Modifications to the 2017 Standard Specifications

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

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

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SECTION 904 - NOTICE TO BIDDERS NO. 1225**

**CODE: (SP)**

**DATE: 11/13/2018**

**SUBJECT: Early Notice to Proceed**

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



## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

**SECTION 904 - NOTICE TO BIDDERS NO. 1226**

**CODE: (IS)**

**DATE: 11/16/2018**

**SUBJECT: Material Storage Under Bridges**

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

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SECTION 904 - NOTICE TO BIDDERS NO. 1241**

**CODE: (IS)**

**DATE: 11/27/2018**

**SUBJECT: Fuel and Material Adjustments**

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

## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

**SECTION 904 - NOTICE TO BIDDERS NO. 2206**

**CODE: (IS)**

**DATE: 01/14/2020**

**SUBJECT: MASH Compliant Devices**

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

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

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

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

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

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SECTION 904 - NOTICE TO BIDDERS NO. 2273**

**CODE: (SP)**

**DATE: 02/12/2020**

**SUBJECT: Mississippi Special Fuel Tax Law**

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

## Gasoline and Dyed Diesel Used for Non-Highway Purposes

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

### Gasoline Used for Non-Highway Purposes

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

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

### Refund Gasoline User

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

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

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

### Refund Gasoline Dealer

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

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

### Dyed Diesel Used for Non-Highway Purposes

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

### Dyed Diesel Used on the Highway

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

### Identifying Dyed Diesel

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



## Special Fuel Used on Government Contracts

### State and Local Government Contracts

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

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

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

### Special Fuel Direct Pay Permit

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

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

### Special Fuel Distributors

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

### Environmental Protection Fee

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

### Penalties

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



**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SECTION 904- NOTICE TO BIDDERS NO. 2397**

**CODE: (SP)**

**DATE: 03/24/2020**

**SUBJECT: Smoothness Tolerances for Ultra-Thin Asphalt Pavement**

Bidders are hereby advised that the smoothness tolerances for ultra-thin asphalt pavement on this project shall meet the requirements of a Category C project in accordance with Subsection 403.03.2.1. There will be no final surface requirements or corrective action based for the short continuous interval. Bidders are responsible for the collection of a preliminary smoothness profile prior to any work being performed.

## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

### SUPPLEMENT TO NOTICE TO BIDDERS NO. 2654

**DATE:** 05/02/2020

The goal is 0 percent for the Disadvantaged Business Enterprise. All Bidders are required to submit Form OCR-481 for all DBEs. Bidders are advised to check the bid tabulation link for this project on the MDOT website at:

[https://mdot.ms.gov/portal/current\\_letting](https://mdot.ms.gov/portal/current_letting)

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



# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2654

CODE: (SP)

DATE: 05/02/2020

**SUBJECT: Disadvantaged Business Enterprises In Special Funded Projects**

The Department has developed a Disadvantaged Business Enterprise Program that is applicable to this contract and is made a part thereof by reference, except approvals and concurrences by the Federal Highway Administration is not applicable to this contract since it is not financed in whole or in part with Federal Funds.

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 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 these contracts on the basis of race, color, sex, or national origin.

## **ASSURANCES THAT CONTRACTORS MUST TAKE:**

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

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

## **DEFINITIONS**

For purposes of this provision the following definitions will apply:

"Disadvantaged Business" means a small business concern: (a) which is at least 51 percent owned by one or more socially and economically disadvantaged individual(s) or in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more socially

and economically disadvantaged individual(s); and (b) whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individual(s) who own it. It is important to note that the business owners themselves must control the operations of the business. Absentee ownership or title ownership by an individual who does not take an active role in controlling the business is not consistent with eligibility as a DBE under 49 CFR Part 26.71.

### **CONTRACTOR'S OBLIGATION**

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

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

### **CONTRACT GOAL**

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

If the percentage of the contract that is proposed for DBEs is 1% or greater, shall be so stated on the last bid sheet of the proposal.

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

Form OCR-481 is available on the MDOT website at [www.mdot.ms.gov](http://www.mdot.ms.gov) under the Civil Rights tab, or by calling 601-359-7466.

The OCR-481 Form must contain the following information:

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

The Reference Number, percent of work to be completed by the DBE subcontractor and the dollar amount of each item. If a portion of an item is subcontracted, a breakdown of that item

including quantities and unit price must be attached, detailing what part of the item the DBE firm is to perform and who will perform the remainder of the item.

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

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

### **GOOD FAITH EFFORTS**

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

- (1) Whether the bidder attended the pre-bid meeting that was scheduled by the Department to inform DBEs of subcontracting opportunities;
- (2) whether the bidder advertised in general circulation, trade association, and minority-focus media concerning the subcontracting opportunities;
- (3) whether the bidder provided written notice to a reasonable number of specific DBEs that their interest in the contract is being solicited;
- (4) whether the bidder followed up initial solicitations of interest by contacting DBEs to determine with certainty whether they were interested;
- (5) whether the bidder selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the contract goal;
- (6) whether the bidder provided interested DBEs with adequate information about the plans, specifications and requirements of the contract;
- (7) whether the bidder negotiated in good faith with interested DBEs and did not reject them as unqualified without sound reasons based on a thorough investigation of their capabilities; and
- (8) whether the bidder made efforts to assist interested DBEs in obtaining any required bonding or insurance.
- (9) whether the bidder has written notification to certified DBE Contractors soliciting subcontracting for items of work in the contract.
- (10) whether the bidder has a statement of why an agreement was not reached.

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

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

The bidder hereby gives assurance that a good faith effort has been made to meet the contract goal for DBE participation for which this proposal is submitted.

### **DIRECTORY**

A list of “Certified DBE Contractors” which have been certified as such by the Mississippi Department of Transportation and other Unified Certification Partners (UPC) can be found on the Mississippi Department of Transportation website at [www.mdot.ms.gov](http://www.mdot.ms.gov). The DBE firm must be certified at the time the project is let and approved by MDOT to count towards meeting the DBE goal.

### **REPLACEMENT**

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

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

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

### **PREBID MEETING**

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

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

**PARTICIPATION / DBE CREDIT**

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

- (1) If the Prime Contractor is a certified DBE firm, only the value of the work actually performed by the DBE Prime can be counted towards the project goal, along with any work subcontracted to a certified DBE firm.
- (2) If the Prime 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. The joint venture must submit a Joint Venture Eligibility Form provided by the Mississippi Department of Transportation.
- (4) Expenditures to DBEs that perform a commercially useful function may be counted toward the goal. A business is considered to perform a commercially useful function when it is responsible for the execution of a distinct element of the work and carries out its responsibilities by actually performing, managing, and supervising the work involved.
- (5) The Contractor may count 100% of the expenditures for materials and supplies obtained from certified DBE suppliers and manufacturers that produce goods from raw materials or substantially alters them for resale provided the suppliers and manufacturers assume the actual and contractual responsibility for the provision of the materials and supplies. The Contractor may count 60 percent of the expenditures to suppliers that are not manufacturers, provided the supplier performs a commercially useful function in the supply process. Within 30 days after receipt of the materials, the Prime Contractor shall furnish to the DBE Coordinator invoices from the certified supplier to verify the DBE goal.
- (6) Any work that a certified DBE firm subcontracts or sub-subcontracts to a non-DBE firm will not count towards the DBE goal
- (7) Only the dollars actually paid to the DBE firm may be counted towards the DBE goal.

**AWARD**

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

- (1) **All Bidders** must submit to the Office of Civil Rights for approval, Form OCR-481 (DBE Commitment) no later than the 3<sup>rd</sup> business day after opening of the bids, or submit information with the bid proposal to satisfy the Department and that adequate good faith

efforts have been made to meet the contract goal. For answers to questions regarding Form OCR-481, contact the MDOT Office of Civil Rights at (601) 359-7466.

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

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

### **DEFAULT**

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

### **DBE REPORTS**

- (1) OCR-481: Refer to "CONTRACT GOAL" section of this Notice to Bidders for information regarding this form.
- (2) OCR-482: At the conclusion of the project 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-03-05-02-483. Evaluations reported on this form are used to determine whether or not the DBE firm is performing a CUF. The Prime Contractor should take corrective action when the report contains any negative evaluations. DBE credit may be disallowed and/or other sanctions imposed if it is determined the DBE firm is not performing a CUF. This form should also be completed and returned to the DBE Coordinator (Office of Civil Rights).
- (4) OCR-484: Each month, the Prime Contractor will submit to the Project Engineer OCR-484 that certifies payments to all Subcontractors and shows all firms even if

the Prime Contractor has paid no monies to the firm during that estimate period (negative report). The Project Engineer will attach the form to the monthly estimate before forwarding to the Contract Administration Division for further processing. Failure of the Contractor to submit the OCR-484 will result in the estimate not being processed and paid.

- (5) OCR-485: Bidder must submit **signed form with bid proposal** of all firms that submitted quotes for material supplies or items to be subcontracted. If the OCR-485 information is not included as part of bid proposal, 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. **The low Bidder** should **return this form** to MDOT with the OCR-481 form, or can also be returned with the Permission to Subcontract Forms (CAD-720, CAD-725 and CAD-521).

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

**SANCTIONS**

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

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

Offense #1	10% of unmet portion of goal	or	\$5,000 lump sum payment	or	Both
Offense #2	20% of unmet portion of goal	or	\$10,000 lump sum payment	or	Both
Offense #3	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 **for a period of up to 12 months after notification by certified email.**

## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2954

CODE: (IS)

DATE: 12/01/2020

SUBJECT: Reflective Sheeting for Signs

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

### Temporary Construction Signs

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

### Permanent Signs

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

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



**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SECTION 904 – NOTICE TO BIDDERS NO. 3599**

**CODE: (SP)**

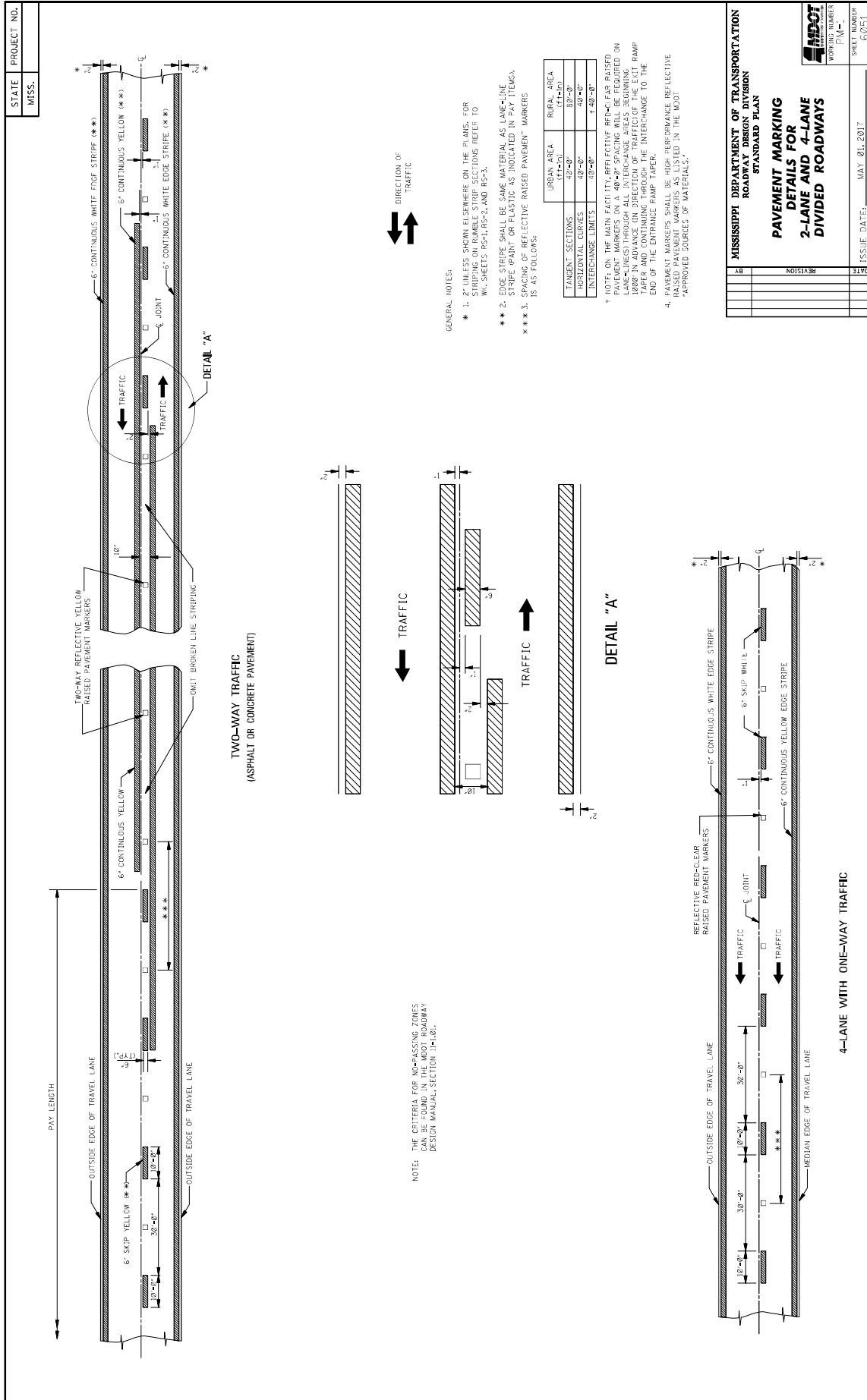
**DATE: 08/11/2021**

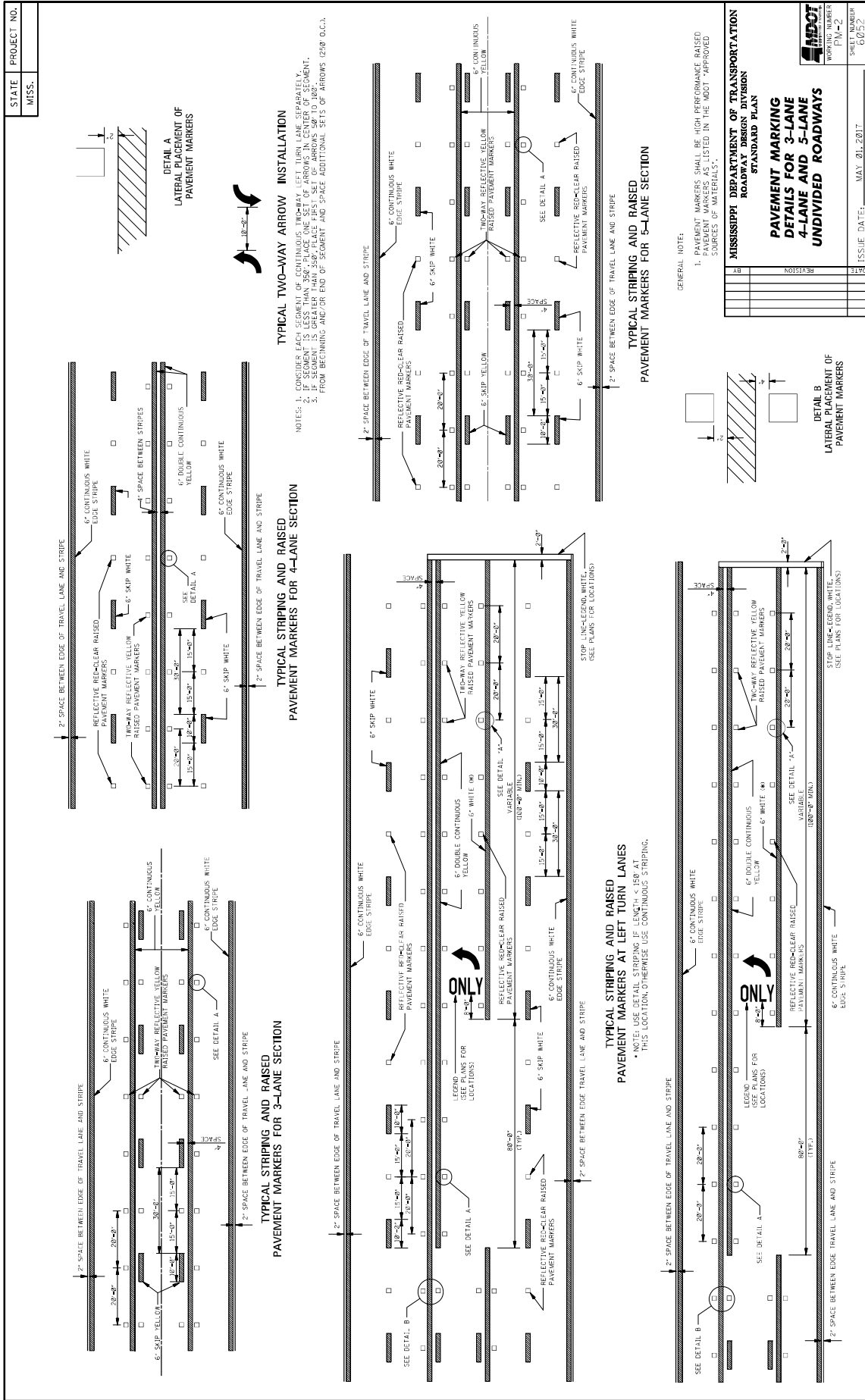
**SUBJECT: Standard Drawings**

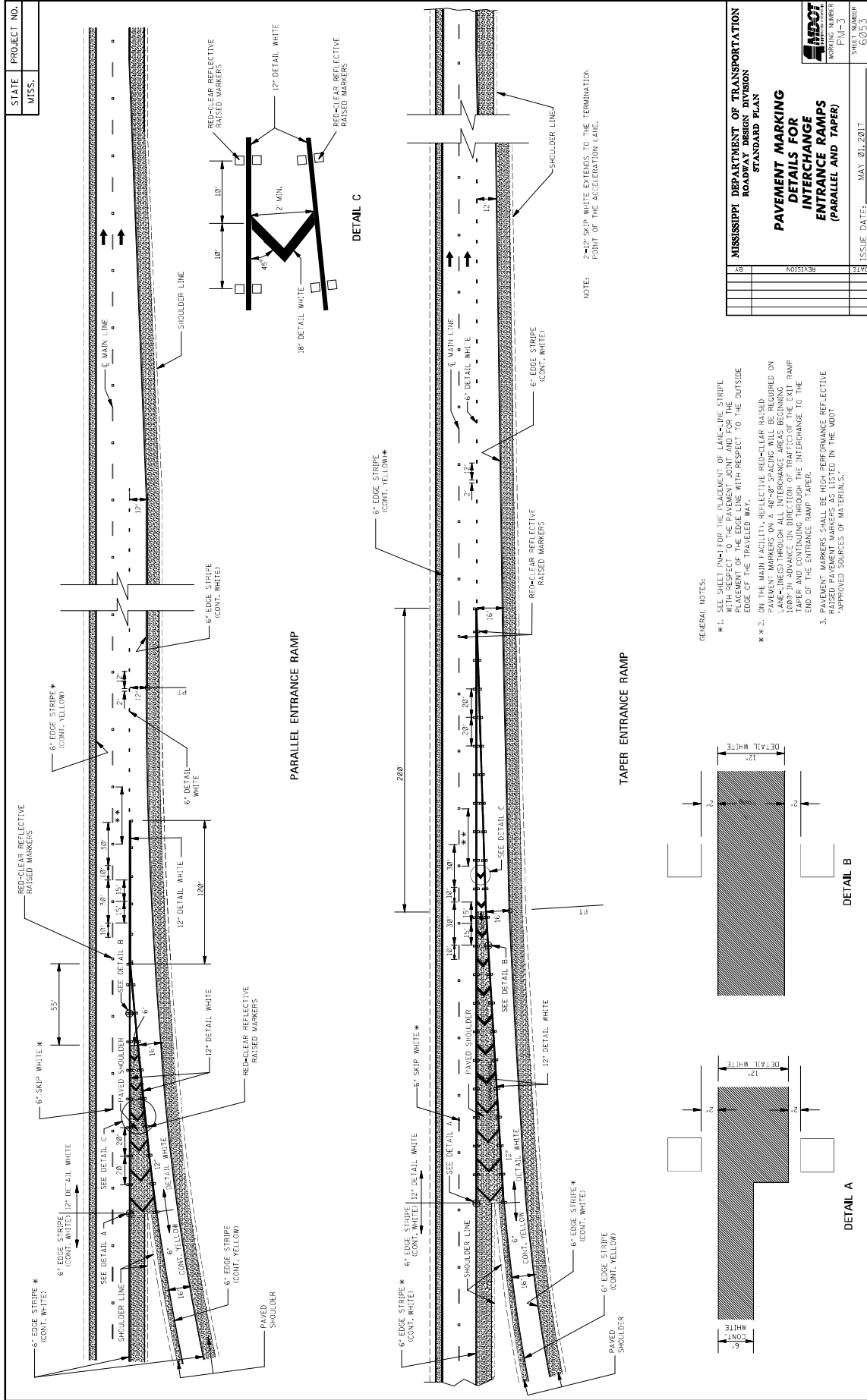
Standard Drawings attached hereto shall govern appropriate items of required work.

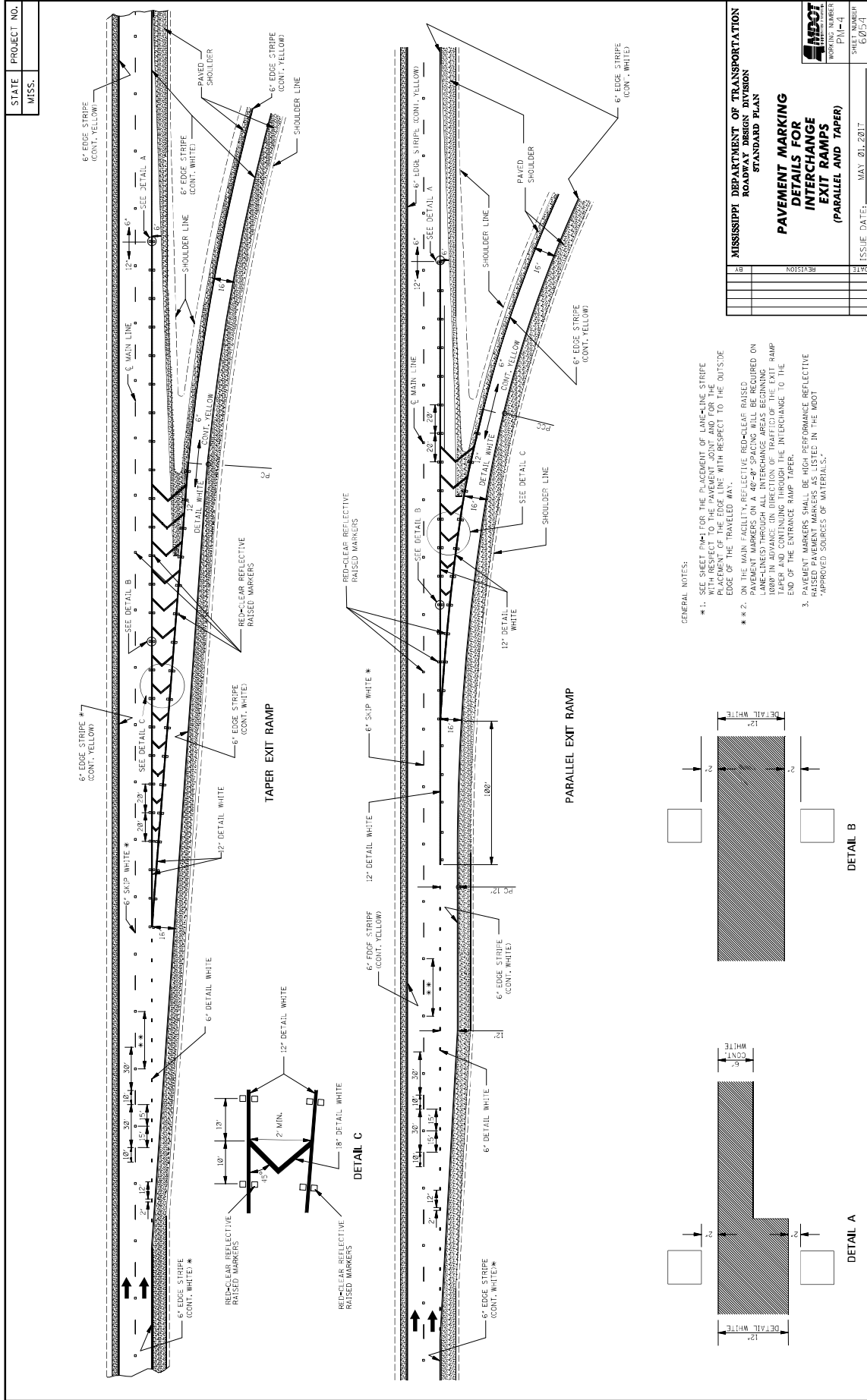
Larger copies of Standard Drawings may be purchased from:

MDOT Plans Print Shop  
MDOT Shop Complex, Building C, Room 114  
2567 North West Street  
P.O. Box 1850  
Jackson, MS 39215-1850  
Telephone: (601) 359-7460  
or FAX: (601) 359-7461  
or e-mail: [plans@mdot.state.ms.us](mailto:plans@mdot.state.ms.us)









STATE MISS.	PROJECT NO.								
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**GENERAL NOTES:**

- TWO HORIZONTAL GAPS (USED BY TEMPLATE CONNECTIONS) OF 1/2" SHALL BE MAINTAINED BETWEEN LETTERS OR BETWEEN LETTERS AND THE SIGN FACE.
- FOR OTHER DETAILS, SEE THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- PAY QUANTITIES FOR PAVEMENT MARKING LEGENDS ARE AS FOLLOWS:

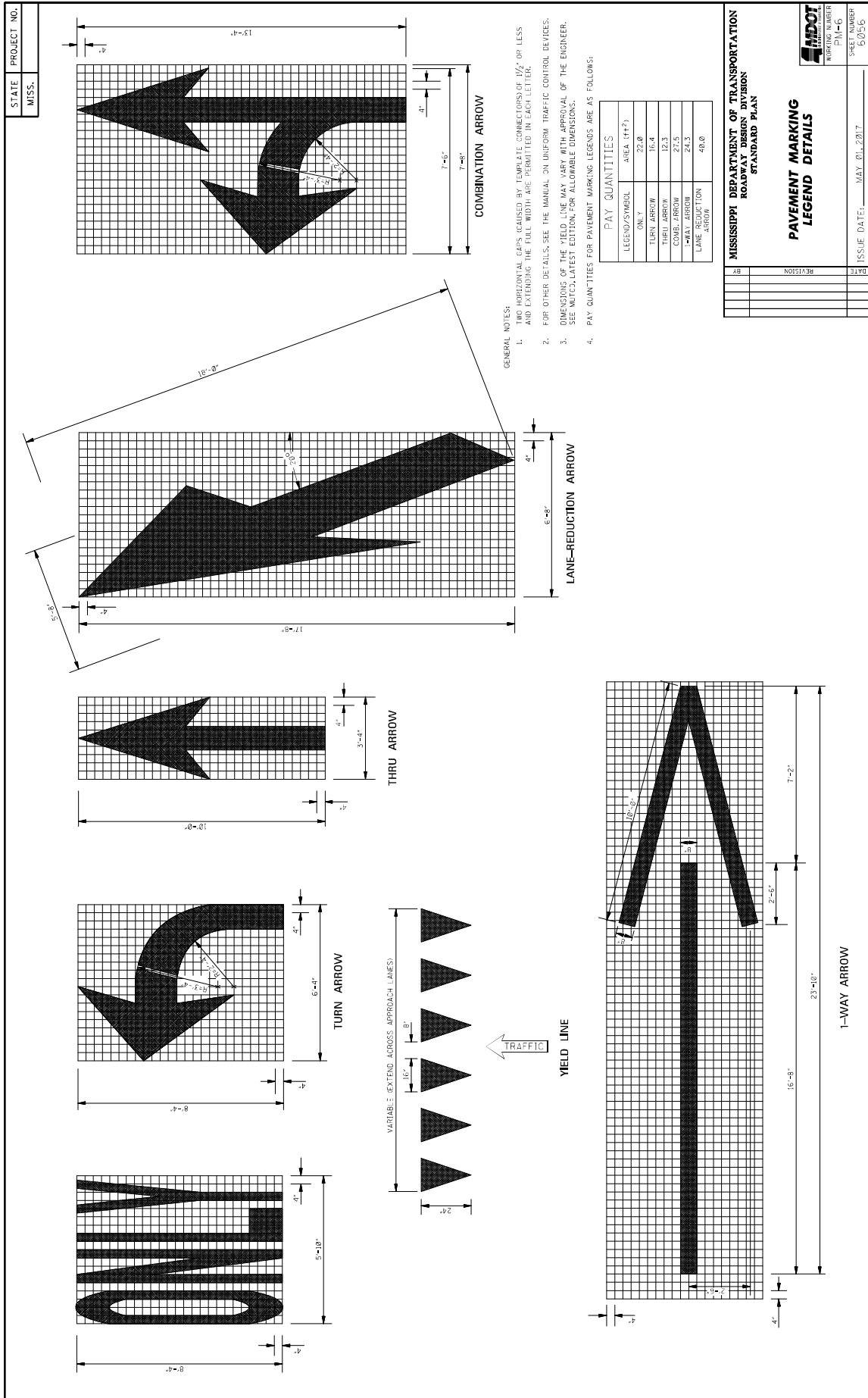
LEGEND	AREA (sq ft)
STOP	24.6
RIGHT	28.6
LEFT	19.5
UP	22.2
DOWN	22.2
AHEAD	32.4
YIELD	26.8
EXIT	18.5
SIGNAL	32.5
SCHOOL	35.2

