



MONROE COUNTY
R O A D
COMMISSION

840 S. Telegraph Road • Monroe, Michigan 48161 • Phone: (734) 240-5102 • Fax: (734) 240-5101

PROPOSAL

FOR

2016 HMA PAVING PROGRAM

BID OPENING:

Thursday, March 24, 2016 at 10:00 a.m.

**BOARD OF COUNTY ROAD COMMISSIONERS
OF THE COUNTY OF MONROE**

Paul Iacoangeli, Chairman
Dan Minton, Vice Chairman
Bruce R. Stammer, Jr., Member
Stephen J. Pace, Member
Charles A. Londo, Member

**MONROE COUNTY ROAD COMMISSION
INVITATION TO BID**

Sealed bids will be received by the Board of County Road Commissioners of the County of Monroe until **10:00 a.m.** local time on **Thursday, March 24, 2016** at their office located at 840 South Telegraph Road, Monroe, Michigan, 48161 for the following:

- 2016 HMA Paving Program
- 2016 Overband Crack Fill Program
- 2016 Pavement Marking Program
- 2016 HMA Mixtures
- 2016 Asphalt Emulsions

Bids will be publicly opened and read aloud by the Bid Committee at 10:00 a.m. Proposals may be downloaded from the Road Commission's website at www.mcrc-mi.org/bids.html .

BOARD OF COUNTY ROAD COMMISSIONERS
OF THE COUNTY OF MONROE, MICHIGAN

**MONROE COUNTY ROAD COMMISSION
PROPOSAL
2016 HMA PAVING PROGRAM**

TO: The Board of County Road Commissioners of the County of Monroe, Michigan

FOR: 2016 HMA Paving Program

Ladies and Gentlemen:

The undersigned bidder hereby affirms that:

1. The proposal is in all respects fair and without any collusion or fraud.
2. The undersigned have examined the site of the proposed project and have made a personal investigation and estimate of quantities.
3. The undersigned will contract to furnish all labor, equipment, tools, material and traffic control devices necessary at the unit prices stated on the attached bid forms and to complete the work in the time specified to the satisfaction of the Board of County Road Commissioners of the County of Monroe, Michigan.

Company: _____

Address: _____

City, State, ZIP: _____

Telephone: _____

By: _____

Title: _____

Date: _____

Notes:

1. If the bidder is a partnership, each member must sign the proposal
2. Corporations must execute the proposal by duly authorized officers in accordance with the Articles of Incorporation.

INSTRUCTIONS TO BIDDERS
and
GENERAL CONDITIONS

The Michigan Department of Transportation 2012 Standard Specifications for Construction are incorporated as part of these bidding documents and shall govern except as provided in the Invitation to Bid, Instructions to Bidders and General Conditions, and Proposal. Reference to the Department or Commission in the Michigan Department of Transportation 2012 Standard Specifications for Construction shall for this project mean the Board of County Road Commissioners of the County of Monroe, hereinafter referred to as "Board", unless otherwise specified.

OWNER

The owner of the project is the Board of County Road Commissioners of the County of Monroe, also referred to as the "Board."

ENGINEER

The Engineer is the Director of Operations or the individual assigned by the Director of Operations to be in charge of the Contract. The person assigned as the Engineer may be an employee of the Board, a consultant or an outside contractor hired by the Board.

BIDDER

The Bidder is one who submits a signed bid with the required documentation directly to the Board at the time and place specified.

BID FORMS

Sealed proposals must be submitted on the bid forms furnished by the Board. The proposal shall be submitted in its entirety (pages 1 through 13) with no modifications or changes except as authorized by an addendum and with no pages removed. All proposals must be filled out in ink or typewritten and shall be legibly signed, giving the complete name and address of the Bidder.

All bids must be in a sealed envelope and clearly marked "**Bid for 2016 HMA Paving Program.**"

BIDDER'S SURETY

The proposal must be accompanied by a cashier's check, certified check or a bid bond made payable to the Board of County Road Commissioners of Monroe County, Michigan in the sum of five percent (5%) of the amount of the bid. Upon awarding and signing of a contract, or in the event of bid rejection, such bid surety will be returned to the Bidder. Bids may be held for a period of forty (40) days.

INTERPRETATION AND ADDENDA

All questions about the meaning or intent of the Bidding Documents are to be directed to the Engineer. Interpretation or clarification considered necessary by the Engineer to such questions will be issued by Addenda delivered to all parties recorded by the Engineer as having received the Bidding Documents. Questions received less than seven days prior to the date for opening the bids may not be answered. Only questions answered by formal written Addenda are binding. Oral and other interpretations or clarifications will be without legal effect.

OPENING OF BIDS

Bids will be received by the Board at 840 S. Telegraph Road, Monroe, Michigan, 48161 until **10:00 a.m.** local time on **Thursday, March 24, 2016** at which time they will be publicly opened and read aloud.

REJECTION OF BIDS

The Board reserves the right to reject any or all bids, including without limitation the right to reject any or all nonconforming, nonresponsive, unbalanced, or conditional bids and to reject the bid of any Bidder if the Board believes that it would not be in the best interest of the project to make an award to that Bidder, whether because the bid is not responsive or if the Bidder is unqualified or of doubtful financial ability or fails to meet any pertinent standards or criteria established by the Board. The Board also reserves the right to waive all informalities in any bid should it be deemed in the best interest of the Road Commission

to do so. Discrepancies between the multiplication of units of work and the unit prices will be resolved in favor of the unit price. Discrepancies between the indicated sum of any column of figures and the correct sum will be resolved in favor of the correct sum. Discrepancies between words and figure will be resolved in favor of words.

TITLE VI ASSURANCE

The Monroe County Road Commission, in accordance with Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 USC 2000d to 2000d-4) and Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, hereby notifies all bidders that it assures that in any contract entered into pursuant to this advertisement, minority 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, national origin, gender, age, or disability in consideration for an award.

PROHIBITION OF DISCRIMINATION

In accordance with Act No. 453, Public Acts of 1976, the Contractor and subcontractors hereby agree not to discriminate against an employee or applicant for employment with respect to hire, tenure, terms, conditions, or privileges of employment, or a matter directly or indirectly related to employment, because of race, color, religion, national origin, age, sex, height, weight, or marital status. Further, in accordance with Act No. 220, Public Acts of 1976 as amended by Act No. 478, Public Acts of 1980, the Contractor and subcontractors hereby agree not to discriminate against an employee or applicant for employment tenure, terms, conditions, or privileges of employment, or a matter directly or indirectly related to employment, because of a disability that is unrelated to the individual's ability to perform the duties of a particular job or position. A breach of the above covenants shall be regarded as a material breach of this contract.