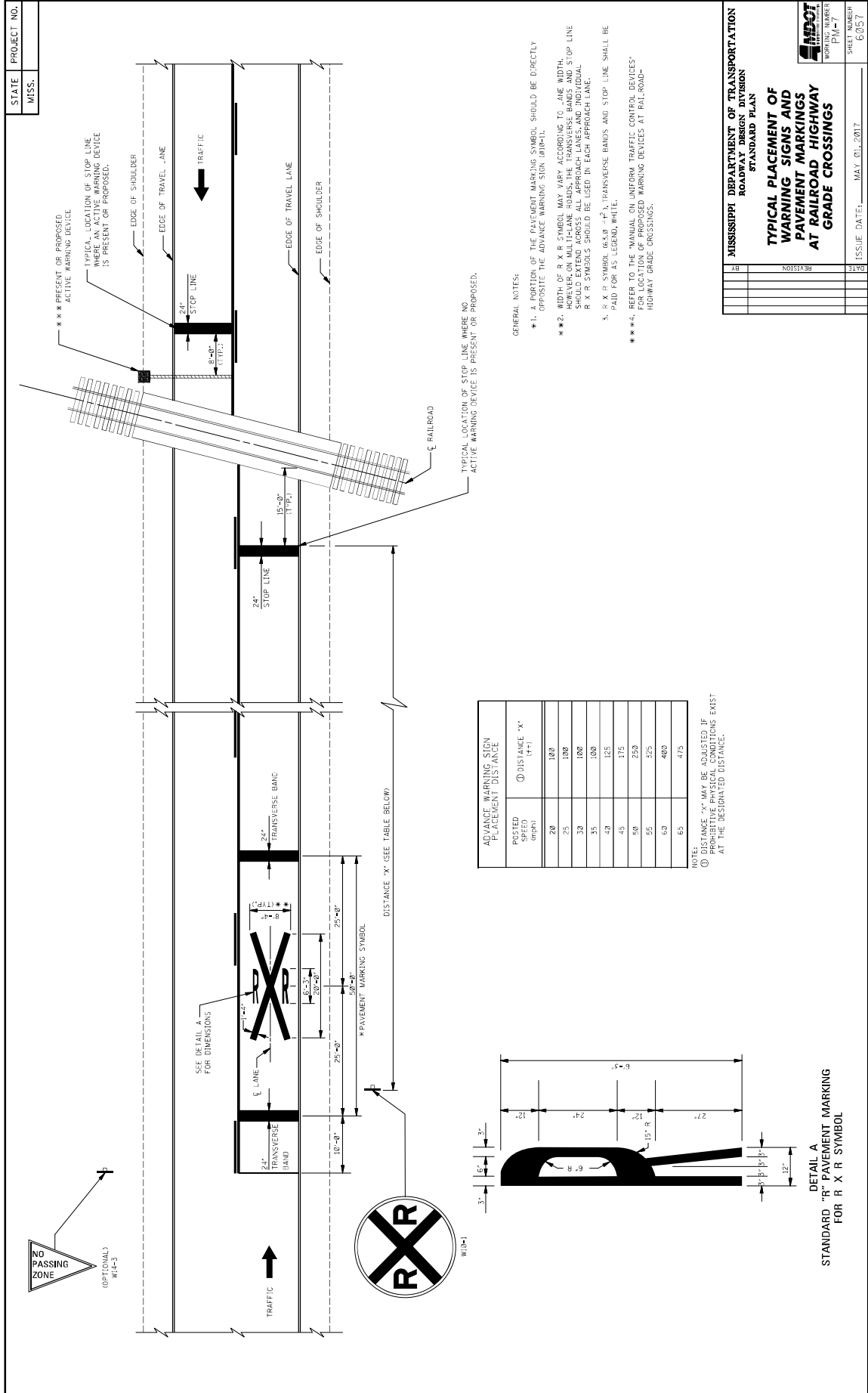
  

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION  
ROADWAY DESIGN DIVISION  
STANDARD PLAN**

**PAVEMENT MARKING  
LEGEND DETAILS**

	DATE
	BY
	REVISION
	ISSUE DATE: MAY 01, 2017
	SHEET NUMBER PM-5 6035





MISSISSIPPI DEPARTMENT OF TRANSPORTATION  
ROADWAY DESIGN DIVISION  
STANDARD PLAN

**TYPICAL PLACEMENT OF WARNING SIGNS AND PAVEMENT MARKINGS AT RAILROAD-HIGHWAY GRADE CROSSINGS**

MDOT  
WORKING NUMBER  
P10-17

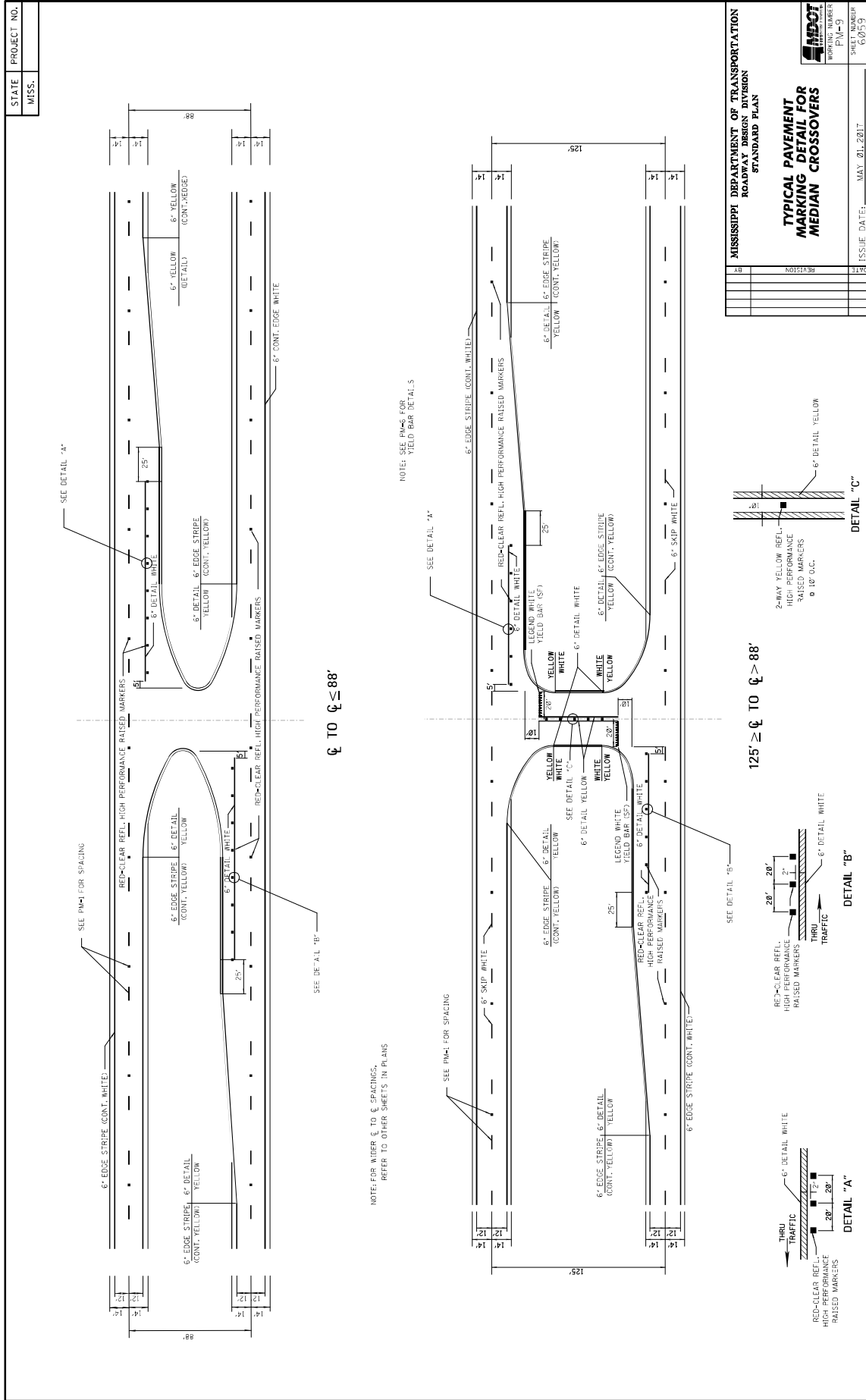
SHEET NUMBER  
60511

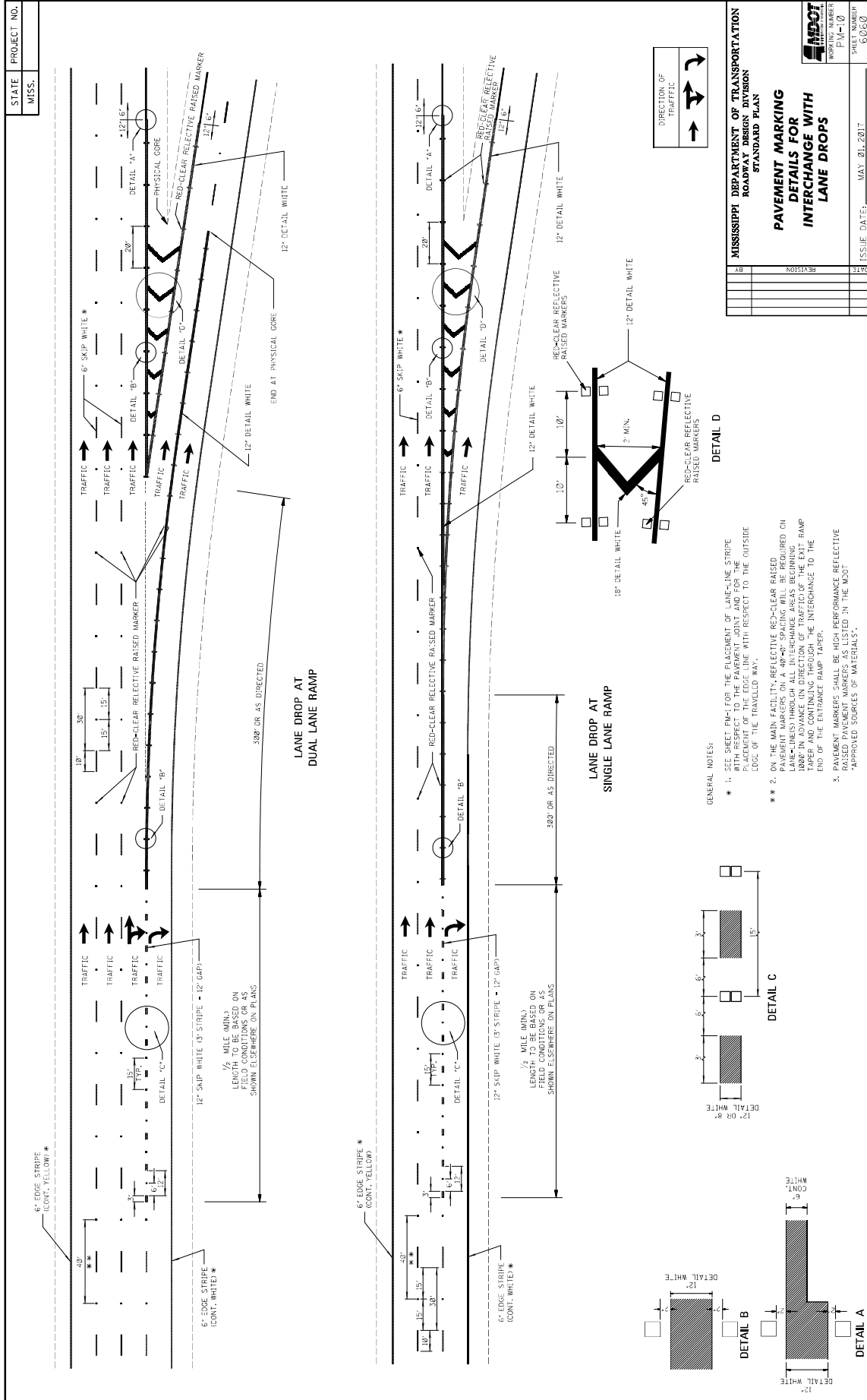
ISSUE DATE: MAY 01, 2017

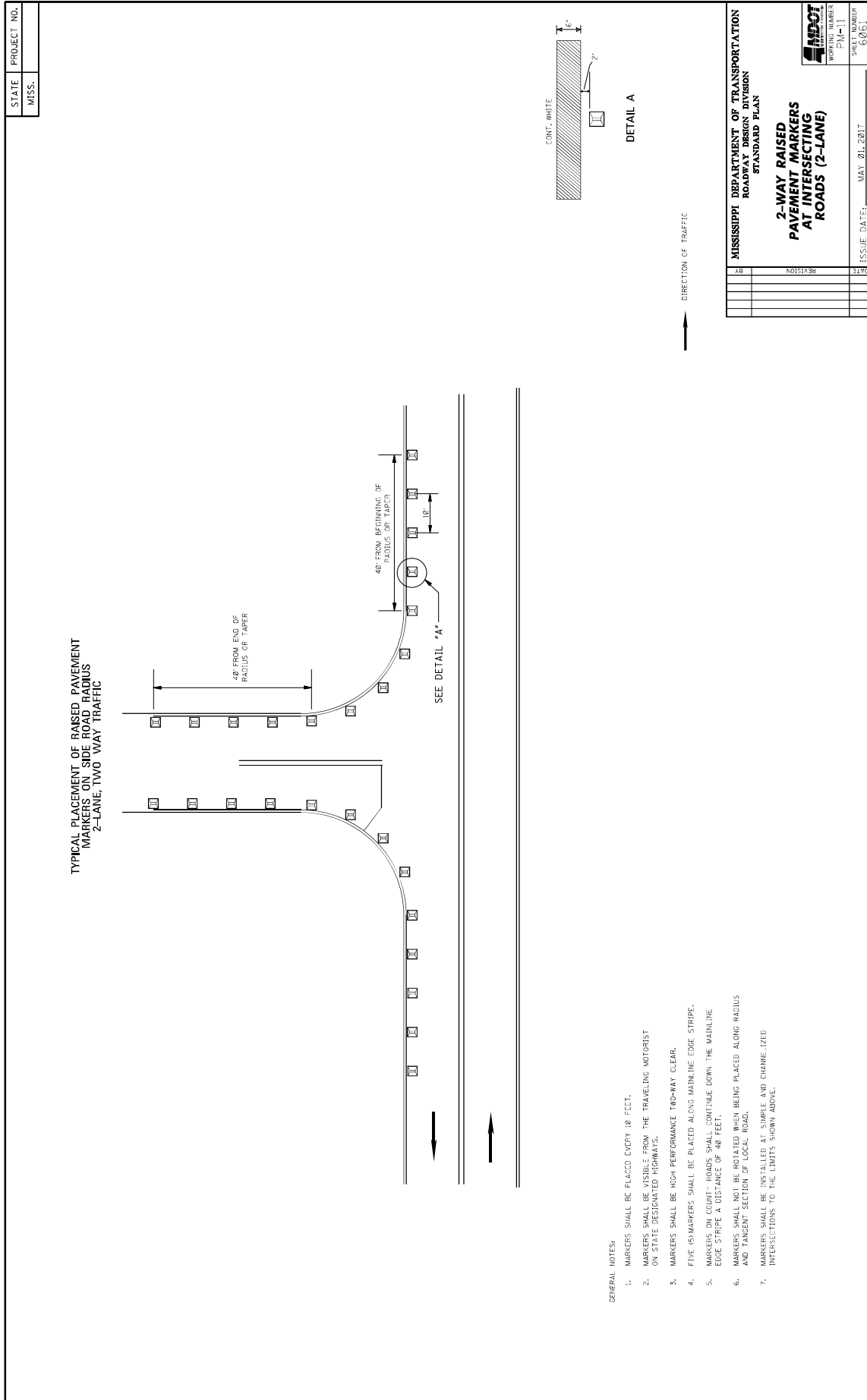
DATE	REVISION

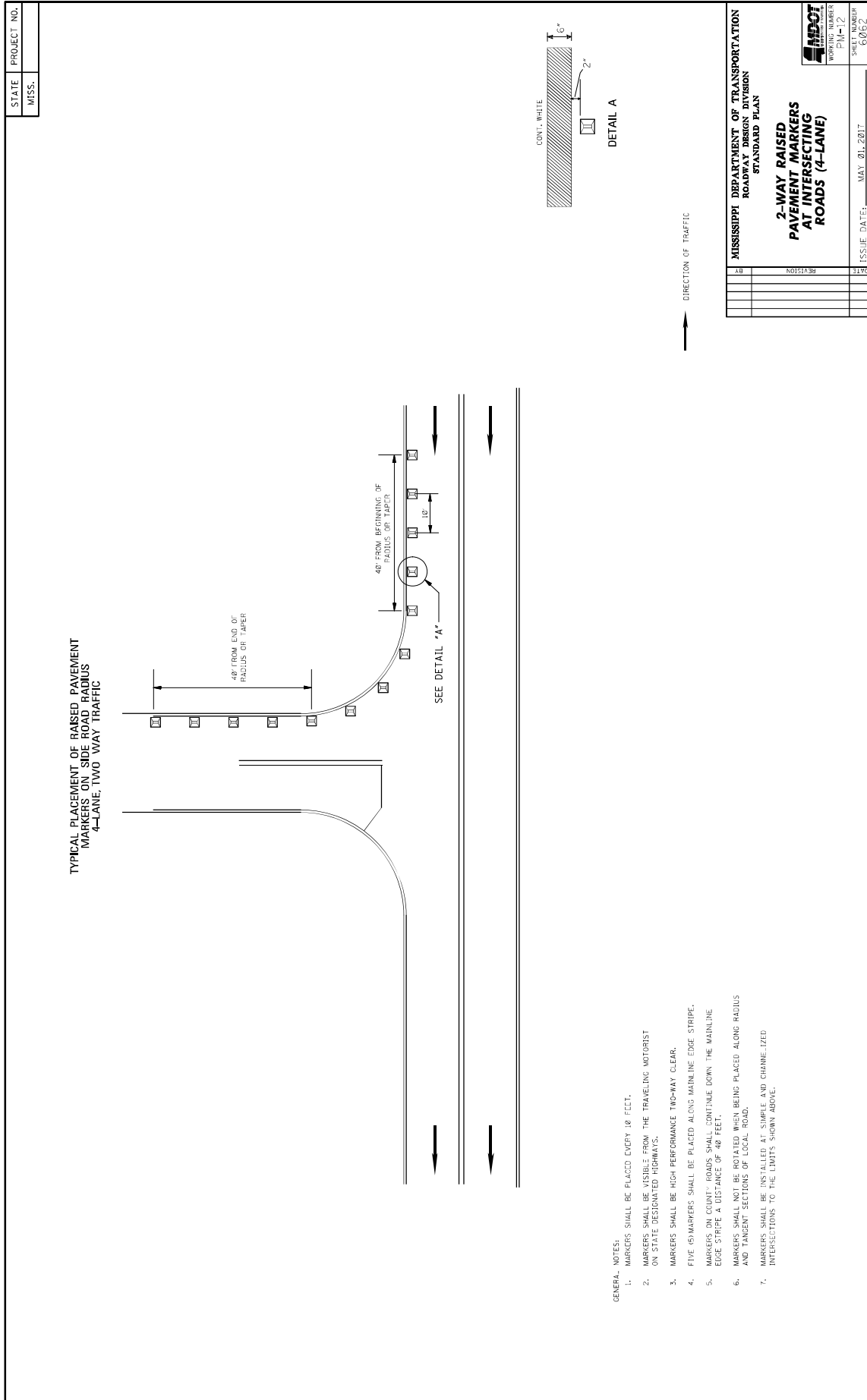


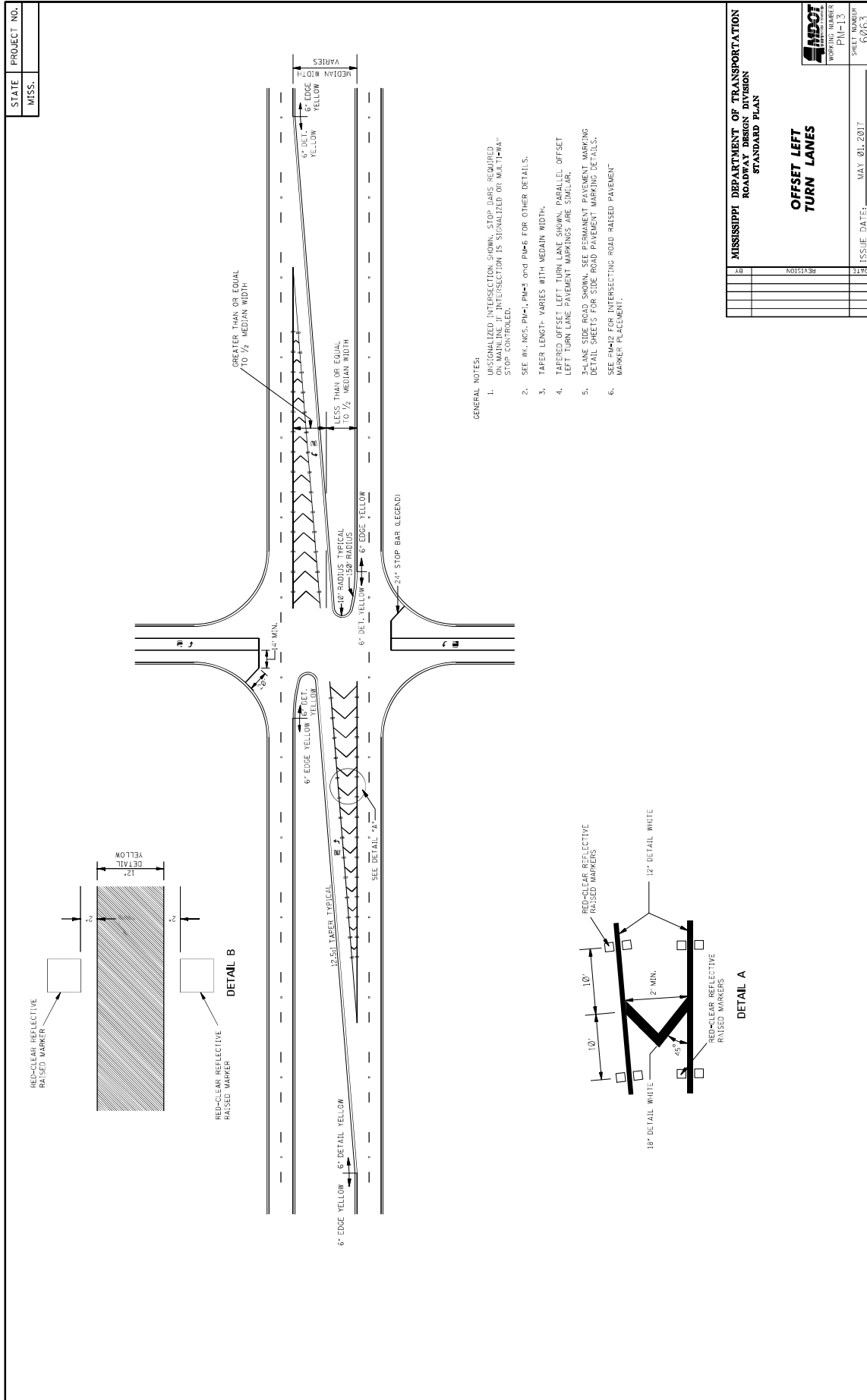


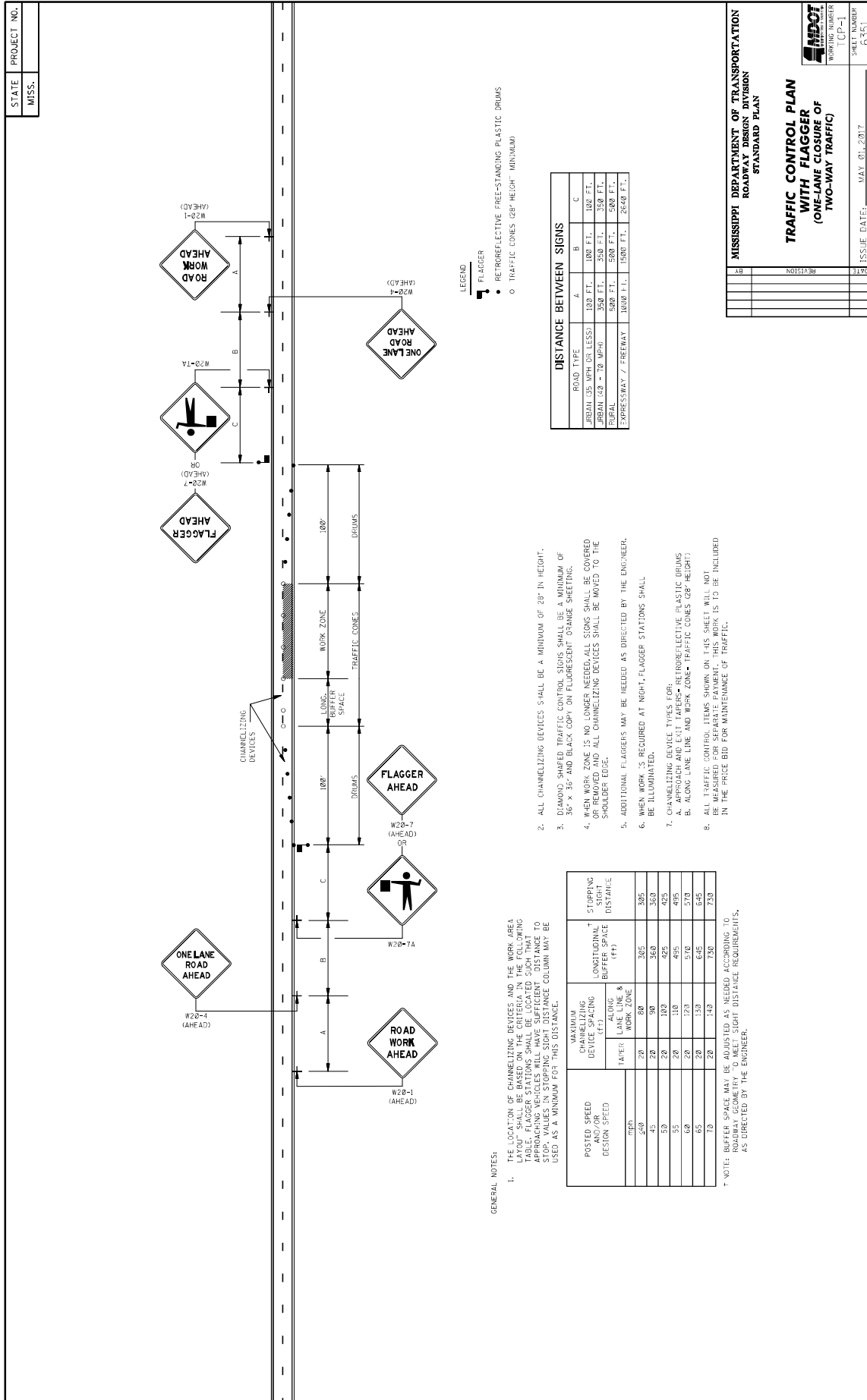


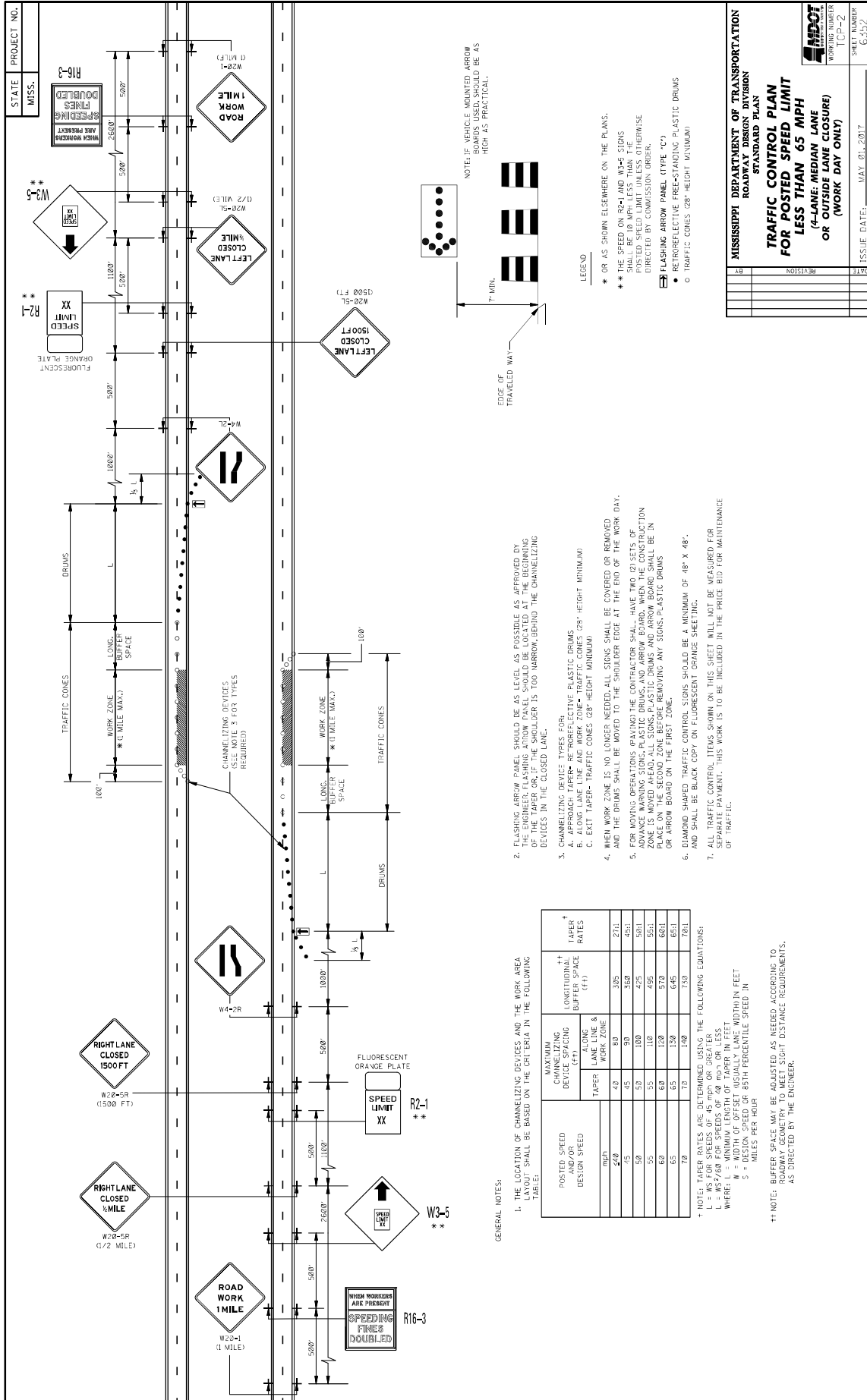












STATE PROJECT NO.  
MISS. R16-3

TRAFFIC CONTROL PLAN  
FOR POSTED SPEED LIMIT  
LESS THAN 65 MPH  
(4-LANE, MEDIAN LANE  
OR OUTSIDE LANE CLOSURE)  
OR (WORK DAY ONLY)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION  
ROADWAY DESIGN DIVISION  
STANDARD PLAN

ISSUE DATE: MAY 01, 2017  
SHEET NUMBER: 6252  
WORKING NUMBER: T1P-2

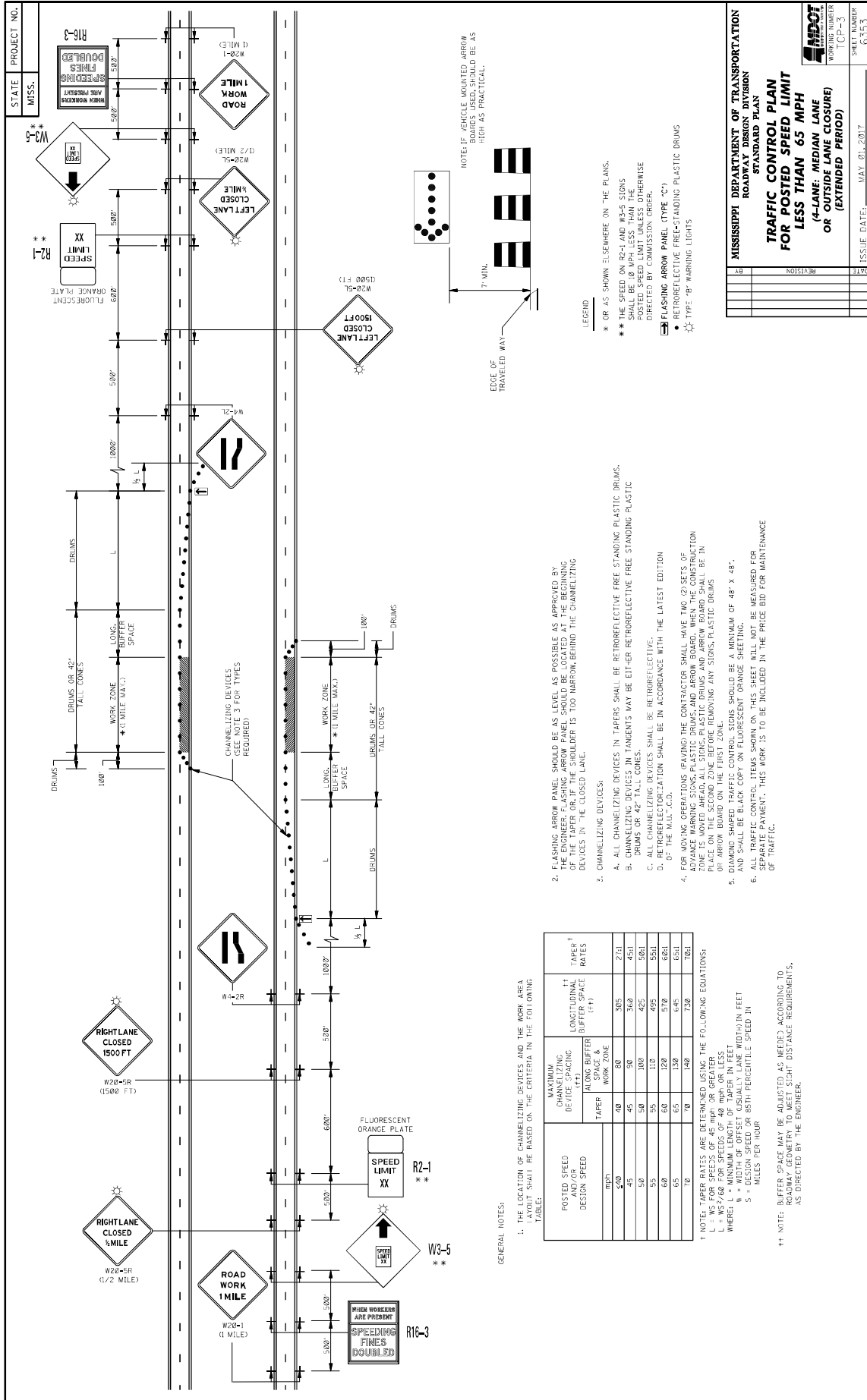
- GENERAL NOTES:
1. THE LOCATION OF CHANNELIZING DEVICES AND THE WORK AREA LAYOUT SHALL BE BASED ON THE CRT DATA IN THE FOLLOWING TABLE:
  2. FLASHING ARROW PANEL SHOULD BE AS LEVEL AS POSSIBLE AS APPROVED BY THE ENGINEER. THE PANEL SHOULD BE PLACED AT THE END OF THE WORK DAY OF THE TAPER OR, IF THE SHOULDER IS TOO NARROW, BEHIND THE CHANNELIZING DEVICES IN THE CLOSED LANE.
  3. CHANNELIZING DEVICES TYPES: F30.
    - A. APPROACH TAPER- RETROREFLECTIVE PLASTIC DRUMS
    - B. ALONG LANE LINE AND WORK ZONE- TRAFFIC CONES (28" HEIGHT MINIMUM)
    - C. EXIT TAPER- TRAFFIC CONES (28" HEIGHT MINIMUM)
  4. WHEN WORK ZONE IS NO LONGER NEEDED, ALL SIGNS SHALL BE COVERED OR REMOVED.
  5. FOR MOVING OPERATIONS (PAVING) THE CONTRACTOR SHALL HAVE TWO (2) SETS OF ADVANCE WARNING SIGNS, PLASTIC DRUMS AND ARROW BOARD. WHEN THE CONSTRUCTION ZONE IS MOVED AHEAD, ALL SIGNS, PLASTIC DRUMS AND ARROW BOARD SHALL BE IN PLACE ON THE SECOND ZONE BEFORE REMOVING ANY SIGNS, PLASTIC DRUMS OR ARROW BOARD ON THE FIRST ZONE.
  6. DIAMOND SHAPED TRAFFIC CONTROL SIGNS SHOULD BE A MINIMUM OF 48" X 48" AND SHALL BE BLACK COPY ON FLUORESCENT ORANGE SHEETING.
  7. ALL TRAFFIC CONTROL ITEMS SHOWN ON THIS SHEET WILL NOT BE MEASURED FOR PAYMENT. THIS WORK IS TO BE INCLUDED IN THE PRICE BID FOR MAINTENANCE OF TRAFFIC.

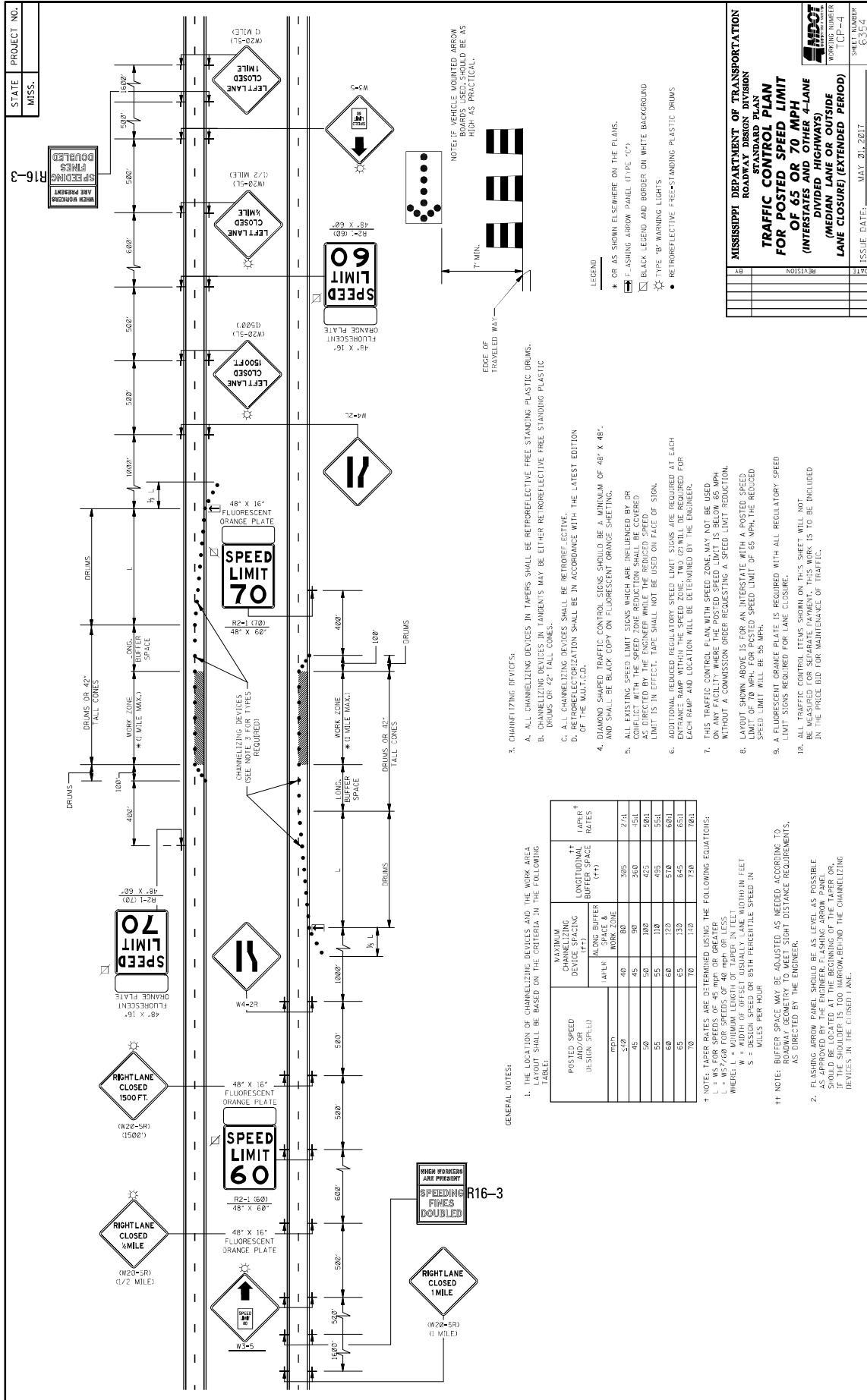
POSTED SPEED AND/OR DESIGN SPEED	MAXIMUM CHANNELIZING DEVICE SPACING (FT)		LONGITUDINAL BUFFER SPACE (FT)	TAPER RATES
	LANE LINE & WORK ZONE	EXIT TAPER		
40	40	80	305	27:1
45	45	90	350	45:1
50	50	100	425	50:1
55	55	110	495	55:1
60	60	120	570	60:1
65	65	130	645	65:1
70	70	140	730	70:1

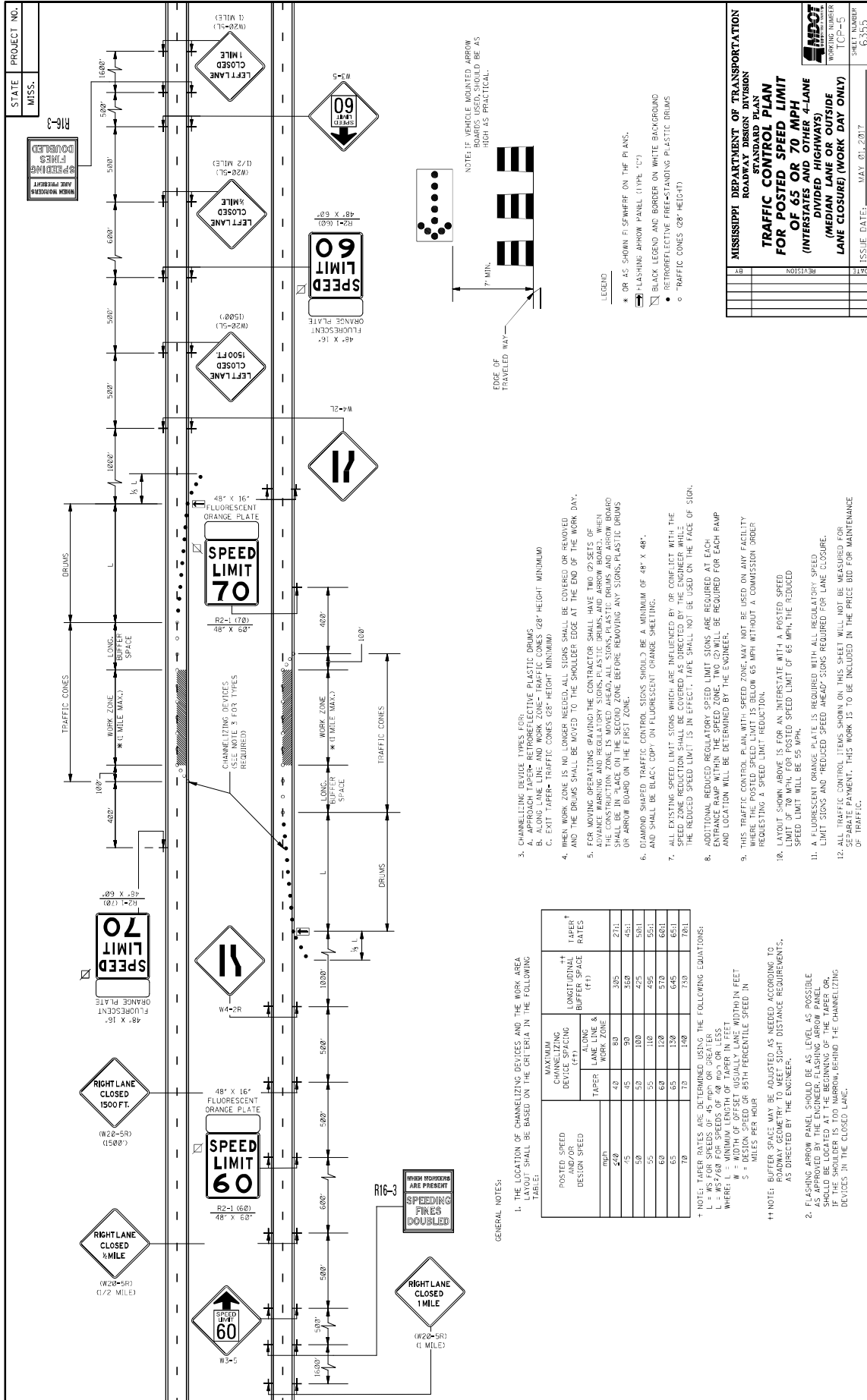
† NOTE: TAPER RATES ARE DETERMINED USING THE FOLLOWING EQUATIONS:  
 L = MS FOR SPEEDS OF 45 MPH OR GREATER  
 L = MS FOR SPEEDS OF 30 MPH OR GREATER  
 WHERE: L = MINIMUM LENGTH OF TAPER IN FEET  
 M = WIDTH OF OFFSET (USUALLY LANE WIDTH) IN FEET  
 S = DESIGN SPEED OR 85TH PERCENTILE SPEED IN MILES PER HOUR

†† NOTE: BUFFER SPACE MAY BE ADJUSTED AS NEEDED ACCORDING TO ROADWAY GEOMETRY TO MEET SIGHT DISTANCE REQUIREMENTS, AS DIRECTED BY THE ENGINEER.









**GENERAL NOTES:**

1. THE LOCATION OF CHANNELIZING DEVICES AND THE WORK AREA LAYOUT SHALL BE BASED ON THE CRITERIA IN THE FOLLOWING TABLE:

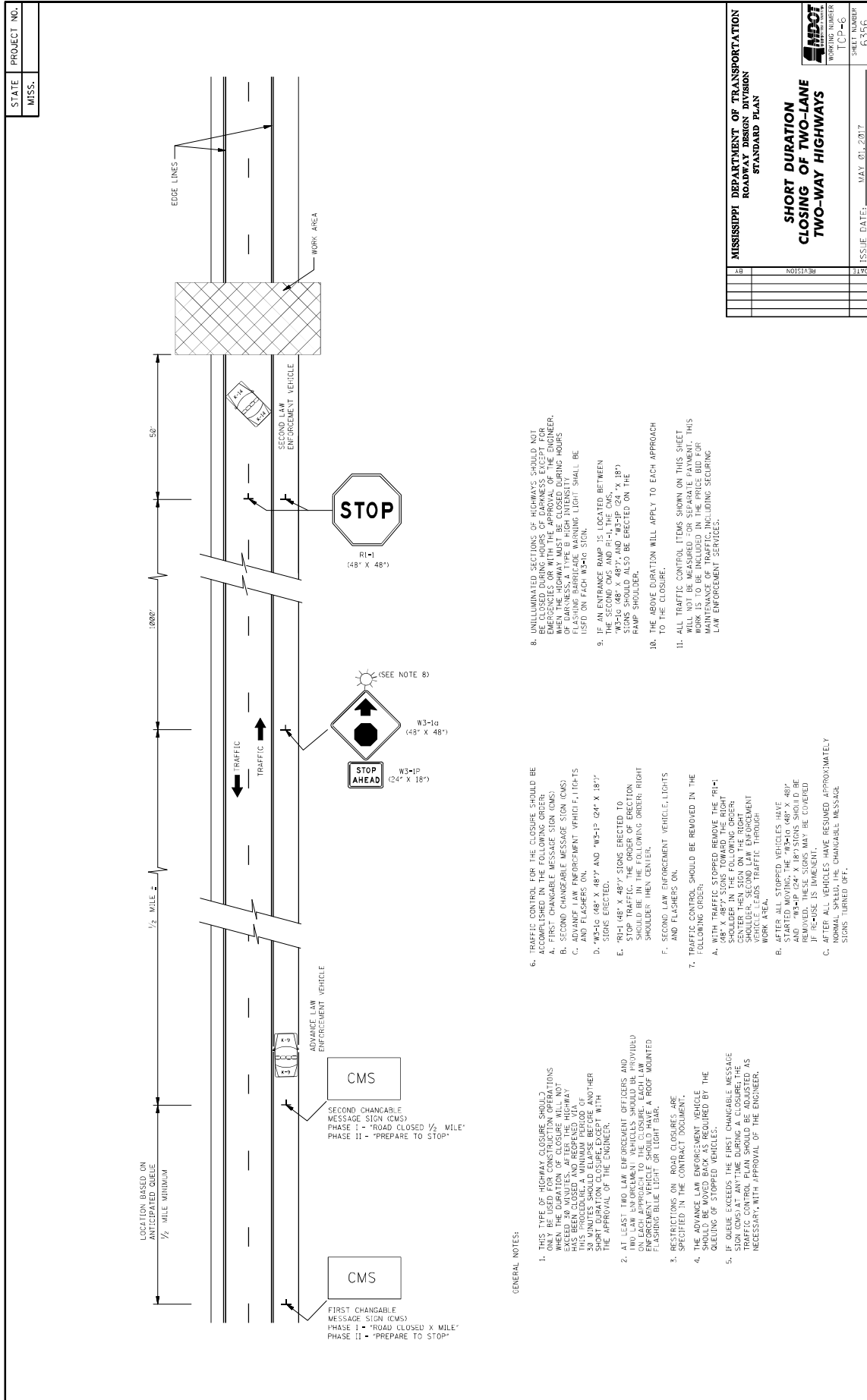
POSTED SPEED AND/OR DESIGN SPEED (mph)	MAXIMUM CHANNELIZING DEVICE SPACING (FT)		LONGITUDINAL BUFFER SPACE (FT)	TAPER RATES
	LANE LINE & WORK ZONE	WORK ZONE		
40	40	80	305	27:1
45	45	90	350	45:1
50	50	100	425	50:1
55	55	110	495	55:1
60	60	120	570	60:1
65	65	130	645	65:1
70	70	140	730	70:1

† NOTE: TAPER RATES ARE DETERMINED USING THE FOLLOWING EQUATIONS:  
L = MS FOR SPEEDS OF 45 MPH OR GREATER  
L = MS FOR SPEEDS OF 30 MPH OR GREATER  
WHERE: L = MINIMUM LENGTH OF TAPER IN FEET  
S = DESIGN SPEED OR 85TH PERCENTILE SPEED IN MILES PER HOUR

†† NOTE: BUFFER SPACE MAY BE ADJUSTED AS NEEDED ACCORDING TO LOCAL RIGHT OF WAY REQUIREMENTS, AS DIRECTED BY THE ENGINEER.

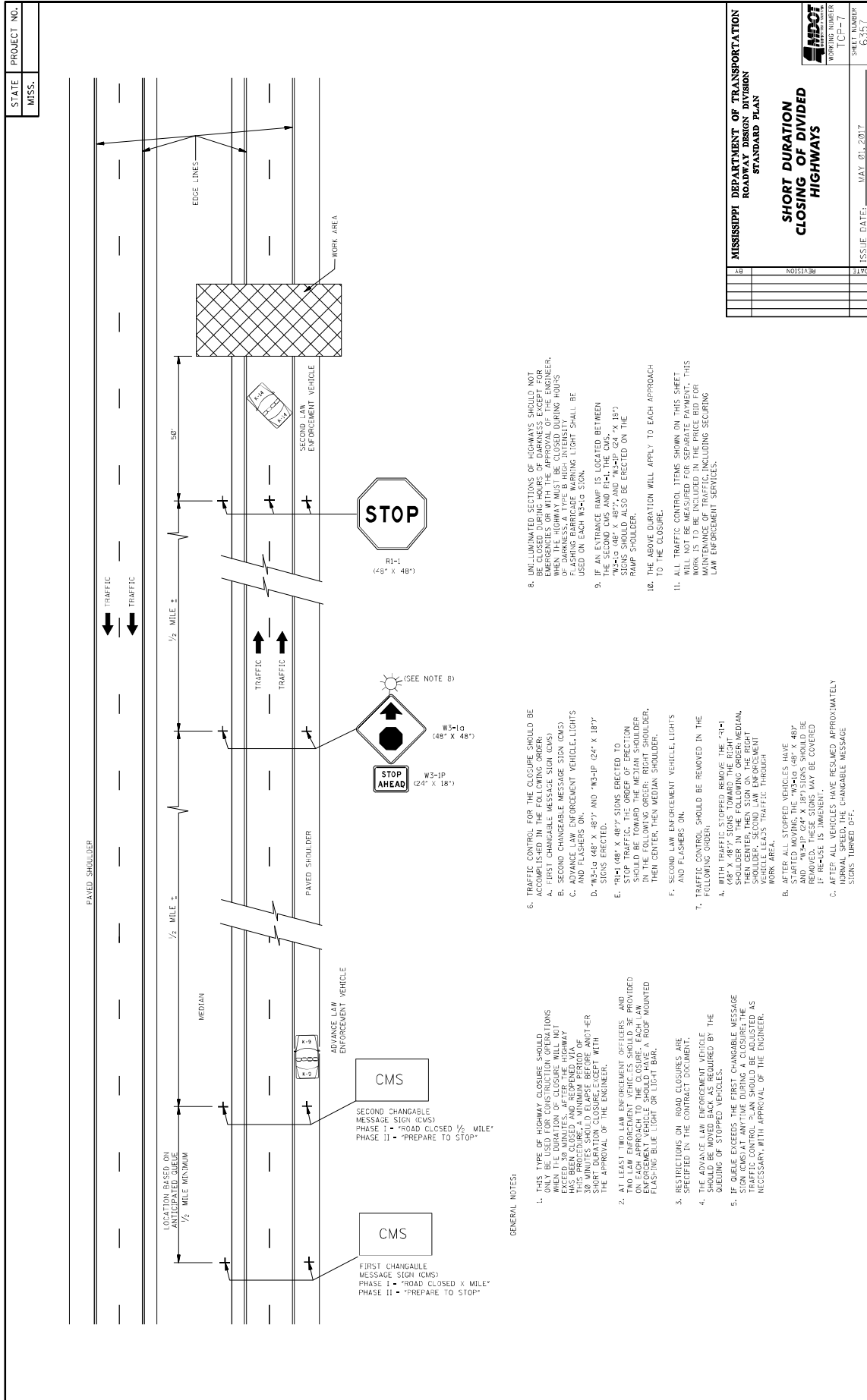
2. FLASHING ARROW PANEL SHOULD BE AS LEVEL AS POSSIBLE AND LOCATED AT THE BEGINNING OF THE TAPER OR IF THE SHOULDER IS TOO NARROW BEHIND THE CHANNELIZING DEVICES IN THE CLOSED LANE.

- CHANNELIZING DEVICE TYPES FOR:
  - APPROACH TAPER- RETROREFLECTIVE PLASTIC DRUMS
  - ALONG LANE LINE AND WORK ZONE- TRAFFIC CONES (28" HEIGHT - MINIMUM)
  - EXIT TAPER- TRAFFIC CONES (28" HEIGHT - MINIMUM)
- WHEN WORK ZONE IS NO LONGER NEEDED- ALL SIGNS SHALL BE COVERED OR REVOKED AND THE DRUMS SHALL BE MOVED TO THE SHOULDER EDGE AT THE END OF THE WORK DAY.
- FOR MOVING OPERATIONS (PAVING) THE CONTRACTOR SHALL HAVE TWO (2) SETS OF ADVANCE WARNING AND REGULATORY SIGNS, PLASTIC DRUMS, AND ARROW BOARDS. WHEN THE CONTRACTOR IS MOVING THE WORK ZONE, THE ADVANCE WARNING AND ARROW BOARD SHALL BE IN PLACE ON THE SECOND ZONE BEFORE REMOVING ANY SIGNS, PLASTIC DRUMS OR ARROW BOARD ON THE FIRST ZONE.
- DIAMOND SHAPED TRAFFIC CONTROL SIGNS SHOULD BE A MINIMUM OF 48" X 48".
- ALL EXISTING SPEED LIMIT SIGNS WHICH ARE INDICATED BY AN ORANGE LETTER WITH THE SPEED ZONE REDUCTION SHALL BE COVERED AS DIRECTED BY THE ENGINEER WHILE THE REDUCED SPEED LIMIT IS IN EFFECT. TAPE SHALL NOT BE USED ON THE FACE OF SIGN.
- ADDITIONAL REVOKED REGULATORY SPEED LIMIT SIGNS ARE REQUIRED AT EACH ENTRANCE RAMP WITHIN THE SPEED ZONE. TWO (2) WILL BE REQUIRED FOR EACH RAMP AND LOCATION WILL BE DETERMINED BY THE ENGINEER.
- THIS TRAFFIC CONTROL PLAN WITH SPEED ZONE MAY NOT BE USED ON ANY FACILITY REQUESTING A SPEED LIMIT REDUCTION.
- THIS TRAFFIC CONTROL PLAN WITH SPEED ZONE MAY NOT BE USED ON ANY FACILITY REQUESTING A SPEED LIMIT REDUCTION.
- LIMIT OF 70 MPH FOR POSTED SPEED LIMIT OF 65 MPH, THE REDUCED SPEED LIMIT WILL BE 55 MPH.
- A FLUORESCENT ORANGE PLATE IS REQUIRED WITH ALL REGULATORY SPEED LIMIT SIGNS AND "REDUCED SPEED AHEAD" SIGNS REQUIRED FOR LANE CLOSURE.
- ALL TRAFFIC CONTROL ITEMS SHOWN ON THIS SHEET WILL NOT BE MEASURED FOR SEPARATE PAYMENT. THIS WORK IS TO BE INCLUDED IN THE PRICE BID FOR MAINTENANCE OF TRAFFIC.



GENERAL NOTES:

- THIS TYPE OF HIGHWAY CLOSURE SHOULD BE USED ONLY WHEN THE DURATION OF CLOSURE WILL NOT EXCEED 30 MINUTES. AFTER THE HIGHWAY IS CLOSED, A MINIMUM PERIOD OF 30 MINUTES SHOULD ELAPSE BEFORE ANOTHER CLOSURE IS ALLOWED TO OCCUR WITH THE APPROVAL OF THE ENGINEER.
- AT LEAST TWO LAW ENFORCEMENT OFFICERS AND ONE ADVANCE LAW ENFORCEMENT VEHICLE SHOULD BE ON EACH APPROACH TO THE CLOSURE. EACH LAW ENFORCEMENT VEHICLE SHOULD HAVE A ROOF MOUNTED FLASHING BLUE LIGHT ON LIGHT BAR.
- RESTRICTIONS ON ROAD CLOSURES ARE SPECIFIED IN THE CONTRACT DOCUMENT.
- THE ADVANCE LAW ENFORCEMENT VEHICLE SHOULD BE POSITIONED BY THE QUEUING OF STOPPED VEHICLES.
- IF QUEUE EXCEEDS THE FIRST CHANGABLE MESSAGE SIGN (CMS) AT ANYTIME DURING A CLOSURE, THE TRAFFIC CONTROL PLAN SHOULD BE ADJUSTED AS NECESSARY, WITH APPROVAL OF THE ENGINEER.
- TRAFFIC CONTROL FOR THE CLOSURE SHOULD BE ACCOMPLISHED IN THE FOLLOWING ORDER:
  - FIRST CHANGABLE MESSAGE SIGN (CMS)
  - SECOND CHANGABLE MESSAGE SIGN (CMS)
  - ADVANCE LAW ENFORCEMENT VEHICLE, LIGHTS AND FLASHERS ON
  - "W3-1A (48" X 48") AND "W3-1P (24" X 18") SIGNS ERECTED.
  - "R1-1 (48" X 48") SIGNS ERECTED TO STOP TRAFFIC. THE ORDER OF ERECTION SHOULD BE IN THE FOLLOWING ORDER: RIGHT SHOULDER THEN CENTER.
  - SECOND LAW ENFORCEMENT VEHICLE, LIGHTS AND FLASHERS ON.
- TRAFFIC CONTROL SHOULD BE REMOVED IN THE FOLLOWING ORDER:
  - WITH TRAFFIC STOPPED REMOVE THE "R1-1 (48" X 48") SIGNS TOWARD THE RIGHT SHOULDER THEN SIGN ON THE RIGHT SHOULDER. SECOND LAW ENFORCEMENT VEHICLE ADDS TRAFFIC THROUGH WORK AREA.
  - AFTER ALL STOPPED VEHICLES HAVE STARTED MOVING, THE "W3-1A (48" X 48") AND "W3-1P (24" X 18") SIGNS SHOULD BE REMOVED IN THE FOLLOWING ORDER: IF ROAD IS TRAVELING IN ONE DIRECTION, NORMAL SPEED; THE CHANGABLE MESSAGE SIGNS TURNED OFF.
- IF AN ENTRANCE RAMP IS LOCATED BETWEEN THE CLOSURE AND THE RAMP, "W3-1A (48" X 48") AND "W3-1P (24" X 18") SIGNS SHOULD ALSO BE ERECTED ON THE RAMP SHOULDER.
- THE ABOVE DURATION WILL APPLY TO EACH APPROACH TO THE CLOSURE.
- ALL TRAFFIC CONTROL ITEMS SHOWN ON THIS SHEET WILL NOT BE MEASURED FOR SEPARATE PAYMENT. THIS WORK IS TO BE INCLUDED IN THE PRICE BID FOR MAINTENANCE OF TRAVEL INCLUDING SECURING LAW ENFORCEMENT SERVICES.
- UNILLUMINATED SECTIONS OF HIGHWAYS SHOULD NOT BE CLOSED DURING HOURS OF DARKNESS EXCEPT FOR EMERGENCY REPAIRS. THE CONTRACT ENGINEER, WHEN THE WORK MUST BE CLOSED DURING HOURS OF DARKNESS, A TYPE B HIGH INTENSITY FLASHING FABRICATED WARNING LIGHT SHALL BE USED ON EACH HOV-3 SIGN.



<b>MISSISSIPPI DEPARTMENT OF TRANSPORTATION</b>	
<b>ROADWAY DESIGN DIVISION</b>	
<b>STANDARD PLAN</b>	
<b>SHORT DURATION</b>	
<b>CLOSING OF DIVIDED</b>	
<b>HIGHWAYS</b>	
ISSUE DATE: MAY 01, 2017	SHEET NUMBER 6357

- GENERAL NOTES:**
1. THIS TYPE OF HIGHWAY CLOSURE SHOULD BE USED ONLY FOR SHORT DURATION CLOSURES WHEN THE DURATION OF CLOSURE WILL NOT EXCEED 30 MINUTES AFTER THE HIGHWAY CLOSURE. THIS PROCEDURE A MINIMUM PERIOD OF 30 MINUTES SHOULD ELAPSE BEFORE ANY OTHER CLOSURES ARE MADE WITH THE APPROVAL OF THE ENGINEER.
  2. AT LEAST TWO LAW ENFORCEMENT OFFICERS AND TWO LAW ENFORCEMENT VEHICLES SHOULD BE PROVIDED ON EACH APPROACH TO THE CLOSURE. EACH LAW ENFORCEMENT VEHICLE SHOULD BE EQUIPPED WITH A ROOF MOUNTED FLASHING BLUE LIGHT OR LIGHT BAR.
  3. RESTRICTIONS ON ROAD CLOSURES ARE SPECIFIED IN THE CONTRACT DOCUMENT.
  4. THE ADVANCE LAW ENFORCEMENT VEHICLE SHOULD BE MOVED BACK AS REQUIRED BY THE QUEUING OF STOPPED VEHICLES.
  5. IF QUEUE EXCEEDS THE FIRST CHANGABLE MESSAGE SIGN, THE ADVANCE LAW ENFORCEMENT TRAFFIC CONTROL PLAN SHOULD BE ADJUSTED AS NECESSARY WITH APPROVAL OF THE ENGINEER.
6. TRAFFIC CONTROL FOR THE CLOSURE SHOULD BE ACCOMPLISHED IN THE FOLLOWING ORDER:
    - A. FIRST CHANGABLE MESSAGE SIGN (CMS)
    - B. SECOND CHANGABLE MESSAGE SIGN (CMS)
    - C. ADVANCE LAW ENFORCEMENT VEHICLE LIGHTS AND FLASHERS ON
    - D. "W3-1G (48" X 48") AND "W3-1P (24" X 18") SIGNS ERECTED.
    - E. "R1-1 (48" X 48") SIGNS ERECTED TO STOP TRAFFIC. THE ORDER OF ERECTION SHOULD BE TOWARD THE MEDIAN SHOULDER, THEN CENTER, THEN MEDIAN SHOULDER, THEN CENTER, THEN MEDIAN SHOULDER.
    - F. SECOND LAW ENFORCEMENT VEHICLE, LIGHTS AND FLASHERS ON.
  7. TRAFFIC CONTROL SHOULD BE REMOVED IN THE FOLLOWING ORDER:
    - A. WITH TRAFFIC STOPPED REMOVE THE "R1-1" SIGN FROM THE CENTER OF THE ROAD SHOULDER IN THE FOLLOWING ORDER: MEDIAN, THEN CENTER, THEN SIGN ON THE RIGHT SHOULDER. AFTER ALL TRAFFIC IS STOPPED, THE VEHICLE LEADS TRAFFIC THROUGH THE WORK AREA.
    - B. AFTER ALL STOPPED VEHICLES HAVE STARTED MOVING, THE "W3-1G (48" X 48") AND "W3-1P (24" X 18") SIGNS SHOULD BE REMOVED. THESE SIGNS MAY BE COVERED IF RELEASE IS IMMINENT.
    - C. AFTER ALL VEHICLES HAVE RESUMED APPROXIMATELY NORMAL SPEED, THE CHANGABLE MESSAGE SIGNS TURNED OFF.
  8. UNILLUMINATED SECTIONS OF HIGHWAYS SHOULD NOT BE CLOSED DURING HOURS OF DARKNESS EXCEPT FOR EMERGENCY REPAIRS. THE SIGNAGE FOR DARKNESS WHEN THE HIGHWAY MUST BE CLOSED DURING HOURS OF DARKNESS: A. TYPE B HIGH-INTENSITY REFLECTIVE SHEETING. B. TYPE B LIGHT SHALL BE USED ON EACH W3-1G SIGN.
  9. IF AN ENTRANCE RAMP IS LOCATED BETWEEN THE SECOND LANE AND R1-1, THE SIGNS "W3-1G (48" X 48") AND "W3-1P (24" X 18") SIGNS SHOULD ALSO BE ERECTED ON THE RAMP SHOULDER.
  10. THE ABOVE DURATION WILL APPLY TO EACH APPROACH TO THE CLOSURE.
  11. ALL TRAFFIC CONTROL ITEMS SHOWN ON THIS SHEET WILL NOT BE MEASURED FOR SEPARATE PAYMENT. THIS WORK SHALL BE INCLUDED IN THE PRICE FOR MAINTENANCE OF SERVICES INCLUDING SECURING LAW ENFORCEMENT SERVICES.

STATE PROJECT NO.  
MISS.

WORKING NUMBER  
ICP-5

SHEET NUMBER  
05300

**WING BARRICADES**

1. WING BARRICADES ARE TYPE II BARRICADES ERRECTED ON THE SHOULDER OF A ROADWAY OR RESTRICTED ROADWAY. WING BARRICADES MAY BE USED AS A MOUNTING FOR THE ADVANCE WARNING SIGNS OR FLASHERS.

2. WING BARRICADES SHOULD BE USED:

A. IN ADVANCE OF A CONSTRUCTION PROJECT EVEN WHEN NO PART OF THE ROADWAY IS ACTUALLY CLOSED.

B. IN ADVANCE OF ALL BRIDGE OR CULVERT WIDENING OPERATIONS.

**BARRICADE CLOSING A ROAD**

	I	II	III
WIDTH OF RAIL **	8" MIN. - 12" MAX.	8" MIN. - 12" MAX.	8" MIN. - 12" MAX.
LENGTH OF RAIL **	24" MIN.	24" MIN.	48" MIN.
WIDTH OF STRIPE *	6"	6"	6"
HEIGHT	36" MIN.	36" MIN.	60" MIN.
NUMBER OF RETROREFLECTORIZED RAIL FACES	2 (ONE EACH DIRECTION)	4 (TWO EACH DIRECTION)	3 IF FACING TRAFFIC IN ONE DIRECTION 4 IF FACING TRAFFIC IN TWO DIRECTIONS

**BARRICADE CHARACTERISTICS**

\* 1. FOR RAILS LESS THAN 36" LONG, 4" WIDE STRIPES MAY BE USED.

\*\* 2. BARRICADES INTENDED FOR USE ON EXPRESSWAYS, FREEWAYS AND OTHER HIGH SPEED ROADWAYS, SHALL HAVE A MINIMUM OF 270 sq ft OF REFLECTIVE AREA FACING TRAFFIC.

**STANDARD BARRICADES**

1. THE MARKING FOR BARRICADE RAILS SHALL BE ORANGE AND WHITE (SLOPING DOWNWARD AT AN ANGLE OF 45° IN THE DIRECTION OF TRAFFIC IS TO PASS).

2. RAIL STRIPE SHALL BE 6 INCHES, EXCEPT THAT 4-INCH WIDE STRIPES MAY BE USED IF RAIL LENGTHS ARE LESS THAN 36 INCHES.

3. DO NOT PLACE SANDBAGS OR OTHER DEVICES TO PROVIDE MASS ON THE BOTTOM RAIL THAT WILL BLOCK VIEW OR RAIL FACE.

4. FOR ADDITIONAL INFORMATION OR DETAILS, SEE METHOD, LATEST EDITION.

5. BARRICADES ARE CLASSIFIED BY FHWA AS CATEGORY II WHEN ZONE DEVICES WHICH REQUIRE SUCCESSFULLY CRASH TESTED. A LIST OF CRASHWORTHY BARRICADES AND OTHER CATEGORY II DEVICES CAN BE FOUND ON FHWA'S WEBSITE: [http://safety.fhwa.dot.gov/roadway\\_dept/pafety\\_guidance/road\\_hardware/cat2.cfm](http://safety.fhwa.dot.gov/roadway_dept/pafety_guidance/road_hardware/cat2.cfm)

**PLASTIC DRUM STRIPPING DETAIL**

1. PLASTIC DRUMS SHALL BE ON END AND USED AS AN EXPEDITED METHOD FOR TRAFFIC CHANNELIZATION. THE COLOR AND MARKING OF DRUMS SHALL BE CONSISTENT WITH MARKING STANDARD FOR ROADWAY SAFETY. THE PREFERRED COLOR OF DRUMS WITH MARKING STRIPES SHALL BE RETROREFLECTIVE. HORIZONTAL, CIRCUMFERENTIAL STRIPES (2 ORANGE & 2 WHITE) 6" WIDE.

2. DRUMS SHOULD NEVER BE PLACED IN THE ROADWAY WITHOUT WARNING SIGNS.

3. WHERE PRACTICAL PLASTIC DRUMS SHOULD BE PLACED NO CLOSER THAN 3'-0" FROM THE EDGE OF TRAVELED LANE.

**TYPE 3 OBJECT MARKER (OM-3R)**

1. TYPE 3 OBJECT MARKERS SHALL BE USED AT ALL EXPOSED BRIDGE ABUTMENTS AND AT OTHER LOCATIONS AS DETERMINED NECESSARY BY THE ENGINEER.

2. THE OM-3R IS SIMILAR EXCEPT THE STRIPES SLOPE DOWNWARD FROM THE UPPER LEFT SIDE TO THE LOWER RIGHT SIDE AND SHALL BE PLACED ON THE LEFT SIDE OF THE OBJECT.

3. THE INSIDE EDGE OF THE MARKER SHALL BE IN LINE WITH THE INNER EDGE OF THE OBSTRUCTION.

**CHEVRON SIGN DETAIL**

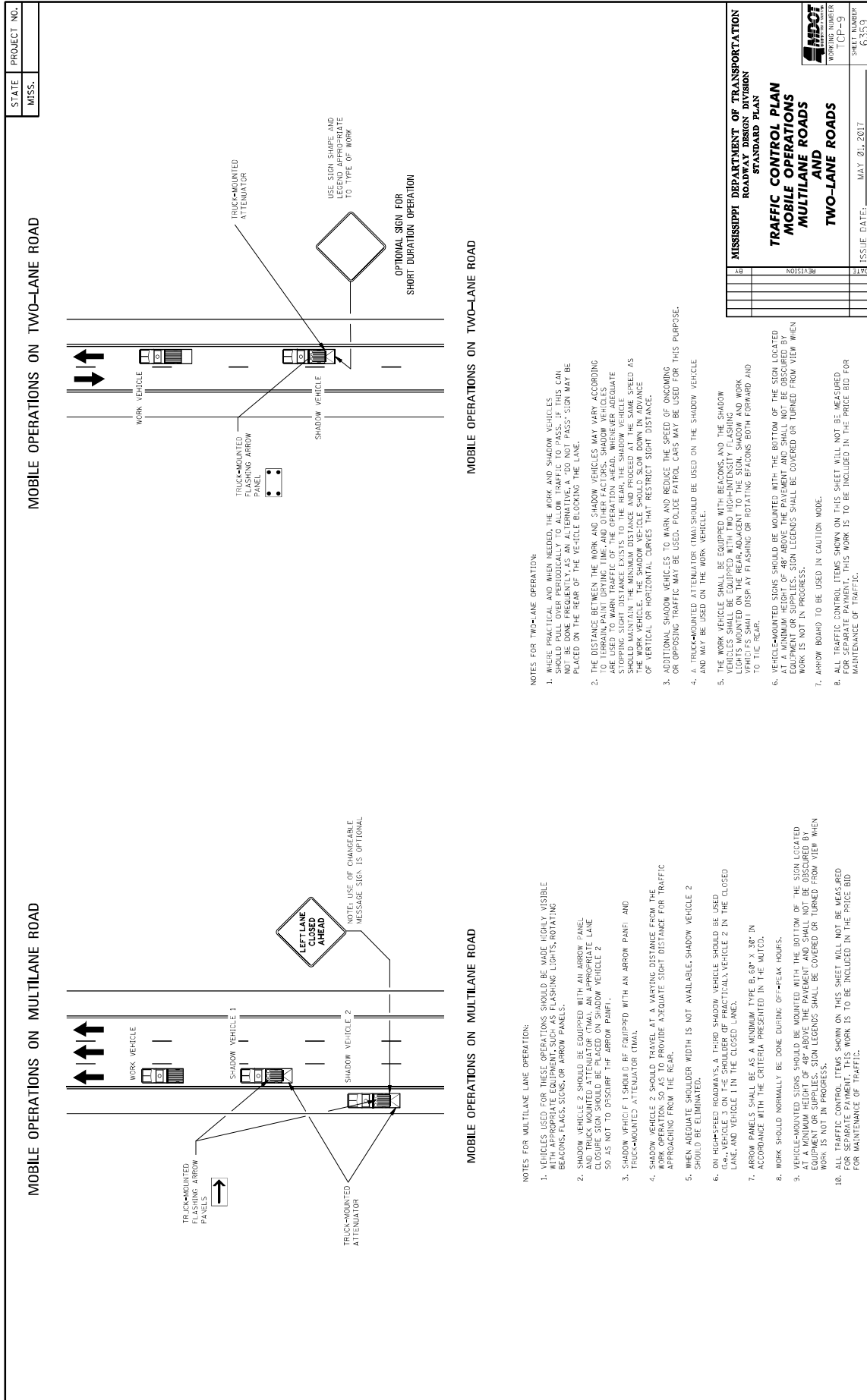
1. A CHEVRON SIGN CONSISTS OF A BLACK CHEVRON TYPE MARKING ON AN ORANGE BACKGROUND AND SHALL POINT IN THE DIRECTION OF TRAFFIC FLOW.

2. THE CHEVRON SIGN SHALL BE MOUNTED ON CRASHWORTHY SUPPORT.

3. CHEVRON SIGNS MAY BE USED TO SUPPLEMENT OTHER STANDARD DEVICES WHERE ONE OR MORE LANES ARE CLOSED FOR CONSTRUCTION OR MAINTENANCE. THEY SHOULD BE PLACED APPROXIMATELY 2'-0" BEHIND THE LANE TRANSITION STRIPE.

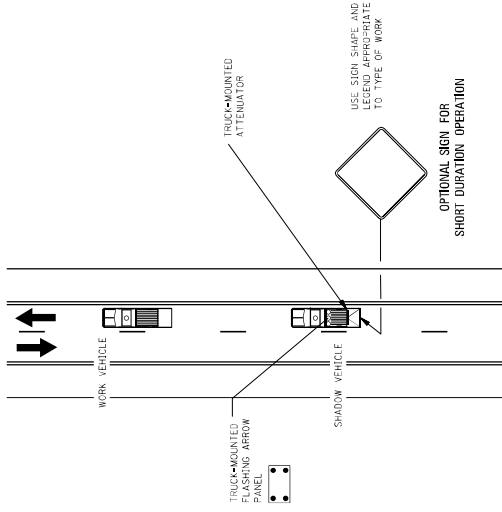
MISSISSIPPI DEPARTMENT OF TRANSPORTATION  
ROADWAY DESIGN DIVISION  
STANDARD PLAN  
**HIGHWAY SIGN AND BARRICADE DETAILS FOR CONSTRUCTION PROJECTS**

DATE: \_\_\_\_\_  
REVISION: \_\_\_\_\_  
ISSUE DATE: MAY 20, 2017



STATE	PROJECT NO.
MISS.	

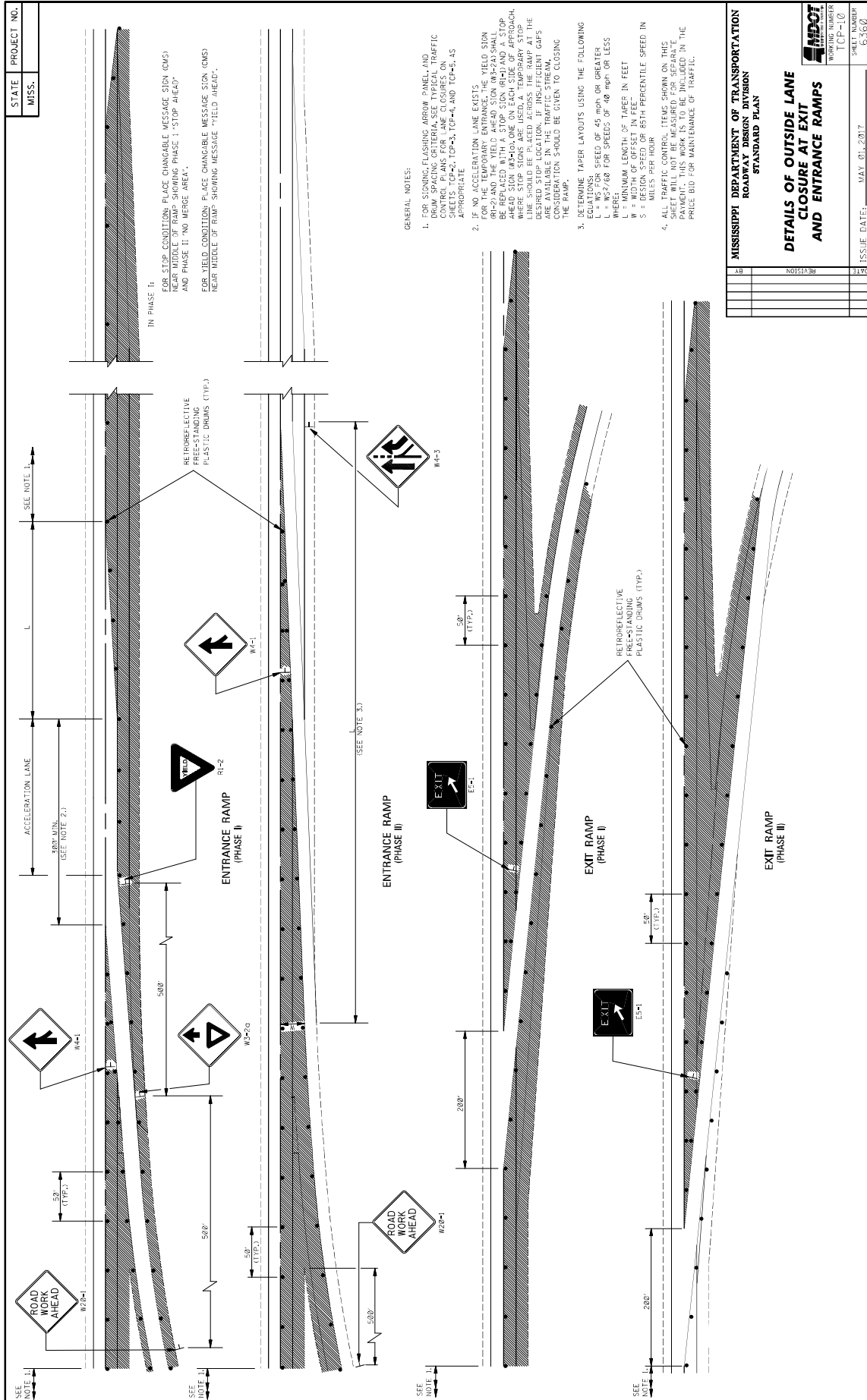
**MOBILE OPERATIONS ON TWO-LANE ROAD**



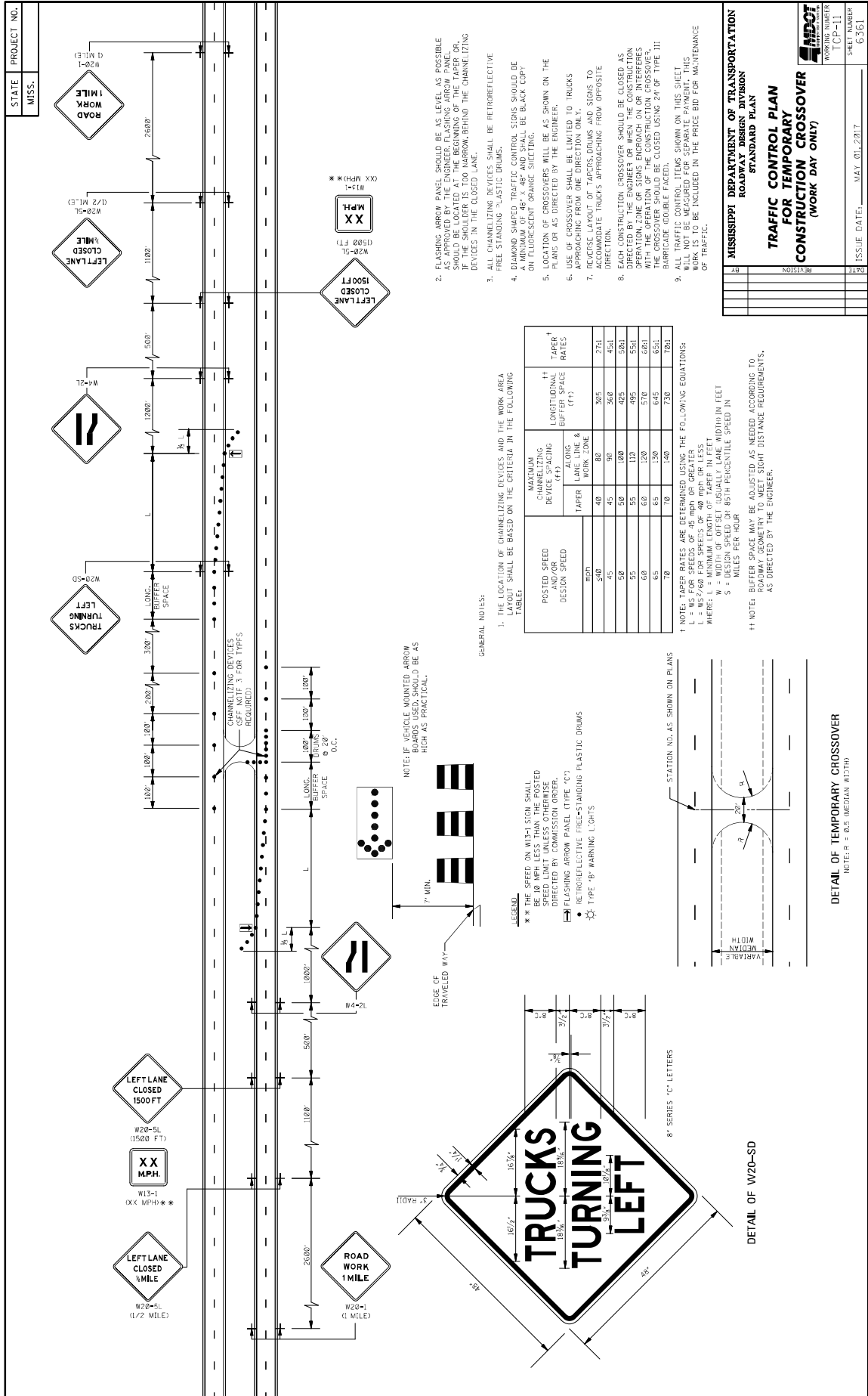
**MOBILE OPERATIONS ON TWO-LANE ROAD**

- NOTES FOR MULTILANE LANE OPERATION:**
- VEHICLES USED FOR THESE OPERATIONS SHOULD BE MADE HIGHLY VISIBLE WITH APPROPRIATE EQUIPMENT, SUCH AS FLASHING LIGHTS, ROTATING BEACONS, FLASCS, SIGNS, OR ARROW PANELS.
  - SHADOW VEHICLE 2 SHOULD BE EQUIPPED WITH AN ARROW PANEL AND TRUCK MOUNTED ATTENUATOR (TMA), AN APPROPRIATE LANE CLOSURE SIGN SHOULD BE PLACED BEHIND SHADOW VEHICLE 2 SO AS NOT TO OBSCURE THE ARROW PANEL.
  - SHADOW VEHICLE 1 SHOULD BE EQUIPPED WITH AN ARROW PANEL AND TRUCK MOUNTED ATTENUATOR (TMA).
  - SHADOW VEHICLE 2 SHOULD TRAVEL AT A VARYING DISTANCE FROM THE WORK OPERATION SO AS TO PROVIDE ADEQUATE SIGHT DISTANCE FOR TRAFFIC APPROACHING FROM THE REAR.
  - WHEN ADEQUATE SHOULDER WIDTH IS NOT AVAILABLE, SHADOW VEHICLE 2 SHOULD BE ELIMINATED.
  - ON HIGH-SPEED ROADWAYS, A THIRD SHADOW VEHICLE SHOULD BE USED (i.e., VEHICLE 3 ON THE SHOULDER OF PRACTICALLY, VEHICLE 2 IN THE CLOSED LANE, AND VEHICLE 1 IN THE CLOSED LANE).
  - ARROW PANELS SHALL BE AS A MINIMUM TYPE B, 60" X 36" IN ACCORDANCE WITH THE CRITERIA PRESENTED IN THE MUTCD.
  - WORK SHOULD NORMALLY BE DONE DURING OFF-PEAK HOURS.
  - VEHICLE-MOUNTED SIGNS SHOULD BE MOUNTED WITH THE BOTTOM OF THE SIGN LOCATED AT A MINIMUM HEIGHT OF 48" ABOVE THE PAVEMENT AND SHALL NOT BE OBSCURED BY EQUIPMENT OR SUPPLIES. SIGN LEGENDS SHALL BE COVERED OR TURNED FROM VIEW WHEN WORK IS NOT IN PROGRESS.
  - ALL TRAFFIC CONTROL ITEMS SHOWN ON THIS SHEET WILL NOT BE MEASURED FOR SEPARATE PAYMENT. THIS WORK IS TO BE INCLUDED IN THE PRICE BID FOR MAINTENANCE OF TRAFFIC.

<b>MISSISSIPPI DEPARTMENT OF TRANSPORTATION</b>	
<b>ROADWAY DESIGN DIVISION</b>	
<b>STANDARD PLAN</b>	
<b>TRAFFIC CONTROL PLAN</b>	
<b>MOBILE OPERATIONS</b>	
<b>MULTILANE ROADS</b>	
<b>TWO-LANE ROADS</b>	
ISSUE DATE:	MAY 01, 2017
SHEET NUMBER	CP-9
WORKING NUMBER	6359



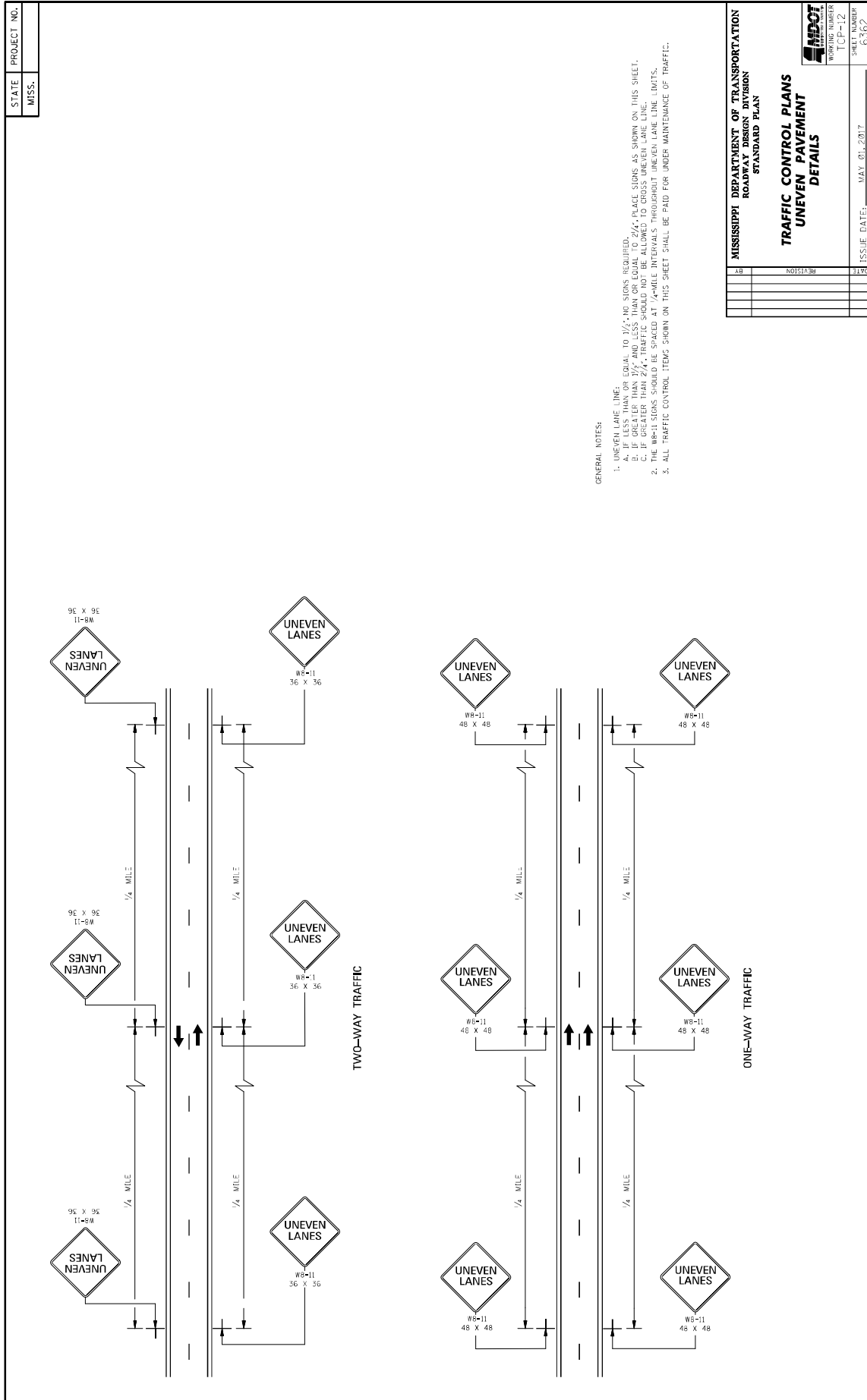


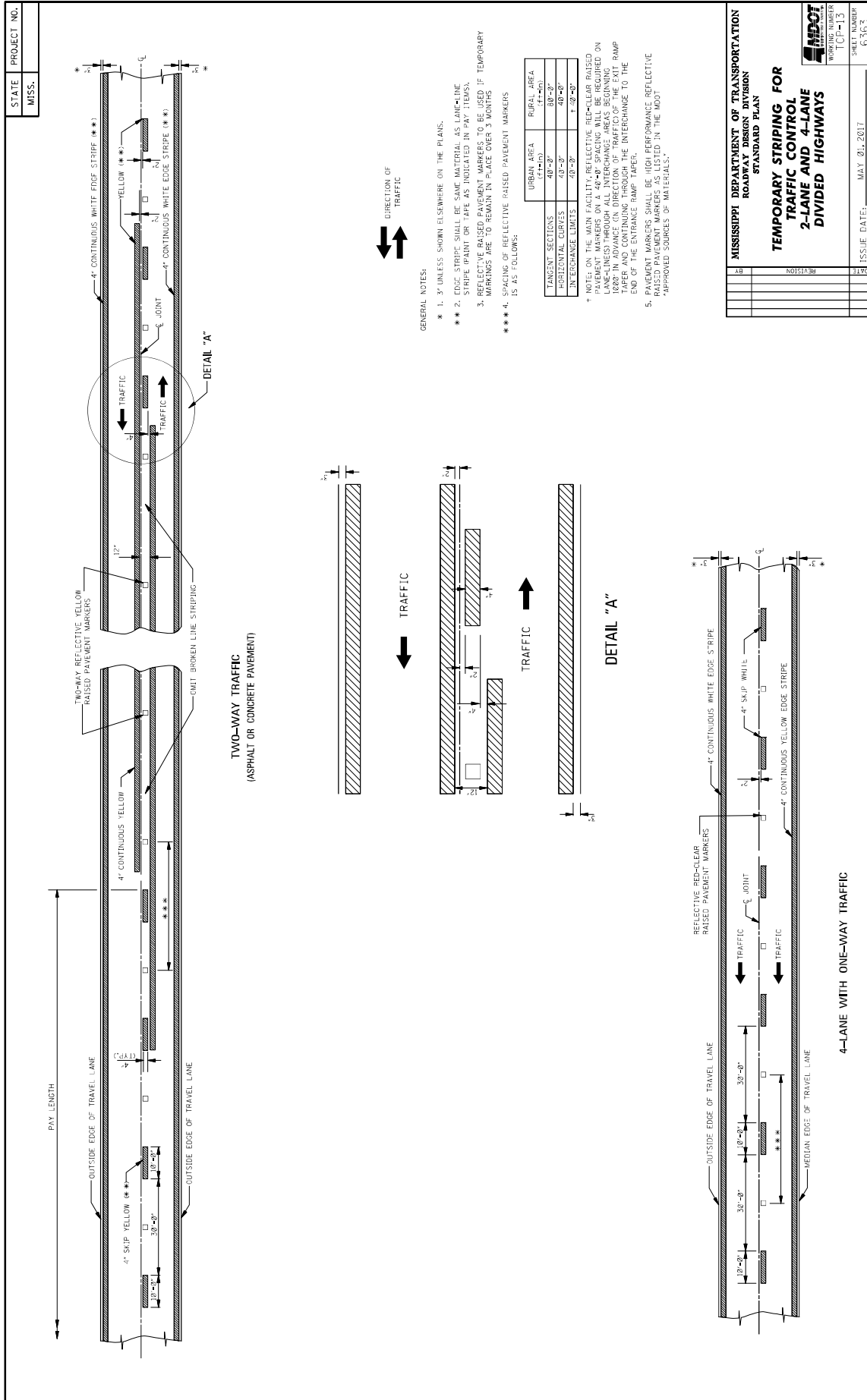


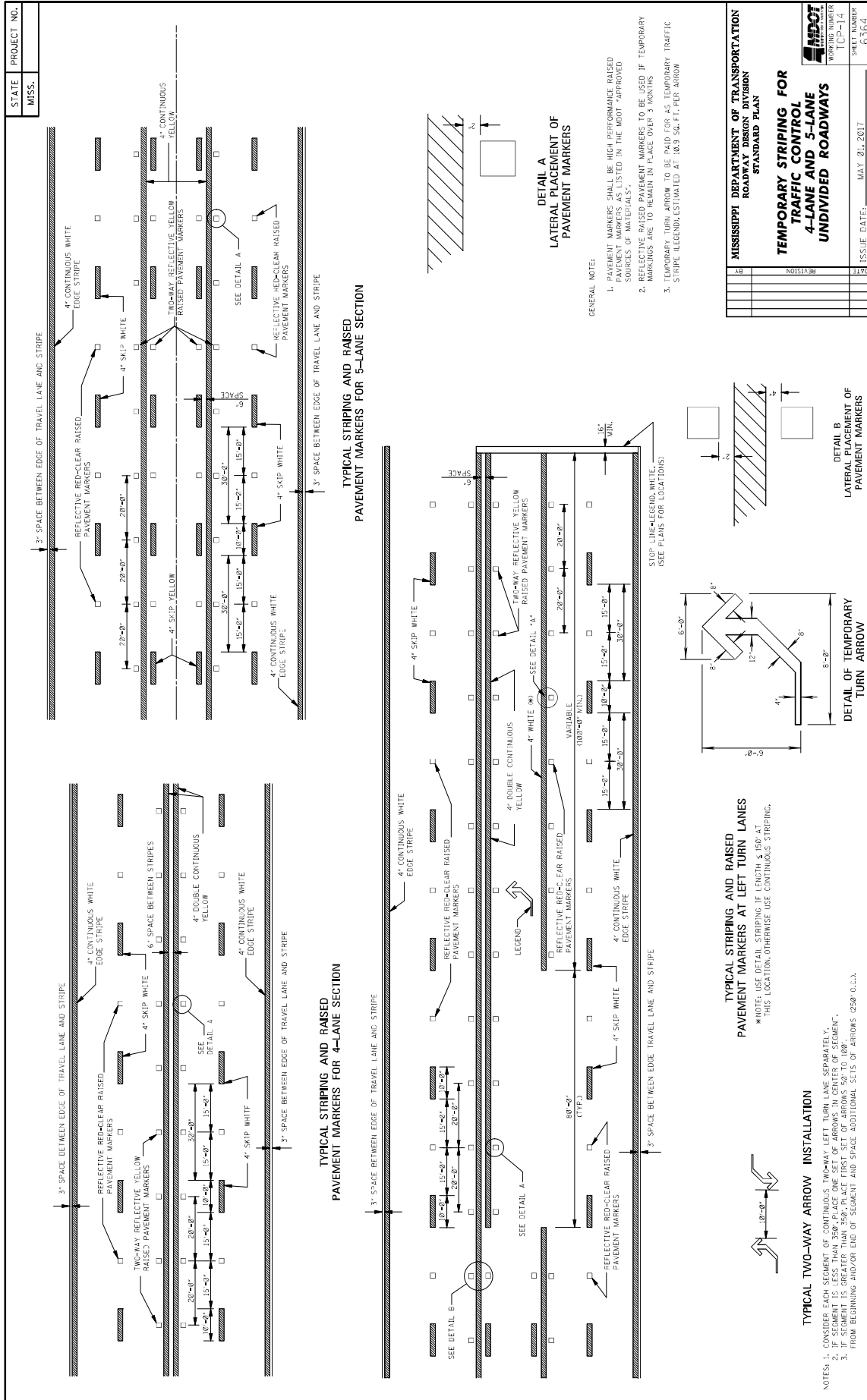
STATE PROJECT NO. MISS. \_\_\_\_\_

MISSISSIPPI DEPARTMENT OF TRANSPORTATION  
 ROADWAY DESIGN DIVISION  
 STANDARD PLAN  
**TRAFFIC CONTROL PLAN  
 FOR TEMPORARY  
 CONSTRUCTION CROSSOVER  
 (WORK DAY ONLY)**

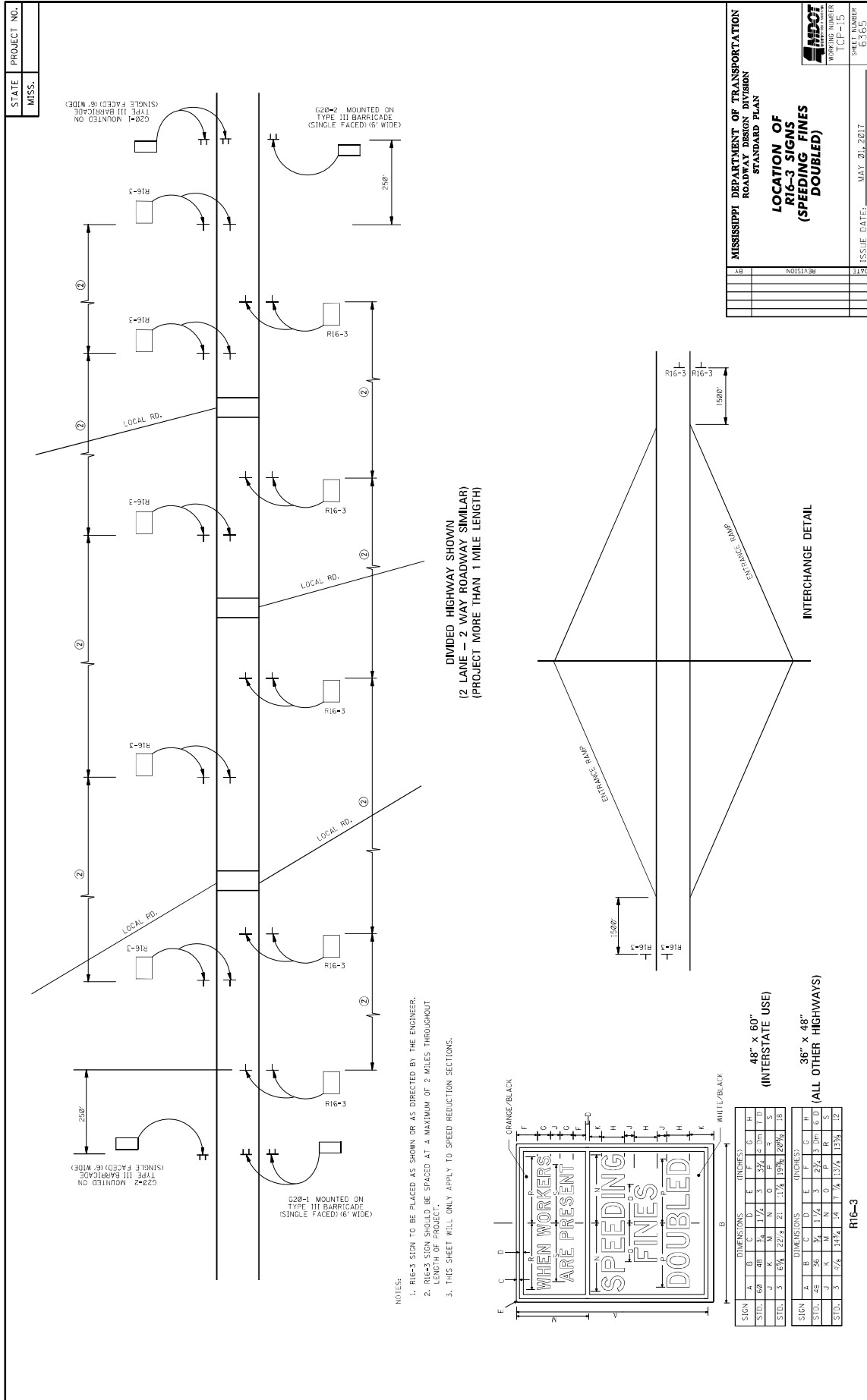
WORKING NUMBER: \_\_\_\_\_  
 SHEET NUMBER: 6561  
 ISSUE DATE: MAY 01, 2017





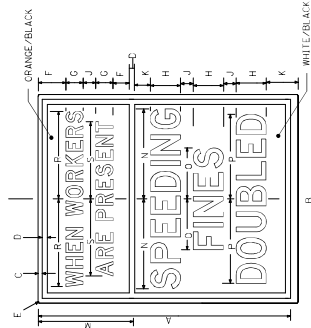


MISSISSIPPI DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN DIVISION STANDARD PLAN	
<b>TEMPORARY STRIPING FOR TRAFFIC CONTROL 4-LANE AND 5-LANE UNDIVIDED ROADWAYS</b>	
ISSUE DATE: MAY 01, 2017	SHEET NUMBER TCP-14
DATE	REVISION



STATE PROJECT NO.	
MISS.	
MISSISSIPPI DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN DIVISION STANDARD PLAN <b>LOCATION OF R16-3 SIGNS (SPEEDING FINES DOUBLED)</b>	
WORKING NUMBER ICP-15	SHEET NUMBER 6-163
ISSUE DATE: MAY 21, 2017	
REVISION	DATE

- NOTES:
1. R16-3 SIGN TO BE PLACED AS SHOWN OR AS DIRECTED BY THE ENGINEER.
  2. R16-3 SIGN SHOULD BE SPACED AT A MAXIMUM OF 2 MILES THROUGHOUT LENGTH OF PROJECT.
  3. THIS SHEET WILL ONLY APPLY TO SPEED REDUCTION SECTIONS.