CONTRACT EXECUTION

The Bidder to whom the Contract is awarded shall, within ten (10) calendar days after notice of award, enter into a written contract with the Board and furnish proof of insurance as hereinafter specified. Failure to execute the contract or furnish satisfactory proof of insurance will be considered cause for annulment of award.

PERFORMANCE AND LIEN BONDS

The successful Bidder to whom the contract is awarded shall furnish two (2) surety bonds as follows:

Performance Bond - To the Board of County Road Commissioners of the County of Monroe, Michigan for the faithful fulfillment of the terms of the contract in the amount of one-hundred (100) percent of the contract amount

Lien Bond - To the Board of County Road Commissioners of the County of Monroe, Michigan for the payment of all labor and materials used in the work in the amount of one-hundred (100) percent of the contract amount

INCREASED OR DECREASED QUANTITIES

The Board reserves the right to increase or decrease quantities from those originally estimated and such changes will be paid for at the unit price bid so long as the total contract amount is not changed more than twenty-five (25) percent. Changes in excess of that amount will be individually negotiated.

PROGRESS SCHEDULE

In no case shall any work be commenced prior to receipt of formal notice of award by the Board.

The low Bidder for the work covered by this proposal will be required to meet with the Board's representative to review the Contractor's proposed work schedule. The schedule for this meeting will be set within one (1) week after the low bidder is determined.

The Board's representative will arrange the time and place for the meeting.

TIME OF COMPLETION

Roads that will be prepared for a chip seal surface treatment shall be completed on or before **June 4, 2016**. The completion dates for the roads that are being prepared for a chip seal are noted in the Log of Work attached to the proposal.

All roads shall be completed on or before **November 5, 2016**.

FAILURE TO COMPLETE ON TIME

Liquidated damages in the amount of **\$400** per day will be assessed for each calendar day that the work remains incomplete beyond the completion dates.

PAYMENTS TO CONTRACTOR

The Contractor shall invoice the Monroe County Road Commission for their work on the contract. Each invoice shall contain, at a minimum, the following information: road name and limits, date(s) the work was performed, pay items, quantities of work completed, and the contract unit prices

FINAL INSPECTION, ACCEPTANCE AND FINAL PAYMENT

The Engineer or their designated representative will make an inspection of all work included in the contract and notify the Contractor of defects to be remedied prior to acceptance and payment.

DISPUTES

The Engineer's written decision on any question arising under the contract between the Board and Contractor shall be final and binding upon both the Board and the Contractor in the absence of fraud, bad faith, or abuse of discretion.

ASSIGNMENT CLAUSE

The contract between the Board and the Contractor may not be assigned to a third party without the written consent of the Board.

TAXES

The Contractor shall include, and will be deemed to have included, in its base bid and contract price all applicable Michigan Sales and Use taxes which have been enacted into law as of the date the bid is submitted.

EXTENSION OF CONTRACT

Upon mutual agreement of both parties, the Board may extend the length of this Contract for up to three additional years. Requests for an extension must be made in writing to the Director of Operations by February 1st.

BOARD RESPONSIBILITY

The Board shall not supervise, direct or have control or authority over, nor be responsible for, the Contractor's means, methods, techniques, sequences or procedures of construction or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with laws and regulations applicable to the furnishing or performance of the work unless otherwise specified in the Special Provisions. The Board will not be responsible for the Contractor's failure to perform or furnish the work in accordance with the Contract Documents.

INDEMNIFICATION, DAMAGE LIABILITY AND INSURANCE

- A. **Indemnification.** The Contractor must hold harmless, indemnify, defend and represent the Board and its officers, agents and employees against any and all claims for bodily injury or property damage, or any other claim arising out of performance of the work on this contract. The Contractor will not be responsible for claims that result from the sole negligence or willful acts of said indemnitee.
- B. **Workers' Compensation Insurance.** The Contractor must carry the necessary Workers' Compensation Insurance and submit a certification that it carries Workers' Compensation to the Board.

C. **Bodily Injury and Property Damage.** The Contractor must carry adequate insurance, satisfactory to the Board, to afford protection against all claims for damage to public or private property and injuries to persons arising out of performance of the work. Copies of completed certificates must be submitted to the Board.

1. **General Liability, Bodily Injury and Property Damage.** The Contractor must provide the following minimum limits of property damage and bodily injury liability:

Bodily Injury and Property Damage Liability:	
Each Occurrence	\$1,000,000
Aggregate	\$2,000,000

2. **Automobile Liability, Bodily Injury and Property Damage.** The Contractor must provide the following minimum limits of property damage and bodily injury liability:

Bodily Injury Liability:	
Each Person	\$500,000
Each Occurrence	\$1,000,000

Property Damage Liability:	
Each Occurrence	\$1,000,000

Combined Single Limit for Bodily Injury and Property Damage Liability:	
Each Occurrence	\$2,000,000

3. **Umbrella Policy.** The Contractor may meet the requirements of above minimum limits of bodily injury and property damage liability through an umbrella policy.

D. **Additional Insured.** The Bodily Injury and Property Damage Policy must include the following endorsements, verbatim:

“Additional Insured: The Board of County Road Commissioners of the County of Monroe, the Monroe County Road Commission and its officers, agents and employees.”

“Provide written notice ten (10) days prior to cancellation, expiration, termination or reduction in coverage for nonpayment of the premium and written notice thirty (30) days prior to cancellation, expiration, termination or reduction in coverage for all other reasons.”

E. **Per Project Aggregate.** The Bodily Injury and Property Damage Policy must be endorsed with an endorsement that provides the General Aggregate Limit to each designated construction project.

F. **Notice.** The Contractor must ensure that all insurance policies and binders include an endorsement by which the insurer agrees to notify the Department in writing at least 30 days before there is a cancellation or material change in coverage. The Contractor must stop operations if any insurance is canceled or reduced, and must not resume operations until new issuance is in force.

G. **Reports.** The Contractor or insurance carrier shall report to the Board any claims received, inspections made and the disposition of claims. The Board will withhold final payment release until either the Contractor pays the claim or until final disposition of the claim by the Contractor's insurance company has been received by the Board.