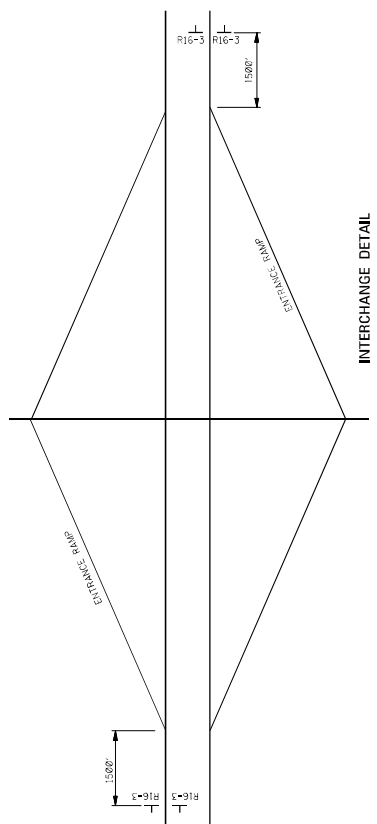


DIMENSIONS (INCHES)	
SIGN	A B C D E F G H
STD.	6-00 48 3/4 1 1/4 5 3/4 4 0 1/4 1 1/4
	J K L M N O P
STD.	3 1 5/8 2 2 1/2 2 1 1 1/4 1 3/8 2 8/16 1 1/2
DIMENSIONS (INCHES)	
SIGN	A B C D E F G H
STD.	36 36 36 36 36 36 36 36
	I J K L M N O P
STD.	3 3/4 3 1/4 3 1/4 3 1/4 3 1/4 3 1/4 3 1/4 3 1/4

**R16-3**

**48" x 60"**  
(INTERSTATE USE)

**36" x 48"**  
(ALL OTHER HIGHWAYS)



STATE MISS.	PROJECT NO.	
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**TYPICAL SHOULDER CLOSURE**

(1) TO BE USED WITH EIGHT (8) FOOT OR GREATER WIDTH IMPROVED SHOULDER.  
 (2) TO BE USED WHEN CONSTRUCTION VEHICLES (EQUIPMENT) ENCRUSHES ON OR WITHIN TWO (2) FEET OF THE SHOULDER BREAK.

**TYPICAL SHOULDER WORK #1**  
(SEE NOTE A-I THIS SHEET)

**TYPICAL SHOULDER WORK #2**

NOTE:  
 WORK OUTSIDE TWO (2) FOOT AND WITHIN TEN (10) FEET OF THE SHOULDER BREAK MAY BE PROTECTED BY PLACING DRUMS ALONG THE SHOULDER EDGE 300 FEET PRIOR TO AND 50 FEET BEYOND THE WORK AREA OR SEE NOTE A-3 THIS SHEET.

**DETAIL OF DRUM PLACEMENT AT PAVEMENT EDGE DROP-OFF**

GRANULAR MATERIAL REQUIRED (SAME CLASSIFICATION AS SHOULDER MATERIAL - SEE TYPICAL SECTIONS)

**NOTES:**

- \* A. PAVEMENT EDGE DROP-OFF
  - 1. IF LESS THAN TWO AND ONE QUARTER (2.25) INCHES PROTECTION REQUIRED PLACE A SHOULDER WORK SIGN (W2-5) 500 FEET IN ADVANCE OF WORK ZONE SHOULDER AND A LOW SHOULDER SIGN (W8-3) AT THE BEGINNING AND THROUGHOUT THE WORK ZONE B (750'-C.C.).
  - 2. TWO AND ONE QUARTER TO THREE INCHES PLACE DRUMS, VERTICAL PANELS OR BARRICADES EVERY 100 FEET ON TANGENT SECTIONS FOR SPEEDS OF 50 MILES PER HOUR OR GREATER. CONES MAY BE USED IN PLACE OF DRUMS, PANELS, AND BARRICADES DURING DAYLIGHT HOURS. FOR TANGENT SECTIONS WITH SPEEDS LESS THAN 50 MILES PER HOUR AND FOR CURVES, DEVICES SHOULD BE PLACED EVERY 50 FEET. SPACING FOR TAPERS SHOULD BE IN ACCORDANCE WITH THE MULTIFIELD (1) / 3 (L) WHERE L IS THE TAPER LENGTH IN FEET.
  - 3. GREATER THAN THREE (3) INCHES POSITIVE SEPARATION OR WEDGE WITH 4:1 OR FLATTER SLOPE NEEDED IF THERE IS EIGHT (8) FEET OR MORE DISTANCE BETWEEN THE EDGE OF TRAVEL LANE AND DROP-OFF. THEN DRUMS, PANELS OR BARRICADES MAY BE USED.
  - 4. FOR TEMPORARY CONDITIONS, DROP-OFFS GREATER THAN THREE (3) INCHES MAY BE PROTECTED WITH DRUMS, VERTICAL PANELS OR BARRICADES FOR SHORT DISTANCES DURING DAYLIGHT HOURS WHILE WORK IS BEING DONE IN THE DROP-OFF AREA.
  - 5. LESSER TREATMENTS THAN THOSE DESCRIBED ABOVE MAY BE CONSIDERED FOR LOW-VOLUME LOCAL STREETS.

**B. DRUM SPACING**

1. TANGENT'S = 2 X S  
 WHERE L = S X W  
 L = TAPER LENGTH IN FEET  
 S = SPEED IN MPH (POSTED OR 85 PERCENTILE)  
 W = WIDTH OF OFFSET IN FEET

X X SPEED (MPH)	LENGTH (FEET)
25	35
30	40
35	45
40	50
45	55
50	60
55	65
60	70
65	75
70	80
75	85
80	90
85	95
90	100
95	105
100	110
105	115
110	120
115	125
120	130
125	135
130	140
135	145
140	150
145	155
150	160
155	165
160	170
165	175
170	180
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180	190
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190	200
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305	315
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315	325
320	330
325	335
330	340
335	345
340	350
345	355
350	360
355	365
360	370
365	375
370	380
375	385
380	390
385	395
390	400
395	405
400	410
405	415
410	420
415	425
420	430
425	435
430	440
435	445
440	450
445	455
450	460
455	465
460	470
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475	485
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755	765
760	770
765	775
770	780
775	785
780	790
785	795
790	800
795	805
800	810
805	815
810	820
815	825
820	830
825	835
830	840
835	845
840	850
845	855
850	860
855	865
860	870
865	875
870	880
875	885
880	890
885	895
890	900
895	905
900	910
905	915
910	920
915	925
920	930
925	935
930	940
935	945
940	950
945	955
950	960
955	965
960	970
965	975
970	980
975	985
980	990
985	995
990	1000

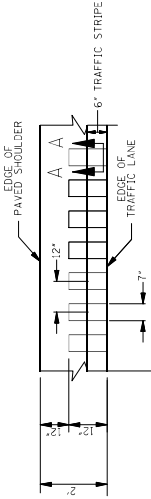
\* \* \* POSTED SPEED, OFF-PEAK 85 PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH.

C. ALL TRAFFIC CONTROL ITEMS SHOWN ON THIS SHEET SHALL BE PAID FOR UNDER MAINTENANCE OF TRAFFIC.  
 TABLE V-1 GUIDELINES FOR LENGTH OF LONGITUDINAL BUFFER SPACE

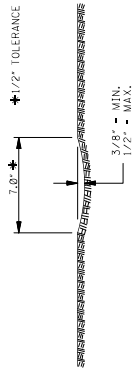
<b>MISSISSIPPI DEPARTMENT OF TRANSPORTATION</b> ROADWAY DESIGN DIVISION STANDARD PLAN	
<b>TRAFFIC CONTROL DETAILS</b> <b>DRUM PLACEMENT</b> <b>SHOULDER CLOSURE</b>	
WORKING NUMBER TCP-16	SHEET NUMBER 6306
ISSUE DATE: MAY 20, 2017	

GENERAL NOTES

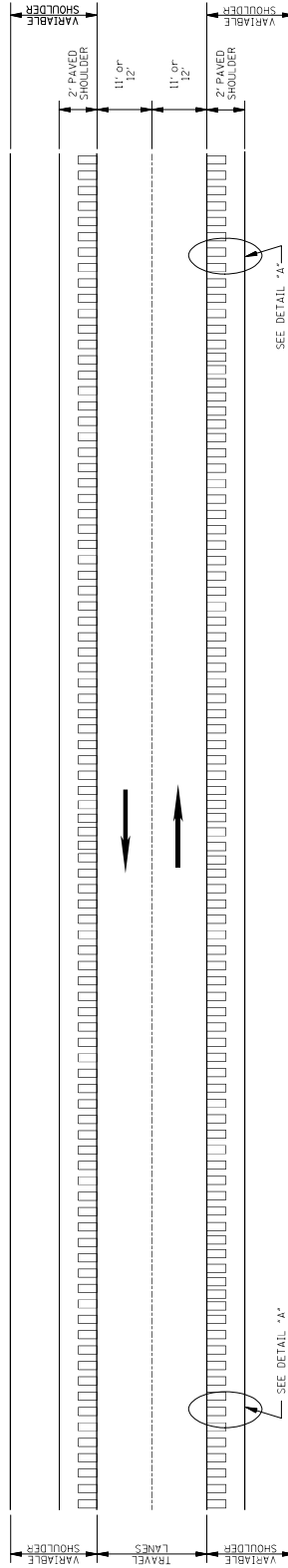
1. GROUND-IN RUMBLE STRIPES SHALL BE APPLIED TO ALL PAVED SHOULDERS OF ALL PAVED SHOULDERS ON THIS PROJECT.
2. GROUND-IN RUMBLE STRIPES SHALL BE APPLIED TO ALL EXISTING AND NEW ASPHALT ROADWAYS, INCLUDING INTERSECTIONS, NORMAL SHOULDER WIDTH AS DIRECTED BY THE ENGINEER.
3. COST TO BE PAID FOR USING APPROPRIATE PAY ITEMS
4. GROUND-IN RUMBLE STRIPES SHALL BE APPLIED TO:
  - A. MAINLINE
  - B. INTERSECTING ROADWAY IF OVERLAP OR RECONSTRUCTED BEYOND NORMAL MAINLINE R.O.W.
  - C. ANY ROADWAY WITH EXISTING RUMBLE STRIPES PRIOR TO CONSTRUCTION.
5. DO NOT USE WHERE TRAVEL LANE IS LESS THAN 11' WIDE.



DETAIL "A"



SECTION "A-A"

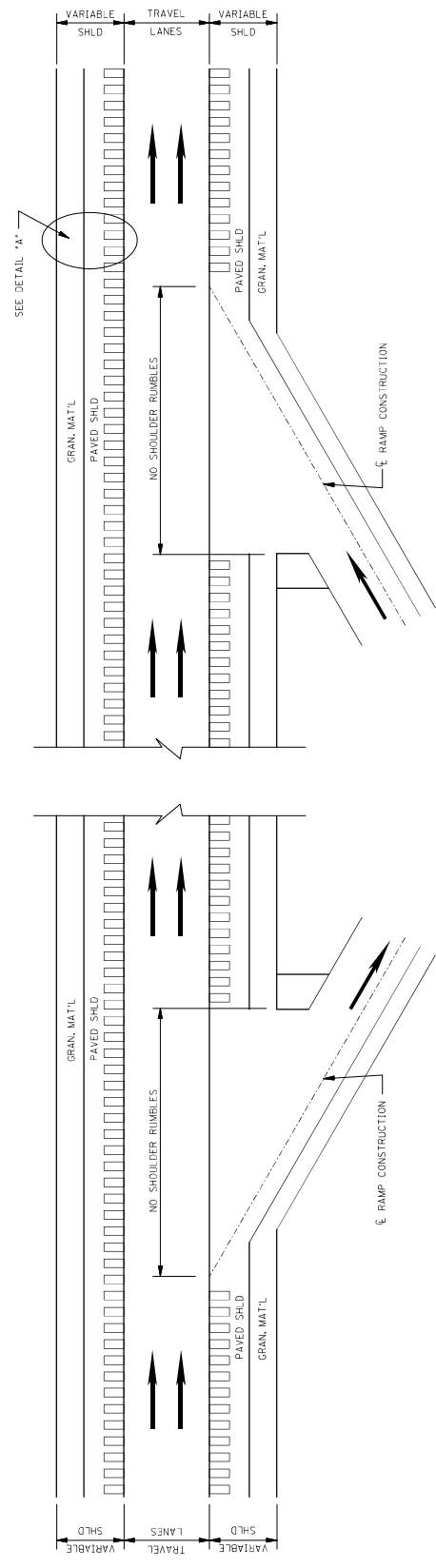
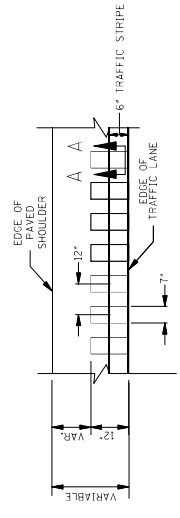
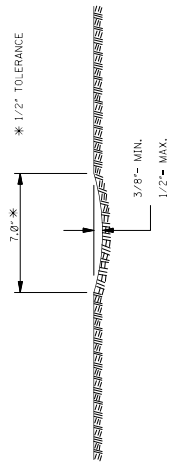


PLAN

NOT TO SCALE

GENERAL NOTES

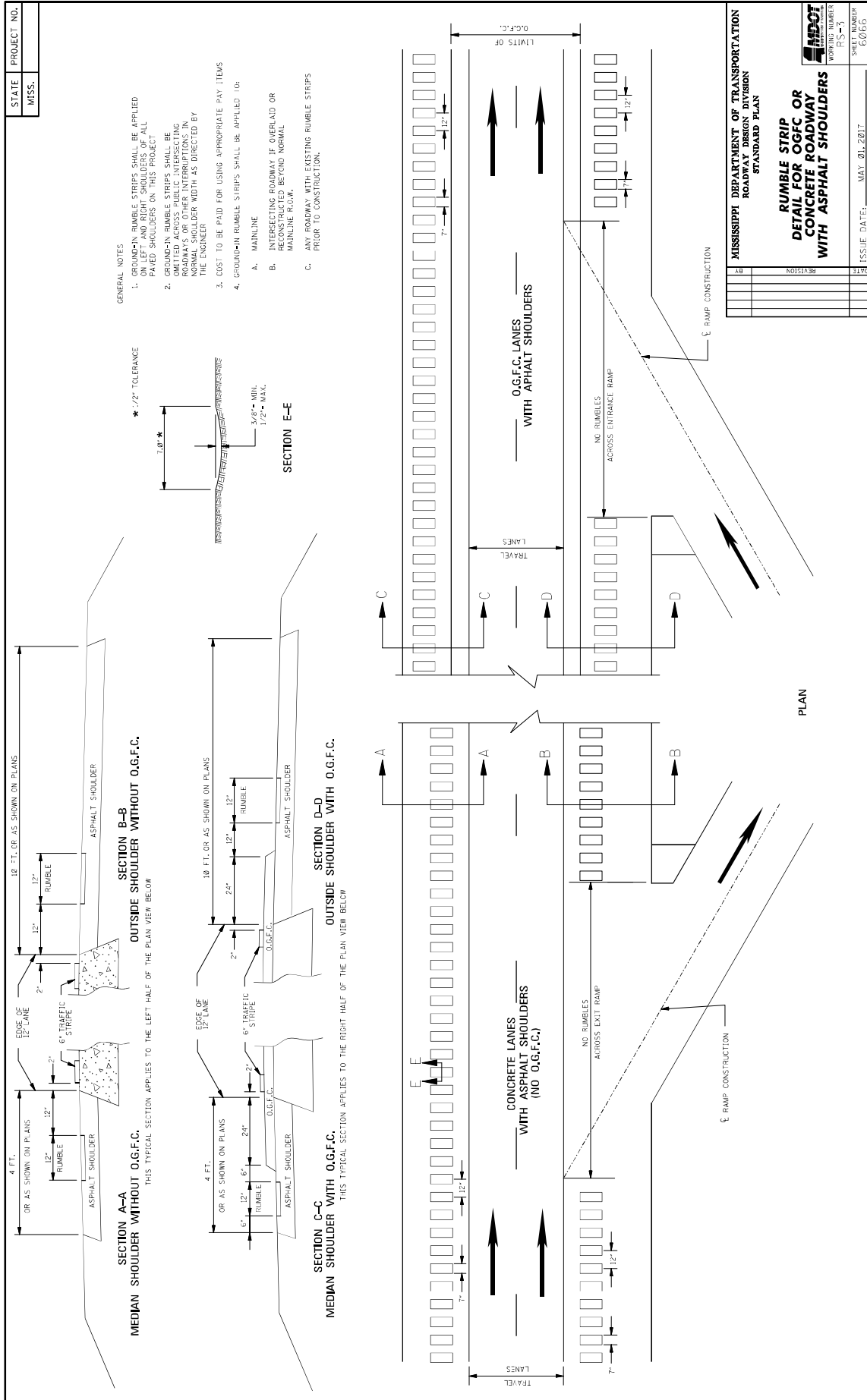
1. GROUND-IN RUMBLE STRIPES SHALL BE APPLIED TO ALL PAVED SHOULDERS AND ALL PAVED SHOULDERS ON THIS PROJECT.
2. GROUND-IN RUMBLE STRIPES SHALL BE APPLIED TO ALL INTERSECTIONS, ROADWAYS, AND OTHER INTERSECTIONS IN NORMAL SHOULDER WIDTH AS DIRECTED BY THE ENGINEER.
3. COST TO BE PAID FOR USING APPROPRIATE PAY ITEMS.
4. GROUND-IN RUMBLE STRIPES SHALL BE APPLIED TO:
  - A. MAINLINE
  - B. INTERSECTING ROADWAY IF OVERLAD OR RECONSTRUCTED BEYOND NORMAL MAINLINE R.O.W.
  - C. ANY ROADWAY WITH EXISTING RUMBLE STRIPES PRIOR TO CONSTRUCTION.



NOT TO SCALE  
DETAILS OF  
RUMBLE STRIPS

MISSISSIPPI DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN DIVISION STANDARD PLAN	
AB	REVISION
05R	REVISION
<p style="text-align: center;"><b>RUMBLE STRIPES 4-LANE HIGHWAYS (ASPHALT LANES, 2-FT OR WIDER, ASPHALT SHOULDERS)</b></p>	
DATE	ISSUE DATE: AUGUST 01, 2017
REVISION	NUMBER
05R	6065





**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SECTION 904 - NOTICE TO BIDDERS NO. 3676**

**CODE: (SP)**

**DATE: 09/21/2021**

**SUBJECT: Asphalt Gyrotory Compactor Internal Angle Calibration**

Bidders are advised that by March 1, 2022, all asphalt gyrotory compactors shall be calibrated to an internal angle of  $1.16^{\circ} \pm 0.02^{\circ}$ . This requirement will be reflected in updates made to MT-78, MT-80, and MT-83. This calibration requirement also extends to all QC/QA testing.

## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

**SECTION 904 - NOTICE TO BIDDERS NO. 4702**

**CODE: (SP)**

**DATE: 11/22/2022**

**SUBJECT: App for Traffic Control Reports**

Bidders are advised that the Department has created a smart phone App for completing and submitting traffic control reports (Form CSD-762) required on this project. The Contractor who monitors traffic control activities and completes traffic control reports will be required to download and use this App when completing and submitting traffic control reports. The reports will then be readily available to all persons who need access to the forms. The App is free and is available for downloading at the following location.

<https://extacctmgmt.mdot.state.ms.us/>

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SECTION 904 - NOTICE TO BIDDERS NO. 5750**

**CODE: (SP)**

**DATE: 03/19/2024**

**SUBJECT: Manual on Uniform Traffic Control Devices (MUTCD)**

Bidders are advised that any reference to the current edition of the MUTCD or the latest edition of the MUTCD within plans, proposal, or standard specifications means the 2009 Edition and the 3 Revisions thereto.

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SECTION 904 - NOTICE TO BIDDERS NO. 5777**

**CODE: (SP)**

**DATE: 04/18/2024**

**SUBJECT: Contract Time**

**PROJECT: SP-1132-00(016) / 109023301 & SP-2167-00(003) / 109023302 – Wayne County**

The completion of work to be performed by the Contractor for this project will not be a specified date but shall be when all allowable working days are assessed, or any extension thereto as provided in Subsection 108.06. It is anticipated that the Notice of Award will be issued no later than **June 11, 2024**.

The Contractor shall request a Notice to Proceed/Beginning of Contract Time date between the dates of **July 11, 2024 and August 08, 2024**.

Should the Contractor request a Notice to Proceed earlier than **July 11, 2024** and it is agreeable with the Department for an early Notice to Proceed, the requested date will become the new Notice to Proceed and Beginning of Contract Time date.

Should the Contractor not request a Notice to Proceed by **August 08, 2024**, the date for the Notice to Proceed and Beginning of Contract Time will be **August 08, 2024**.

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

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

The progress schedule for this project shows the Notice to Proceed and Beginning of Contract Time starting at the latest possible date. If the Contractor requests a Notice to Proceed earlier than this date, the Contractor shall submit a revised progress schedule showing the work beginning at the new Notice to Proceed and Beginning of Contract Time date.

# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

**SECTION 904 - NOTICE TO BIDDERS NO. 5778**

**CODE: (SP)**

**DATE: 01/29/2024**

**SUBJECT: Scope of Work**

**PROJECT: SP-1132-00(016) & SP-2167-00(003) / 109023301 & 302 -- Wayne County**

The contract documents do not include an official set of construction plans but may, by reference, include some Standard Drawings when so specified in a Notice to Bidders entitled, "Standard Drawings".

Work on the project shall consist of overlaying SR 63 from approximately 0.6 miles south of Turkey Creek Bridge (south of Clara) (Station 10+00) north 9.2 miles to the junction of SR 184 in Waynesboro (Station 497+22), placing Ultra-thin leveling and overlaying SR 184 approximately 2.2 miles from the intersection of US 84 West of Waynesboro to SR 63.

## **GENERAL REQUIREMENTS**

1. Prior to the overlay, centerline alignment shall be determined by the Contractor by measuring the existing roadway at 500-foot intervals in tangent sections and 100-foot intervals in horizontal curves. The existing shoulders shall be clipped and surplus material shall be spread along the edge of the shoulders, fore slopes, or other adjacent areas as directed by the Project Engineer, and will be an absorbed item.
2. It shall be the responsibility of the Contractor to protect the roadway and all existing structures, such as bridges, culverts, signs, and curb, from damage occurring as a result of the Contractor's operations. Damages to existing structures caused by the Contractor's operations shall be repaired or replaced at no cost to the State.
3. The Contractor shall erect and maintain construction signing, provide all signs and traffic handling devices, and shall provide two portable R16-3 signs per work zone or lane closure in addition to signs required by standard drawings in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), latest edition. Fluorescent orange sheeting shall be used on all construction and traffic control signs except for those designated to be black legend and border on white background. All plastic drums shall have a ballasting collar made from recycled truck tires or other suitable material. The cost for this work shall be included in the price bid for pay item 618-A: Maintenance of Traffic.
4. Incidental work such as removing vegetation, shaping and compaction of shoulder, removing excess asphalt material, project clean-up, and other incidental work necessary to complete the project will not be measured for separate payment, but will be included in other bid items, and must be performed during the operating hours for this project.
5. If pavement section marking tape is encountered on this project, it shall be located prior to overlaying and placed back in same location after paving operations have ceased. The

section marking shall be 8-inch high performance cold plastic detail stripe and shall be four feet (4') in length. The marking shall be centered across the centerline stripe. The cost of this item shall be absorbed in other bid items.

6. All transitions including B.O.P., bridge approaches, and all tie-ins shall be cold milled  $\frac{3}{4}$ " and variable. Milled surfaces shall be covered with asphalt within seven (7) calendar days of removal.
7. The existing shoulders shall be raised to match the new pavement elevations by placing  $1\frac{1}{2}$ " and variable depth of Size 825B crushed stone on the shoulders. Placement of the crushed stone on the finished surface course shall not be permitted. The material shall be bladed, rolled, and compacted to a finished slope of 4% where practical. Shoulders with existing adequate shoulder material in place shall be bladed to a slope of 4%; the cost of which shall be included in the prices of other items bid.
8. Temporary striping shall conform to finished stripe specifications for alignment, neatness, reflectivity, and straightness. All permanent pavement markings shall be hot thermoplastic. Special care should be taken for the placement of thermoplastic detail stripe along the edge of pavement at turn-outs on all local roads where detail stripe is required as per Typical PMD-1. Temporary edge lines shall be placed at the end of each mainline paving day.
9. Raised pavement markers shall be placed as per sheet PM-1 of the Standard Drawings. **However, centerline raised pavement markers will be placed every 40 feet, both in curves and in tangents.** Any removal of existing raised pavement markers or rumble bars shall be considered an absorbed item. Only flexible adhesive shall be allowed for placement of raised pavement markers meeting the requirements of Subsection 720.03.7.7 of the Standard Specifications.

**SP-1132-00(016) / 109023301 -- SR 63**

1. SR 63 shall be overlaid with  $\frac{3}{4}$ " of Ultra-Thin asphalt from the BOP to Sta. 486+70. Prior to the overlay, a leveling course of  $\frac{3}{4}$ " & variable Ultra-Thin asphalt shall be placed. Existing cross slopes of 2% in tangent sections or proper superelevation rates in curves shall be maintained. In sections with cross slopes that are less than 2% in tangents or less than the proper superelevation rate in curves, cross slopes shall be improved by adjusting the leveling course to a varying thickness between  $\frac{1}{2}$ " and 1". 1,090 tons of Ultra-Thin asphalt have been included in the project quantity total for leveling rutted areas, which will be accomplished during the placement of the Ultra-Thin asphalt leveling course. The finished asphalt pavement will meet smoothness tolerances for maximum deviation from a 10 foot straight edge as stated in Subsection 403.03.2 of the Standard Specifications. Any failed areas on the main facility shall be removed by milling and repaired by backfilling with 19-mm, MT asphalt as directed by the Project Engineer. Removal areas will be marked by MDOT personnel and include but are not limited to areas included in Table 1. Approximately 833 tons of 19-mm, MT asphalt will be used for backfill in removal sections. All turn lanes, local roads, guard rail pads, and driveways shall be overlaid with 9.5-mm, MT asphalt. Publicly maintained roads or streets shall be surfaced to the existing R.O.W.; privately owned entrances shall be surfaced a distance of 10 feet & variable from edge of pavement. Any site

grading at local roads or drives will not be measured for separate payment but will be considered an absorbed item. The Contractor shall mill a 12-inch SHALLOW DEPTH rumble strip (See Standard Drawing UTRS-1) along the inside of the 2-foot paved shoulder and place the traffic stripe on the inside 6” of the rumble strip. Rumble strips will be omitted between Sta. 58+50 (300’ South of County Barn Road) and Sta. 85+76 (Clara School Road) in Clara, and between Sta. 417+50 (Industrial Park Road) and Sta. 497+22 (EOP at SR 184) in Waynesboro. If water stands when project is complete, the Contractor shall correct at no additional cost to the State.

**TABLE 1**

Location	Lane	Size	Area (sf)
168+15 to 171+90	Left	375 x 13.5	5063
197+88 to 201+43	Left	355 x 13.5	4793
237+88 to 240+00	Left	212 x 13.5	2862
328+50 to 330+00	Left	150 x 13.5	2025
349+00 to 351+00	Left	200 x 13.5	2700
419+10 to 420+74	Left	164 x 13.5	2214
485+68 to 486+71	Left	103 x 13.5	1391
58+90 to 59+40	Right	50 x 13.5	675
61+57 to 62+84	Right	127 x 13.5	1715
65+10 to 66+92	Right	182 x 13.5	2457
180+90 to 182+94	Right	204 x 13.5	2754
211+87 to 214+02	Right	215 x 13.5	2903
237+88 to 240+00	Right	212 x 13.5	2862
259+58 to 260+30	Right	72 x 13.5	972
328+50 to 330+00	Right	150 x 13.5	2025
349+00 to 351+00	Right	200 x 13.5	2700
485+55 to 486+75	Right	120 x 13.5	1620

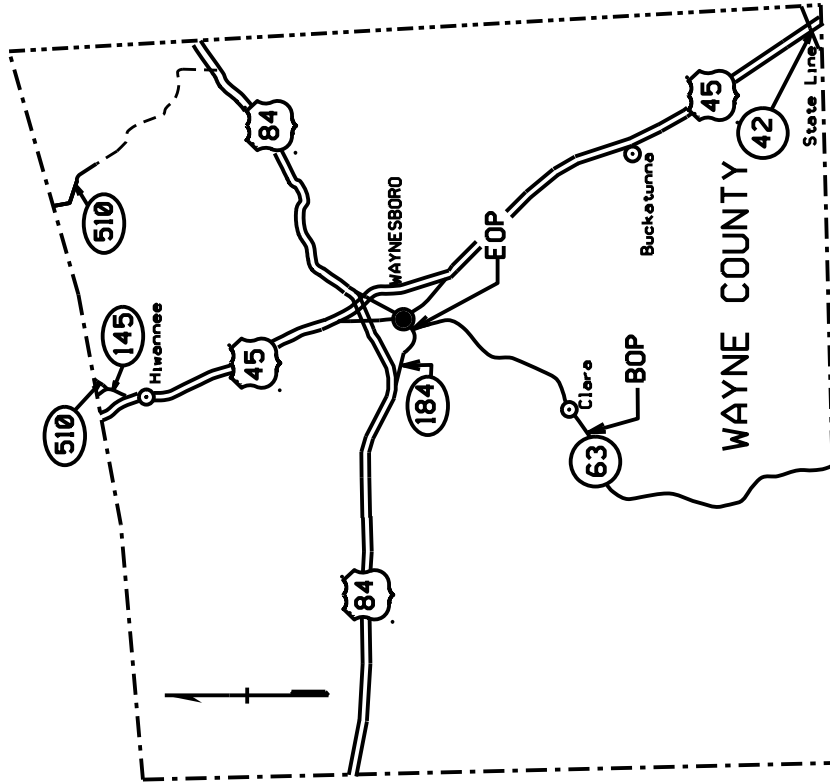
- SR 63 shall be overlaid from Sta. 486+70 to Sta. 497+22 (EOP) (curb and gutter section within the City of Waynesboro) with 1½” of 9.5-mm, MT asphalt. Prior to the overlay, SR 63 shall be cold milled throughout this area, including parking areas as directed by the Project Engineer. All milled material will become the property of the Contractor, except for 500 tons or 50% of the total cold milling, whichever is less, which shall be stockpiled at the MDOT Maintenance Tie-up on SR 184 or as designated by the Engineer and will become the property of MDOT. Milled surfaces shall be covered with asphalt within five(5) calendar days of removal. Care shall be taken so that the finished grade allows water to drain into the inlets and that the asphalt ties flush with inlets and gutters. The finished asphalt pavement will meet smoothness tolerances for maximum deviation from a 10-foot straight edge as stated in Subsection 403.03.2 of the Standard Specifications. All turn lanes, local roads, guard rail pads, and driveways shall be overlaid with 9.5-mm, MT asphalt. Publicly maintained roads or streets shall be surfaced to the existing R.O.W.; privately owned entrances shall be surfaced a distance of 10 feet & variable from edge of pavement. Any site grading at local roads or drives will not be measured for separate payment but will be considered an absorbed item. If water stands when project is complete, the Contractor shall correct at no additional cost to the State.



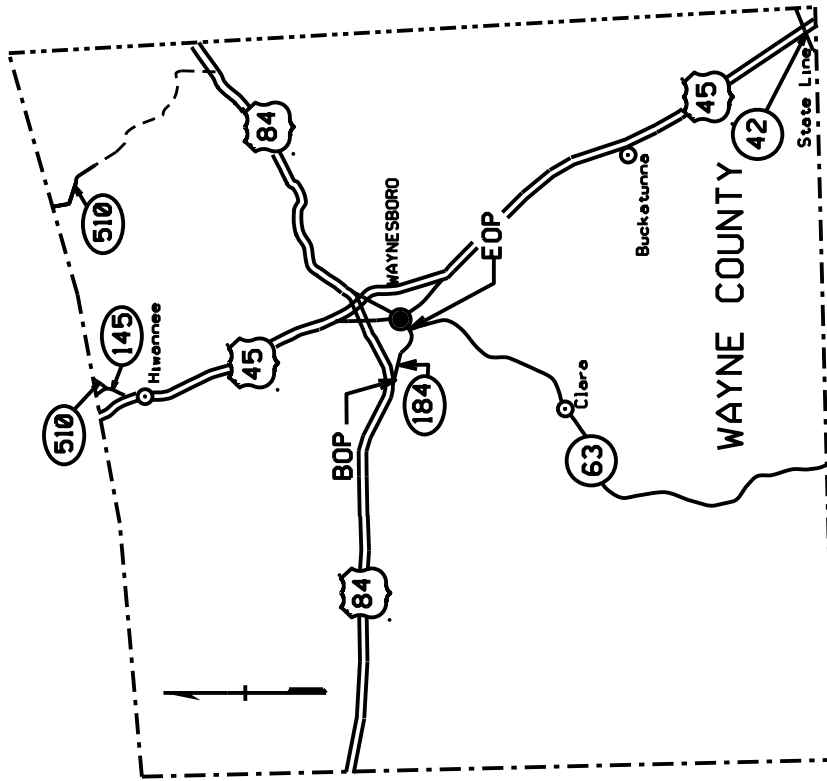
3. All work to be performed between Sta. 486+70 and Sta. 497+22 (EOP) (curb and gutter section within the City of Waynesboro) shall be performed Sunday through Thursday only, from 7:00 p.m. to 6:00 a.m. All operations which are performed during non-daylight hours shall be properly illuminated to allow for the safe and complete performance and inspection of the work. If it is the Project Engineer's opinion that there is not proper lighting for adequate and safe performance and inspection of the work, the Contractor shall make the necessary adjustments to improve the lighting. The cost for these adjustments shall be absorbed by the Contractor. Lighting systems shall be positioned such that they do not cause glare to drivers or nearby homes and businesses. When necessary, the lighting systems shall include screening to minimize glare. Prior to the initial start of nighttime operations, a lighting plan shall be submitted to the Project Engineer for reviews and approval in accordance with Section 680 of the Standard Specifications. The Project Engineer shall have fourteen (14) days in which to reviews the lighting plan. No nighttime construction shall commence until the lighting plan has been approved in writing. The lighting system shall be considered incidental to other contract items and no direct payment will be made for such. Vibratory rollers will not be permitted from Sta. 417+50 to Sta. 497+22 (EOP.)
4. Any vehicle detection devices that are not in proper operation prior to or that become damaged during construction operations shall be replaced as directed by the Engineer. The type of vehicle detection device installed shall be the same as its predecessor.

**SP-2167-00(003) / 109023302 -- SR 184**

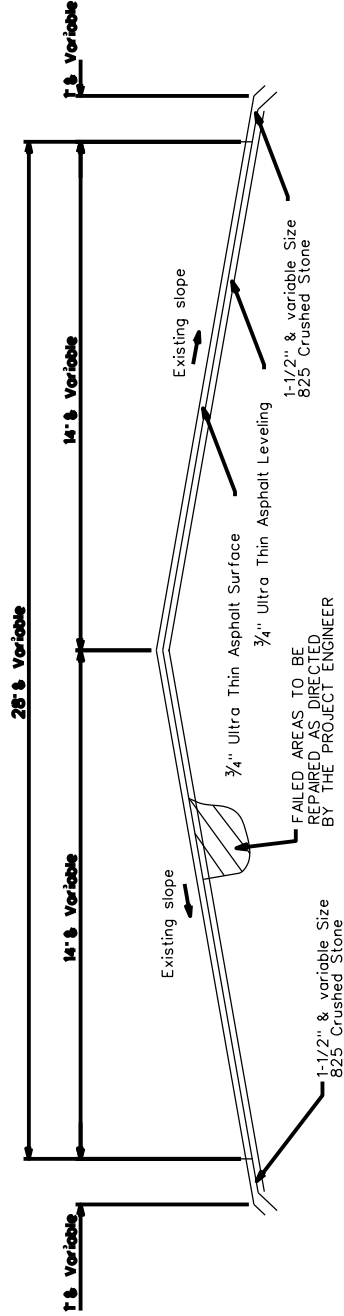
1. SR 184 shall be overlaid with  $\frac{3}{4}$ " of Ultra-Thin asphalt. Prior to the overlay, a leveling course of  $\frac{3}{4}$ " of Ultra-Thin asphalt shall be placed (6,430 tons). Existing cross slopes of 2% in tangent sections or proper superelevation rates in curves shall be maintained. In sections with cross slopes that are less than 2% in tangents or less than the proper superelevation rate in curves, cross slopes shall be improved by adjusting the leveling course to a varying thickness between  $\frac{1}{2}$ " and 1". All turn lanes, local roads, guard rail pads, and driveways shall be overlaid with Ultra-Thin asphalt (280 tons). Publicly maintained roads or streets shall be surfaced to the existing R.O.W.; privately owned entrances shall be surfaced a distance of 10 feet & variable from edge of pavement. Any site grading at local roads or drives will not be measured for separate payment but will be considered an absorbed item. If water stands when project is complete, the Contractor shall correct at no additional cost to the State.
2. The Contractor shall mill a 12-inch wide rumble strip along the inside of the shoulders as per Standard Drawing RS-UT. The rumble strip shall be milled to a depth of between  $\frac{1}{4}$ " and  $\frac{3}{8}$ " due to the thickness of the surface asphalt. The traffic stripe shall be placed on the inside six inches (6") of the rumble strip.
3. Incidental work such as removing vegetation, shaping and compaction of shoulder, removing excess asphalt material, project clean-up, and other incidental work necessary to complete the project will not be measured for separate payment, but will be included in other bid items, and must be performed during the operating hours for this project.



THE ABOVE REFERENCED PROJECT IS FOR AN OVERLAY OF SR 63 FROM 0.6 MILES SOUTH OF TURKEY CREEK BRIDGE (NEAR CLARA), NORTH 9.2 MILES TO SR 184 IN WAYNESBORO



THE ABOVE REFERENCED PROJECT IS FOR AN OVERLAY OF SR 184 FROM US 84 E TO SR 63 IN WAYNESBORO

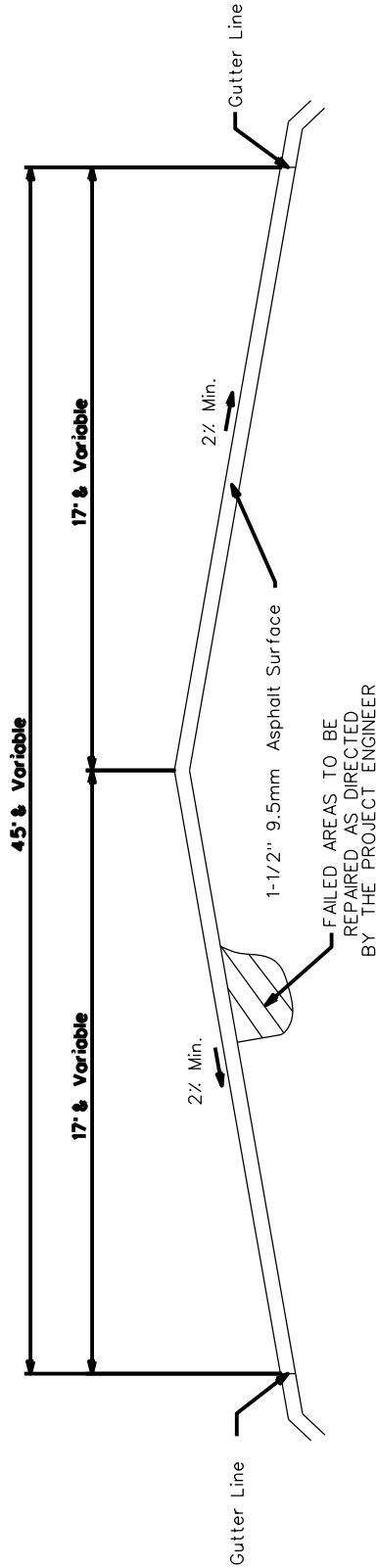


NOTES:

- (1) THE EXISTING PAVEMENT EDGE SHALL BE CUT TO A SMOOTH AND NEAR VERTICAL FACE WITH AN APPROVED CUTTING DEVICE. (NOTE MEASURED FOR SEPARATE PAY.)
- (2) TRUE CENTERLINE PAVEMENT ALIGNMENT SHALL BE DETERMINED BY THE CONTRACTOR BY MEASURING THE EXISTING ROADWAY AT 500ft. INTERVALS IN TANGENT SECTIONS, AND 100ft. INTERVALS IN HORIZONTAL CURVES.

**SR 63 FROM 0.6 MILES SOUTH OF TURKEY CREEK (NEAR CLARA), NORTH 9.2 MILES TO SR 184 IN WAYNESBORO, EXCLUDING CURB AND GUTTER SECTION**

**BOP TO STA. 486+70**



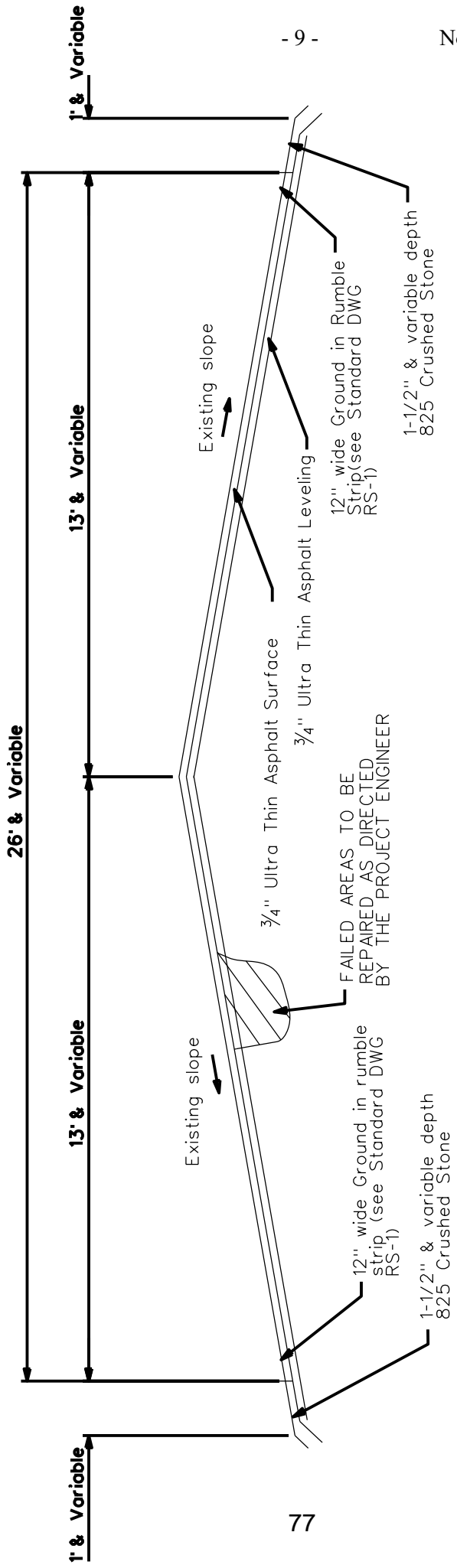
Existing Roadway to be milled 1-1/2" between gutter lines (including parking areas) prior to overlay. Curb & gutter section width varies.

NOTES:

TRUE CENTERLINE PAVEMENT ALIGNMENT SHALL BE DETERMINED BY THE CONTRACTOR BY MEASURING THE EXISTING ROADWAY AT 500ft. INTERVALS IN TANGENT SECTIONS, AND 100ft. INTERVALS IN HORIZONTAL CURVES.

**TYPICAL SECTION SR 63 WITHIN CURB & GUTTER SECTION IN WAYNESBORO STA. 486+70 TO STA. 497+22**

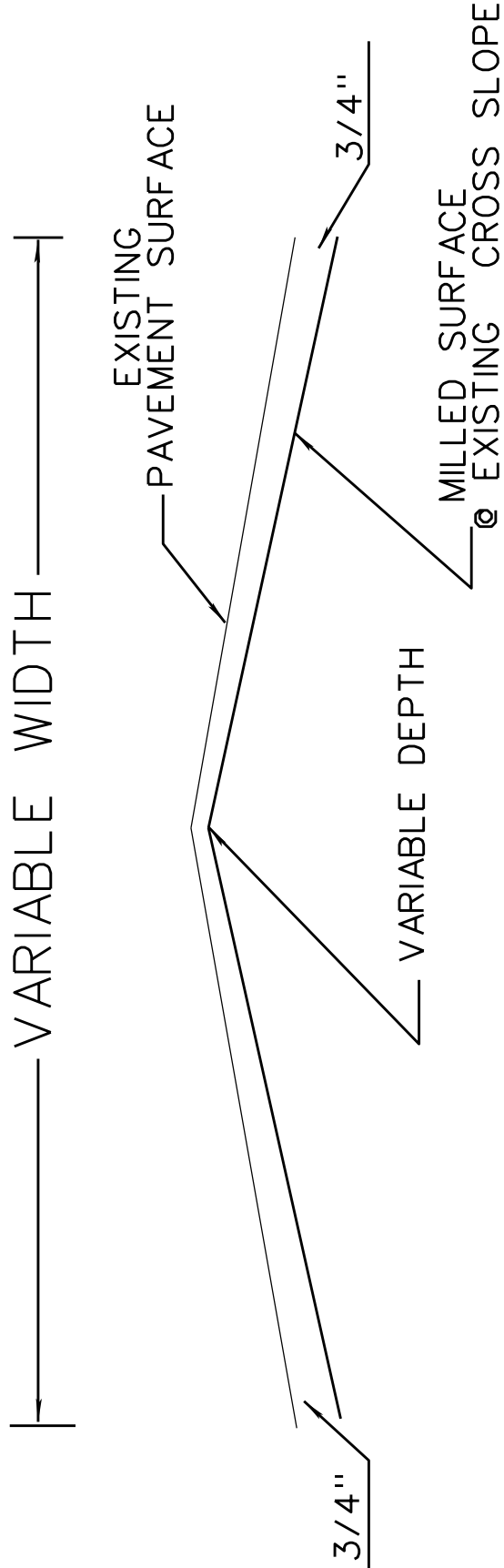
# SR 184



NOTES:

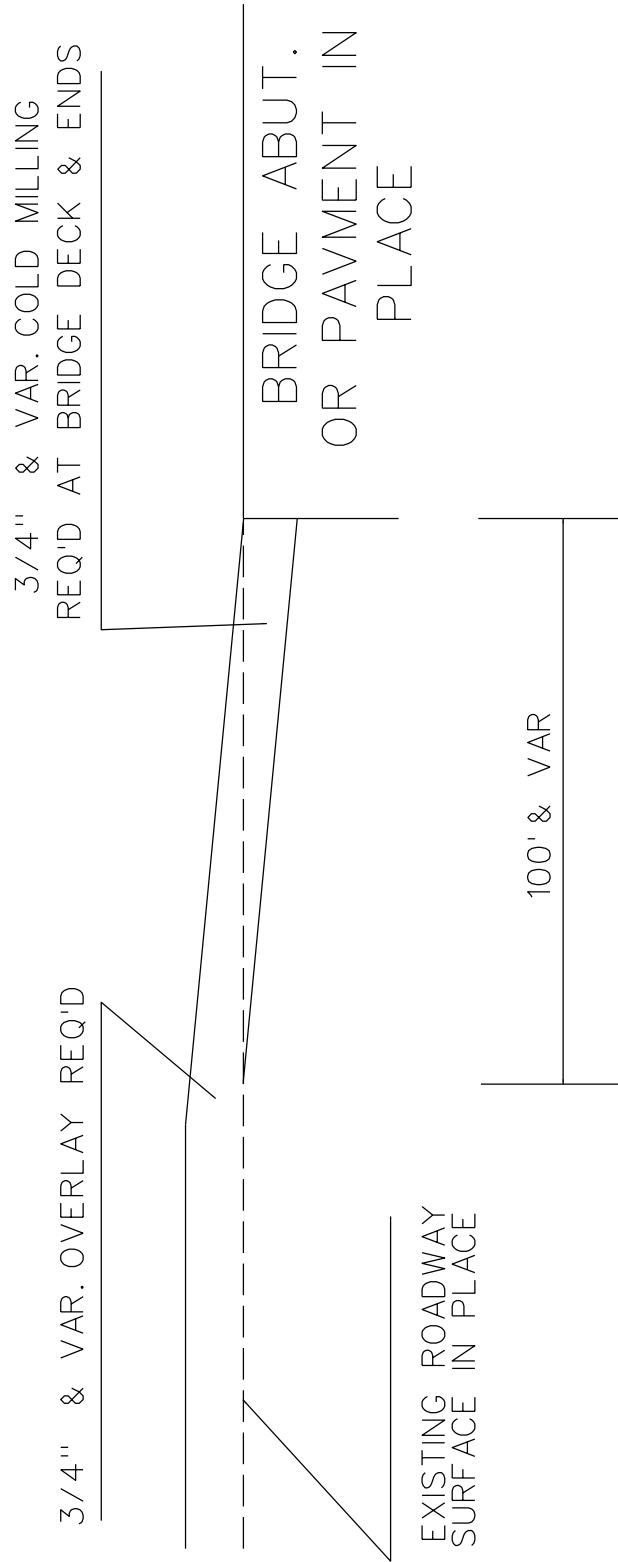
- (1) TRUE CENTERLINE PAVEMENT ALIGNMENT SHALL BE DETERMINED BY THE CONTRACTOR BY MEASURING THE EXISTING ROADWAY AT 500ft. INTERVALS IN TANGENT SECTIONS, AND 100ft. INTERVALS IN HORIZONTAL CURVES.

# TYPICAL MILLING DIAGRAM



**SR 63**

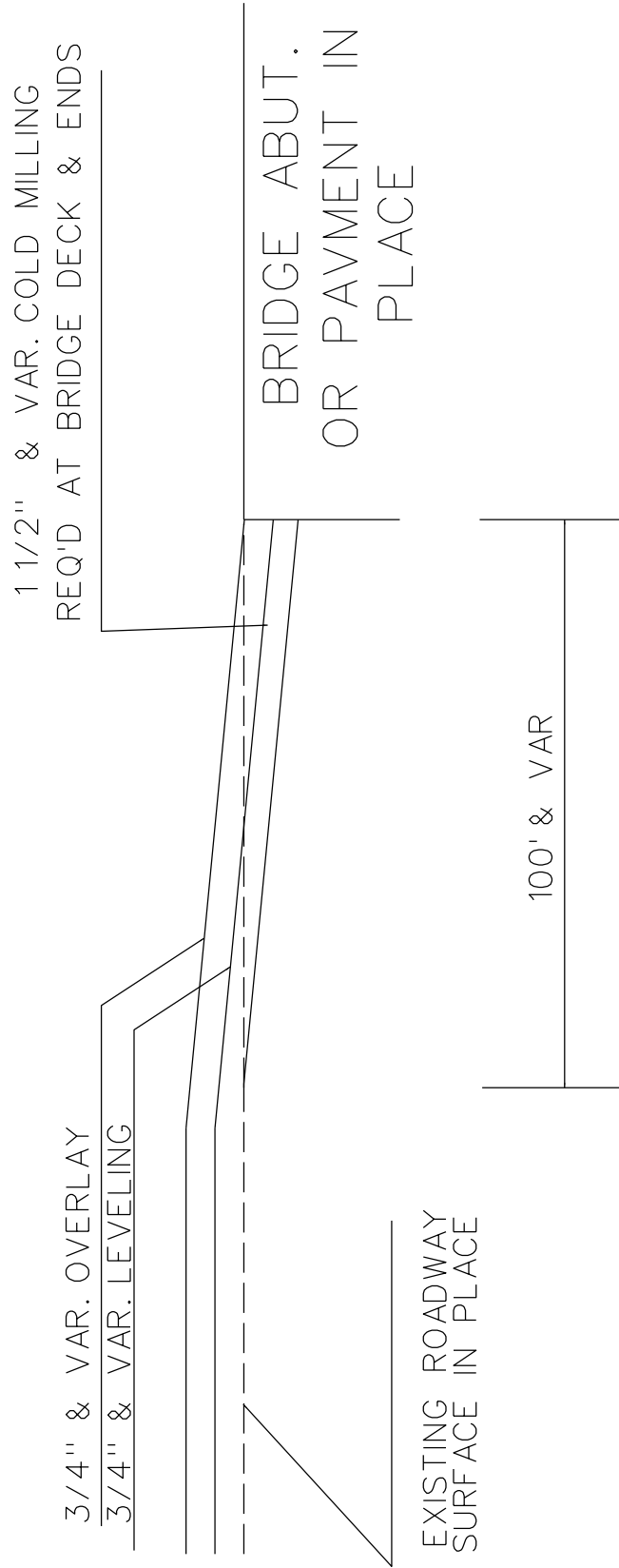
TYPICAL MILLED TRANSITION AT  
BRIDGE ABUT. OR PAVEMENT IN PLACE



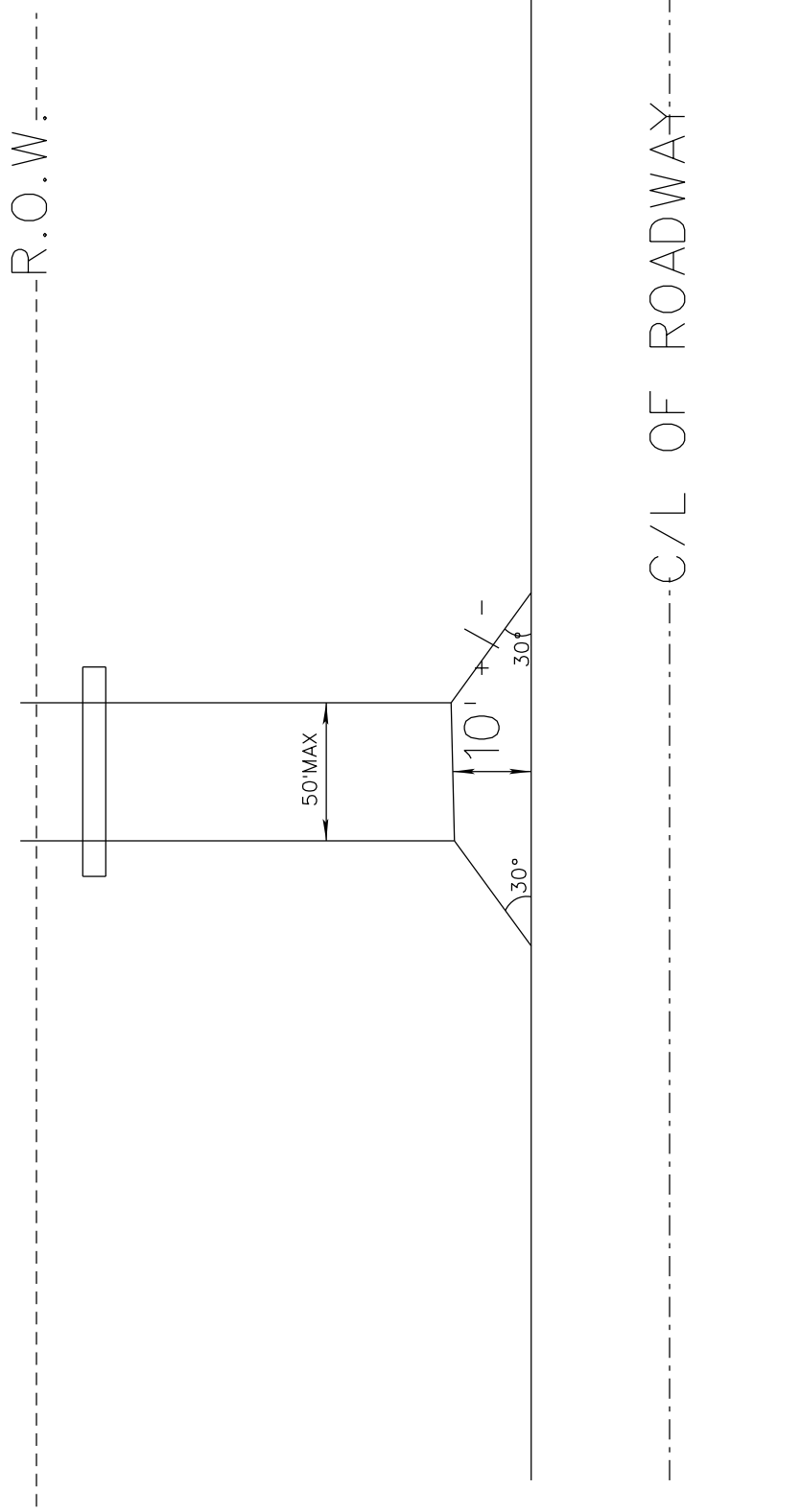


**SR 184**

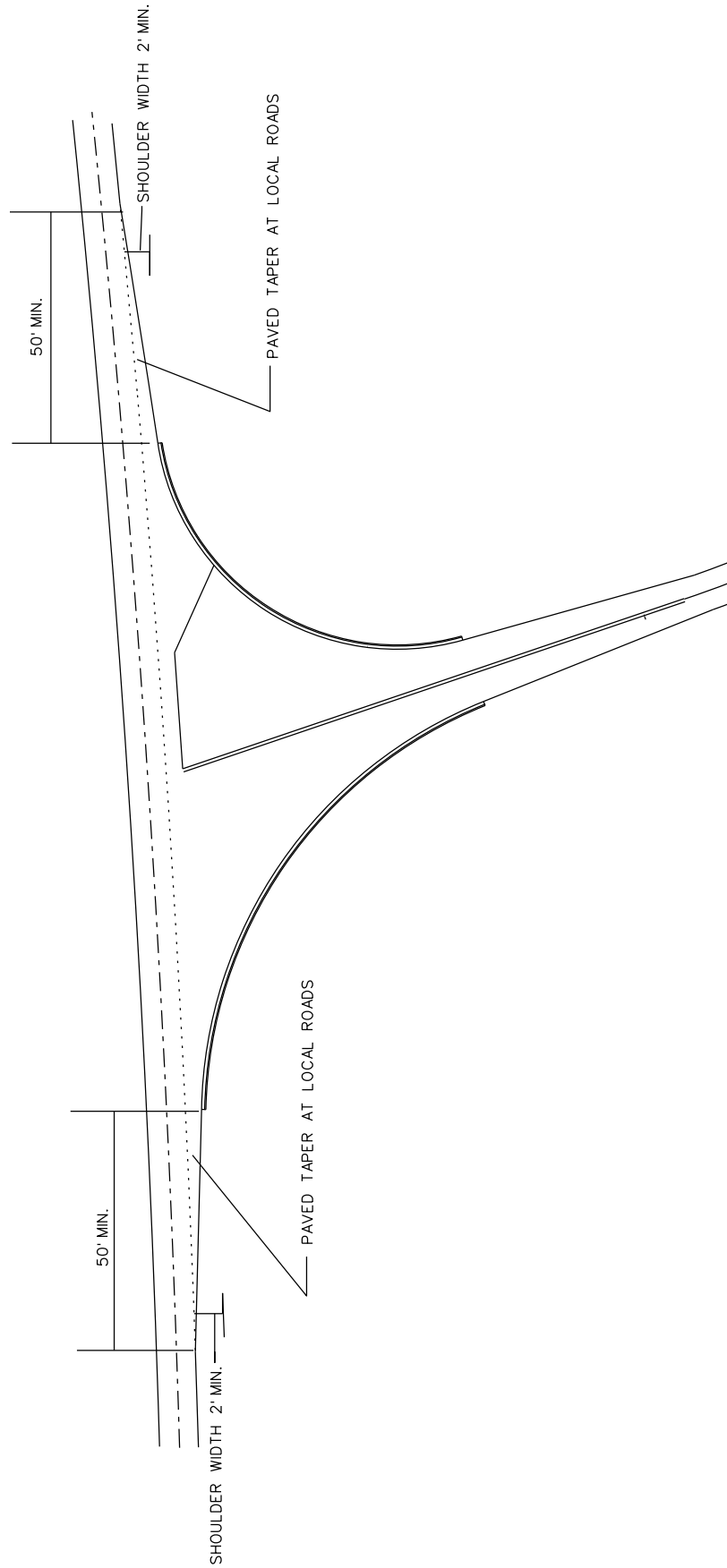
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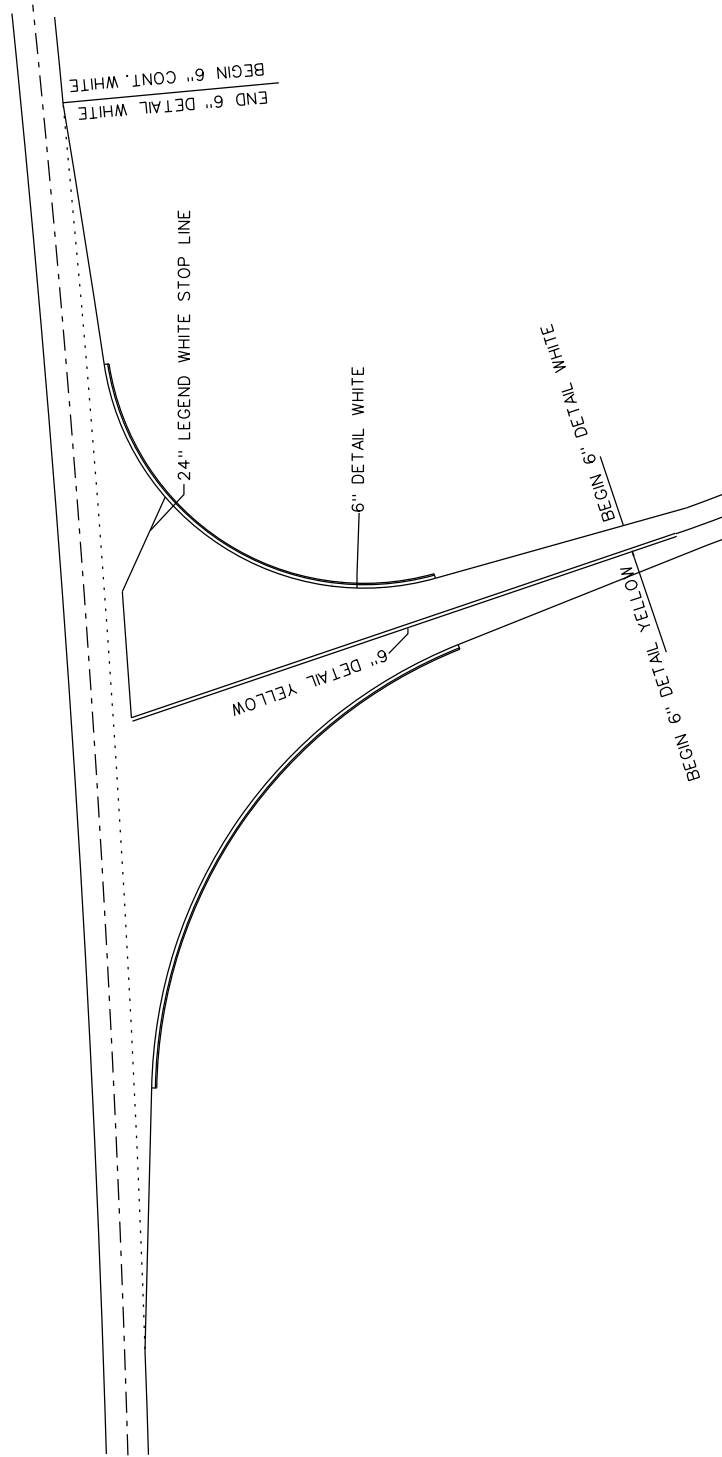
PRIVATE DRIVEWAY DETAIL

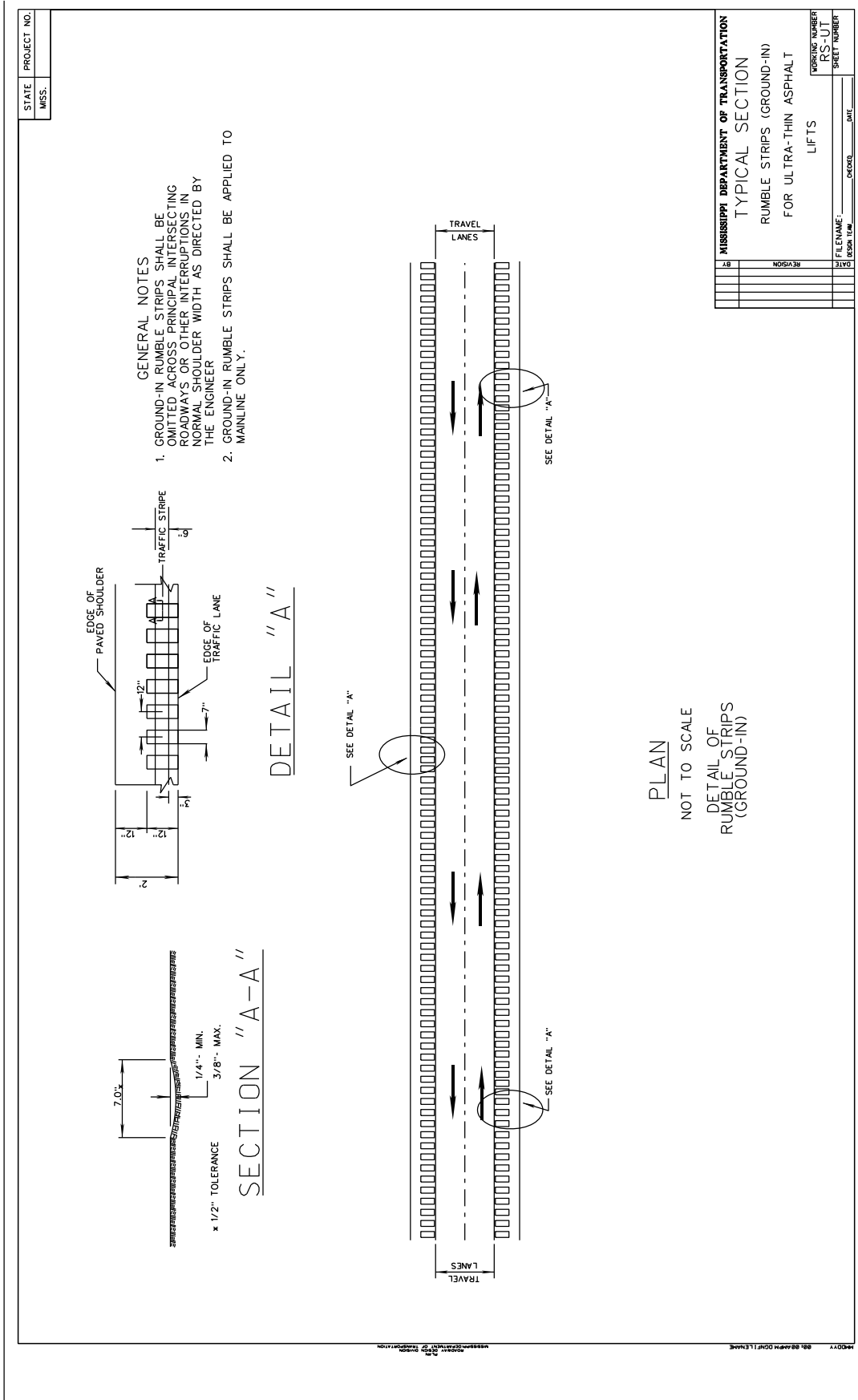


# TYPICAL FOR PAVED TAPER AT LOCAL ROADS



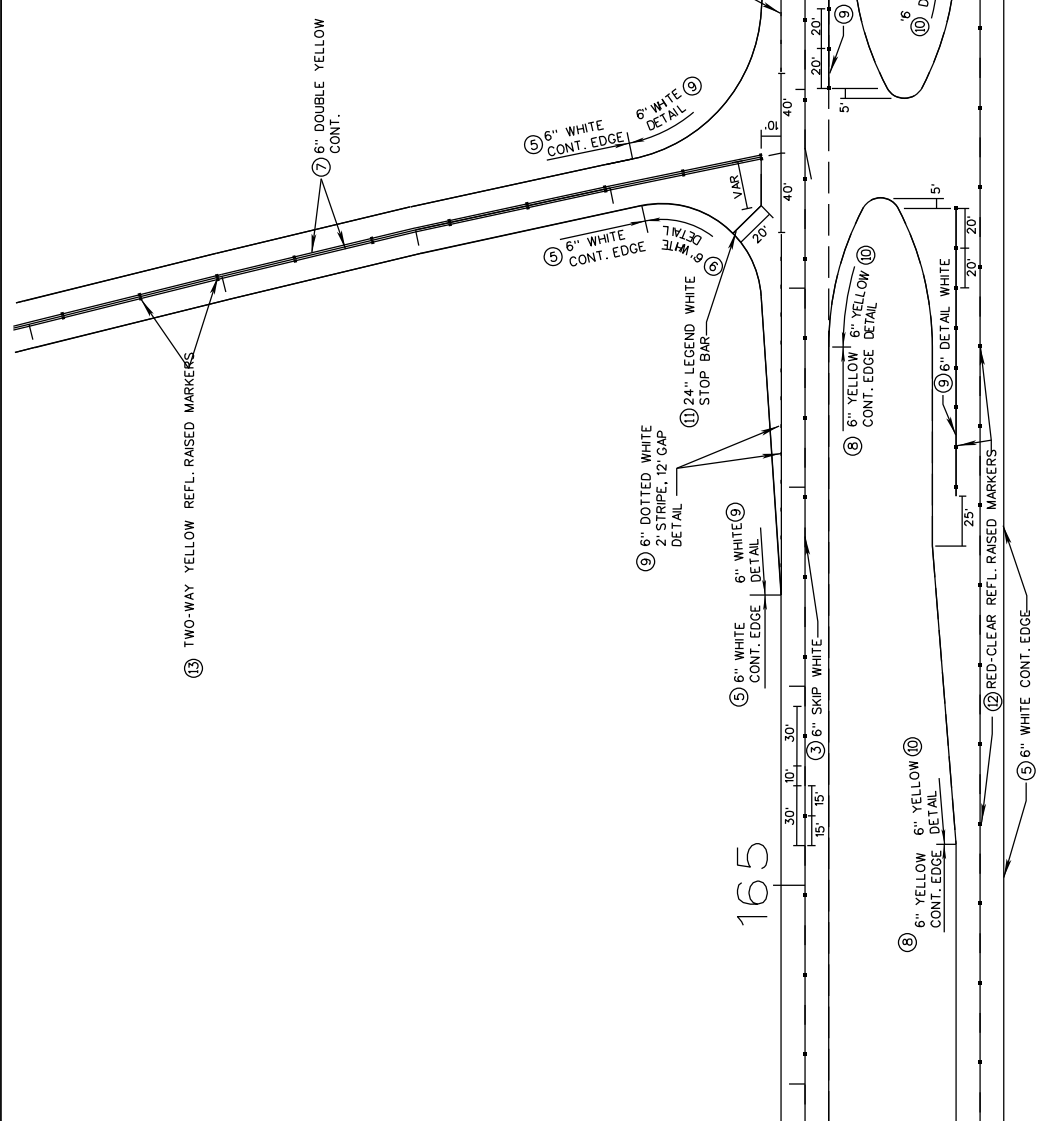
# TYPICAL STRIPING FOR SIMPLE INTERSECTION AT LOCAL ROADS





STATE	PROJECT NO.
MISS.	STP-004-01032

PAVEMENT MARKING			
SYMBOL	DESCRIPTION	TYPE	QUANTITY
(1)	LEFT TURN ARROW AND ONLY (TAPE & ) PAINT		
(2)	RED-CLEAR REFLECTIVE RAISED MARKERS EACH		
(3)	TWO-WAY YELLOW REFLECTIVE RAISED MARKER EACH		
(4)	6" TRAFFIC SKIP WHITE (10'-30')	PLASTIC	
(5)	6" CONTINUOUS EDGE WHITE (SOLID)	PLASTIC	
(6)	6" CONTINUOUS TRAFFIC YELLOW (SOLID)	PLASTIC	
(7)	6" CONTINUOUS TRAFFIC WHITE (SOLID)	PLASTIC	
(8)	6" DETAIL STRIPE WHITE (SOLID)	PLASTIC	
(9)	6" DETAIL STRIPE YELLOW (SOLID)	PLASTIC	
(10)	6" DETAIL STRIPE WHITE (2'-12')	PLASTIC	
(11)	24" THERMO LEGEND (WHITE/STOP BAR)		
(12)	6" DOTTED WHITE 2' STRIPE, 12' GAP		
(13)	6" WHITE CONT. EDGE		
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MISSISSIPPI DEPARTMENT OF TRANSPORTATION	
DETAIL OF STRIPING	
PROJECT NO:	LOCAL RD. @ STA.
COUNTY:	
FILE NAME:	
REVISION:	
DATE:	
WORKING NUMBER:	
PMD/ST:	
SHEET NUMBER:	55
CHECKED:	
DATE:	

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SECTION 904 – NOTICE TO BIDDERS NO. 5779**

**CODE: (SP)**

**DATE: 04/17/2024**

**SUBJECT: Lane Closure Restrictions**

**PROJECT: SP-1132-00(016) & SP-2167-00(003) / 109023301&302– Wayne County**

Bidders are advised of the following restrictions:

- Lane closures between Sta. 486+70 and Sta. 497+22 (EOP) (curb and gutter section within the City of Waynesboro) shall be restricted between the hours of 7:00 pm to 6:00 am Sunday through Thursday.
- Changes or variances from the listed restrictions shall be submitted to the Project Engineer in writing for review and written approval.

A lane rental fee of **\$1,500.00** per full or partial 5 minutes shall be assessed for closures or obstructions that extend beyond the times mentioned above. No exposed signs shall be viewable to the traveling public prior to or after the above mentioned times. No part of a closures, drums or cones, shall be in the roadway prior to or after the above mentioned times.

Failure to begin work within this one (1) hour will result in the contractor being assessed a lane rental fee of **\$1,500.00** per full or partial 5 minutes until work begins.

# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-101-1

CODE: (IS)

DATE: 07/20/2023

SUBJECT: Definitions and Terms

Section 101, Definitions and Terms, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

**907-101.01--Abbreviations.** After the abbreviation API on page 1, add the following.

APL Approved Products List

Replace the abbreviation for AWPA on page 1 with the following.

AWPA American Wood Protection Association

**907-101.02--Definitions.** Delete the sentence after the list of holidays in Subsection 101.02 on page 6 under **holidays, legal**, and substitute the following.

When a legal holiday falls on a Saturday or Sunday, the succeeding Monday, or as proclaimed by the Governor, will be observed as a legal holiday.

Delete the definition for Notice to Proceed in Subsection 101.02 on page 8, and substitute the following.

**Notice to Proceed** - Written notice to the Contractor to proceed with the contract work.

Delete the definition for “Plans” in Subsection 101.02 on page 8, and substitute the following.

**plans** - The approved plans, profiles, typical cross-sections, working drawings and supplemental drawings, or exact reproduction thereof, that show the location, character, dimensions, and details of the work to be done. The plans may also include electronic files, referred to on the plans as Electronic Files Identified as Plans, which may include engineering models, spreadsheets, CADD files or other electronic files used to convey design intent. When the contract does not have an official set of plans, reference to the plans shall mean the contract documents.



## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-102-2

CODE: (IS)

DATE: 11/22/2017

SUBJECT: **Bidding Requirements and Conditions**

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

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

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

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

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

## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-103-2

CODE: (SP)

DATE: 06/22/2017

SUBJECT: Award and Execution of Contract

Section 103, Award and Execution of Contract, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

**907-103.01--Consideration of Proposal.** Delete the second and third paragraphs of Subsection 103.01 on page 19, and substitute the following.

**907-103.01.1--For Projects Constructed Without Federal Funds.** Resident Contractors actually domiciled in Mississippi are to be granted preference over nonresidents in awarding of Contracts financed 100% with State funds.

In consideration of proposals that are equal to or in excess of \$50,000 and financed 100% with State funds, a nonresident bidder domiciled in a state having laws granting preference to local Contractors will be considered for such contracts on the same basis as the nonresident bidder's state awards contracts to Mississippi Contractors bidding under similar circumstances. When a nonresident Contractor submits a bid equal to or in excess of \$50,000 on a contract financed 100% with State funds, a copy of the current laws from the state of domicile and an explanation thereof pertaining to treatment of nonresident Contractors shall be attached. If no preferential treatment is provided for Contractors in the state of domicile and contracts are awarded to the lowest responsible bidder, a statement to this effect shall be attached. Should the attachment not accompany the bid when submitted, the Contractor shall have 10 days following the opening of the bids to furnish the required information to the Contract Administration Director for attachment to the bid. Failure to provide the attachment within 10 days will result in the nonresident Contractor's bid being rejected and not considered for award. As used herein, the term "resident Contractor" includes a nonresident person, firm or corporation that has been qualified to do business in this State and has maintained a permanent full-time office in the State of Mississippi for two years prior to the submission of the bid, and the subsidiaries and affiliates of such a person, firm or corporation.

## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-105-2

CODE: (IS)

DATE: 07/20/2023

SUBJECT: Control of Work

Section 105, Control of Work, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

**907-105.01--Authority of the Engineer.** Delete the first sentence of the second paragraph of Subsection 105.01 on page 31, and substitute the following.

The Engineer has the right to suspend the work wholly or in part and to withhold payments because of the Contractor's failure to correct conditions unsafe for workmen or the general public, for failure to carry out provisions of the Contract, or for failure to carry out orders.

**907-105.02--Plans and Working Drawings.** Delete the first paragraph of Subsection 105.02 on page 31, and substitute the following.

After the contract is executed by the Executive Director, the Contractor will receive, free of charge, two bound copies of the proposal and contract documents (one executed and one blank) two full scale copies of the plans, five half-scale copies of the Plans, and Electronic Files Identified as Plans. The Contractor shall have one copy of the proposal and contract documents and one half-scale copy of the plans available at all times during work activity on the project.

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION NO. 907-108-4**

**CODE: (SP)**

**DATE: 10/07/2020**

**SUBJECT: Subletting of Contract**

Section 108, Prosecution and Progress, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

**907-108.01--Subletting of Contract.**

**907-108.01.1--General.** Delete the third sentence of the tenth paragraph of Subsection 108.01.1 on the bottom of page 72.

# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-109-5

CODE: (IS)

DATE: 11/14/2023

SUBJECT: Measurement and Payment

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

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

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

**907-109.04--Extra Work.**

**907-109.04.1--Supplemental Agreement.** Delete the second paragraph of Subsection 109.04.1 on page 90.

**907-109.04.2--Force Account Agreement.** Delete the last sentence of subparagraph (c) in Subsection 109.04.2 on page 91, and substitute the following.

An amount will be added equal to fifteen percent (15%) of the sum thereof, excluding sales tax.

Delete subparagraph (d) in Subsection 109.04.2 on pages 91 & 92, and substitute the following.

- (d) **Equipment.** Equipment used for force account work shall be of sufficient size and type necessary to perform the required work in an economic and expeditious manner. The Contractor must provide the manufacturer, make, model, year, type of fuel and other necessary information to determine proper hourly payment rates. 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.

For equipment authorized by the Engineer for use on the force account work, the Engineer will use the equipment rental rates from the “*Rental Rate Blue Book*” as published on the Equipment Watch website [www.equipmentwatch.com](http://www.equipmentwatch.com) for the time period the force account work is authorized to determine payment to the Contractor. The maximum allowable rates

are determined as follows:

1. The hourly equipment rate will equal the FHWA total hourly rate. This rate takes into account adjustment factors for age and region.
2. The hourly estimated operating costs have been included in the FHWA total hourly rate.
3. The idle and standby rates shall be as listed in the "*Rental Rate Blue Book*" as reported by *Equipment Watch*.
4. These rates include the basic machine plus any necessary attachments.

Standby rates shall apply when equipment is not in operation and is approved by the Engineer to standby for later use to complete the work. Idle rates shall apply to equipment located on the project and the engine is burning fuel but no ground engaging or other components are actively engaged in meaningful work. In general, idle or standby rates shall apply when equipment is not in use, but will be needed again to complete the work and the cost of moving the equipment will exceed the accumulated standby cost. If the idle standby cost should exceed the equipment moving cost to or from the work site, the Contractor will be entitled to the moving cost only. Idle or standby rates will be used under the following conditions:

1. The equipment is totally dedicated to the force account work and not used intermittently on other work.
2. Idle or standby cost will be considered only after equipment has been operated on force account work.
3. The sum of idle or standby time and operating time shall not exceed eight (8) hours per day or 40 hours in a week.
4. Idle or standby payment will not apply to days not normally considered to be work days such as holidays, weekends, or days of inclement weather when no other work is taking place.

The Department will not pay for idle or standby time when equipment is inoperable, for time spent repairing equipment, or for the time elapsed after the Engineer has advised the Contractor that the equipment is no longer needed. The Department will determine if it will be more cost effective to pay standby time on approved equipment on site or for multiple mobilizations.

If equipment is needed, which is not included in the *Rental Rate Blue Book* as reported by *Equipment Watch*, the Department and Contractor will agree upon reasonable rental rates in writing before the equipment is used.

All equipment shall be subject to approval from day to day in accordance with the requirements of Subsection 108.05.

**907-109.06--Partial Payment.**

**907-109.06.2--Advancement on Materials.**

Delete the next to last paragraph of Subsection 109.06.2 on page 95, and substitute the following.

Materials for which an advanced payment has been allowed must be paid for by the Contractor within 30 days of the estimate on which the advanced payment was first allowed and proof of said payment must be verified by the supplier. If proof of payment is not furnished within the allowable 30 days, the advanced payment will be deducted on subsequent current estimates until such time that proof of payment is furnished.

**907-109.07--Changes in Material Costs.** After the fifth paragraph of Subsection 109.07 on page 96, change the web address to the following.

[https://mdot.ms.gov/portal/current\\_letting](https://mdot.ms.gov/portal/current_letting)

# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-411-1

CODE: (IS)

DATE: 06/13/2018

SUBJECT: Material Transfer Equipment

Section 411, Ultra-Thin Asphalt Pavement, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

**907-411.03--Construction Requirements.** After Subsection 411.03.10 on page 327, add the following.

**907-411.03.11--Material Transfer Equipment.** Excluding 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.

**907-411.05--Basis of Payment.** Add the “907” prefix to the pay item listed on page 328.



# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

## SUPPLEMENT TO SPECIAL PROVISION NO. 907-618-4

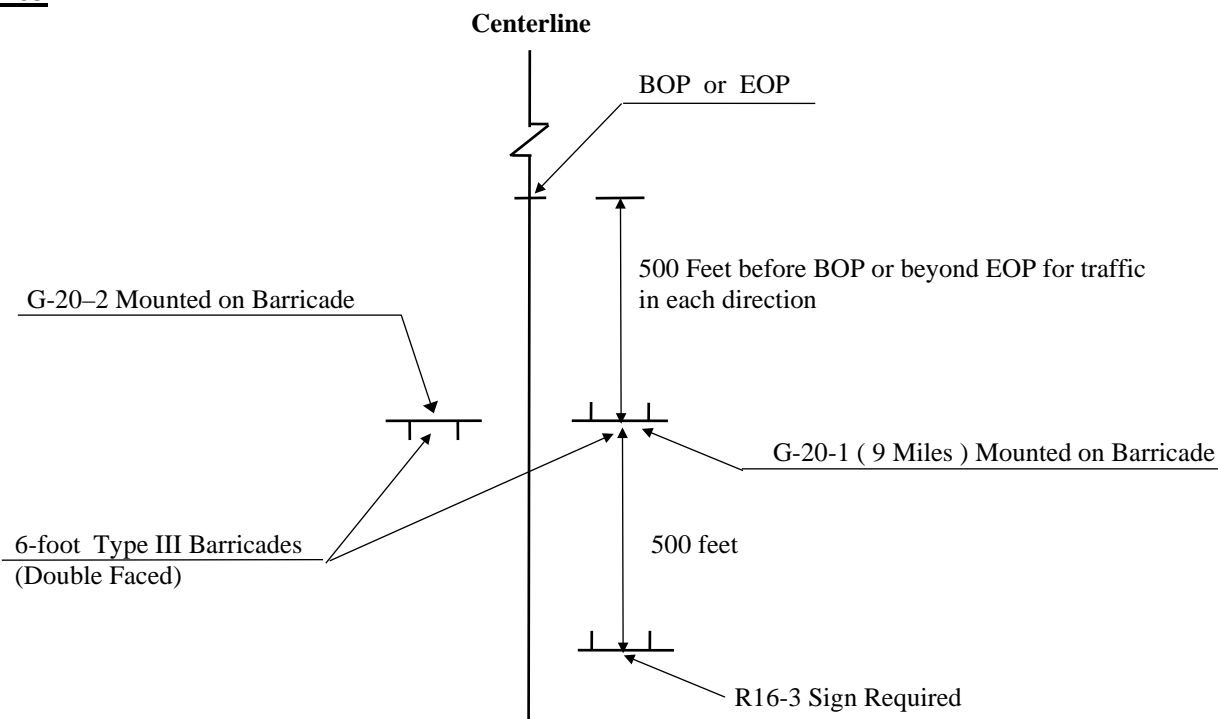
**DATE:** 01/30/2024

**PROJECT:** SP-1132-00(016) & SP-2167-00(003) / 109023301 & 302 -- Wayne County

After the first paragraph of Subsection 907-618.01.2 on page 1, add the following.

Additional traffic control devices will be required as follows.

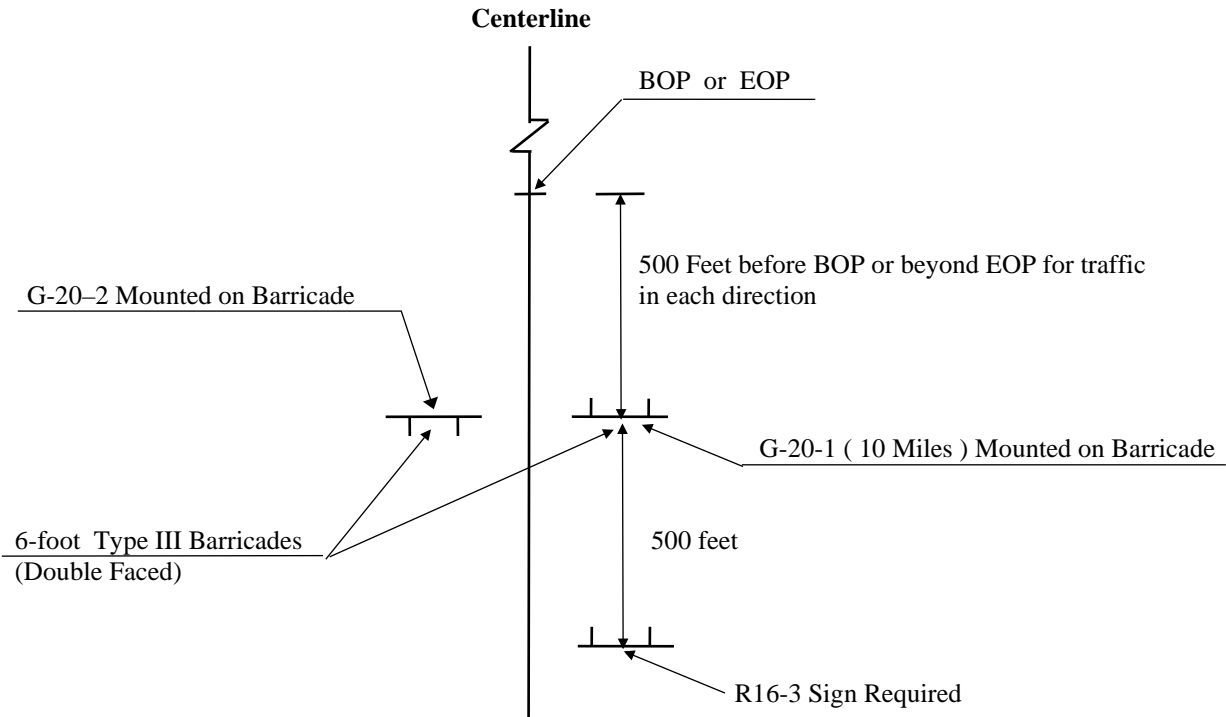
### SR 63



### ADDITIONAL TRAFFIC CONTROL SIGNS REQUIRED:

- 44 - W20-1 "AHEAD" signs required. One (1) W20-1 "AHEAD" sign is required at each local road or street entering the project.
- 115 - R4-1 "DO NOT PASS" signs required.
- 12 - R4-2 "PASS WITH CARE" signs required.
- 12 - W14-3 "NO PASSING ZONE" signs required.
- 10 - R16-3 "SPEEDING FINES DOUBLED" signs required.