MAINTENANCE OF TRAFFIC

Maintain traffic in accordance with sections 104.07, 104.11, 812 and 922 of the Michigan Department of Transportation 2012 Standard Specifications for Construction and the Michigan Manual of Uniform Traffic Control Devices (MMUTCD).

The Contractor shall be responsible for the protection of vehicular and pedestrian traffic, work in progress and construction workers in the work zone through the implementation of procedures as described in this proposal, the MMUTCD, the Standard Specifications for Construction, and other applicable state and federal requirements.

The Contractor shall coordinate this work with any other contractors or maintenance agencies performing work within the work zone or adjoining areas to avoid conflicts in the maintenance of traffic, construction signing and the orderly progress of contract work.

Two-way traffic, with a minimum of one lane of traffic, shall be maintained at all times utilizing lane closures and flag control.

Signing for lane closures shall be in accordance with Michigan Department of Transportation Maintaining Traffic Typical M0020a, M0140a, M0231a and M330a except that Speed Limit signs (R2-1), Work Zone Begins signs (R5-18c), Arrow symbol signs (W1-6), Center Left Turn Lane Closed signs (W20-5a) and End Road Work signs will not be required where shown.

Channelizing devices for lane closures shall be 28 inch traffic cones.

The Contractor shall notify the Engineer a minimum of 48 hours prior to the implementation of any lane closures.

All work shall be conducted during normal daytime hours unless otherwise approved by the Engineer. Normal daytime hours are considered to be Monday through Saturday from 7 a.m. to 7 p.m.

Traffic will not be allowed to drive on a milled surface for longer than 72 hours.

No work shall be performed during the Memorial Day, Independence Day or Labor Day holiday weekends as defined by the Engineer.

All labor, equipment, temporary signs and channelizing devices required for maintaining traffic will not be paid for separately and are included in the unit prices for other items of work.

SPECIFICATIONS

All work not otherwise specified shall be done in accordance with the Michigan Department of Transportation 2012 Standard Specifications for Construction. Within these specifications all references to the Michigan Department of Transportation shall mean the Board.

MATERIALS

All materials shall be in accordance with sections 501, 902 and 904 of the Michigan Department of Transportation 2012 Standard Specifications for Construction except as modified herein.

The Contractor shall submit a job mix formula for each HMA mixture used. The Contractor may use mix designs approved by the Michigan Department of Transportation or Ohio Department of Transportation on other projects.

The air void content for all HMA mixtures, except for the HMA Ultra-Thin mixture, shall be field regressed to 3.0 percent with liquid asphalt cement.

The virgin asphalt binder for all HMA mixtures shall be PG 58-28 unless otherwise specified.

QUALITY CONTROL

The Contractor shall prepare and implement a quality control (QC) plan for the production of HMA mixtures in accordance with the HMA Production Manual.

For each day's production greater than 500 tons, the Contractor must perform a minimum of one QC test per day for gradation, AC content and air voids. A copy of the QC test results shall be provided to the Engineer.

ITEMS OF WORK

Following is a description of the items of work on this contract:

Aggregate Base, Conditioning (Syd) – The Aggregate Base, Conditioning item of work shall be in accordance with section 302 of the Michigan Department of Transportation 2012 Standard Specifications for Construction except as modified herein. This item of work will be used for the grading and compaction of the existing aggregate base on Ivor Lindsay Road. This item of work also includes the placement of temporary ramps with millings at the POB, POE and two driveways after the removal of the existing HMA surface and the removal of the temporary gravel ramps prior to the placement of the HMA leveling course.

HMA Base Crushing and Shaping (Syd) – The HMA Base Crushing and Shaping item of work shall be in accordance with section 305 of the Michigan Department of Transportation 2012 Standard Specifications for Construction.

Shoulder, CI II (Ton) – The Shoulder, CI II item of work shall be in accordance with section 307 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. This item of work will be used for the placement of 23A aggregate shoulders as noted in the Log of Work attached to the proposal.

Dr Structure Cover, Adj, Case 1 (Ea) – The Dr Structure Cover, Adj, Case 1 item of work shall be in accordance with section 403 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. This item of work will be used for adjusting drainage structure covers within the existing pavement as noted in the Log of Work attached to the proposal. If alterations to the drainage structure exceed 6 inches in order to repair unsound portions of the structure, the additional depth of adjustment will be paid for as extra work.

Dr Structure, Temp Lowering (Ea) – The Dr Structure, Temp Lowering item of work shall be in accordance with section 403 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. This item of work will be used for the temporary lowering of drainage structure covers prior to milling the pavement as noted in the Log of Work attached to the proposal.

Sanitary Structure Cover, Adj, Case 1 (Ea) – The Sanitary Structure Cover, Adj, Case 1 item of work shall be in accordance with the Special Provision for Sanitary Structure Cover, Adjust attached to the proposal. This item of work will be used for adjusting sanitary structure covers within the existing pavement as noted in the Log of Work attached to the proposal. If alterations to the sanitary structure exceed 6 inches in order to repair unsound portions of the structure, the additional depth of adjustment will be paid for as extra work.

Cold Milling HMA Surface (Syd) – The Cold Milling HMA Surface item of work shall be in accordance with section 501 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. This item of work will be used for continuous cold milling operations at the specified depth as noted in the Log of Work attached to the proposal.

HMA Surface, Rem (Syd) – The HMA Surface, Rem item of work shall be in accordance with section 501 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. This item of work will be used for cold milling the HMA surface for spot pavement repairs at the specified depth as noted in the Log of Work attached to the proposal. This item will also be used to pay for the milling on any individual project less than 2,000 square yards.

Pavt for Butt Joints, Rem (Syd) – The Pavt for Butt Joints, Rem item of work shall be in accordance with section 501 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. This item of work will be used for cold milling butt joints as noted in the Log of Work attached to the proposal.

Hand Patching (Ton) – The Hand Patching item of work shall be in accordance with section 501 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. This item of work will be used for placing and compacting HMA in the base repair areas as noted in the Log of Work attached to the proposal.

HMA Base Repair, Rem (Syd) – The HMA Base Repair, Rem item of work shall be in accordance with section 501 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. This item of work will be used for removing the HMA surface to a depth of 6 inches or to the underlying base material, whichever is less, in the base repair areas as noted in the Log of Work attached to the proposal.

HMA, 5E1, 3% Air Voids (Ton) – The HMA, 5E1, 3% Air Voids item of work shall be in accordance with section 501 of the Michigan Department of Transportation 2012 Standard Specifications for Construction except the air void content for this mixture shall be field regressed to 3.0 percent with liquid asphalt cement. The virgin asphalt binder for this mixture shall be PG 58-28. This item of work will be used for placement of an HMA wearing course as noted in the Log of Work attached to the proposal.

HMA, LVSP, 3% Air Voids (Ton) – The HMA, LVSP, 3% Air Voids item of work shall be in accordance with section 501 of the Michigan Department of Transportation 2012 Standard Specifications for Construction except the air void content for this mixture shall be field regressed to 3.0 percent with liquid asphalt cement. The virgin asphalt binder for this mixture shall be PG 58-28. This item of work will be used for placement of HMA leveling and wearing courses as noted in the Log of Work attached to the proposal.

HMA, Ultra-Thin, Medium Volume, 3% Air Voids (Ton) – The HMA, Ultra-Thin, Medium Volume item of work shall be in accordance with Special Provision for HMA Ultra-Thin Overlay attached to the proposal. The virgin asphalt binder for this mixture shall be PG 58-28. This item of work will be used for placement of an HMA wearing course as noted in the Log of Work attached to the proposal.

HMA, Zone Patching, LVSP, 3% Air Voids (Ton) – The HMA, Zone Patching, LVSP, 3% Air Voids item of work shall be in accordance with section 501 of the Michigan Department of Transportation 2012 Standard Specifications for Construction except the air void content for this mixture shall be field regressed to 3.0 percent with liquid asphalt cement. The virgin asphalt binder for this mixture shall be PG 58-28. This item of work will be used for placement of HMA zone patches and spot repairs as noted in the Log of Work attached to the proposal.

Pavt Mrkg, Type NR, Tape, 4 inch, Yellow, Temp (Foot) - The Pavt Mrkg, Type NR, Tape, 4 inch, Yellow, Temp item of work shall be in accordance with section 812 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. This item of work will be used for the placement of temporary pavement markings on HMA leveling courses as directed by the Engineer. The markings shall be a single 2 foot line spaced at 50 feet center-to-center of marking.

Pavt Mrkg, Type R, 4 inch, Yellow, Temp (Foot) - The Pavt Mrkg, Type R, 4 inch, Yellow, Temp item of work shall be in accordance with section 812 of the Michigan Department of Transportation 2012 Standard Specifications for Construction except that removing and disposing of the temporary markings will not be required. This item of work will be used for the placement of temporary pavement markings on HMA wearing courses as directed by the Engineer. The markings shall be a single 2 foot line spaced at 50 feet center-to-center of marking.

MEASUREMENT AND PAYMENT

The Engineer will measure and pay for **Aggregate Base Conditioning** in accordance with the section 302 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. The unit price for **Aggregate Base, Conditioning** includes the cost of installing temporary ramps with millings

at the POB, POE and any driveways within the project limits after the removal of the existing HMA surface and removing the temporary ramps prior to placement of the HMA leveling course.

The Engineer will measure and pay for **HMA Base Crushing and Shaping** in accordance with the section 305 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. The pay limits for **HMA Base Crushing and Shaping** shall be one (1) foot beyond the proposed edge of pavement. The unit price for **HMA Base Crushing and Shaping** includes the cost of providing and removing temporary gravel ramps at the POB, POE and bridge decks within the project limits.

The Engineer will measure and pay for **Shoulder, CI II** in accordance with the section 307 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. The unit price for **Shoulder, CI II** includes the cost of providing temporary signs, channelizing devices and traffic regulators for maintaining traffic.

The Engineer will measure and pay for **Dr Structure Cover, Adj, Case 1** and **Dr Structure, Temp Lowering** in accordance with the section 403 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. The unit price for **Dr Structure Cover, Adj, Case 1** and **Dr Structure, Temp Lowering** includes the cost of providing temporary signs, channelizing devices and traffic regulators for maintaining traffic.

The Engineer will measure and pay for **Sanitary Structure Cover, Adj, Case 1** in accordance with the Special Provision for Sanitary Structure Cover, Adjust attached to the proposal. The unit price for **Sanitary Structure Cover, Adj, Case 1** includes the cost of providing temporary signs, channelizing devices and traffic regulators for maintaining traffic.

The Engineer will measure and pay for **Cold Milling HMA Surface, HMA Surface, Rem** and **Pavt for Butt Joints, Rem** in accordance with the section 501 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. The unit prices for **Cold Milling HMA Surface, HMA Surface, Rem** and **Pavt for Butt Joints, Rem** include the cost of providing temporary signs, channelizing devices and traffic regulators for maintaining traffic.

The Engineer will measure **HMA, (type)** by the weight placed as supported by weigh tickets. The unit price for **HMA, (type)** includes the cost of:

1. Cleaning the existing pavement;
2. Applying a bond coat;
3. Placing and compacting the hot mix asphalt mixture;
4. Performing QC testing on the hot mix asphalt mixture and providing QC test results to the Engineer; and
5. Providing temporary signs, channelizing devices and traffic regulators for maintaining traffic.

The Engineer will measure and pay for **Pavt Mrkg, Type NR, Tape, 4 inch, Yellow, Temp** and **Pavt Mrkg, Type R, 4 inch, Yellow, Temp** in accordance with the section 812 of the Michigan Department of Transportation 2012 Standard Specifications for Construction. The unit prices for **Pavt Mrkg, Type NR, Tape, 4 inch, Yellow, Temp** and **Pavt Mrkg, Type R, 4 inch, Yellow, Temp** include the cost of providing and placing temporary pavement markings.