**SR 184**



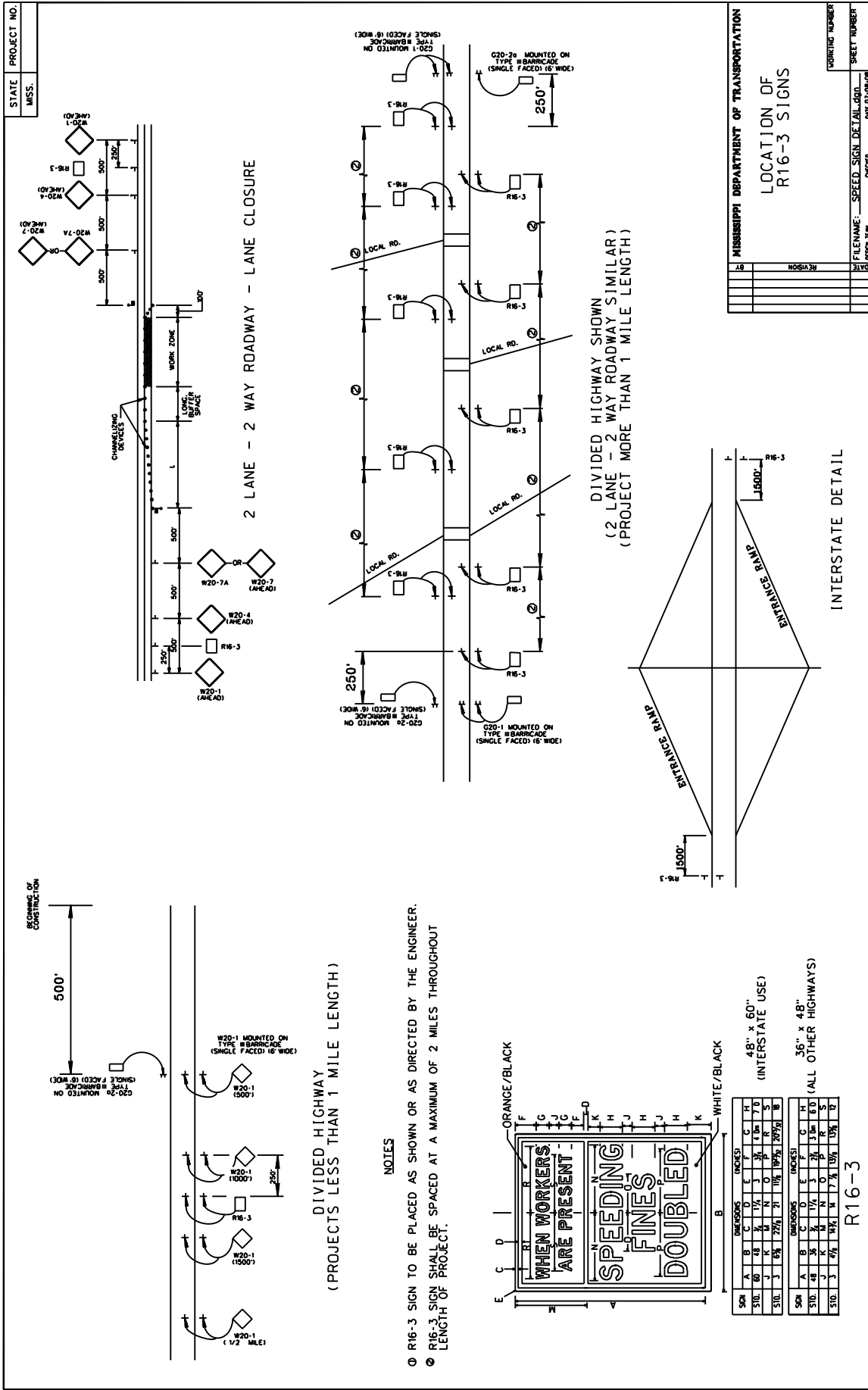
**ADDITIONAL TRAFFIC CONTROL SIGNS REQUIRED:**

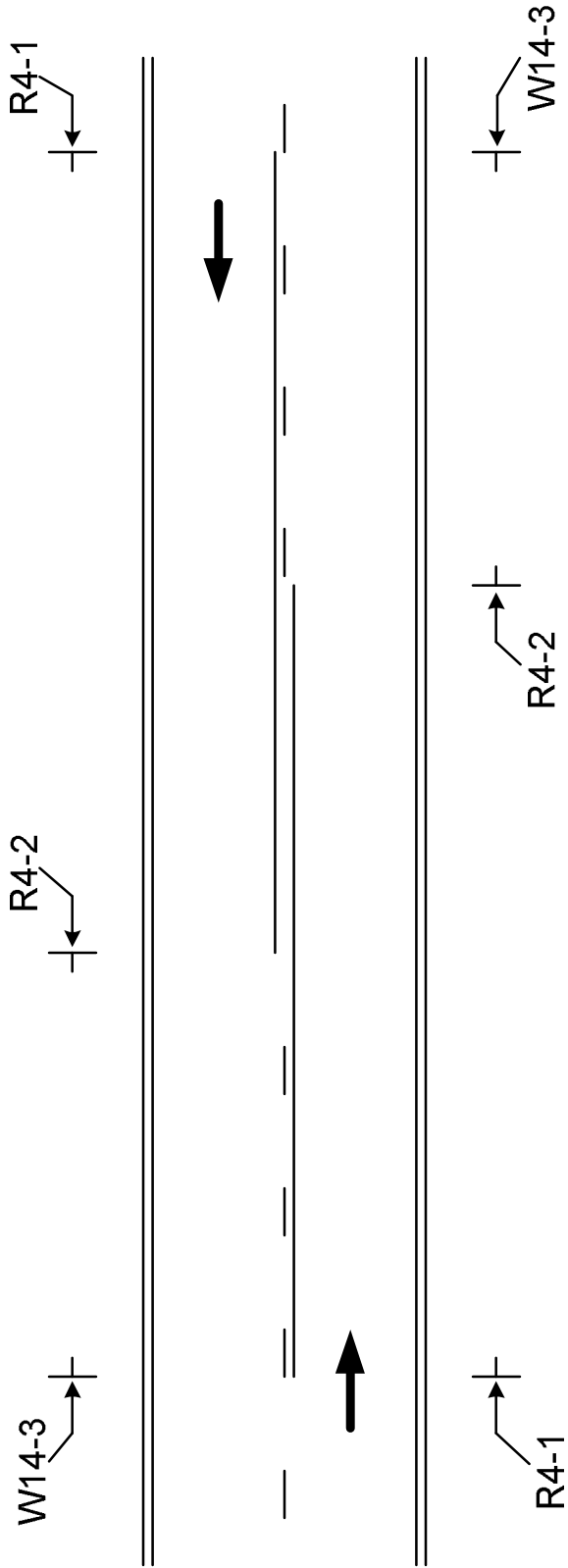
- 15 - W20-1 "AHEAD" signs required. One (1) W20-1 "AHEAD" sign is required at each local road or street entering the project.
- 3 - R4-1 "DO NOT PASS" signs required.
- 0 - R4-2 "PASS WITH CARE" signs required.
- 0 - W14-3 "NO PASSING ZONE" signs required.
- 0 - R16-3 "SPEEDING FINES DOUBLED" signs required.

R4-1 "DO NOT PASS", R4-2 "PASS WITH CARE", and W14-3 "NO PASSING ZONE" signs are required in accordance with Subsection 618.03.3, this drawing, and as specified in the Manual on Uniform Traffic Control Devices.

R16-3 signs shall be spaced in accordance with sheet titled "Location of R16-3 Signs".

All construction signs and barricades shown on this page shall be included in the bid price for Pay Item 618-A, Maintenance of Traffic. Fluorescent orange sheeting shall be used on all construction and traffic control signs except for R16-3, R4-1 and R4-2 signs which shall be black legend and border on white background.





The W14-3, No Passing Zone sign, shall be placed on the left side of the road at the beginning of each no passing zone.

The R4-1, Do Not Pass signs, shall be placed on the right side of the road at the beginning of the no passing zone. Additional R4-1 signs shall be placed right and left in increments of 750 to 1000 feet throughout the length of the no passing zone.

The R4-2, Pass With Care sign, shall be placed on the right side of the road at the end of the no passing zone.

The R4-1, R4-2 and W14-3 signs are to be used when standard pavement markings are not in place. The signs may also be used to emphasize pavement markings.

## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-618-4

CODE: (SP)

DATE: 02/01/2018

SUBJECT: Additional Signing Requirements

Section 618, Maintenance of Traffic and Traffic Control Plan, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

**907-618.01.2--Traffic Control Plan.** At the end of Subsection 618.01.2 on page 441, add the following:

For compliance with the traffic control plan, the Contractor will be required to install and maintain traffic control devices at various locations throughout the project. Payment for these devices will be included in the price bid for pay item no. 618-A, Maintenance of Traffic per lump sum.

## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-619-6

CODE: (SP)

DATE: 03/21/2018

SUBJECT: Temporary Portable Rumble Strips

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

**907-619.02--Materials.** After Subsection 619.02.15 on page 472, add the following.

**907-619.02.16--Temporary Portable Rumble Strips.** Temporary portable rumble strips shall be RoadQuake manufactured by PSS and meet the following requirements:

- capable of being installed without adhesives or bolts,
- have a minimum weight of 100 pounds,
- have a minimum overall length of 11 feet,
- have a minimum width of 12 inches, and
- have a maximum height of 3/4 inch.

Temporary portable rumble strips shall be installed in accordance with the attached details, or as directed by the Engineer.

**907-619.03--Construction Requirements.** After Subsection 619.03.11 on page 476, add the following.

**907-619.03.16--Temporary Portable Rumble Strips.** Temporary portable rumble strips shall be placed at locations shown on the traffic control plans, attached drawing, or as directed by the Engineer. The rumble strips shall be removed when lane closures are removed, relocated when lane closures are relocated, or as directed by the Engineer.

Prior to placement of the rumble strips, the roadway shall be cleaned to be free of dust, sand, and other materials that may cause slippage. The minimum roadway temperature at the time of installation shall be in accordance with manufacturer recommendations.

A minimum of three (3) temporary portable rumble strips shall be arranged in an array. The spacing of temporary portable rumble strips in each array shall be on 15-foot centers. One array of three (3) strips shall be used in each lane. The rumble strips shall be regularly monitored and maintained to ensure they stay in place under traffic.

**907-619.04--Method of Measurement.** At the end of Subsection 619.04 on page 478, add the following.

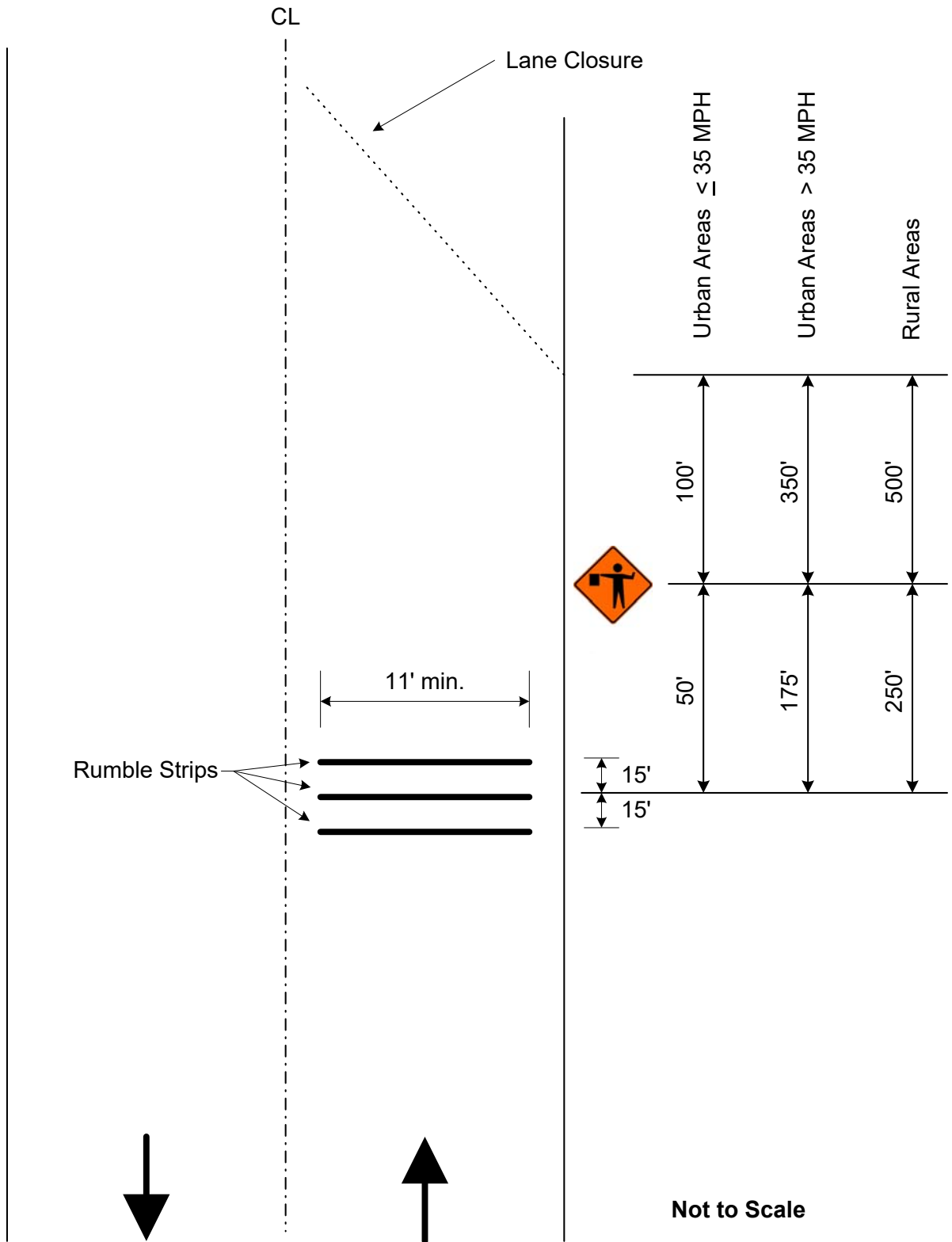
Temporary Portable Rumble Strips will be measured for payment by the linear foot only when a pay item for temporary portable rumble strips is included in the contract. Otherwise, temporary portable rumble strips will be included in the cost of pay item 618-A, Maintenance of Traffic. The quantity of temporary portable rumble strips will be the length of rumble strips approved by the Engineer to be in-place on the project at any one time.

**907-619.05--Basis of Payment.** After the fifth paragraph of Subsection 619.05 on page 478, add the following.

Temporary Portable Rumble Strips measured as prescribed above, will be paid for at the contract unit price per linear foot, which price shall be full compensation for cleaning the roadway surface, installing the rumble strips, maintenance and repair of the strips, cleaning and resetting of the strips, removal and replacement, and for all labor, equipment, tools, and incidentals necessary to complete the work.

After the last pay item listed on page 480, add the following.

907-619-B: Temporary Portable Rumble Strips - per linear foot



**Detail of Temporary Portable Rumble Strips**



# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-624-1

CODE: (SP)

DATE: 01/17/2017

SUBJECT: Inverted Profile Thermoplastic Traffic Stripe

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

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

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

**907-624.02--Materials.**

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

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

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

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

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

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

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

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

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

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

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

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

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

**907-624.02.2.6--Flow Characteristics.**

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

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

**907-624.02.2.7--Reflectivity.** The initial reflectance for the in-place marking shall have a minimum reflectance value of 450 mcd/ft<sup>2</sup> for white and 350 mcd/ft<sup>2</sup> for yellow, when measured with a MiroLux Ultra 30 retroreflectometer, or approved equal.

**907-624.02.2.8--Wet Reflectivity.** The initial reflectance for the in-place marking when wet shall have a minimum reflectance value of 200 mcd/ft<sup>2</sup> for white and 175 mcd/ft<sup>2</sup> for yellow, when measured with an approved retroreflectometer. The stripe shall be wetted utilizing a pump type sprayer for five (5) seconds. After 30 seconds, place the retroreflectometer on the stripe and measure the reflectance.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**907-624.03--Construction Requirements.**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

- (A) Skip Lines: Eighteen (18) measurements, distributed over six (6) skip lines, shall be made at each check point.
- (B) Center Lines and/or Edge Lines: Eighteen (18) measurements shall be made over 300 linear feet of continuous stripe.

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

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

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

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

Payment will be made under:

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

\* High Contrast may be specified

# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-640-1

CODE: (IS)

DATE: 11/15/2017

SUBJECT: Inductive Loop Vehicle Detection Systems

Section 640, Inductive Loop Vehicle Detection Systems, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

**907-640.01--Description.** Delete the first sentence of Subsection 640.01 on page 578, and substitute the following.

This work consists of furnishing all component materials required to form complete independent vehicle inductive loop detection systems as specified herein.

**907-640.02--Materials.**

**907-640.02.2.4.1--Tuning.** Delete the sentence in Subsection 640.02.2.4.1 on page 579, and substitute the following.

The amplifier card shall tune automatically upon the application of power in accordance with NEMA TS 2-2003 v02.06 Section 6.5.2.20.

**907-640.02.2.4.2--Modes of Operation.** Delete the sentence in Subsection 640.02.2.4.2 on page 579, and substitute the following.

Each amplifier card channel shall be capable of functioning in both presence and pulse mode in accordance with NEMA TS 2-2003 v02.06 Section 6.5.2.17.

**907-640.02.2.4.3--Sensitivity Control.** Delete the sentence in Subsection 640.02.2.4.3 on page 579, and substitute the following.

Each channel of the amplifier card shall meet NEMA TS 2-2003 v02.06 Section 6.5.2.15 requirements for sensitivity controls.

**907-640.02.2.4.4--Crosstalk Avoidance.** Delete the sentence in Subsection 640.02.2.4.4 on page 579, and substitute the following.

The amplifier card shall be capable of preventing crosstalk between channels of the same unit in accordance with NEMA TS 2-2003 v02.06 Section 6.5.2.23.

**907-640.02.2.4.5--Outputs.** Delete the sentence in Subsection 640.02.2.4.5 on page 579, and substitute the following.

Each output device shall conform to NEMA TS 2-2003 v02.06 Section 6.5.2.26 requirements.

**907-640.02.2.4.6--Controls and Indicators.** Delete the sentence in Subsection 640.02.2.4.6 on page 580, and substitute the following.

All amplifier card controls and indicators shall be in accordance with NEMA TS 2-2003 v02.06 Section 6.5.2.25.

**907-640.02.2.4.7--Self-Tracking.** Delete the sentence in Subsection 640.02.2.4.7 on page 580, and substitute the following.

The amplifier card shall automatically accommodate after- tuning changes in the loop/lead-in in accordance with NEMA TS 2-2003 v02.06 Section 6.5.2.21.

**907-640.02.2.4.10--Loop Detector Amplifier Tests.** Delete the sentence in Subsection 640.02.2.4.10 on page 580, and substitute the following.

Each amplifier card shall conform to the performance requirements set forth in NEMA TS 2-2003 v02.06 Section 2.8.

**907-640.02.2.4.12--Delay and Extension Timing.** Delete the last two sentences in Subsection 640.02.2.4.12 on page 580, and substitute the following.

Detector card delay timing capabilities shall be provided in accordance with NEMA TS 2-2003 v02.06 Section 6.5.2.24.1. Detector card extension timing capabilities shall be provided in accordance with NEMA TS 2-2003 v02.06 Section 6.5.2.24.2.

**907-640.03.1.2--Saw Cuts.** Delete the second sentence of the second paragraph of Subsection 640.03.1.2 on page 581, and substitute the following.

Where lead-in cable is required to pass through the curbside, it shall be installed in ¾-inch PVC or rigid steel conduit.

**907-640.04--Method of Measurement.** Delete the first paragraph of Subsection 640.04 on page 583.

Vehicle Loop Assembly and Shielded Cable will be measured by the linear foot computed horizontally along the saw slot, regardless of number of turns, in which the loop wire or shielded cable is installed and will include the loop lead-in to the pull box.

**907-640.05--Basis of Payment.** Delete the pay items listed on pages 583 and 584, and substitute the following.

- 907-640-A: Vehicle Loop Assembly - per linear foot
- 907-640-B: Shielded Cable, AWG \_\_, \_\_ Conductor - per linear foot
- 907-640-C: Loop Detector Amplifier \* - per each

\* Additional information may be indicated

# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-643-5

CODE: (SP)

DATE: 10/03/2023

SUBJECT: Video Vehicle Detection

Section 643, Video Vehicle Detection System, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

Delete Section 643 on pages 601 through 628 and substitute the following.

## SECTION 907-643 - VIDEO VEHICLE DETECTION

**907-643.01--Description.** This section specifies the minimum requirements for Video Vehicle Detection and Multi-Sensor Vehicle Detection furnished and installed in accordance with the design(s) for the location(s) designated on the project plans, in any related notice to bidders, or as directed. The work shall consist of providing all labor, materials, equipment, and incidentals necessary to furnish, install, test, and operate the system. The video vehicle detection system shall at a minimum use one or more sensors recommended by the manufacturer and video analytics hardware and software to detect vehicle presence, provide a detection output, and generate volume, occupancy, and speed data.

Type 1 Video Vehicle Detection shall provide presence or pulse detection of vehicles, bicycles, and pedestrians for Traffic Signal Controller inputs and be an AI Based Traffic Monitoring and Management System which detects, classifies, and tracks vehicles, pedestrians and bicyclists in areas of interest via processing of video feed from any IP, CCTV, Analog, or Fisheye Camera, on a GPU powered edge server/processor and provides a suite of outputs including NTCIP and SDLC detection calls to the controller and advanced traffic analytics. The work shall consist of providing all labor, materials, equipment, and incidentals necessary to furnish, install, and test the Video Vehicle Detection equipment, complete and ready for service. The Sensor and Processor shall be paid for separately under different pay items. Type 1A Sensor shall be a fixed bullet style camera. Type 1B Sensor shall be a fisheye style camera.

Type 2 Video Vehicle Detection shall provide presence or pulse detection of vehicles, bicycles, and pedestrians for Traffic Signal Controller inputs utilizing a camera with independent video detection processor. The work shall consist of providing all labor, materials, equipment, and incidentals necessary to furnish, install, and test the Video Vehicle Detection equipment, complete and ready for service.

Type 3 Video Vehicle Detection shall provide presence or pulse detection and tracking of vehicles, bicycles, and pedestrians for Traffic Signal Controller inputs. Type 3 Video Vehicle Detection shall be a single (multiple may be required for large intersections) fisheye lens camera, designed to be mounted on signal pole or mast arm, with included detection processor. The work shall consist of providing all labor, materials, equipment, and incidentals necessary to furnish,

install, and test the Video Vehicle Detection equipment, complete and ready for service. The Sensor and Processor shall be paid for separately under different pay items.

Multi-Sensor Vehicle Detection will provide detection of vehicles on a roadway using a Multi-Sensor Detection for Traffic Signal Controller inputs. The Multi-Sensor shall utilize two (2) different sensors of different technologies, video imaging and radar, to detect and track vehicles. The module shall process information from both video imaging and radar sensors simultaneously in real-time. The work shall consist of providing all labor, materials, equipment, and incidentals necessary to furnish, install, and test the Multi-Sensor Vehicle Detection equipment, complete and ready for service. The Sensor and Processor shall be paid for separately under different pay items.

**907-643.02--Materials.**

**907-643.02.1--Materials for Type 1 Video Vehicle Detection.** Type 1 Video Vehicle Detection shall consist of a GPU server/processor, deep learning-based object detection and classification algorithms, tracking algorithms, application software, and all associated equipment required to setup and operate in a field environment.

Type 1 Video Vehicle Detection shall utilize video input from any IP, CCTV and/or Analog camera to collect video image data for the GPU server for purposes of detecting and classifying vehicles, pedestrians and bicyclists and generating traffic data. Type 1 Video Vehicle Detection shall be able to communicate detection calls to the traffic controller using NTCIP and SDLC standard.

Type 1 processor shall utilize either multiple fixed view cameras or a single fisheye camera depending on the layout of the intersection. When using a fisheye lens camera, the processor must be able to provide advanced detection for each approach utilizing a single camera. The processor shall utilize and demonstrate tracking-based algorithms (in lieu of trip-line) to provide real-time vehicle, pedestrian, and bicyclist detection outputs. The processor shall be able to detect either approaching or departing vehicles in multiple traffic lanes simultaneously. The processor shall be able to issue detection calls based on vehicle class (car, light truck, heavy truck, bus, motorcycle, bicyclist, pedestrian). The processor shall be able to communicate detection calls to the traffic controller using NTCIP and SDLC standard. The processor shall provide flexible detection placement anywhere within the field of view of the camera. A single detection template shall be able to replace one or more conventional detector loops. The processor shall operate at a level of performance comparable to properly operating inductive loops, excluding issues of occlusion due to limitations imposed by camera placement. The processor shall trigger a state of "all call" to the controller in the event of an equipment failure or system malfunction.

The Type 1 processor shall be rack or shelf mountable and shall be designed to operate reliably in the adverse environment found in the typical roadside traffic cabinet. The processor shall operate at 120-240 VAC, requiring 30W or less power. The processor shall not require shielding from other electronic devices, such as power supplies and communication equipment and shall feature LAN, HDMI, and USB interface ports on the front surface of the unit. The processor shall be able to interface with analog cameras via built-in analog camera adapter and BNC connector (4 channel). The processor shall be able to communicate via both NTCIP and SDLC with traffic

controllers.

The Type 1 software shall support the creation and modification of at least thirty (30) object detection templates within the graphical user interface. The application software shall show images of the object detection templates superimposed on the video image of traffic. The application software shall support the assignment of a phase and detector number to each road and crosswalk lane. These assignments can be modified at any time through the software. The application software shall support direction of travel assignment within detection template. The application software shall place a detection box around all detected and tracked objects (cars, pedestrians, etc.). The application software shall calculate and display speed for each detected object. The application software shall calculate wait times for all detected objects when stopped. The application software shall maintain a database of current and historical traffic data and allow for the user to run reports against this data to include traffic counts, turn movement counts, average speed, 85<sup>th</sup> percentile speed, vehicle classification by lane, wait times, arrivals on green, queue length, level of service and total delay.

Type 1A sensor shall be a fixed bullet style camera. Type 1A sensors shall be full featured network cameras with a minimum of 5-megapixel resolution. Single fixed view cameras shall be optimized to capture images in challenging light conditions including low light and strong backlight. Single fixed view cameras shall be outdoor rated with a wide temperature range and shall be impact resistant and ready for extreme temperatures. Zoom and focus shall be remotely controlled. Mounting hardware shall be included with the sensor.

Type 1B sensor shall be a Fisheye style camera. Type 1B sensors shall deliver video in any light condition using forensic WDR, IR and Lightfinder technologies. The sensor shall offer a minimum of 12 MP resolution and offer 360 degrees of viewing. The Sensor shall offer a 360-degree overview, de-warped panorama, double panorama and corridor and quad views. All views shall be able to be streamed simultaneously up to 12 fps. The sensor shall be password protected and IP based with network access control. The sensor shall be designed to operate reliably in an operating temperature ranging from -40°F to +131°F degrees at 5 percent to 95 percent relative humidity, non-condensing. Mounting hardware shall be included with the sensor.

Power and communications cable shall either be Cat-5E or Cat-6, outdoor rated, shielded cable.

**907-643.02.2--Materials for Type 2 Video Vehicle Detection.** Type 2 Video Vehicle Detection shall consist of a power supply, video camera, mounting brackets, lightning protection, and a separate processor capable of processing the number of camera and phase combination video sources shown on the project plans.

Type 2 processor shall have a minimum of 24 detection zones per camera input and each detection zone shall be capable of being sized to suit the site and the desired vehicle detection area. Six (6) additional count zones for bicycles shall be provided to accumulate bicycle counts at user specified intervals. Type 2 processor shall have up to six (6) detection zones per camera view that have the capability to count the number of vehicles detected, measure classification, occupancy, and speed.

Type 2 processor shall be shelf mounted and shall be capable of sending high-resolution



streaming video to a traffic management center. Type 2 processor shall have one or more video inputs and one (1) video output, responding to specific site applications, camera locations and detection zones shown on the project plans. The system shall be NTCIP compliant utilizing either Ethernet or SDLC communications with the controller.

The Type 2 processor shall be able to detect vehicles and bicycles in real time as they travel across each detection zone and detect in multiple lanes using only the video image. Detection zones shall be programmed utilizing either a wireless connection or via ethernet with a laptop or tablet. The menu shall facilitate placement of detection zones and setting of zone parameters or to view system parameters. The video detection processor shall default to a safe condition, such as minimum recall, fixed recall or a constant call on each active detection channel, in the event of unacceptable interference with the video signal, low visibility conditions, or power failure. The Processor shall be capable of automatically detecting a low-visibility condition such as fog and respond by placing all defined detection zones in a constant call mode. The system shall automatically revert to normal detection mode when the low-visibility condition no longer exists.

Type 2 sensors shall be completely compatible with the video detection processor and shall be certified by the manufacturer to ensure proper system operation. Type 2 sensors shall produce accurate detector outputs under all roadway lighting conditions, regardless of time of day. The minimum illumination of the sensor shall be 1.0 Lux. The lens shall have a minimum of 12x optical zoom and shall have a maximum power consumption of 10 watts. The sensor shall have a maximum weight of 4.8 pounds. The field of view shall be adjustable from ground level. The Sensor shall include mechanisms to compensate for changing of lighting by using an electronic shutter and/or auto-iris lens. The sensor shall be housed in a weather-tight sealed enclosure and shall be equipped with a sunshield. The sunshield shall include a provision for water diversion to prevent water from flowing in the camera's field of view. The sensor enclosure shall include a thermostatically controlled heater to assure proper operation of the lens shutter at low temperatures and prevent moisture condensation on the optical faceplate of the enclosure. The sensor enclosure shall be equipped with weather-tight connections for power/communications. The sensor shall meet the regulatory requirements of NEMA TS-2, FCC part 15, Class A.

Power and communications cable shall either be Cat-5E or Cat-6, outdoor rated, shielded cable.

**907-643.02.3--Materials for Type 3 Video Vehicle Detection.** Type 3 Video Vehicle Detection processor shall support one or more fisheye camera sensors. If equipped with one sensor, the processor shall be capable of simultaneously supporting up to four (4) additional sensors for special requirements, such as advance detection or underpass detection.

The processor shall comply with NEMA standards, TS1, TS2 Type 1 and Type 2, 170/2070 and ITS.

The processor will have at a minimum four (4) USB 3.0 ports for expansion flexibility and have an optional, built-in modem, and shall not exceed 8.5" x 11.5" x 1.75" and weigh no more than 5.2 pounds. The unit shall have flexible mounting options including the ability to lie flat on a cabinet shelf, be mounted in a standard traffic cabinet rack with optional mounting ears or be installed vertically with optional base. The outer enclosure shall be a powdered-coated aluminum.

A surge protection junction unit shall be provided for each sensor.

An Ethernet protection module shall be provided for each sensor and installed in the traffic signal cabinet.

The Type 3 Video Vehicle Detection shall have at least one downward-facing fisheye sensor capable of seeing the center of the intersection and have an omnidirectional line of site to track vehicles entering and exiting the intersection. The sensor shall be a color sensor and shall require no adjustment for focus. The sensor shall have a thermostatically controlled heater residing inside the enclosure to reduce the effects of ice and condensation. Any plastics used on or in the enclosure shall have ultraviolet inhibitors. A waterproof and dust tight aluminum enclosure shall be utilized. The weight of the sensor including the enclosure shall not exceed eight pounds.

The sensor's mounting bracket shall utilize a two (2) piece, ten (10) foot 90° mounting pole. The sensor junction box should mount at the base of the vertical pole and allow for the installer to adjust the sensor's horizontal position with one hand and tighten the bracket without having to support the sensor simultaneously.

The Type 3 Video Vehicle Detection configuration shall be for a system that views, captures, and derives data based on the objects that pass within the sensor field of view along a highway, road, ramp, or other commonly used transit pathway via processing video images. Signal Performance Metrics shall be captured by the system.

The system shall have a modular electrical design and use Ethernet to connect and network with the different system components. Streaming video images, alerts, and data shall be transmitted from the field back to a Traffic Operations Center (TOC) via the systems client software.

The Type 3 Video Vehicle Detection shall provide real time vehicle detection (within 500 milliseconds (ms) of vehicle arrival). The system should detect the presence of vehicles for up to 64 detection zones per sensor. The detection zones shall be sensitive to the direction a vehicle travels and the direction to be detected by each detection zone shall be programmable by a client software user. The system should provide a flexible detection zone placement anywhere within one hundred (150) feet of the sensors. Advanced detection zones may be placed up to three hundred (300) feet from a Fisheye sensor when mounted at least forty (40) feet high.

Placement of detection zones will be done by means of a graphical interface using the MJPEG image of the roadway. The client software displays images of the detection zones overlaid on the video image of traffic while the processor is running. The detection zones, when operating, shall display outlined or filled, with a visible change indicating activation.

A laptop should be used to draw detection zones. Alternatively, a mouse, keyboard, and monitor may be connected directly to the processor to configure a site. The detection zones should be capable of being sized and shaped to provide optimal road coverage and detection.

When a vehicle occupies a detection zone, the detection zone on the live video will indicate the

presence of a vehicle, thereby verifying proper operation of the system.

The presence of the vehicle as well as the signal states will be indicated via colored LED lights on the front panel of the processor.

Equipment failure, either sensor or the processor, shall result in constant vehicle detection on the affected detection zones.

The sensors will use five (5) watts nominally and a maximum of fifty (50) watts with active heaters. The sensors will be Power over Ethernet (POE) and will only require a single shielded, burial grade, gel filled CAT5e cable for both power and data, or composite fiber cable. Each sensor shall have its own surge protector junction unit and EPM surge protection unit in the traffic cabinet. The processor shall operate within a range of 89 to 240 VAC, 60Hz single phase. Power to the processor is from the transient protected side of the AC power distribution system in the traffic control cabinet where the processor is installed.

**907-643.02.4--Materials for Multi Sensor Vehicle Detection.** Multi-Sensor Vehicle Detection Sensor assembly shall utilize two (2) different sensors of different technologies, video imaging and radar, to detect and track vehicles at distances up to 600 feet. The detector shall fuse vehicle information from the two sensors to provide highly accurate and precise detection for special or advanced applications. The system shall include a video imaging sensor and radar sensor, and a separate detection processor.

The Multi-Sensor Vehicle Detector processor shall be a shelf mounted unit. The processor shall process information from both video imaging and radar sensors simultaneously in real-time. An LED indicator shall be provided to indicate the presence of the sensor signal. The LED shall illuminate upon valid sensor synchronization and turn off when the presence of a valid sensor signal is removed. For multi-channel video input configurations, a momentary push-button shall be provided on the front panel to cycle through each input video channel. The real-time video output shall have the capability to show text and graphical overlays to aid in system setup. A communications port shall be provided on the front panel that allows the user to remotely configure the system and/or to extract calculated vehicle/roadway information. Each MVD shall have the capability to be addressable. Additionally, the processor shall allow the use of extension modules to provide up to 24 open collector contact closures per camera input. Each open collector output shall be capable of sinking 30 mA at 24 VDC. Open collector outputs will be used for vehicle detection indicators as well as discrete outputs for alarm conditions. The processor shall utilize non-volatile memory technology to store on-board firmware and operational data. The processor shall not consume more than 20 watts.

Detection zones shall be programmed via a laptop or tablet. The menu shall facilitate placement of detection zones and setting of zone parameters or to view system parameters. The processor shall store up to three (3) different detection zone patterns in non-volatile memory. The processor shall detect vehicles in real time as they travel across each detection zone and shall default to a safe condition, such as a constant call on each active detection channel, in the event of unacceptable interference or loss of the sensor signal. Up to 24 detection zones per camera input shall be supported and each detection zone can be sized to suit the site and the desired

vehicle detection region.

The video imaging camera sensor shall be supplied by the Multi-Sensor Vehicle Detection manufacturer. The camera enclosure shall utilize technology for the heating element of the front glass cable terminations at the data combiner for video and power shall not require crimping or special tools and shall have a weatherproof protective cover. The camera sensor shall allow the user to set the focus and field of view via Wi-Fi connectivity. The camera shall produce a useable video image of vehicles under all roadway lighting conditions, regardless of time of day. The camera electronics shall include automatic gain control (AGC) and shall be digital signal processor (DSP). The camera sensor shall include an electronic shutter control and auto-iris lens that operates in tandem with the electronic shutter. The lens shall be a minimum 10X zoom lens with a variable focal length. The camera shall be housed in a weather-tight sealed enclosure conforming to IP-67 specifications. The housing shall allow the camera to be rotated to allow proper alignment between the camera and the traveled road surface. The camera enclosure shall be equipped with a sunshield. The sunshield shall include a provision for water diversion to prevent water from flowing in the camera's field of view. The glass face on the front of the enclosure shall have an anti-reflective coating to minimize light and image reflections.

The radar sensor shall operate in the 24 GHz frequency band. The detection range shall be 600 feet minimum. The sensor shall be able to track up to 20 independent objects simultaneously in one (1) to four (4) traffic lanes. Object speed detection shall be within a range of zero (0) to 150 mph. The radar sensor shall be housed in a weather-tight sealed enclosure conforming to IP-67 specifications. The housing shall allow the radar to be adjusted to allow proper alignment between the sensor and the traveled road surface. The radar sensor shall communicate with and acquire power from the sensor data combiner. Data and power cables between the radar sensor and sensor data combiner shall be fully isolated from the sensor enclosure.

Multi-Sensor Vehicle Detection Sensor assembly shall be housed in an overall, single enclosure. The maximum power consumption for the assembly shall be less than ten (10) watts typical, twenty (20) watts peak.

The power/communications cable to be used between the Multi-Sensor Vehicle Detection Sensor assembly and the processor shall be a single Cat-5E or Cat-6 outdoor rated cable.

**907-643.02.5--Functional Requirements.** Detection shall be at least 98% accurate in all weather conditions, with slight degradation acceptable under adverse weather conditions (e.g., rain, snow, or fog) which reduce visibility. Detection accuracy is dependent upon site geometry, camera placement, camera quality and detection zone location, and these accuracy levels do not include allowances for occlusion or poor video due to camera location or quality. For presence detection, the detection zone shall be active as long as a vehicle or pedestrian occupies the zone. Detection accuracy of the system shall be comparable to properly operating inductive loops. Detection accuracy should include the presence of any vehicle in the defined detection zone regardless of the lane the vehicle is occupying.

**907-643.02.6--Physical and Environmental Specifications.**

**907-643.02.6.1--Type 1 Video Vehicle Detection.** The GPU server shall be designed to operate reliably in an operating temperature ranging from -29°F to +165°F degrees at 0 percent to 95 percent relative humidity and have vibration and shock parameters of at least 5 G RMS 10 to 500 Hz and 50 G, half sine 11 ms, respectively. System components comply with the environmental requirements detailed in the NEMA TS 2 standard.

**907-643.02.6.2--Type 2 Video Vehicle Detection.** The interface shall operate in a temperature range from -31°F to +165°F and a humidity range from 0% to 95% relative humidity. The video vehicle detection processor shall operate reliably in a typical roadside traffic cabinet environment. Internal cabinet equipment and a video vehicle detection processor shall be provided that meets the environmental requirements of NEMA TS-2-2003 Section 2. If the processor is located in the sensor, it shall meet the same requirements.

The sensor(s) shall operate in a temperature range of -30°F to 140°F. Additionally, a heater shall be included to prevent the formation of ice and condensation in cold weather. The heater shall not interfere with the operation of the video camera sensor electronics, or cause interference with the video signal.

Vibrations shall meet the requirements of NEMA TS 2-2003 Section 2.1.9.

Shock shall meet the requirements of NEMA TS 2-2003 Section 2.1.10.

The sensor and enclosure shall withstand 150 dB for 30 minutes continuously, with no reduction in function or accuracy.

**907-643.02.6.3--Type 3 Video Vehicle Detection.** The processor will meet or exceed the NEMA TS-2 standard of -29° F - 165° F (-34° C - 74° C) and meet or exceed a 5-30Hz vibration test as well as a 10G shock test. The processor shall operate properly in an environment with 0% to 95% relative humidity, non-condensing.

The sensor(s) shall operate properly in an environment with 0% to 100% relative humidity.

**907-643.02.6.4--Multi-Sensor Vehicle Detection.** When mounted outdoors in the enclosure, the sensor assembly shall operate in a temperature range from -29°F to +165°F and a humidity range from 0% RH to 100% RH.

The processor shall operate satisfactorily in a temperature range from -40°F to +165°F and a humidity range from zero (0) %RH to 95 %RH, non-condensing as set forth in NEMA specifications.

### **907-643.03--Construction Requirements.**

**907-643.03.1--Installation.** Installation of the Video and Multi-Sensor Vehicle Detection shall be as recommended by the manufacturer and performed by a Contractor trained and certified by the supplier. Where time does not reasonably permit training of the installing Contractor, a supplier factory representative shall supervise and assist a Contractor during installation of the

**Video and Multi-Sensor Vehicle Detection.**

The Contractor shall perform the following:

- 1) Install all sensors, system processors and associated enclosures and equipment at the locations specified in the plans, in any related notice to bidders, per manufacturer's recommendations, or as directed.
- 2) Install all cabinet-mounted equipment in the intersection equipment cabinet or as specified in the plans.
- 3) Cabling from all sensors shall be installed in accordance with the manufacturer's recommendations.
- 4) Make all necessary adjustments and modifications to the **system** prior to requesting inspection for system/device acceptance.
- 5) Mount the sensors as per manufacturer's recommendations or as shown in the plans.
- 6) Mount the sensors to view approaching traffic unless otherwise directed.
- 7) Optimize the **sensor's** location and zone of detection as directed by the Engineer, or authorized designee.
- 8) Adjust the sensor zoom lens to match the width of the road/detection area and minimize lane vehicle occlusion.
- 9) Fasten all other cabinet components, with hex-head or Phillips-head machine screws insulated with nuts (with locking washer or insert) or into tapped and threaded holes. Do not use self-tapping or self-threading fasteners.
- 10) Provide electrical cables for video, communications signaling and power supply between the cabinet and the sensor as recommended by the manufacturer, and as required for a fully functional System.

**907-643.03.2--Testing.** All equipment associated with the Video and Multi-Sensor Vehicle Detection **system** shall undergo testing to verify conformance to requirements of the plans and these special provisions. All costs associated with testing shall be included in the overall contract price; no separate payment will be made for any testing.

If requested by the Project Engineer, Standalone Acceptance Testing (SAT) shall include videos of the approach with detection zones overlaid showing detector activations. A **one (1) hour video** shall be made of each approach and compared to actual detection calls. 30-minute videos shall be made starting 15 minutes prior to sunrise and sunset for each approach and compared to actual detection calls. All videos shall be date and time stamped. All videos shall be provided to the Engineer with a summary of the results including total calls, missed calls and false calls. All test results must meet a 98% accuracy requirement. The Contractor must demonstrate the accuracy requirements at selected intersections after a (30) day burn in period. The intersections to be tested will be randomly selected by the Project Engineer.

**907-643.03.3--Warranty.** The Video and Multi-Sensor Vehicle Detection shall be warranted to be free of manufacturer defects in materials and workmanship for a period of **one (1) year** from the date of final acceptance. Equipment covered by the manufacturer's warranties shall have the registration of that component placed in the Department'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 the Department 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.

**907-643.03.4--Training.** When called for in the **plans**, the Contractor shall submit to the Project Engineer for approval a detailed **training plan** including course agendas, detailed description of functions to be demonstrated and a schedule. The Contractor must also submit the **trainer's** qualifications to the Project Engineer for approval prior to scheduling any training. The training must include both classroom style training and hands-on training in the field of the maintenance and troubleshooting procedures required for each component. The training should also consist of a hands-on demonstration of all software configuration and functionality where applicable.

The supplier of the detection system shall, at a minimum, provide a 16-hour operations and maintenance training class with suitable documentation for up to eight (8) **people** selected by the Department. The operations and maintenance class shall be scheduled at a mutually acceptable time and location.