COMMUNICATIONS

Any questions regarding this bid shall be directed to the person listed below:

Name: Michael Smith
Phone: 734-240-5103
Email: MSmith@mcrc-mi.org

**MONROE COUNTY ROAD COMMISSION
UNIT PRICE CONTRACT
2016 HMA PAVING PROGRAM**

TO: Board of County Road Commissioners of Monroe County, Michigan

The undersigned, having full knowledge of the proposal and specifications for the **2016 HMA Paving Program** including Bidders' Addenda _____ and the conditions of these Contract Documents, hereby agrees to furnish all labor, equipment, materials, transportation and incidentals necessary to perform the Work as specified in the Instructions to Bidders and General Provisions at the unit price named below:

Item Description	Estimated Quantity	Unit	Unit Price	Bid Amount
Aggregate Base, Conditioning	1,950	Syd	\$	\$
HMA Base Crushing and Shaping	11,660	Syd	\$	\$
Shoulder, CI II	5,060	Ton	\$	\$
Dr Structure Cover, Adj, Case 1	7	Ea	\$	\$
Dr Structure, Temp Lowering	7	Ea	\$	\$
Sanitary Structure Cover, Adj, Case 1	8	Ea	\$	\$
Cold Milling HMA Surface	54,770	Syd	\$	\$
HMA Surface, Rem	9,835	Syd	\$	\$
Pavt for Butt Joints, Rem	1,340	Syd	\$	\$
Hand Patching	35	Ton	\$	\$
HMA Base Repair, Rem	100	Syd	\$	\$
HMA, 5E1, 3% Air Voids	7,335	Ton	\$	\$
HMA, LVSP, 3% Air Voids	12,945	Ton	\$	\$
HMA, Ultra-Thin, Medium Volume	1,260	Ton	\$	\$
HMA, Zone Patching, LVSP, 3% Air Voids	2,250	Ton	\$	\$
Pavt Mrkg, Type NR, Tape, 4 inch, Yellow, Temp	120	Ft	\$	\$
Pavt Mrkg, Type R, 4 inch, Yellow, Temp	4,690	Ft	\$	\$
Total Bid				\$

Contractor Signature: _____

Printed Name and Title: _____

Quantities are not guaranteed. Final payment will be based on actual quantities.

Bidder agrees that the work will be completed and ready for final payment in accordance with the General Conditions. Work on the **2016 HMA Paving Program** is to be completed by either **June 4, 2016** or **November 5, 2016** as detailed in the Time of Completion section above.

Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the work on time.

The following documents are attached to and made a condition of this Bid:

Required Bid Security in the form of either:

Certified Check or a Bidder's Bond in the amount of:

_____ Dollars (\$ _____)

Communications concerning this Bid shall be addressed to the Bidder's representative.

Name of Representative: _____

Address: _____

City, State, ZIP: _____

Telephone Number: _____

Fax Number: _____

E-Mail Address: _____

The terms used in this Bid, which are defined in subsection 101.03 of the Michigan Department of Transportation 2012 Standard Specifications of the Construction, have the meanings assigned to them in the Standard Specifications for Construction.

SUBMITTED on: _____, 2016

If Bidder is:

An Individual

By: _____ (SEAL)
Individual's Name

Doing Business As: _____

Business Address: _____

Phone No: _____

A Partnership

By: _____ (SEAL)
Firm Name

General Partner

Business Address: _____

Phone No.: _____

A Corporation

By: _____ (Corporate SEAL)
Corporate Seal

State of Incorporation

By: _____
Name of Person Authorized to Sign

Title

Business Address: _____

Phone No.: _____

A Joint Venture

By: _____
Name

Business Address: _____

Phone No.: _____

By: _____
Name

Business Address: _____

Phone No.: _____

(Each joint venture must sign. The manner of signing for each individual, partnership and corporation that is a party to the joint venture should be in the manner indicated above.)

2016 HMA PAVING PROGRAM PROPOSAL

ATTACHMENTS

1. Log of Work
2. Special Provision for Sanitary Structure Cover, Adjust
3. Special Provision for HMA Ultra-Thin Overlay
4. Maintaining Traffic Typical

**Monroe County Road Commission
2016 HMA Paving Program**

Log of Work

Township	Road Name	From	To	Primary /Local	Length (mile)	Width (feet)	Aggregate Base, Conditioning (Syd)	HMA Base Crushing and Shaping (Syd)	Shoulder, CI II (Ton)	Dr Structure Cover, Adj, Case 1 (Ea)	Dr Structure, Temp Lowering (Ea)	Sanitary Structure Cover, Adj, Case 1 (Ea)	Cold Milling HMA Surface (Syd)	HMA Surface, Rem (Syd)	Pavt for Butt Joints, Rem (Syd)	Hand Patching (Ton)	HMA Base Repair, Rem (Syd)	HMA, 5E1, 3% Air Voids (Ton)	HMA, LVSP, 3% Air Voids (Ton)	HMA, Ultra-Thin, Medium Volume (Ton)	HMA, Zone Patching, LVSP, 3% Air Voids (Ton)	Pavt Mrkg, Type NR, Tape, 4 inch, Yellow, Temp (Ft)	Pavt Mrkg, Type R, 4 inch, Yellow, Temp (Ft)	Early Completion Date?	Notes	
Ash	Fessner	Grafton	300' E. of Grafton	Local	0.06	22									50						90				Overlay existing pavement, 1.5" HMA leveling course, 1.5" HMA wearing & one butt joint	
Ash	Labo	RR Tracks	Grafton	Local	0.48	24							2,950											06/04/16	1.5" HMA zone patch, one location (2,210' x 12')	
Ash	Parkway	Carleton Rockwood	Dead End	Local	0.48	14-17													405						1.5" HMA overlay	
Ash	Ready	I-275	Sweitzer	Local	1.34	20-24																	06/04/16	1.5" HMA zone patches, twelve locations (Total = 8,200' x 11' average width)		
Ash / Exeter	Exeter	South Stony Creek	O'Hara	Primary	0.55	22		7,700	180						50			630	855			120	232		Crush & shape, 2" HMA leveling, 1.5" HMA wearing & one butt joint (Labo)	
Bedford	Dean	Brentwood Lane	Jackman	Primary	0.28	22							3,700										120		1.5" HMA overlay, one approach (Dean), three butt joints (POB, POE & Dean), fall work	
Bedford	Clover Lane	Ohio State Line	Whiteford Center	Local	0.57	22			180																2" HMA wearing course over stabilized base, July or August work	
Bedford	Ivor Lindsay	End of Certification	Lewis	Local	0.12	27		1,950						1,950												Remove 4 inches of existing HMA and gravel, grade and compact existing base & 4" HMA
Bedford	Section	Whiteford Center	Secor	Local	0.96	20			495																	2" HMA wearing course over stabilized base, July or August work
Frenchtown	Cole, Spaulding & Sandy Creek	Vivian	I-75	Primary	0.56	26						8			180								240			1" HMA overlay, nine butt joints (POB, POE & side streets) & eight sanitary manhole adjustments
Frenchtown	Macomb	City Limit	Cole	Primary	0.55	31				7	7		6,500			35	100						720			1" HMA overlay w/ Edge milling (Macomb), 1.5" HMA mill & fill (Cole), seven drainage structure temp lowerings and adjustments & HMA base repair at 10 locations (outside edge)
Frenchtown	North Stony Creek	Mentel	North Dixie	Primary	2.10	22			675						740									890		1.5" HMA overlay, HMA wedging along curve east of Newport South, eight butt joints (POB, POE, RR tracks, sidestreet & school approaches)
Frenchtown	Reinhardt	Bluebush	Heiss	Primary	1.46	N/A			405																	Add gravel to existing shoulders (no HMA paving)
Frenchtown	Stewart	Raisinville	Bates Lane	Primary	0.90	N/A			540																	Add gravel to existing shoulders (no HMA paving)
Frenchtown	Bates Lane	North Custer	Stewart	Local	1.86	21			360				10,230		75									780		2" HMA mill & fill (4,600'), 1.5" HMA overlay (5,200') & one butt joint at Stewart
Frenchtown	Dazarow	Stewart	Dead End	Local	0.27	18							3,040													1.5" HMA mill & fill
Frenchtown	Lavender	City Limit	Stewart	Local	0.11	21								1,415												1.5" HMA mill & fill
Frenchtown	North Stony Creek	War	400' W. of War	Local	0.08	22			25				980											32		2" HMA mill & fill to be performed in conjunction with work on War (400' x 22')
Frenchtown	Santure	Dead End	M-125	Local	0.33	21								620												2" HMA zone patch, one location (465' x 12')
Frenchtown	War	South Stony Creek	Post	Local	0.45	22			180				4,840	490	75									188		2" HMA mill & fill (2,000'), 2" HMA zone patch (200' x 22) & one butt joint (at bridge deck)
Ida	Ida Center	Lewis	Geiger	Primary	0.92	19			270						50											1" HMA scratch course, 1.5" HMA overlay & two butt joints (POB and POE)
Milan	Cone	Petersburg	US-23	Primary	1.90	20								5,360										06/04/16	1.5" HMA mill & fill spot repairs, 18 locations (4,825' x 10')	
Dundee	Dennison	M-50	Collins	Primary	0.80	21			270						50									336		1" HMA scratch course, 1.5" HMA overlay & two butt joints (POB and POE)
LaSalle	LaPlaisance	N. of Knabb	Mortar Creek	Primary	0.75	21		3,960	495																	Crush & shape & 2" HMA wearing
LaSalle / Raisinville	Albain	Strasburg	0.44 mile W. of Goutz	Local	1.38	21			400						70											1" HMA scratch course, 1.5" HMA overlay & two butt joints (POB and POE)
Raisinville	Ida Maybee	M-50	S. of Dixon	Primary	0.89	22			360				11,500													2.25" HMA mill & fill
Summerfield	Deerfield	500' W. of Taft	River Raisin Bridge	Primary	0.85	22			225				11,030													2.25" HMA mill & fill
Whiteford	Sylvania-Petersburg	Consear	US-223	Primary	0.07	22																		06/04/16	1.5" HMA zone patch, one location at culvert crossing (400' x 22')	
Frenchtown	Heiss	Doederline	Exeter	Local	0.24	21																		06/04/16	1.5" HMA zone patch (1,250' x 21')	
Totals					21.31			1,950	11,660	5,060	7	7	8	54,770	9,835	1,340	35	100	7,335	12,945	1,260	2,250	120	4,690		

MONROE COUNTY ROAD COMMISSION

SPECIAL PROVISION
FOR
SANITARY STRUCTURE COVER, ADJUST

MSG:MLS

1 of 3

03-28-14

a. Description. This work consists of adjusting or temporarily lowering sanitary structures as directed by the Engineer.

b. Materials. Provide materials in accordance with section 403 of the Standard Specifications for Construction and the following exceptions and additions:

1. Precast Concrete Adjusting Ring – Provide precast concrete manhole adjusting rings meeting the requirements of subsection 913.06 of the Standard Specifications for Construction. No other method of adjustment is permitted.
2. Butyl Rubber Sealant – Provide $\frac{3}{4}$ inch diameter butyl rubber sealant from one of the following:
 - A. Conseal CS-202 by Concrete Sealants, Inc.
 - B. BN109 – Butyl-Nek Joint Sealant by Henry
 - C. Kent Seal No. 2 Butyl Sealant by Hamilton Kent
3. Anchor Bolts – Provide $\frac{5}{8}$ inch diameter stainless steel (Type 304) threaded rod of sufficient length to anchor the casting and adjusting rings into the cone section of the existing sanitary manhole. The nuts and washers for the anchor bolts shall also be stainless steel (Type 304).
4. Adhesive System – Provide an adhesive system from the Qualified Products List in section 712.03J of the Michigan Department of Transportation Materials Source Guide for grouting of the anchor bolts.

c. Construction. All work shall be in conformance with section 403 of the Standard Specifications for Construction and the following requirements:

1. Adjusting sanitary structure covers applies when the new elevation of the cover requires a vertical change of no greater than 6 inches. Immediately before placing the HMA top course or overlay, make final adjustments to sanitary sewer structure covers within the HMA pavement section.
2. Adjust the cover to the required elevation by supporting it on precast concrete adjusting rings.
3. Place two (2) rows of $\frac{3}{4}$ inch diameter butyl rubber sealant between each of the following joints:

- A. Between the top of the cone and the bottom adjusting ring
 - B. Between each adjusting ring
 - C. Between the bottom of the casting and the top adjusting ring
4. Mortar joints will not be permitted. Metal or plastic shims may be used for fine adjustments of the frames.
 5. Drill four (4) holes through the precast adjusting rings to set the 5/8 inch diameter stainless steel anchor bolts for the manhole frame. The holes for the anchor bolts shall extend a minimum of 6 inches into the cone of the manhole.
 6. After drilling the holes, clean with a blast of oil-free compressed air.
 7. After cleaning the holes, fill with a grout selected from section 712.03J of the Qualified Products List and insert the anchor bolts.
 8. After the grout has cured sufficiently, secure the manhole frame to the anchor bolts with stainless steel washers and nuts.
 9. Apply a 1/2 thick plaster coat of mortar to the outer and inner surface of the structure from the bottom of the casting to a minimum of 3 inches below the limit of the adjustment.