**907-643.03.5--Maintenance and Technical Support.** The supplier shall maintain an adequate inventory of parts to support maintenance and repair of the detection system. Spare parts shall be available for delivery within 30 days of placement of an acceptable order at the **supplier's** current pricing and terms of sale of said spare parts.

The suppliers shall maintain an ongoing program of technical support for the 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.

The installation or training support shall be provided by a factory-authorized representative and shall be a minimum IMSA-Level II Certified Traffic Signal Technician.

All product documentation shall be written in the English language.

**907-643.04--Method of Measurement.** Video and Multi-Sensor Vehicle Detection Sensor of the type specified will be measured as a unit per each.

Video and Multi-Sensor Vehicle Detection Processor of the type specified will be measured as a unit per each.

Video and Multi-Sensor Vehicle Detection Cable and/or Power Cable will be measured by the linear foot, measured horizontally along the conduit, messenger cable or mast arm and vertically along the pole.

Video and/or Multi-Sensor Vehicle Detection Training will be measured as a lump sum after the

completion of all training.

**907-643.05--Basis of Payment.** Video and Multi-Sensor Vehicle Detection Sensor, measured as prescribed above, will be paid for at the contract unit price per each, which price shall be full compensation for installation, system integration, documentation, system software, and testing of a complete video detection sensor site including video camera sensor, the sensor environmental enclosure, attachment hardware and brackets, completion of all testing requirements, warranties and all work, equipment and appurtenances as required to provide and install a complete video detection system. The price bid shall also include all system documentation including shop drawings, operations, and maintenance manuals, wiring diagrams, block diagrams and other materials necessary to document the operation of the Video and Multi-Sensor Vehicle Detection Sensor. This price shall be full compensation for all labor, tools, materials, equipment, and incidentals necessary to complete the work and quality assurance.

Video and Multi-Sensor Vehicle Detection Processor, measured as prescribed above, will be paid for at the contract unit price per each, which price shall be full compensation for installation, system integration, documentation, system software, and testing of a complete video detection processor site including video detection processor, completion of all testing requirements, warranties and all work, equipment and appurtenances as required to provide and install a complete video detection system. The price bid shall also include all system documentation including shop drawings, operations, and maintenance manuals, wiring diagrams, block diagrams and other materials necessary to document the operation of the Video and Multi-Sensor Vehicle Detection Processor. This price shall be full compensation for all labor, tools, materials, equipment, and incidentals necessary to complete the work and quality assurance.

Video and Multi-Sensor Vehicle Detection Cable and/or Power Cable will be paid at the contract unit price per linear foot, which price shall be full compensation for all labor, materials, equipment tools, furnishing, installing, system integration, connections, testing, and all incidentals necessary to complete the work.

Video and/or Multi-Sensor Vehicle Detection Training, measured as prescribed above, will be paid for at the contract unit lump sum price, which price shall be full compensation for all training costs including all coordination, materials, labor, training location costs, and all incidentals required to complete the training.

Payment will be made under:

- 907-643-A: Video Vehicle Detection Sensor, Type \_\_\_\_\_ - per each
- 907-643-B: Video Vehicle Detection Cable - per linear foot
- 907-643-C: Video Vehicle Detection Processor, Type \_\_\_\_\_ - per each
- 907-643-D: Video and/or Multi-Sensor Vehicle Detection Training - lump sum
- 907-643-E: Multi-Sensor Vehicle Detection Sensor - per each



907-643-F: Multi-Sensor Vehicle Detection Cable - per linear foot

907-643-G: Multi-Sensor Vehicle Detection Processor - per each

# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-663-6

CODE: (IS)

DATE: 12/15/2023

SUBJECT: Networking Equipment

Section 907-663, Networking Equipment, is hereby added to and made part of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

## SECTION 907-663 -- NETWORKING EQUIPMENT

**907-663.01--Description.** This section specifies the minimum requirements for providing networking communication equipment, including network switches, terminal servers, fiber optic modems, SD-WAN routers, and associated cabling, furnished and installed.

Network Switches are divided into three (3) categories; Layer 2 hardened, Layer 3 hardened, and Layer 3 non-hardened. There can be multiple types per category such as Type A, B, C etc. Types will be defined by options based on versions and numbers of ports, and/or additional modules such as built in fiber modems, wireless components, and terminal servers. The number of specific port versions will also be defined by plan requirements, NTBs, and Special Provisions.

Field and core hardened category switches shall be environmentally hardened devices.. These switches support Intelligent Transportation Elements deployed on arterial streets and the highway system where network switches are required for communications but HVAC systems are not available for environmental control. Elements include but are not limited to traffic signals, dynamic message signs, surveillance cameras, and vehicle detection systems. Field and core non-hardened category switches will support the Intelligent Transportation System and be installed in the Traffic Management Center and Communications Huts which are environmentally controlled.

This section also specifies the minimum requirements for standalone and network switch module terminal servers, standalone and network switch modules, SD-WAN Routers, and Ethernet Network cable. The terminal servers shall be hardened. 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. SD-WAN Routers shall be used to provide data network connectivity via a cellular network bi-directionally to remote sites such as portable traffic signal sites, portable CMS, smart work zones, ITS site locations, or devices that need serial or Ethernet communication that can be provided over cellular service.

The Ethernet network cable will be installed in conduit and cabinets between elements that are within 300 feet of each other to eliminate the need for two hardened switches. The work shall consist of providing all labor, materials, equipment, and incidentals necessary to furnish, install, and test the networking equipment.

**907-663.02--Materials.** Network switches, terminal servers, cell modems, and associated cabling will be placed in the field device cabinets and shall meet the following requirements.

**907-663.02.1--Network Switch Requirements.** All 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 18dB.
  - 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 Standard Specifications. 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) Meet the IEEE 802.3 (10Mbps Ethernet) standard.
- 4) Meet the IEEE 802.3u (Fast Ethernet 100 Mbps) standard.
- 5) Meet the IEEE 802.3x (Full Duplex with Flow Control) standard.
- 6) Meet the IEEE 802.1p (Priority Queuing) standard.
- 7) Meet the IEEE 802.1Q (VLAN) standard per port for up to four VLAN's.
- 8) Meet the IEEE 802.1w (Rapid Spanning Tree Protocol) standard.
- 9) Meet the IEEE 802.3ad (Port Trunking) standard for a minimum of two groups of four ports.
- 10) The field switches shall meet IEEE 802.3D (Spanning Tree Protocol) standard.
- 11) Capable of mirroring any port to any other port within the switch.
- 12) Password manageable through:
  - a. SNMP
  - b. Telnet/CLI
  - c. HTTP (Embedded Web Server) with Secure Sockets Layer (SSL)
- 13) Full implementation of SNMPv1 and SNMPv2c.
- 14) Full implementation of GVRP (Generic VLAN Registration Protocol).
- 15) Full implementation of IGMP and IGMP snooping.
- 16) Minimum MTBF of 100,000 hrs using Bellcore TS-332 standard.
- 17) Full implementation of RFC 783 (TFTP) to allow remote firmware upgrades.
- 18) UL approved.
- 19) The field switch shall provide LED status indicators as follows:
  - 1) power on and off
  - 2) network status per port (transmit, receive, link, speed)
- 20) Unused ports (copper and optical) shall be covered with rubber or plastic dust caps/covers.
- 21) Switches Types that are required to be Environmentally Hardened shall meet the following environmental requirements:
  - a. The field switches [this excludes Types C, E and F] shall operate between -34° to +74°C, including power supply.

- b. The field switches [this excludes Types C, E and F] shall operate from 10% to 90% non-condensing humidity.

**907-663.02.1.1–Layer 2 Network Switch.** Layer 2 network switches shall be provided in locations where only Layer 2 network functionality is required. These locations will generally be field site locations. Layer 2 network switches shall adhere to the following minimum requirements.

- 1) Shall be environmental hardened
- 2) 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.
- 3) 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.

**907-663.02.1.1.1--Type A Network Switch.** Type A network switches shall be a layer 2 network switch at minimum and shall be environmentally hardened. The Type A shall be provided in situations where a minimal number of interface ports are required. The Type A switch shall adhere to the following minimum requirements in addition to the Layer 2 network switch 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.

**907-663.02.1.1.2--Type B Network Switch.** Type B network switches shall be a Layer 2 network switch at minimum and shall be environmentally hardened. The Type B shall be provided in situation where minimal number of interface ports are required. The Type B switch shall adhere to the following minimum requirements in addition to the Layer 2 network switch requirements.

- 1) Minimum of twelve (12) 10/100/1000 Base-TX ports. Each port shall connect via RJ-45 connector.
- 2) Minimum of two (2) 1000 Base Long Reach optical ports.

**907-663.02.1.2–Layer 3 Network Switch.** Layer 3 network switches shall be provided in locations where Layer 2 and Layer 3 network functionality is required. These locations will generally be Environmental Controlled Field HUBs, TMC equipment rooms, and control rooms. Where Layer 3 Network Switching is required but Environmental Control is not available, Environmentally Hardened Type Layer 3 switches shall be provided. In addition to meeting the general network Requirements, Layer 3 Switches have the following additional Requirements:

- 1) Each switch shall provide Layer 2 and Layer 3 switching and routing services.
- 2) Each switch shall meet the IEEE 802.1d (Virtual Bridge) standard.
- 3) Each switch shall meet the IEEE 802.1x (authentication) standard.
- 4) Access Control Lists (ACLs)
- 5) IPv4 and IPv6 multicast
- 6) IP Service-Level Agreement (IP SLA)
- 7) Open Shortest Path First (OSPFv2 and OSPFv3)
- 8) Border Gateway Protocol (BGP)

9) Enhanced Interior Gateway Routing Protocol (EIGRP)

**907-663.02.1.2.1--Type C Network Switch Requirements.** The Type C network switch, which is a base core switch, will be installed in the communication hubs and shall meet the following requirements:

- 1) Each switch shall be populated with modules including the following features and capabilities:
  - a. Minimum of 64Gbps/48Mpps module Bandwidth
  - b. Minimum of 8-GE uplink ports available per network switch assembly. The Contractor shall provide an uplink SFP optical module compatible with the interface for the uplink as indicated in the Location & Configuration of Communication Nodes notice to bidders for each uplink
  - c. In one (or more) modules: 24 Ethernet 10/100/1000 RJ-45 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 Standard Specifications. 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) Supports 10 gigabit ethernet of SFP optics.
- 6) NEBS Level 3 compliant.
- 7) Meet the requirements of :
  - a. IEEE 802.3z
  - b. IEEE 802.3ab
  - c. IEEE 802.1Q
  - d. GR-20-CORE: Generic requirements for Optical Fiber and Optical Fiber Cable
  - e. GR-326-CORE: Generic Requirements for Singlemode
- 8) Full implementation of BGPv4 protocol as outlined by RFCs: 4271, 6286, 6608, 6793, 7606, 7705, 8212
- 9) Full implementation of OSPF protocol as outlined by RFCs: 2178, 1583, 1587, 1745, 1765, 1850, 2154, 2328, 1850, 1997, 2385, 2439, 2842, 2918, 2370.
- 10) Capable of mirroring any port to any other port within the switch.
- 11) Password manageable through:
  - a. SSH (Secure Shell)
- 12) Full implementation of MLD (Multicast Listener Discovery).
- 13) Full implementation of IGMPv2.
- 14) Full implementation of PIM-SM and PIM-DM.
- 15) Comply with FCC 47 CRF Part 15 Class A emissions.
- 16) Bandwidth flow rate limiting policing support per port.
- 17) Full security implementation of
  - a. Support SSH, 802.1x (rel 2)
  - b. Access Control Lists (ACL's)
  - c. RADIUS authentication
  - d. TACACS+ authentication
- 18) The power supply units shall be hot swappable.

**907-663.02.1.2.1.1--Type C1 Network Switch Requirements.** The Type C1 network switch will be installed in communication hubs where a maximum total of 4 pair/(8 strands) of fiber optic cable will be actively in use or in environmentally controlled wireless towers and shall meet the following requirements:

- 1) Each switch shall be populated with an 4-port SFP gigabit ethernet module and also include the following features and capabilities:
  - a. Minimum of 88Gbps Switching Capacity and 480Gbps Stacking Bandwidth
  - b. In one (or more) Fiber SFP-based module(s): a minimum of 8 1000Base-X (SFP-based) compatible access ports which may also be used as uplink ports. The Contractor shall provide whichever is greater between a minimum number of SFP optic modules to interface to the fiber as indicated in the plans and NTBs, or a minimum of eight (8) and shall meet the following minimum requirements:
    - i. Optical budget of 18dB
    - ii. Switch shall be stackable and contain dual power supplies
    - iii. Same optical wavelength as Type A & B switches
    - iv. Same optical transmitter power as Type A & B switches
- 2) Non-Chassis based switch
- 3) Operate from 23° to 113°F.
- 4) RIPng, OSPFv6, and EIGRPv6 support
- 5) Full implementation of GMRP (Generic Multicast Registration Protocol).
- 6) Have redundant power supplies installed.

**907-663.02.1.2.1.2--Type C2 Network Switch Requirements.** The Type C2 network switch will be installed in the Communication Hubs where a minimum total of 5 pair/ (10 strands) of fiber optic cable will be actively in use. This type switch may also be installed in environmentally controlled wireless towers if the minimum total of 5 pair/(10 strands) fiber optic cable in-use rule applies. This type switch shall also meet the following requirements:

- 1) Each switch shall be populated with three (3) modules including the following features and capabilities:
  - a. In one (or more) Fiber SFP-based module(s): a minimum of 48 1000Base-X (SFP-based) compatible access ports and a minimum of 8 1000Base-X (SFP-based) uplink ports. The Contractor shall provide whichever is greater between a minimum number of SFP optic modules to interface to the fiber as indicated in the plans and NTBs, or a minimum of 14 and shall meet the following minimum requirements:
    - i. Optical budget of 18dB
    - ii. Hot-swappable network modules
    - iii. Same optical wavelength as Type A & B switches
    - iv. Same optical transmitter power as Type A & B switches
- 2) Operate from 10 to 90% non-condensing humidity
- 3) Operate from 32° to 104°F.
- 4) Designed as a chassis with easy to remove modules.
- 5) Chassis backplane shall be passive.
- 6) All modules shall be hot-swappable.
- 7) Must have installed redundant power supplies in which each supports a minimum of 4200 watts.

- 8) Switch assembly shall have a minimum of three (3) module slots.
- 9) Blank covers for all remaining slots.

**907-663.02.1.2.1.3--Type C3 Network Switch Requirements.** The Type C3 network switch will be installed in the communication hubs where a minimum total of 5 pair/(10 strands) of fiber optic cable will be actively in use. This type switch may also be installed in environmentally controlled wireless towers if the minimum total of 5 pair/(10 strands) fiber optic cable in-use rule applies. This type switch shall also meet the following requirements:

- 1) Each switch shall be populated with modules including the following features and capabilities:
  - a. Redundant Layer 2/3 switching and routing services
  - b. In one (or more) Fiber SFP-based module(s): a minimum of 48 1000Base-X (SFP-based) compatible access ports and a minimum of 8 1000Base-X (SFP-based) uplink ports. The Contractor shall provide whichever is greater between a minimum number of SFP optic modules to interface to the fiber as indicated in the plans and NTBs, or a minimum of 14 and shall meet the following minimum requirements:
    - i. Optical budget of 18dB
    - ii. Hot-swappable network modules
    - iii. Same optical wavelength as Type A & B switches
    - iv. Same optical transmitter power as Type A & B switches
- 2) Operate from 32° to 104°F.
- 3) Operate from 10 to 90% non-condensing humidity
- 4) Designed as a chassis with easy to remove modules.
- 5) Chassis backplane shall be passive.
- 6) All modules shall be hot-swappable.
- 7) Must have installed redundant power supplies in which each supports a minimum of 4200 watts.
- 8) Switch assembly shall have a minimum of 6 module slots.
- 9) Blank covers for all remaining slots.

**907-663.02.1.2.1.4--Type C4 Network Switch Requirements.** The Type C4 network switch will be installed in the communication hubs where no less than 21 pairs/(42 strands) of fiber optic cables will be active and in use and shall meet the following requirements:

- 1) Each switch shall be populated with modules including the following features and capabilities:
  - a. Redundant Layer 2/3 switching and routing services
  - b. The switch chassis shall be capable of accommodating up to 440 Gbps per slot.
  - c. In one (or more) Fiber SFP-based module(s): a minimum of 48 1000Base-X (SFP-based) compatible access ports and a minimum of 8 1000Base-X (SFP-based) uplink ports. The Contractor shall provide whichever is greater between a minimum number of SFP optic modules to interface to the fiber as indicated in the plans and NTBs, or a minimum of 14 and shall meet the following minimum requirements:
    - i. Optical budget of 18dB
    - ii. Hot-swappable network modules
    - iii. Same optical wavelength as Type A & B switches

- iv. Same optical transmitter power as Type A & B switches
- 2) Operate from 32° to 104°F.
- 3) Supports relative humidity - Ambient (noncondensing) operating: 5% to 90%
- 4) Designed as a chassis with easy to remove modules.
- 5) Chassis backplane shall be passive.
- 6) All modules shall be hot-swappable.
- 7) Must have installed dual-redundant (4) power supplies in which each supports a minimum of 3000 watts.
- 8) Switch assembly shall have a minimum of seven (7) module slots.
- 9) Blank covers for all remaining slots.

**907-663.02.1.2.2--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 four (4) different types of modular cards. The Type D network switch shall meet the minimum requirements specified below:

- 1) The switch shall be chassis designed with a minimum of four (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 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 NTBs.
  - 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 Project Engineer on selection of cellular radio type (HSPA/EVDO)
  - d. Terminal Server module:
    - i. Module that meets terminal server requirements Subsection 663.02.6
  - e. 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 be provided to match functionality of installed modules.
- 4) Shall be DIN or Panel mountable.
- 5) Password manageable through:
  - a. SSHv2 (Secure Shell)
- 6) Full implementation of VRRP.
- 7) Comply with FCC 47 CRF Part 15 Class A emissions.
- 8) Bandwidth flow rate limiting policing support per port.
- 9) Full security implementation of
  - a. Support SSH2, 802.1x (rel 2)
  - b. Access Control Lists (ACL's)
  - c. RADIUS
- 10) Blank covers for all remaining slots.
- 11) Electronic surfaces shall be covered with conformal coating for additional environmental protection.

**907-663.02.1.2.3--Type E Network Switch Requirements.** The Type E network switch will be installed in locations where multiple backbone fibers converge or high concentration of ports are needed for a field location but need a hardened switch and shall meet the following requirements:

- 1) Each switch shall be populated with redundant switch fabric modules that meet the following minimum requirements:
  - a. Minimum of 2-GE uplinks available per card with a minimum capability to expand to eight (8). The Contractor shall provide an uplink SFP optical module compatible with the interface for the uplink as indicated in the Notice to Bidders entitled "Location & Configuration of Communication Nodes" for each uplink.
- 2) The Contractor will need to determine port count configuration based on the project plans for the Type E switch. Optical interfaces shall include 1000 Base-X (SFP-based module(s)) with a minimum of four (4) ports. The Contractor shall provide whichever is greater between a minimum number of SFP optic modules to interface to the fiber as indicated in the plans and NTBs, or a minimum of six (6) and shall have a minimum Optical budget of 18dB and be the same optical wavelength as Type A & B switches.
  - a. Optical receiver maximum input power level shall not be exceeded.
  - b. Optical attenuators shall be added as needed; fiber optic attenuator patch cords shall be in accordance with Section 657 of the Standard Specifications. It is the Contractor's responsibility to determine where attenuators are needed and shall be included in the cost of the switch.
- 3) Include a minimum of eight (8) Ethernet 10/100/1000 ports
- 4) Include a minimum of four (4) SFP ports must support 1000-Base-X/10 gigabit-ethernet-optics.
- 5) 19" rack mountable.
- 6) Chassis backplane shall be passive.
- 7) Meet the requirements of :
  - a. IEEE 802.3z
  - b. IEEE 802.3ah
  - c. IEEE 802.1Q
  - d. GR-20-CORE: Generic requirements for Optical Fiber and Optical Fiber Cable
  - e. GR-326-CORE: Generic Requirements for Singlemode

- 8) Full implementation of BGPv4 protocol as outlined by RFCs: 4271, 6286, 6608, 6793, 7606, 7705, 8212
- 9) Full implementation of OSPF protocol as outlined by RFCs: 2178, 1583, 1587, 1745, 1765, 1850, 2154, 2328, 1850, 1997, 2385, 2439, 2842, 2918, 2370.
- 10) Capable of mirroring any port to any other port within the switch.
- 11) Password manageable through:
  - a. SSHv2 (Secure Shell)
- 12) Full implementation of GMRP (Generic Multicast Registration Protocol).
- 13) Full implementation of IGMPv2.
- 14) Full implementation of PIM-SM and PIM-DM.
- 15) Full implementation of DVMRPv3.
- 16) Full implementation of VRRP.
- 17) Comply with FCC 47 CRF Part 15 Class A emissions.
- 18) Bandwidth flow rate limiting policing support per port.
- 19) Full security implementation of
  - a. Support SSH2, 802.1x (rel 2)
  - b. Access Control Lists (ACL's)
  - c. RADIUS
  - d. TACACS
- 20) Have redundant power supplies installed.
- 21) Blank covers for all remaining slots.
- 22) Have options or modules to add a terminal server as specified in Subsection 663.02.2
- 23) Have options or modules to add a cellular interface as specified in Subsection 663.02.3

**907-663.02.1.2.3.1--Type E1 Network Switch Requirements.** The Type E1 network switch will be installed in locations where multiple backbone fibers converge or a high concentration of ports are needed for a field location and a hardened switch is required and shall meet the following requirements:

- 1) Each switch shall be populated with redundant switch fabric modules that meet the following minimum requirements:
  - a. 56 to 64Gbps switching bandwidth/41.67 mpps with 64byte packets
- 2) Based from the project plans, the Contractor must determine the appropriate configuration of port types and count by selecting one of the options below:
  - a. Include a minimum of 12 10/100/1000 ethernet ports and a minimum of 16 optical 1000Base-X(SFP-Based).
  - b. Include a minimum of 24 10/100/1000 ethernet ports and a minimum of 4 optical 1000 base-X (SFP-Based).
- 3) Operate from -45° to +75°C.
- 4) Operate relative humidity of 5% to 95% noncondensing

**907-663.02.1.2.3.2--Type E2 Network Switch Requirements.** The Type E2 network switch will be installed in locations where multiple backbone fibers converge or a high concentration of ports are needed for a field location, a hardened switch and larger bandwidth are needed, and shall meet the following requirements:

- 1) Each switch shall be populated with redundant switch fabric modules that meet the following minimum requirements:
  - a. 128Gbps switching bandwidth/41.67 mpps with 64byte forwarding rate
- 2) Based from the project plans, the Contractor must determine the appropriate configuration of port types and count by selecting one of the options below:
  - A. Include a minimum of 12 10/100/1000 ethernet ports and a minimum of 12 optical 1000Base-X(SFP-Based).
  - B. Include a minimum of 12 10/100/1000 ethernet ports and a minimum of 16 optical 1000 base-X (SFP-Based).
- 3) Supports 10 gigabit ethernet of SFP optics.
- 4) Operate from -40° to +85°C.
- 5) Operate relative humidity of 0% to 95% noncondensing

**907-663.02.1.2.4--Type F Network Switch Requirements.** The Type F network switch will be Layer 3 switches installed in field locations with wireless communications or access points and shall meet the following requirements:

- 1) Each switch shall be populated with switch modules that meet the following minimum requirements:
  - a. 20Gbps Aggregate Bandwidth
  - b. Minimum of 4-GE uplinks available per switch with a minimum of 2 being fiber ports. The Contractor shall provide an uplink SFP optical module compatible with the interface for the uplink as indicated in the Notice to Bidders entitled "Location & Configuration of Communication Nodes" for each uplink.
  - c. SD flash port for swappable Management Card configuration
  - d. Supports High Density Power over Ethernet (PoE) for up to 8 devices
  - e. Supports Cisco Common Industrial Protocol (CIP)
  - f. Support of SCADA (Supervisory Control And Data Acquisition) connectivity.
  - g. Can be supported with IP services.
- 2) In addition to the uplink ports, interfaces ports shall include:
  - a. 8 PoE 10/100/1000
  - b. 4 SFP ports
    - i. Optical receiver maximum input power level shall not be exceeded.
    - ii. Optical attenuators shall be added as needed; fiber optic attenuator patch cords shall be in accordance with Section 657 of the Standard Specifications. It is the Contractor's responsibility to determine where attenuators are needed and shall be included in the cost of the switch.
- 3) DIN Rail Mountable.
- 4) Operate from -40° to +70°C.
- 5) Operate from 5% to 95% non-condensing humidity
- 6) Supports IEEE 802.1AE MACsec, Security Group Access Control Lists (SGACL)
- 7) RIPng, OSPFv6, and EIGRPv6 support
- 8) Full implementation of IGMPv2.
- 9) Full implementation of PIM-SM and PIM-DM.
- 10) Supports Redundant DC input voltage

11) Power supplies with PoE support and 6' minimum power cord(s).

**907-663.02.2--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).

**907-663.02.3--SD-WAN Router.** The SD-WAN (Software Defined Wide Area Network) router supports next generation wide area networking leveraging multiple internet connection types. The SD-WAN router shall be the alternative selection instead of cellular modem communications to provide network communications to very small data networks to connect to the traffic management centers.

**907-663.02.3.1--Functional Requirements.** SD-WAN Router, antenna, wiring assemble, configuration software, and installation necessary shall be provided and furnished for a working cellular wireless communication connection in accordance with plans and specifications and compatible with the requirements of the MDOT system, and the wireless service carrier used by MDOT. Unless otherwise indicated on the plans, all items that are required to complete the installation and ensure an operational system shall be supplied by the Contractor whether listed above or not. Items required but not listed above shall be at no direct pay. All components supplied

by the Contractor are the responsibility of the Contractor. It shall be the responsibility of the Contractor to properly configure and deliver a working SD-WAN cellular communications system. It shall be the responsibility of the Contractor to determine the final configuration of all electrical connections. Cellular account setup shall be coordinated with MDOT Information Systems Division. Warranty and cellular carrier account shall be transferred into MDOT's name upon acceptance of the project.

**907-663.02.3.2--SD-WAN Router System.** The SD-WAN shall adhere to the following minimum requirements.

- 1) Each router shall meet the following minimum requirements:
  - a. Layer 2/3 switching and routing services.
  - b. Minimum of 250 Mbps bidirectional Throughput
  - c. Minimum of Four 10/100BASE-T Fast Ethernet ports or better
  - d. Minimum of 2 x GE RJ45 LAN ports
  - e. Supports Cisco Common Industrial Protocol (CIP)
  - f. Support of SCADA, DNP3, T101-104, Raw Socket TCP, and UDP.
  - g. Provides LTE QoS with support for up to 8 concurrent bearers on each cellular WAN interface for traffic classification and prioritization.
  - h. 1-year warranty, maintenance, and support.
  - i. Dual active LTE backhaul with expansion module.
  - j. Virtual Router Redundancy Protocol (VRRP) (RFC 2338)
  - k. Hot Standby Router Protocol (HSRP)
  - l. Dual SIM support on the LTE module for cellular failover
  - m. IPv6 unicast and multicast forwarding.
  - n. IPv6 ACLs
  - o. IPv6 over cellular
  - p. IPv6 routing
  
- 2) WAN Interfaces
  - a. Combo 10/100/1000 Gigabit Ethernet port (RJ45 and SFP) on the base platform and additional 10/100/1000 Gigabit Ethernet SFP on the expansion module and include supported SFPs - *The Contractor shall provide an uplink SFP optical module compatible with the interface for the uplink as indicated in the Location & Configuration of communication Nodes notice to bidders for each uplink.*
  - b. LTE: Modular with options for single and dual active LTE and LTE-Advanced
  - c. LTE in United States supports 3 cellular companies AT&T, cSpire and Verizon.
  - d. LTE bands 1-5, 7, 8, 12, 13, 20, 25, 26, 29, 30, and 41
  - e. FDD LTE 700 MHz (band 12), 700 MHz (band 29), 800 MHz (band 20), 850 MHz (band 5 CLR), 850 MHz (band 26 Low), 900 MHz (band 8), 1800 MHz (band 3), 1900 MHz (band 2), 1900 MHz (PCS band 25), 1700 MHz and 2100 MHz (band 4 AWS), 2100 MHz (band 1), 2300 MHz (band 30), or 2600 MHz (band 7)
  - f. TDD LTE 2500 MHz (band 41)
  - g. Carrier aggregation band combinations: 1+8; 2+(2,5,12,13,29); 3+(7,20); 4+(4,5,12,13,29); 7+(7,20); 12+30, 5+30, and 41+41
  - h. Theoretical download and upload speeds: 300 and 50 Mbps.

- 3) IPv4 and IPv6 services features
  - a. Routing Information Protocol Versions 1 and 2 (RIPv1 and RIPv2)
  - b. Generic Routing Encapsulation (GRE) and Multipoint GRE (MGRE)
  - c. Standard 802.1d Spanning Tree Protocol (STP)
  - d. Network Address Translation (NAT)
  - e. Dynamic Host Configuration Protocol (DHCP) server, relay, and client
  - f. Dynamic DNS (DDNS)
  - g. DNS proxy
  - h. DNS spoofing
  - i. Access Control Lists (ACLs)
  - j. IPv4 and IPv6 multicast
  - k. IP Service-Level Agreement (IP SLA)
  - l. Open Shortest Path First (OSPFv2 and OSPFv3)
  - m. Border Gateway Protocol (BGP)
  - n. Enhanced Interior Gateway Routing Protocol (EIGRP)
  - o. Virtual Route Forwarding (VRF) Lite
  - p. Next-Hop Resolution Protocol (NHRP)
  - q. Serial data encapsulation and relay
  - r. L2TPv3 over sub-interfaces and VLAN

**907-663.02.3.3--Environmental Characteristic.** Environmental operating temperature ranges shall be as follows.

- a. Operate from -40 to 140°F (-40 to 60°C) in a sealed NEMA cabinet with no airflow.
- b. Operate from -40 to 158°F (-40 to 70°C) in a vented cabinet with 40 Linear Feet per Minute (LFM) of air
- c. Operate from -40 to 167°F (-40 to 75°C) in a forced air enclosure with 200 LFM of air type tested at 85°C for 16 hours
- d. Optical receiver maximum input power level shall not be exceeded.
- e. Optical attenuators shall be added as needed.
- f. 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

**907-663.02.4--Ethernet Network Cable.** Ethernet network cables shall adhere to the following minimum requirements.

- 1) 4 Pair #24 AWG STP Category 6, Category 5e, or other ethernet cable (generally meeting Category 6 Specifications, the applicable requirements of Subsection 722.03 and approved by MDOT) as per manufacturer's recommendations.
- 2) These items are paid for as ethernet network cable installed between cabinets and does not apply to other patch cords installed inside cabinets or huts.
- 3) Supplied ethernet network cable shall be suitable for use outdoors in ducts and as a minimum meet the following requirements:
  - a. Fully water blocked
  - b. Conforms to the National Electrical Code Article 800

- c. UL 1581 certified
- d. Voltage Rating 300 Volts or greater
- e. Operating and installation temperature (-4°F to 140°F)
- f. The allowable bend radius must be 10 times the Cable's Outside Diameter or smaller
- g. Recommended for 1000Base-T applications for a distance of 100 meters.

**907-663.02.4.1--Ethernet Patch Cords.** The ethernet patch cords shall be furnished and installed as needed to connect the network switches with other equipment. Ethernet patch cords shall be considered an incidental component for this project and furnished and installed as needed to provide a functional system. Ethernet 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, Category 5e, or other Ethernet cable (generally meeting Category 6 Specifications and approved by MDOT) as required by the manufacturer.
- 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 5e or Category 6 performance criteria.
- 6) Length as needed. Excessive slack is not permitted.

**907-663.02.5--Submittals.** The submittal requirements defined in the Notice to Bidders entitled "ITS General Requirements", along with the requirements below and throughout this specification, shall be met. All costs associated with submittals shall be included in the overall contract price; no separate payment will be made for any documenting and submitting.

The Contractor shall provide project submittals for network switches including scheduling requirements. The project submittals for network switches, terminal servers, cellular modems, and fiber optic modems 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.

**907-663.03--Construction 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 Ethernet patch cords and fiber optic patch cords for a complete and functional installation.
- 5) Ethernet network cable installed in conduit shall be installed and terminated per the manufacturers recommended procedures. Slack Ethernet network cable shall be provided in pullboxes as indicated in the plans.
- 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 663.03.4 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.

**907-663.03.1--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 and turn on multicast protocols.
- 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.

**907-663.03.2--Testing.** All networking equipment shall undergo testing to verify conformance to requirements of the plans and these special provisions. The Contractor shall conduct a Project



Testing Program as required in the Notice to Bidders entitled "ITS General Requirements." All costs associated with the Project Testing Program shall be included in the overall contract price; no separate payment will be made for any testing.

**907-663.03.3--Documentation.** 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. All equipment and software must be fully functional and pass a Final Inspection by the ITS Manager and Project Engineer before being accepted by the MDOT

**907-663.03.4--Warranty** At a minimum, the warranty requirements defined in the Notice to Bidders entitled "ITS General Requirements" or this specification, whichever is longer, shall be met. All costs associated with the warranty requirements shall be included in the overall contract price.

**907-663.03.5--Training.** The minimum training requirements shall be as defined in the Notice to Bidders entitled "ITS General Requirements."

**907-663.03.6--Quality Assurance.** The quality assurance requirements defined in the Notice to Bidders entitled "ITS General Requirements" shall be met. All costs associated with the quality assurance requirements shall be included in the overall contract price.

**907-663.04--Method of Measurement.** Network switches of the type specified will be measured per each installation as specified in the Project plans. Such measurement shall be inclusive of furnishing, installing, system integration and testing of a network switch including all chassis, modules, power cables, power supplies, software, license, fiber optic patch cords, fiber optic attenuator patch cords, Ethernet patch cords and all incidental components, attachment hardware, mounting shelf and hardware, testing requirements, warranties and all work, equipment and appurtenances as required to provide a fully functional switch ready for use. Type C, Type D, and Type E network switch module cards shall be specified per Project plans or NTBs for each site location. It shall also include all system documentation including: shop drawings, operations and maintenance manuals, wiring diagrams, block diagrams, and other material necessary to document the operation of the switch and network.

Terminal server will be measured per each installation. Such measurement shall be inclusive of furnishing, installing, system integration and testing of a Terminal Server including all incidental components, attachment hardware, mounting shelf and hardware, testing requirements, warranties, and all work, equipment and appurtenances as required to provide a fully functional Terminal Server ready for use.

**SD-WAN Routers** shall be measured per each and will include the, **router**, antenna, reset timers, cabling, factory and manufacturing inspection, testing, storage, packaging, shipping, warranty, and all work, equipment, and appurtenances as required to effect the full operation and control of the **SD-WAN Router** complete in place and ready for use.

Ethernet network cable, installed in conduit, will be measured by the linear foot, and shall be obtained by accurate measurement of the runs including horizontally, vertically, aerially along the messenger cable, from the device to the device cabinet, and with liberal allowances made for slack in boxes, as indicated in the plans.

Network equipment training shall be measured as a lump sum which shall include all coordination, materials, labor, training location costs, and all incidentals required to complete the training as described in the Notice to Bidders entitled "ITS General Requirements."

**907-663.05--Basis of Payment.** Network [Switches](#), [Terminal Servers](#), [SD-WAN Routers](#) and [Fiber Optic Modems](#), measured as prescribed above, will be paid for at the contract unit price bid per each. The price shall be full compensation for documentation and submittals, warranties, testing, all labor, tools, materials, equipment, quality assurance, and all incidentals necessary to complete the work.

Ethernet network cable installed between cabinets will be paid for by linear foot measured horizontally.

Network equipment training, measured as prescribed above, will be paid for at the contract unit lump sum price, which price shall be full compensation for all training costs including coordination, materials, labor, training location costs, submittals, and all incidentals required to complete the training as described in the Notice to Bidders entitled "ITS General Requirements."

Payment will be made under:

- 907-663-A: Network Switch, Type \_\_\_ - per each
- 907-663-B: Terminal Server - per each
- 907-663-C [SD-WAN Router](#) - per each
- 907-663-D: Ethernet Network Cable, Installed in Conduit - per linear foot
- 907-663-E: Network Equipment Training - lump sum

# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-701-3

CODE: (IS)

DATE: 05/04/2021

SUBJECT: Hydraulic Cement

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

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

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

**907-701.02--Portland Cement.**

**907-701.02.1-General.**

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

When used in portland cement concrete, the total alkali contribution from all cement types in this Subsection shall not exceed 4.0 lb. per cubic yard of concrete calculated as follows:

$$\text{lb alkali per cu Yd} = \frac{(\text{lb cement per cu Yd}) \times (\% \text{Na}_2\text{O equivalent in cement})}{100}$$

In the above calculation, the maximum cement alkali content reported on the cement mill certificate shall be used. An example calculation can be found in the Department’s *Concrete Field Manual*.

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

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

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

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

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

**Table 1- Cementitious Materials for Soluble Sulfate Conditions or Seawater**

Sulfate Exposure	Water-soluble sulfate (SO <sub>4</sub> ) in soil, % by mass	Sulfate (SO <sub>4</sub> ) in water, ppm	Cementitious material required
Moderate and Seawater	0.10 - 0.20	150 - 1,500	Type I cement with one of the following replacements of cement by weight: 24.5 - 25.0% Class F fly ash, or 49.5 - 50.0% GGBFS or Type II <sup>**</sup> cement
Severe	0.20 - 2.00	1,500 - 10,000	Type I cement with a replacement by weight of 49.5 - 50.0% GGBFS, or Type II <sup>*</sup> cement with one of the following replacements of cement by weight: 24.5 - 25.0% Class F fly ash, or 49.5 - 50.0% GGBFS

\* Type III cement conforming to AASHTO M85 with a maximum 8% tricalcium aluminate (C<sub>3</sub>A) may be used in lieu of Type II cement as allowed in Subsection 701.02.1; this cement is given the designation “Type III(MS).”

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

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

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

**907-701.04--Blended Hydraulic Cement.**

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

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

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

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

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

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

The blended cement manufacturer shall include the percent equivalent alkalis as Na<sub>2</sub>O on their cement mill reports.

When calculating the total alkali contribution with blended cements, use the equivalent alkali content of the base portland cement. An example calculation for cases where blended cements are used can be found in the Department’s *Concrete Field Manual*.

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

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

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

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

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

**Table 2- Cementitious Materials for Soluble Sulfate Conditions or Seawater**

Sulfate Exposure	Water-soluble sulfate (SO <sub>4</sub> ) in soil, % by mass	Sulfate (SO <sub>4</sub> ) in water, ppm	Cementitious material required
Moderate and Seawater	0.10 - 0.20	150 - 1,500	Type IL (MS) * cement, Type IL cement with one of the following replacements of cement by weight: 24.5 - 35.0% Class F fly ash, or 49.5 - 50.0% GGBFS, Type IP (MS) cement, or Type IS (MS) cement
Severe	0.20 - 2.00	1,500 - 10,000	Type IL cement with a replacement of cement by weight of 49.5 - 50.0% GGBFS, or Type IL (MS) cement with one of following replacements of cement by weight: 24.5 - 35.0% Class F fly ash, or 49.5 - 50.0% GGBFS

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

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

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

Delete Subsection 701.04.3 on page 721.

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION NO. 907-702-4**

**CODE: (IS)**

**DATE: 09/11/2018**

**SUBJECT: Bituminous Materials**

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

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

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

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

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

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

**TABLE V  
SPECIFICATION FOR FOG SEAL**

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

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

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION NO. 907-703-2**

**CODE: (SP)**

**DATE: 11/29/2022**

**SUBJECT: Gradation**

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

**907-703.03--Coarse Aggregates for Hydraulic Cement Concrete.**

**907-703.03.2--Detail Requirements.**

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

Delete Note 2 under the table in Subsection 703.03.2.4 on page 734, and substitute the following.

Note <sup>2</sup> – 100 percent shall pass the 1-inch sieve for Size 67 used in Class F and Class FX concrete.



**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION NO. 907-705-1**

**CODE: (IS)**

**DATE: 06/13/2018**

**SUBJECT: Stone Riprap**

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

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

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

## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-707-3

CODE: (IS)

DATE: 10/27/2021

SUBJECT: Joint Materials

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

### 907-707.02--Joint Filler.

907-707.02.2--Preformed Sponge, Rubber, Cork and Closed-Cell Polypropylene Foam Joint Fillers for concrete Paving and Structural Constructions. Delete the two paragraphs of Subsection 707.02.2 on page 755, and substitute the following.

Preformed joint filler shall conform to AASHTO M 153 for sponge, rubber, and cork and tested according to ASTM D545. The type required will be indicated on the plans.

Closed-cell polypropylene foam shall conform to the requirements in ASTM D8139 and tested in accordance with ASTM D545.

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

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

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

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

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION NO. 907-711-2**

**CODE: (IS)**

**DATE: 09/11/2018**

**SUBJECT: Plain Steel Wire**

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

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

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

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

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

# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-712-1

CODE: (SP)

DATE: 12/07/2021

SUBJECT: Fence and Guardrail

Section 712, Fence and Guardrail, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

**907-712.01--General.** After the sentence in Subsection 712.01 on page 785, add the following.

All materials' inspection, testing, and certification will be performed in accordance with the requirements of the current version of the Department's *Materials Division Inspection, Testing, and Certification Manual*.

Delete Subsections 712.02 and 712.03 on page 785, and substitute the following.

**907-712.02--Barbed Wire.** Barbed wire shall conform to the requirements of AASHTO M 280. In the coastal counties of Hancock, Harrison, and Jackson, either Coating Type Z Class 3 or Coating Type A shall be furnished. In all other areas of the State, either Coating Type Z Class 1, Coating Type Z Class 3, Coating Type ZA Class 60, or Coating Type A shall be furnished.

**907-712.03--Metallic-Coated, Steel Woven Wire Fence Fabric.** Woven wire fencing (i.e., "hog wire") shall conform to the requirements of AASHTO M 279. In the coastal counties of Hancock, Harrison, and Jackson, either Coating Type Z Class 3 or Coating Type A shall be furnished. In all other areas of the State, either Coating Type Z Class 1, Coating Type Z Class 3, Coating Type ZA Class 60, or Coating Type A shall be furnished.

**907-712.04--Chain Link Fence.** Delete Subsections 712.04.1 thru 712.04.7 on pages 785 & 786, and substitute the following.

**907-712.04.1--Fabric.** In the coastal counties of Hancock, Harrison, and Jackson, either Type I Class D, Type II, Type III, or Type IV fabrics shall be furnished. In all other areas of the State, either Type I Class C, Type I Class D, Type II, Type III, or Type IV fabrics shall be furnished.

**907-712.04.2--Tie Wire.** Tie wire shall be of the same material as the fencing wire being used, shall be of good commercial quality, and shall meet the requirements of AASHTO M 181. Either Type I, Type II, Type III, or Type IV tie wire shall be furnished.

**907-712.04.3--Tension Wire.** Tension wire shall be of the same material as the fencing wire being used, shall be of good commercial quality, and shall meet the requirements of AASHTO M 181. In the coastal counties of Hancock, Harrison, and Jackson, either Type I Class 3, Type II, Type III, or Type IV tension shall be furnished. In all other areas of the State, either Type II, Type III, Type IV, or Type I Classes 1, 2, or 3 tension wires shall be furnished.

**907-712.04.4--Posts Rails, Gate Frames, and Expansion Sleeves.** Posts, rails, gate frames, and expansion sleeves shall conform to the requirements for posts in Subsection 712.05.2, unless otherwise designated in the contract.

**907-712.04.5--Miscellaneous Fittings and Hardware.** Miscellaneous fittings and hardware shall conform to the requirements of Subsection 712.16.

**907-712.05--Fence Posts and Braces.**

**907-712.05.1--Treated Timber Posts and Braces.**

**907-712.05.1.1--General.** Delete the third, fourth, fifth, and sixth paragraphs of Subsection 712.05.1.1 on page 787, and substitute the following.

All wood posts and braces shall be treated in accordance with Subsections 718.03 and 718.04.

**907-712.05.1.2--Round Posts.** Delete the last sentence of the last paragraph of Subsection 712.05.1.2 on page 788.

**907-712.05.1.3--Sawed Posts.** Delete the last sentence of the paragraph of Subsection 712.05.1.3 on page 788.

**907-712.05.1.4--Sawed Braces.** Delete the last sentence of the paragraph of Subsection 712.05.1.4 on page 788.

Delete Subsection 712.05.2 on page 788, and substitute the following.