Contact Scott Callaway (734-241-5926) of the Monroe Metropolitan Pollution Control System a minimum of two (2) business days in advance of the work to arrange for inspection of the structure adjustments.

d. Measurement and Payment. The completed work as described will be paid for at the contract unit price for the following contract item (pay item):

Contract Item (Pay Item)	Pay Unit
Sanitary Structure Cover, Adj, Case 1.....	Each
Sanitary Structure Cover, Adj, Case 2.....	Each
Sanitary Structure Cover, Adj, Add Depth.....	Foot

The unit price for **Sanitary Structure Cover, Adj, Case 1** includes the cost of the following:

1. Saw cutting existing pavement, curb, and curb and gutter;
2. Adjusting the cover up or down, no greater than 6 inches;
3. Placing two (2) rows of butyl rubber sealant between each joint;
4. Drilling holes and installing four (4) stainless steel threaded anchor bolts;

5. Securing the manhole frame to the anchor bolts with stainless steel washers and nuts;
6. Applying a ½ inch thick plaster coat of mortar to the outer and inner surface of the structure; and
7. Removing and replacing pavement adjacent to the adjusted cover.

Removal and replacement of curb and gutter adjacent to the adjusted structure will be paid for separately.

Sanitary Structure Cover, Adj, Case 2 applies to sanitary structure adjustments located outside existing pavement, curb, and curb and gutter or within pavement at locations where the pavement is shown to be removed.

The Engineer will measure **Sanitary Structure Cover, Adj, Add Depth** beginning 6 inches from the bottom of the casting to the limit of the additional adjustment depth.

Temporary lowering of sanitary structure covers, if required, will be measured and paid for as **Dr Structure, Temporary Lowering** in accordance with subsection 403.04.E of the Standard Specifications for Construction.

MONROE COUNTY ROAD COMMISSION

SPECIAL PROVISION
FOR
HMA ULTRA-THIN OVERLAY

MCRC:MLS

1 OF 4

04-03-15

a. Description. This work consists of providing and placing a Hot Mix Asphalt (HMA) Ultra-Thin Overlay. The HMA mixture shall be provided in accordance with the Standard Specifications for Construction except where modified herein.

b. Materials. Provide materials in accordance with the following:

1. Bond Coat. The bond coat material shall be Type SS-1h emulsified asphalt conforming to the requirements of Section 904 of the Standard Specifications for Construction.
2. HMA Ultra-Thin Overlay. The HMA Ultra-Thin Overlay shall be composed of a mixture of aggregate, asphalt binder and mineral filler, if required, as listed in Table 1.

Table 1 - HMA Ultra-Thin Overlay Mixture Requirements

Parameter	Low Volume Comm. ADT <380	Medium Volume Comm. ADT 380 - 3400	High Volume Comm. ADT >3400
Marshall Air Voids, %	4.5	4.5	5.0
VMA (min), % (a)	15.5	15.5	15.5
Fines to Binder Ratio (max)	1.2	1.4	1.4
Flow (0.01 in.)	8-16	8-16	8-16
Stability (min), lbs	1200		
a. VMA calculated using Gsb of the combined aggregates.			

3. Aggregate Gradation and Physical Properties. The combined gradation of the aggregate portion of the mixture, including the mineral filler, shall be within the limits of Table 2. The physical properties of the combined aggregates shall meet the criteria of Table 3.

Table 2 - HMA Ultra-Thin Overlay Aggregate Gradation

Sieve Size	Total Passing Percent by Weight
1/2 inch	100
3/8 inch	99-100
No. 4	75-95
No. 8	55-75
No. 30	25-45
No. 200	3-8

Table 3 - HMA Ultra-Thin Overlay Aggregate Physical Requirements

Parameter	Low Volume Comm. ADT <380	Medium Volume Comm. ADT 380 - 3400	High Volume Comm. ADT >3400
Crushed (min), %	50	75	95
Angularity Index (min) (MTM 118)	2.5	3.0	4.0
L.A. Abrasion (max), % loss	40	35	35
Aggregate Wear Index (AWI)	(a)	(a)	(a)
a. An AWI of 220 is required for projects with less than or equal to 2000 ADT. For projects with an ADT greater than 2000, the minimum AWI requirement is 260.			

In addition, the sum of the shale, siltstone, ochre, coal, clay-ironstone and particles which are structurally weak or are found to be non-durable in service shall not exceed 8.0 percent.

- Performance Graded (PG) Asphalt Binder. Binder selection is based on present day two-way commercial ADT as listed in Table 4. The PG binder shall meet all the requirements in Section 904 of the Standard Specifications for Construction.

Table 4 - Asphalt Binder Selection for HMA Ultra-Thin Overlay

Low Volume Comm. ADT <380	Medium Volume Comm. ADT 380 - 3400	High Volume Comm. ADT >3400
PG 58-28	PG 58-28	PG 64-28

1. Construction

- Bond Coat Application. The bond coat material will be applied to completely cover the prepared surface at a rate of 0.11 - 0.15 gal/syd.
- Mixture Application Rate. The target application rate shall be 83 lbs/syd unless specified by the Engineer to address special circumstances.
- Density. Thoroughly compact the mixture immediately after placement using the number of rollers method. The number of compaction and finish rollers used shall be as specified in Table 5 based on the square yards per hour of Ultra-Thin HMA Overlay being placed.

Table 5 – Number of Rollers Required Based on Placement Rate

Average Laydown Rate syd/hour	Number of Rollers Required	
	Compaction Rollers	Finish Rollers
Less than 800	1	1*
801 – 2000	1	1
2001 – 5500	2	1
5501 - 7200	3	1
* The compaction roller may be used as the finish roller also.		

4. Mix Design. The Contractor shall submit to the Owner a complete mix design according to the Procedures Manual for Mix Design Processing following the Express Mix Design Procedures prior to the start of production.
5. Quality Control. The Contractor shall provide and follow a Quality Control (QC) plan for the Ultra-Thin HMA Overlay that will maintain adequate QC for production and construction processes applicable to this specification and the contract documents. For QC purposes, the Contractor must perform at least one QC test per day for gradation, AC content and air voids. The Owner shall be provided a copy of the QC plan for review, prior to mix production and placement.

After the job-mix-formula is established, the aggregate gradation and the binder content of the HMA mixture furnished for the work shall be maintained within the Range 1 uniformity tolerance limits permitted for the job-mix-formula specified in Table 6. However, if deviations are predominantly either below or above the job-mix-formula, the Owner may order alterations in the plant to bring the mixture to the job-mix-formula. If two consecutive aggregate gradations on one sieve, or binder contents as determined by the QC tests, are outside Range 1 but within Range 2 tolerance limits, the Contractor shall suspend all operations. Contract time will continue during these times when the plant is down. Before resuming any production, the Contractor shall propose, for the Owner's approval, all necessary alterations to the materials or plant so that the job-mix-formula can be maintained. The Owner, after evaluating for effects on AWI and mix design properties, will approve or disapprove such alterations.