**907-712.05.2--Metal Posts.**

**907-712.05.2.1--Round Steel Pipe.** Round steel pipe shall meet the requirements of AASHTO M 181, either Grade 1 (i.e., meeting the requirements in ASTM F 1083) or Grade 2 (i.e., meeting the requirements of ASTM F 1043).

Round steel pipe shall be sized in accordance with NPS (nominal pipe size) designations as shown on Plans, and not according to the outer or inner pipe diameter.

**907-712.05.2.2--Steel Fence Post and Assemblies, Hot-Wrought.** Steel posts with the following section shapes, Tee, channel or U, and Y-Bar shall meet the requirements of AASHTO M 281, galvanized in accordance with the requirements of AASHTO M 111, unless otherwise specified in the contract. Acceptance of these steel posts shall be by certification from the manufacturer, producer, supplier, or fabricator, as applicable.

**907-712.05.2.3--Blank.**

**907-712.05.2.4--Steel H-Beam Posts.** Steel H-Beam posts shall be produced from structural quality weldable steel having a minimum yield strength of 45,000 psi and shall be galvanized in accordance with ASTM A 123. Steel H-Beam line posts shall be 2.250 inches by 1.625 inches and shall weigh 3.43 pounds per foot. A tolerance of plus or minus 5.0 percent is allowed for

weight per foot. A tolerance of plus or minus 1.0 percent is allowed for dimensions.

**907-712.05.2.5--Aluminum-Alloy Posts and Assemblies.** Round aluminum-alloy posts shall meet the requirements of ASTM B 241, Alloy 6061, T6. Aluminum-Alloy H-Beam posts shall meet the requirements of ASTM B 221, Alloy 6061, T6.

**907-712.05.2.6--Formed Steel Section Posts.** Formed steel section posts, "C" sections, shall be formed from sheet steel conforming to ASTM A 1011, Grade 45, and shall be galvanized in accordance with ASTM A 123.

**907-712.06--Guard and Guardrail Posts.**

**907-712.06.2--Treated Wood Posts.**

**907-712.06.2.1--Square Posts.** Delete the paragraph in Subsection 712.06.2.1 on page 789, and substitute the following.

All square posts shall be inspected for conformance with Section 712.05, except that the posts may be rough and shall be within  $\pm 3/8$ " of the dimensions shown on the plans.

**907-712.06.2.2--Round Posts.** Delete the paragraph in Subsection 712.06.2.2 on page 789, and substitute the following.

All round posts shall be inspected for conformance with Section 712.05, except that the posts shall be of the shape and dimensions shown on the plans.

**907-712.06.5--Treated Wood Blocks for Use with Metal Guardrail Posts.** Delete the paragraphs of Subsection 712.06.5 on pages 789 & 790, and substitute the following.

Treated wood blocks for use with metal guardrail posts shall be within  $\pm 3/8$ " of the size and dimensions shown on the plans, except that a minus tolerance shall not be allowed for the slotted width in which the metal post must fit.

Delete Subsection 712.16 on page 791, and substitute the following.

**907-712.16--Hardware.** All ferrous metal hardware for fencing such as bolts, nuts, washers, and metal straps shall be as specified on the plans and galvanizing shall not be less than 1.0 ounce per square foot of uncoated area. Aluminum coated hardware shall be coated with aluminum meeting the requirements of AASHTO M 181 for aluminum coating and at the rate of not less than 0.4 ounces per square foot of uncoated area.

Aluminum alloy hardware shall conform to the requirements of ASTM B 221 for extruded aluminum alloy 6063, T6. The finished members shall be of uniform quality.

Aluminum-zinc coated hardware shall be coated with an aluminum-zinc alloy meeting the chemical requirements and weight of coating specified for aluminum-zinc alloy coated metal gates.

## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-714-3

CODE: (SP)

DATE: 08/31/2021

SUBJECT: Miscellaneous Materials

Section 714, Miscellaneous Materials, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

### 907-714.01--Water.

907-714.01.1--General. Delete the last sentence of the second paragraph in Subsection 714.01.1 on page 794.

907-714.01.2--Water for Use in Concrete. Delete Subsection 714.01.2 on page 794, and substitute the following:

Water from municipal sources is permitted be used as mixing water in concrete, mortar, and grout without Department testing. Water from non-municipal water sources used in mixing of concrete, mortar, and grout which does not meet the requirements in Subsection 714.01.1 shall be tested for conformance as required in AASHTO M157, Table 1 and Table 2.

907-714.01.3--Water for Use in Chemically Stabilized Based. Delete the first sentence of first paragraph in Subsection 714.01.3 on page 794, and substitute the following:

Water used in the construction of bases that contain cement, lime, or other chemical additive shall be as set out in Subsection 714.01.1. Water from municipal sources is permitted to be used without testing for conformance to the requirements below. If water is not from a municipal source, it shall not contain impurities in excess of the following limits:

Delete Subsection 714.01.6 on page 795, and substitute the following.

### 907-714.01.6--Blank.

### 907-714.05--Fly Ash.

907-714.05.1--General. Delete the first sentence of the fifth paragraph in Subsection 714.05.1 on page 797.

**907-714.13--Geotextiles.**

**907-714.13.11--Tables.** Delete Table 1 in Subsection 714.13.11 on page 813, and substitute the following.

**Table 1 - Geotextiles**

Type Designation	I <sup>1</sup> Sediment Control	II <sup>1</sup> Control	III Drainage	IV Paving	V Separation & Drainage		VI Separation, Stabilization & Reinforcement		VIII High Strength	IX High Strength	Test Method
					Woven	Non-Woven	Woven	Non-Woven			
Grab Strength (lb)	50	90	110	90	200	280	180	450	280	280	ASTM D 4632
Elongation (%)	----	50% max @ 45 lb	20% min	50% min @ break	50% min	50% max	50% min	50% max	50% min	50% min	ASTM D 4632
Seam Strength (lb)	----	----	70	----	180	240	160	400	240	240	ASTM D 4632
Puncture Strength (lb)	----	----	40	----	80	110	75	180	115	115	ASTM D 6241
Trapezoidal Tear (lb)	----	----	40	----	80	100	70	150	100	100	ASTM D 4533
Asphalt Retention (gal/yd <sup>2</sup> )	----	----	----	0.2	----	----	----	----	----	----	ASTM D 6140
Permittivity (sec <sup>-1</sup> ) min	0.05	0.05	0.5	----	0.2	0.2	0.2	0.2	0.2	0.2	ASTM D 4491
AOS Woven (mm) max	0.60	0.60	0.6	----	0.6	0.43	----	0.43	----	----	ASTM D 4751
AOS Non-Woven (mm) max	0.84	0.84	0.43	----	0.43	----	0.43	----	0.43	0.43	----
Tensile Strength after UV (% Retained)	70% @ 500 hr	70% @ 500 hr	50% @ 500 hr	----	50% @ 500 hr	50% @ 500 hr	50% @ 500 hr	50% @ 500 hr	50% @ 500 hr	50% @ 500 hr	ASTM D 4355
Melting Point °(F)	----	----	----	325	----	----	----	----	----	----	ASTM D 276
Minimum Ultimate Tensile Strength <sup>3</sup> (lb/in)	----	----	----	----	----	----	----	----	660	2000	ASTM D 4595

Notes: 1 - All property values, with the exception of apparent opening size (AOS), represent minimum average roll values in the weakest principal direction. Values for AOS represent the maximum average roll values, 2 - Values not identified in this table should meet manufacturer certification for the use and application, 3 - Machine direction



Delete Subsection 714.15 on pages 816 and 817 and substitute the following.

**907-714.15--Geogrids.**

**907-714.15.1--General.** A geogrid is defined as a geosynthetic formed by a regular network of connected elements with apertures greater than 0.25 inch to allow interlocking with surrounding soil, rock, and other surrounding materials to function primarily as reinforcement.

Geogrid shall be manufactured from an expanded strain hardened monolithic polymer sheet composed of one or more synthetic polymers and shall be mildew resistant and inert to biological degradation and naturally encountered chemicals, alkalis and acids. The geogrid shall contain stabilizers and/or inhibitors, or a resistance finish or covering to make it resistant to deterioration from direct sunlight, ultraviolet rays, and heat.

Geogrid manufacturers shall participate in and be in compliance with the American Association of State Highway Transportation Officials (AASHTO) National Transportation Product Evaluation Program's (NTPEP) Geosynthetics audit program. Geogrid shall meet the requirements of Table II for the application and type shown on the plans and shall be selected from the Department's Approved Lists.

**907-714.15.1.1--Geogrid for Retaining Walls and Reinforced Soil Slopes.** Geogrid for retaining walls and reinforced soil slopes shall be creep tested in accordance with AASHTO R69 and meet Long Term Design Load, Minimum Ultimate Tensile Strength, and open area criteria listed in Table II. Manufacturers shall perform at least one long-term creep test for no less than 10,000 hours in accordance to ASTM D 5262 for each polymer or composition of polymers from which the geogrid is produced. The long-term design load that shall be reported for design use, shall be that load at which no more than 10% strain occurs over a 100-year design life of the geogrid, as calculated in accordance with AASHTO R69. Long-term design loads shall be reported unfactored, and the AASHTO strength reduction factors (Durability and Installation, and safety factors) will be considered by the Department's Geotechnical Branch on a site specific design basis.

**907-714.15.1.2--Geogrid for Subgrade Stabilization.** Geogrid for subgrade stabilization shall meet Minimum Ultimate Tensile Strength and open area criteria listed in Table II.

**907-714.15.2--Marking, Shipment, and Storage.** Each roll or container of geogrid shall be visibly labeled with the name of the manufacturer, trade name of the product, lot number, and quantity of material. In addition, each roll or container shall be clearly tagged to show the type designation that corresponds to that required by the plans. During shipment and storage the geogrid shall be protected from direct sunlight, and temperatures above 120°F or below 0°F. The geogrid shall either be wrapped and maintained in a heavy duty protective covering or stored in a safe enclosed area to protect from damage during prolonged storage.

**907-714.15.3--Manufacturer Certification.** The Contractor shall furnish the Engineer three copies of the manufacturer's certified test reports indicating that the geogrid furnished conforms to the requirements of the specifications and is of the same composition as the originally approved

by the Department.

**907-714.15.4--Acceptance Sampling and Testing.** Final acceptance of each shipment will be based upon results of tests performed by the Department on verification samples submitted from the project, as compared to the manufacturer's certified test reports. The Engineer will select one roll or container at random from each shipment for sampling. As sample extending full width of the randomly selected roll or container and being at least five (5) square yards in area will be obtained and submitted by the Engineer. All material samples shall be provided at no cost to the State.

**TABLE II  
GEOGRIDS**

Physical Properties	Type Designation						Test Method
	I	II	III	IV	V	VI	
Long Term Design Load <sup>1</sup> , pounds per foot, Machine Direction	250	500	750	1500	2500	3500	AASHTO R69, ASTM D5262
Minimum Ultimate Tensile Strength <sup>2</sup> , pounds per foot, Machine Direction	500	1000	1500	3000	5000	7000	ASTM D6637
Open Area, percent	70	70	50	50	50	50	Direct Measurement

<sup>1</sup> Minimum design criteria requirement.  
<sup>2</sup> Minimum Average Roll Value (MARV).

## MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-718-1

CODE: (SP)

DATE: 12/07/2021

SUBJECT: Timber and Dimension Lumber

Section 718, Timber and Dimension Lumber, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

Delete the Subsections in Section 718 on pages 836 thru 838, and substitute the following.

**907-718.01--General.** All timber and dimension lumber shall be Southern pine and shall conform in all respects to applicable requirements of AASHTO M 168. The Department reserves the right to sample and to test all materials at any time; all inspection, testing, and certification of materials will be performed in accordance with the requirements of the current version of the Department's *Materials Division Inspection, Testing, and Certification Manual*.

Timber and dimension lumber shall be furnished in the sizes shown on the plans or as specified. Unless otherwise specified, timber and dimension lumber shall be No. 1, or better, graded according to the latest American Lumber Standards.

Only one type of preservative shall be used for the treatment of materials for any one class of construction on a project, unless otherwise specified.

Where treated timber and dimensional lumber is to be used in non-highway construction or use, such as decking, handrails in walking trails, or in any manner where general public exposure by touch is possible, the treatment requirements will be as per project plans and/or approved by the State Materials Engineer.

**907-718.02--Untreated Timber and Dimension Lumber.** Untreated timber and dimension lumber shall conform to the requirements of AASHTO M 168.

**907-718.03--Treated Timber and Dimension Lumber.** Timber and dimension lumber to be treated shall meet the requirements herein specified and shall be treated as specified. Treated timber or dimensional lumber will not be accepted for use unless it has been inspected by an authorized representative of the Department and found to be satisfactory after treatment.

**907-718.03.1--Blank.**

**907-718.03.2--Treatment.**

**907-718.03.2.1--General.** All materials shall be treated in accordance with AASHTO M 133 unless otherwise directed by the Environmental Protection Agency (EPA).

**907-718.03.2.2--Blank.**

**907-718.03.2.3--Inspection.** Treated timber and dimension lumber shall be inspected by an authorized representative of the Department before being incorporated into the work. Treatment reports shall be provided to the Department for each lot of material supplied.

**907-718.03.3--Blank.**

**907-718.03.4--Storage of Treated Material.** All material treated for stock shall be stacked as compactly as possible on a well-drained surface. Material shall be supported on sills spaced as necessary, not to exceed 10 foot intervals and shall have at least one foot of air space beneath the stacks.

All materials treated with preservatives for use in buildings and applications where painting is required shall be dried after treatment. The treated wood shall be dried in accordance with American Lumber Standards.

**907-718.04--Preservative.** Preservatives shall be as specified in AASHTO M 133 unless otherwise directed by the Environmental Protection Agency (EPA).

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION NO. 907-720-2**

**CODE: (IS)**

**DATE: 09/11/2018**

**SUBJECT: Acceptance Procedure for Glass Beads**

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

**907-720.01--Glass Beads.**

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

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

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION NO. 907-721-4**

**CODE: (IS)**

**DATE: 04/19/2022**

**SUBJECT: Materials for Signing**

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

**907-721.06--Reflective Sheeting.**

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

**MINIMUM COEFFICIENTS OF RETROREFLECTION  
Candela per foot candle per square foot (cd/ft<sup>2</sup>)  
Per ASTM Designation D4956**

**TABLE 4  
Type IX Sheeting**

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

**TABLE 5  
Type XI Sheeting**

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

After Subsection 721.10 on page 864, add the following.

**907-721.11--Digital Applied Printing.** The following addresses the requirements for digitally printed finished retroreflective traffic control signs on flat sheet aluminum and digitally printed traffic sign faces intended to be applied to a sign substrate.

**907-721.11.1--Digitally Printed Ink Systems.** Traffic signs must be produced using components, and processes that comply with the retroreflective sheeting manufacturer’s recommendations.

Digital printed ink systems used to print traffic signs must meet and comply with daytime and nighttime chromaticity (color standards) as recognized in ASTM D4956 “Standard Specification for Retroreflective Sheeting for Traffic Control.”

Digital printed ink systems must meet 70% of the initial retroreflectivity specifications of each respective reflective film color as found in ASTM D4956 “Standard Specification for Retroreflective Sheeting for Traffic Control.”

Prior to fabrication and preferably at the preconstruction meeting, the Contractor shall advise the Project Engineer in writing as to which signs on the project will be digitally printed and which ones will be screen printed. The Contractor shall submit to the Project Engineer certifications for all digitally printed signs, which will be forwarded to the State Traffic Engineer for review.

**907-721.11.2--Protective Overlay Film.** Permanent traffic signs printed with digital ink systems will be fabricated with a full sign protective overlay film designed to provide a smooth surface needed for retroreflectivity, and to protect the sign from fading and UV degradation. The overlamine shall comply with the retroreflective sheeting manufacturer’s recommendations to ensure proper adhesion and transparency and will also meet the reflective film durability as identified in Table 1.

**Table 1  
Retroreflective Film Minimum Durability Requirements**

<b>ASTM D4956 Type</b>	<b>Full Sign Replacement Term (years)</b>	<b>Sheeting Replacement Term (years)</b>
IV	7	10
VIII	7	10
IX	7	12
XI	7	12

Temporary signs used in work zones printed with black ink only will not require a protective overlay film as long as the finished sign is warranted for a minimum outdoor durability of three years by the sheeting manufacturer.

**907-721.11.3--Inspection.** During fabrication, the Contractor shall provide sufficient testing and quality control throughout fabrication to insure good workmanship. Once the material has been received, it may be subject to random testing to ensure compliance with all requirements. If any test samples do not conform to the requirements, the entire order may be returned at the vendor’s expense.

**907-721.11.4--Traffic Sign Performance Warranty Provisions.** Based on the ASTM Type of sheeting specified, traffic control signs shall be warranted for the duration shown in Table 1. The Contractor shall supply a copy of the warranty document with complete details of terms and conditions upon request of the Department.

**907-721.11.5--Certified Digital Sign Fabricator.** Sign fabricators using digital imaging methods to produce regulated traffic signs must be certified by the reflective sheeting manufacturer whose materials are used to produce the delivered signs.

Certified sign fabricators must undergo an audit process by the sheeting manufacturer to ensure they have the proper equipment, manufacturing capabilities, manufacturing application processes and the materials required to fulfill the sheeting manufacturer's warranty obligations. Sign fabricators must recertify annually with reflective sheeting manufacturers or utilize a 3<sup>rd</sup> party certifier approved by the reflective sheeting manufacturer.

The Contractor shall submit proof of Sign Fabricator Certification as issued by the retroreflective sign sheeting manufacturer to the Project Engineer upon delivery of the signs, or with the Shop Drawings.



# MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-722-1

CODE: (IS)

DATE: 11/15/2017

SUBJECT: **Materials for Traffic Signal Installation**

Section 722, Materials for Traffic Signal Installation, of the 2017 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follow.

**907-722.02.3--Design Strength Requirements.** Delete Subsection 722.02.3 on pages 864 thru 866, and substitute the following.

Unless specified otherwise in the plans, poles shall meet the requirements of the AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*, as specified in the plans with all interim supplements. All components of the assemblies shall be designed to the following:

- Importance Factor: 1.0; 50 year mean recurrence interval
- Basic Wind Speed (3 second gust): As shown on the project plans
- Minimum Gust Effect Factor: 1.14
- Fatigue Category: II
- Ice Loading: As shown on the project plans
- Natural Wind Gust Pressure Loads: Included
- Truck Induced Gust Pressure Loads: Not included
- Galloping: Not included

**907-722.02.5--Mast Arms for Traffic Signal and Equipment Poles.** Delete the first four sentences of the third paragraph of Subsection 722.02.5 on page 867, and substitute the following.

Anchor base plates must meet the minimum requirements of ASTM A36 or ASTM A709 Grade 36 or ASTM A572 Grade 50 and must be welded to the shaft by either telescoped with two continuous arc welds or by back up ring using full penetration welds.. Flange plate shall telescope the large end of the arm and be welded by either two (2) continuous arc welds, one (1) being on the outside of the plate, adjacent to the shaft, and the other one (1) on the inside at the end of the tubular cross section or by back up ring using full penetration welds. The thru-bolt flange plate or tapped flange plate supporting the mast arm shall be welded to the pole near the top and supported side plate tangent to the pole and gusset plates both top and bottom. The thru-bolt or tapped flange plate must be sufficient to develop the full capacity of the connecting bolts.

**907-722.03--Electric Cable.** Delete the paragraphs for Loop Detector Wire and Loop Detector Lead-in Cable in Subsection 722.03 on page 869.

Delete the first sentence of “Communication Cable” in Subsection 722.03 on page 870, and substitute the following.

Communication cables shall be as per the manufacturer's recommendation.

**907-722.05.4--Type III or Type IV Rigid Non-Metallic Conduit.** After the last sentence of Subsection 722.05.4 on page 871, add the following.

Schedule 40 conduit shall be used unless otherwise noted in the plans.

Delete the title of Subsection 722.13.3 on page 876, and substitute the following.

**907-722.13.3--Power Service Pedestal.**

Delete the first paragraph of Subsection 722.13.3 on page 876, and substitute the following.

The pedestal shall be of NEMA Type 3R rainproof construction and shall be UL Listed as "Enclosed Industrial Control Equipment" (UL 508A). External construction shall comply with UL50 requirements and shall be unpainted aluminum.

Nominal size of the pedestal shall be 48"H x 16"W x 16"D.

Pedestal shall have a voltage rating or 120v/240v single phase with an Amperage rating of 800A.

After the first sentence of the seventh paragraph of Subsection 722.13.3 on page 876, add the following.

An outdoor rated heavy duty combination lock shall be provided to lock the customer compartment door.

**907-722.14.1.3--Optical System.** Delete the sixteenth paragraph of Subsection 722.14.1.3 on page 879, and substitute the following.

The signal module on-board circuitry shall include voltage surge protection to withstand high-repetition noise transients and low-repetition high-energy transients as stated in Section 2.1.6, NEMA Standard TS 2, 1992.

Delete the last sentence of the seventeenth paragraph of Subsection 722.14.1.3 on page 879, and substitute the following.

Load switches shall be compatible with NEMA TS 1 or later, or Model 170-1989 or later.

Delete Subsection 722.14.5 on page 882, and substitute the following.

**907-722.14.5--Blank.**

Delete Subsections 722.14.7 and 722.14.8 on page 882.

# SECTION 905 - PROPOSAL

Date \_\_\_\_\_

Mississippi Transportation Commission  
Jackson, Mississippi

Sirs: The following proposal is made on behalf of \_\_\_\_\_  
\_\_\_\_\_ of \_\_\_\_\_

for constructing the following designated project(s) within the time(s) hereinafter specified.

The plans are composed of drawings and blue prints on file in the offices of the Mississippi Department of Transportation, Jackson, Mississippi.

The Specifications are the current Standard Specifications of the Mississippi Department of Transportation approved by the Federal Highway Administration, except where superseded or amended by the plans, Special Provisions and Notice(s) to Bidders attached hereto and made a part thereof.

I (We) certify that I (we) possess a copy of said Standard and any Supplemental Specifications.

Evidence of my (our) authority to submit the Proposal is hereby furnished. The proposal is made without collusion on the part of any person, firm or corporation. I (We) certify that I (we) have carefully examined the Plans, the Specifications, including the Special Provisions and Notice(s) to Bidders, herein, and have personally examined the site of the work. On the basis of the Specifications, Special Provisions, Notice(s) to Bidders, and Plans, I (we) propose to furnish all necessary machinery, tools, apparatus and other means of construction and do all the work and furnish all the materials in the manner specified. I (We) understand that the quantities mentioned herein are approximate only and are subject to either increase or decrease, and hereby propose to perform any increased or decreased quantities of work at the unit prices bid, in accordance with the above.

I (We) acknowledge that this proposal will be found irregular and/or non-responsive unless a certified check, cashier's check, or Proposal Guaranty Bond in the amount as required in the Advertisement (or, by law) is submitted electronically with the proposal or is delivered to the Contract Administration Engineer prior to the bid opening time specified in the advertisement.

**INSTRUCTION TO BIDDERS: Alternate and Optional Items on Bid Schedule.**

1. Two or more items entered opposite a single unit quantity WITHOUT DEFINITE DESIGNATION AS "ALTERNATE ITEMS" are considered as "OPTIONAL ITEMS". Bidders may or may not indicate on bids the Optional Item proposed to be furnished or performed WITHOUT PREJUDICE IN REGARD TO IRREGULARITY OF BIDS.
2. Items classified on the bid schedule as "ALTERNATE ITEMS" and/or "ALTERNATE TYPES OF CONSTRUCTION" must be preselected and indicated on bids. However, "Alternate Types of Construction" may include Optional Items to be treated as set out in Paragraph 1, above.
3. Optional items not preselected and indicated on the bid schedule MUST be designated in accordance with Subsection 102.06 prior to or at the time of execution of the contract.
4. Optional and Alternate items designated must be used throughout the project.

I (We) further propose to perform all "force account or extra work" that may be required of me (us) on the basis provided in the Specifications and to give such work my (our) personal attention in order to see that it is economically performed.

I (We) further propose to execute the attached contract agreement (Section 902) as soon as the work is awarded to me (us), and to begin and complete the work within the time limit(s) provided for in the Specifications and Advertisement. I (We) also propose to execute the attached contract bond (Section 903) in an amount not less than one hundred (100) percent of the total of my (our) part, but also to guarantee the excellence of both workmanship and materials until the work is finally accepted.

I (We) shall submit electronically with our proposal or deliver prior to the bid opening time a certified check, cashier's check or bid bond for **five percent (5%) of total bid** and hereby agree that in case of my (our) failure to execute the contract and furnish bond within Ten (10) days after notice of award, the amount of this check (bid bond) will be forfeited to the State of Mississippi as liquidated damages arising out of my (our) failure to execute the contract as proposed. It is understood that in case I am (we are) not awarded the work, the check will be returned as provided in the Specifications.

**SECTION 905 -- PROPOSAL (CONTINUED)**

I (We) hereby certify by digital signature and electronic submission via Bid Express of the Section 905 proposal below, that all certifications, disclosures and affidavits incorporated herein are deemed to be duly executed in the aggregate, fully enforceable and binding upon delivery of the bid proposal. I (We) further acknowledge that this certification shall not extend to the bid bond or alternate security which must be separately executed for the benefit of the Commission. This signature does not cure deficiencies in any required certifications, disclosures and/or affidavits. I (We) also acknowledge the right of the Commission to require full and final execution on any certification, disclosure or affidavit contained in the proposal at the Commission's election upon award. Failure to so execute at the Commission's request within the time allowed in the Standard Specifications for execution of all contract documents will result in forfeiture of the bid bond or alternate security.

Respectfully Submitted,

DATE \_\_\_\_\_

\_\_\_\_\_  
Contractor

BY \_\_\_\_\_  
Signature

TITLE \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY, STATE, ZIP \_\_\_\_\_

PHONE \_\_\_\_\_

FAX \_\_\_\_\_

E-MAIL \_\_\_\_\_

(To be filled in if a corporation)

Our corporation is chartered under the Laws of the State of \_\_\_\_\_ and the names, titles and business addresses of the executives are as follows:

\_\_\_\_\_  
President Address

\_\_\_\_\_  
Secretary Address

\_\_\_\_\_  
Treasurer Address

The following is my (our) itemized proposal.

Thin Lift Overlay on approximately 9 miles of SR 63 from Clara to SR 184 & approximately 2 miles of SR 184 from US 84 to SR 63, known as State Project Nos. SP-1132-00(016) / 109023301 & SP-2167-00(003) / 109023302 in Wayne County.

Line no.	Item Code	Adj Code	Quantity	Units	Description[Fixed Unit Price]
<b>Roadway Items</b>					
0010	201-D001		30	Station	Random Clearing
0020	202-B188		4,800	Square Yard	Removal of Pavement, All Types and Depths
0030	202-B240		3,925	Linear Feet	Removal of Traffic Stripe
0040	304-F003	(GT)	12,400	Ton	Size 825B Crushed Stone Base
0050	403-A005	(BA1)	835	Ton	19-mm, MT, Asphalt Pavement
0060	403-A014	(BA1)	2,450	Ton	9.5-mm, MT, Asphalt Pavement
0070	406-A002		29,900	Square Yard	Cold Milling of Bituminous Pavement, All Depths
0080	407-A001	(A2)	58,905	Gallon	Asphalt for Tack Coat
0090	423-A001		15	Mile	Rumble Strips, Ground In
0100	618-A001		1	Lump Sum	Maintenance of Traffic
0110	618-B001		2	Square Feet	Additional Construction Signs (\$10.00)
0120	619-A1001		37	Mile	Temporary Traffic Stripe, Continuous White
0130	619-A2001		39	Mile	Temporary Traffic Stripe, Continuous Yellow
0140	619-A4002		9	Mile	Temporary Traffic Stripe, Skip Yellow
0150	619-A5001		15,250	Linear Feet	Temporary Traffic Stripe, Detail
0160	619-A6002		5,500	Linear Feet	Temporary Traffic Stripe, Legend
0170	620-A001		1	Lump Sum	Mobilization
0180	626-C002		19	Mile	6" Thermoplastic Double Drop Edge Stripe, Continuous White
0190	626-D003		5	Mile	6" Thermoplastic Traffic Stripe, Skip Yellow
0200	626-E004		20	Mile	6" Thermoplastic Traffic Stripe, Continuous Yellow
0210	626-G002		8,110	Linear Feet	Thermoplastic Detail Stripe, White
0220	626-G003		8,150	Linear Feet	Thermoplastic Detail Stripe, Yellow
0230	626-H004		39	Square Feet	Thermoplastic Legend, White
0240	626-H005		6,305	Linear Feet	Thermoplastic Legend, White
0250	627-J001		1,030	Each	Two-Way Clear Reflective High Performance Raised Markers
0260	627-L001		1,924	Each	Two-Way Yellow Reflective High Performance Raised Markers
0270	627-M001		1,850	Each	One-Way Clear Reflective High Performance Raised Markers
0280	630-G005		112	Each	Type 3 Object Markers, OM-3R or OM-3L, Post Mounted
0290	630-G006		20	Each	Type 3 Object Markers, OM-3R or OM-3L, 2 Markers Per Post, Post Mounted
0300	907-411-A001	(BA1)	26,360	Ton	Ultra Thin Asphalt Pavement
0310	907-619-B001		66	Linear Feet	Temporary Portable Rumble Strips
0320	907-640-A001		150	Linear Feet	Vehicle Loop Assemblies
0330	907-643-A005		1	Each	Video Vehicle Detection Sensor, Type 1B
0340	907-643-B001		50	Linear Feet	Video Vehicle Detection Cable
0350	907-643-C002		1	Each	Video Vehicle Detection Processor, Type 1

Line no.	Item Code	Adj Code	Quantity	Units	Description[Fixed Unit Price]
0360	907-663-A001		1	Each	Network Switch, Type A
0370	907-663-C002		1	Each	SD-WAN Router
<b>ALTERNATE GROUP AA NUMBER 1</b>					
0380	907-624-B002		2,110	Linear Feet	6" Inverted Profile Thermoplastic Traffic Stripe, Continuous White
0390	907-624-C001		590	Linear Feet	6" Inverted Profile Thermoplastic Traffic Stripe, Skip Yellow
0400	907-624-D002		1,190	Linear Feet	6" Inverted Profile Thermoplastic Traffic Stripe, Continuous Yellow
<b>ALTERNATE GROUP AA NUMBER 2</b>					
0410	628-H001		2,110	Linear Feet	6" High Performance Cold Plastic Traffic Stripe, Continuous White
0420	628-I002		590	Linear Feet	6" High Performance Cold Plastic Traffic Stripe, Skip Yellow
0430	628-J001		1,190	Linear Feet	6" High Performance Cold Plastic Traffic Stripe, Continuous Yellow

SECTION 905 - COMBINATION BID PROPOSAL (Continued)

**CONDITIONS FOR COMBINATION BID**

If a bidder elects to submit a combined bid for two or more of the contracts listed for this month's letting, the bidder must complete and execute these sheets of the proposal in each of the individual proposals to constitute a combination bid. In addition to this requirement, each individual contract shall be completed, executed and submitted in the usual specified manner.

Failure to execute this Combination Bid Proposal in each of the contracts combined will be just cause for each proposal to be received and evaluated as a separate bid.

It is understood that the Mississippi Transportation Commission not only reserves the right to reject any and all proposals, but also the right to award contracts upon the basis of lowest separate bids or combination bids most advantageous to the State.

It is further understood and agreed that the Combination Bid Proposal is for comparison of bids only and that each contract shall operate in every respect as a separate contract in accordance with its proposal and contract documents.

I (We) agree to complete each contract on or before its specified completion date.

\*\*\*\*\*

**COMBINATION BID PROPOSAL**

This proposal is tendered as one part of a Combination Bid Proposal utilizing option \_\_\_\* of Subsection 102.11 on the following contracts:

\* Option to be shown as either (a), (b), or (c).

	<u>Project No.</u>	<u>County</u>	<u>Project No.</u>	<u>County</u>
1.	_____	_____	6.	_____
2.	_____	_____	7.	_____
3.	_____	_____	8.	_____
4.	_____	_____	9.	_____
5.	_____	_____	10.	_____

(a) If Combination A has been selected, your Combination Bid is complete.

(b) If Combination B has been selected, then complete the following page.

SECTION 905 - COMBINATION BID PROPOSAL (Continued)

Project Number	Pay Item Number	Unit	Unit Price Reduction	Total Item Reduction	Total Contract Reduction
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					

For Informational Purposes Only



SECTION 905 - COMBINATION BID PROPOSAL (Continued)

Project Number	Pay Item Number	Unit	Unit Price Reduction	Total Item Reduction	Total Contract Reduction
9.					
10.					

(c) If Combination C has been selected, then initial and complete ONE of the following.

\_\_\_\_\_ I (We) desire to be awarded work not to exceed a total monetary value of \$ \_\_\_\_\_.

\_\_\_\_\_ I (We) desire to be awarded work not to exceed \_\_\_\_\_ number of contracts.



TO: EXECUTIVE DIRECTOR, MISSISSIPPI DEPARTMENT OF TRANSPORTATION  
JACKSON, MISSISSIPPI

**CERTIFICATE**

If awarded this contract, I (we) contemplate that portions of the contract will be sublet. I (we) certify that those subcontracts which are equal to or in excess of fifty thousand dollars (\$50,000.00) will be in accordance with regulations promulgated and adopted by the Mississippi State Board of Contractors on September 8, 2011.

I (we) agree that this notification of intent DOES NOT constitute APPROVAL of the subcontracts.

_____	_____
(Individual or Firm)	(Address)
_____	_____
(Individual or Firm)	(Address)
_____	_____
(Individual or Firm)	(Address)
_____	_____
(Individual or Firm)	(Address)

NOTE: Failure to complete the above DOES NOT preclude subsequent subcontracts. Subsequent subcontracts, if any, equal to or in excess of fifty thousand dollars (\$50,000.00) will be in accordance with regulations promulgated and adopted by the Mississippi State Board of Contractors on September 8, 2011.

Contractor \_\_\_\_\_

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION**  
**CERTIFICATION**

I, \_\_\_\_\_,  
(Name of person signing bid)

individually, and in my capacity as \_\_\_\_\_ of  
(Title of person signing bid)

\_\_\_\_\_  
(Name of Firm, partnership, or Corporation)

do hereby certify under penalty of perjury under the laws of the United States and the State of Mississippi

that \_\_\_\_\_, Bidder  
(Name of Firm, Partnership, or Corporation)

on Project No. **SP-1132-00(016)/ 109023301000 & SP-2167-00(003)/ 109023302000**

in Wayne County(ies), Mississippi, has not either directly or indirectly entered into any agreement, participated in any collusion; or otherwise taken any action in restraint of free competitive bidding in connection with this contract; nor have any of its corporate officers or principal owners.

Except as noted hereafter, it is further certified that said legal entity and its corporate officers, principal owners, managers, auditors and others in a position of administering federal funds are not currently under suspension, debarment, voluntary exclusion or determination of ineligibility; nor have a debarment pending; nor been suspended, debarred, voluntarily excluded or determined ineligible within the past three years by the Mississippi Transportation Commission, the State of Mississippi, any other State or a federal agency; nor been indicted, convicted or had a civil judgment rendered by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three years.

Do exceptions exist and are made a part thereof?            Yes / No

Any exceptions shall address to whom it applies, initiating agency and dates of such action.

Note: Exceptions will not necessarily result in denial of award but will be considered in determining bidder responsibility. Providing false information may result in criminal prosecution or administrative sanctions.

All of the foregoing is true and correct.

(1/2016 S)

## SECTION 902

CONTRACT FOR \_\_\_\_\_  
LOCATED IN THE COUNTY(IES) OF \_\_\_\_\_

STATE OF MISSISSIPPI  
COUNTY OF HINDS

This Contract is entered into by and between the Mississippi Transportation Commission (the "Commission") and the undersigned contractor (the "Contractor"), as follows:

As consideration for this Contract, the Commission agrees to pay the Contractor the amount(s) set out in the Proposal attached hereto. Said payment will be made in the manner and at the time(s) specified in the Specifications and/or Special Provisions, if any. In exchange for said consideration, the Contractor hereby agrees to accept the prices stated in the Proposal as full compensation for the furnishing of all labor, materials and equipment, and the execution of the scope of work identified for this referenced Project as contemplated in this Contract, and as more fully outlined in the Contract Documents (the "Work"). The Contract Documents consist of the Advertisement, the Notice to Bidders, the Proposal, the Specifications, the Special Provisions, and the approved Plans, all of which are hereby made a part of this Contract and incorporated herein by reference.

The Contractor shall be responsible for all loss or damage arising out of, or in any way in connection with the Work, or from any unforeseen obstructions or difficulties that may be encountered in the prosecution of the Work, and for all risks of every description connected with the Work, with the exception of any items specifically excluded in the Contract Documents. The Contractor shall fully and faithfully complete the Work in a good and workmanlike manner, according to the Contract Documents and any Supplemental Agreements thereto.

The Contractor further agrees that the Work shall be done under the direct supervision of, and to the complete satisfaction of, the Executive Director of the Mississippi Department of Transportation, or his authorized representative(s), and, when federal funds are involved, subject to the inspection and approval of the Federal Highway Administration, or its agents, and/or the agents of any other state or federal agency whose funds are involved. Further, the Work shall be done in accordance with any applicable state and federal laws, and any such rules and regulations issued by the Commission and/or any relevant Federal Agency.

The Contractor agrees that all labor as outlined in the Contract Documents may be secured from a list furnished by the Manager of the Win Job Center nearest the project location, or any successor thereto.

It is agreed and understood that each and every provision of law and clause required by law to be inserted into this Contract shall be deemed to be inserted herein, and this Contract shall be read and enforced as though it were included herein. If through mere mistake or otherwise, any such provision is not inserted, then upon the application of either party hereto, the Contract shall be physically amended to make such insertion.

The Contractor agrees that he has read each and every clause of the Contract Documents, and fully understands the meaning of same, and hereby acknowledges that he will comply with all terms, covenants and agreements therein.

Witness our signatures, this the \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Contractor

By: \_\_\_\_\_  
Title: \_\_\_\_\_

\_\_\_\_\_  
Signed and sealed in the presence of: (name and address of witness)

\_\_\_\_\_  
\_\_\_\_\_

MISSISSIPPI TRANSPORTATION COMMISSION

\_\_\_\_\_  
Executive Director

\_\_\_\_\_  
Secretary to the Commission

Award authorized by the Mississippi Transportation Commission in session on the \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, Minute Book No. \_\_\_\_\_, Page No. \_\_\_\_\_.

**SECTION 903  
PERFORMANCE BOND**

**PERFORMANCE BOND FOR THE FOLLOWING CONTRACT:**

Project No.: \_\_\_\_\_

For the construction of: \_\_\_\_\_

Contract date: \_\_\_\_\_ Contract amount: \_\_\_\_\_

**FOR OWNER: MISSISSIPPI TRANSPORTATION COMMISSION, 401 N. WEST STREET, JACKSON, MISSISSIPPI 39201.**

**CONTRACTOR** (full legal name, contact person, phone number and address):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SURETY** (legal name, phone number, principal place of business and address *for notice purposes*):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Second Surety (if applicable):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns, to the Owner for the performance of the Contract, which is incorporated herein by reference, and subject to the following terms:

1. If the Contractor fully and faithfully performs the Contract, the Surety and the Contractor shall have no obligation under this Bond.
2. The Surety's obligation under this Bond shall arise after:
  - (a) the Owner first provides notice to the Contractor and the Surety that termination is imminent, pursuant to the current edition of the Mississippi Standard Specifications for Road and Bridge Construction, which is a part of the Contract; and
  - (b) the Owner declares a Contractor Default, terminates the Contract, and notifies the Surety.
3. The Surety shall promptly and at the Surety's expense, take one of the following actions:
  - (a) Arrange for the Contractor, with the consent of the Owner, to perform and complete the Contract; or
  - (b) Undertake to perform and complete the Contract itself, through its agents or independent contractors.
4. If the Surety does not proceed as provided in Paragraph 3, within 20 calendar days as set forth in Section 108.08 of the current edition of the Mississippi Standard Specifications for Road and Bridge Construction, then the Surety shall be deemed to be in default on this Bond, and the Owner shall be entitled to enforce any remedy available to it under the Contract and applicable law.
5. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

- (a) the responsibilities of the Contractor for correction of defective work and completion of the Contract;
  - (b) additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 3; and
  - (c) liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of the Contractor.
6. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders and other obligations.
  7. The penal sum of the Bond shall be subject to increase or decrease based on any subsequent Supplemental Agreements and/or final contract quantities.
  8. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address listed for notice purposes on the first page of this Bond.

**CONTRACTOR AS PRINCIPAL**

Company: \_\_\_\_\_

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

**SURETY**

Company: \_\_\_\_\_

Signature: \_\_\_\_\_

MS Insurance ID # \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

**SURETY (if applicable)**

Company: \_\_\_\_\_

Signature: \_\_\_\_\_

MS Insurance ID # \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

**SECTION 903  
PAYMENT BOND**

**PAYMENT BOND FOR THE FOLLOWING CONTRACT:**

Project No.: \_\_\_\_\_

For the construction of: \_\_\_\_\_

Contract date: \_\_\_\_\_ Contract amount: \_\_\_\_\_

**FOR OWNER: MISSISSIPPI TRANSPORTATION COMMISSION, 401 N. WEST STREET, JACKSON, MISSISSIPPI 39201.**

**CONTRACTOR** (full legal name, contact person, phone number and address):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SURETY** (legal name, phone number, principal place of business and address *for notice purposes*):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Second Surety (if applicable):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns, to the Owner for payment of labor, materials and equipment furnished for use in the performance of the Contract, which is incorporated herein by reference, subject to the following terms:

1. If the Contractor promptly makes payment of all sums due to any and all subcontractors, suppliers and/or laborers, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Contract, then the Surety and the Contractor shall have no obligation under this Bond.
2. The Owner shall provide notice to the Surety of any claims, demands, liens or suits against the Owner or the Owner's property that it receives from any person or entity ("Claimants") seeking payment for labor, materials or equipment furnished for use in the performance of the Contract.
3. Upon notice of any claims, demands, liens or suits provided by the Owner or Contractor or given to the Surety by a Claimant, the Surety shall promptly and at the Surety's expense, defend, indemnify and hold harmless the Owner against said claim, demand, lien or suit and shall take the following additional actions:
  - (a) Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
  - (b) Pay or arrange for payment of any undisputed amounts.
4. The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have no obligation under this Bond to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.



5. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders and other obligations.
6. The penal sum of the Bond shall be subject to increase or decrease based on any subsequent Supplemental Agreements and/or final contract quantities.

**CONTRACTOR AS PRINCIPAL**

Company: \_\_\_\_\_  
Signature: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Address: \_\_\_\_\_  
\_\_\_\_\_

**SURETY**

Company: \_\_\_\_\_  
Signature: \_\_\_\_\_ MS Insurance ID # \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Address: \_\_\_\_\_  
\_\_\_\_\_

**SURETY (if applicable)**

Company: \_\_\_\_\_  
Signature: \_\_\_\_\_ MS Insurance ID # \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Address: \_\_\_\_\_  
\_\_\_\_\_



# 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 **Thin Lift Overlay on approximately 9 miles of SR 63 from Clara to SR 184 & approximately 2 miles of SR 184 from US 84 to SR 63, known as State Project Nos. SP-1132-00(016) / 109023301 & SP-2167-00(003) / 109023302 in Wayne County.**

NOW THEREFORE, the condition of this obligation is such that if the aforesaid Principal shall be awarded the contract, the said Principal will, within the time required, enter into a formal contract and give a good and sufficient bond to secure the performance of the terms and conditions of the contract, then this obligation to be void; otherwise the Principal and Surety will pay unto the Obligee the difference in money between the amount of the bid of the said Principal and the amount for which the Obligee legally contracts with another party to perform the work if the latter amount be in excess of the former, but in no event shall liability hereunder exceed the penal sum hereof.

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_

\_\_\_\_\_  
(Principal)

(Seal)

\_\_\_\_\_  
(Witness) (Name) By: \_\_\_\_\_ (Title)

\_\_\_\_\_  
(Surety) (Seal)

\_\_\_\_\_  
(Witness) (Attorney-in-Fact) By: \_\_\_\_\_

\_\_\_\_\_  
(MS Agent)

\_\_\_\_\_  
Mississippi Insurance ID Number

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION  
OFFICE OF CIVIL RIGHTS  
JACKSON, MISSISSIPPI**

**LIST OF FIRMS SUBMITTING QUOTES**

I/we received quotes from the following firms on:                      Letting Date: May 29, 2024

Project No: SP-1132-00(016) / 109023301 & SP-2167-00(003) / 109023302

County: Wayne

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

\_\_\_\_\_ **FIRM NAME**