Table 6 – Uniformity Tolerance Limits (for QC and Acceptance)

Parameter	Range 1 (a)	Range 2
Air Voids, % (b)	± 1.0	± 2.0
Binder Content, %	± 0.40	± 0.50
% Passing # 8 and Larger Sieves	± 5.0	± 8.0
% Passing # 30 Sieve	± 4.0	± 6.0
% Passing # 200 Sieve	± 1.0	± 2.0
a. This range allows for normal mixture and testing variations. The mixture shall be proportioned to test as closely as possible to the Job-Mix-Formula. b. Air Void limits apply to QC testing and are optional for Acceptance testing.		

6. Acceptance Sampling and Testing. Acceptance sampling and testing may be performed by the Owner. Each day of production, a minimum of two samples will be obtained for each mix type. Acceptance testing will be performed at the frequency specified by the Owner. No less than three samples shall be obtained for each mix type.
7. Rejected Mixtures. If for any one mixture, two consecutive aggregate gradations on one sieve or binder contents as determined by acceptance tests exceed the uniformity tolerance of Range 2 under Table 5, or do not meet the minimum requirements for crushed particle content specified in the project documents, the mixture will be rejected. If such mixtures are placed in a pavement, the remaining portions of the failing acceptance samples (split sample) will be sent to an independent Laboratory to confirm the acceptance test results. If the Laboratory's results do not confirm the acceptance test results, then no price adjustments will be made for the mixture involved. If the

Laboratory’s results confirm the acceptance test results and if, in the Owner’s judgment, the defective mixture can remain in place, the contract unit price for the defective mixture involved, as determined from acceptance tests, will be decreased on the following basis: The contract unit price for material outside of Range 2 will be decreased 25 percent.

The Owner may take into account the Contractor’s QC test results when making acceptance decisions and price adjustments.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price for the following pay items:

Pay Item	Pay Unit
HMA, Ultra-Thin, Low Volume.....	Ton
HMA, Ultra-Thin, Medium Volume.....	Ton
HMA, Ultra-Thin, High Volume.....	Ton

The Engineer will measure **HMA, Ultra-Thin, (type)** by the weight placed as supported by weigh tickets. The unit price for **HMA, Ultra-Thin, (type)** includes the cost of:

1. Cleaning the existing pavement;
2. Applying a bond coat;
3. Placing and compacting the hot mix asphalt mixture;
4. Performing QC testing on the hot mix asphalt mixture and providing QC test results to the Engineer; and
5. Providing temporary signs, channelizing devices and traffic regulators for maintaining traffic.

MINIMUM MERGING TAPER LENGTH "L" (FEET)

OFFSET FEET	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)									
	25	30	35	40	45	50	55	60	65	70
1	10	15	20	27	45	50	55	60	65	70
2	21	30	41	53	90	100	110	120	130	140
3	31	45	61	80	135	150	165	180	195	210
4	42	60	82	107	180	200	220	240	260	280
5	52	75	102	133	225	250	275	300	325	350
6	63	90	123	160	270	300	330	360	390	420
7	73	105	143	187	315	350	385	420	455	490
8	83	120	163	213	360	400	440	480	520	560
9	94	135	184	240	405	450	495	540	585	630
10	104	150	204	267	450	500	550	600	650	700
11	115	165	225	293	495	550	605	660	715	770
12	125	180	245	320	540	600	660	720	780	840
13	135	195	266	347	585	650	715	780	845	910
14	146	210	286	374	630	700	770	840	910	980
15	157	225	307	400	675	750	825	900	975	1050

TAPER LENGTH "L" IN FEET

THE FORMULAS FOR THE MINIMUM LENGTH OF A MERGING TAPER IN DERIVING THE "L" VALUES SHOWN IN THE ABOVE TABLES ARE AS FOLLOWS:

"L" = $\frac{W \times S^2}{60}$ WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 40 MPH OR LESS

"L" = S x W WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 45 MPH OR GREATER

- L = MINIMUM LENGTH OF MERGING TAPER
- S = POSTED SPEED LIMIT IN MPH PRIOR TO WORK AREA
- W = WIDTH OF OFFSET

TYPES OF TAPERS

UPSTREAM TAPERS


- MERGING TAPER
- SHIFTING TAPER
- SHOULDER TAPER
- TWO-WAY TRAFFIC TAPER

DOWNSTREAM TAPERS

(USE IS OPTIONAL)

TAPER LENGTH

- L - MINIMUM
- 1/2 L - MINIMUM
- 1/3 L - MINIMUM
- 100' - MAXIMUM
- 100' - MINIMUM (PER LANE)

 TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TABLES FOR "L", "D" AND "B" VALUES		
	DRAWN BY: CON:AE:djf	JUNE 2006	M0020a
CHECKED BY: BMM	PLAN DATE:	1 OF 2	
FILE: K:/DGN/TSR/STDS/ENGLISH/MNTTRF/M0020a.dgn		REV.	08/21/2006

DISTANCE BETWEEN TRAFFIC CONTROL DEVICES "D"
AND LENGTH OF LONGITUDINAL BUFFER SPACE ON
"WHERE WORKERS PRESENT" SEQUENCES


"D" DISTANCES	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)									
	25	30	35	40	45	50	55	60	65	70
D (FEET)	250	300	350	400	450	500	550	600	650	700

GUIDELINES FOR LENGTH OF
LONGITUDINAL BUFFER SPACE "B"

SPEED* MPH	LENGTH FEET
20	33
25	50
30	83
35	132
40	181
45	230
50	279
55	329
60	411
65	476
70	542

* POSTED SPEED, OFF PEAK 85TH PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED

1 BASED UPON AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) BRAKING DISTANCE PORTION OF STOPPING SIGHT DISTANCE FOR WET AND LEVEL PAVEMENTS (A POLICY ON GEOMETRIC DESIGN OF HIGHWAY AND STREETS), AASHTO. THIS AASHTO DOCUMENT ALSO RECOMMENDS ADJUSTMENTS FOR THE EFFECT OF GRADE ON STOPPING AND VARIATION FOR TRUCKS.

 Michigan Department of Transportation TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TABLES FOR "L", "D" AND "B" VALUES		
	DRAWN BY: CON:AE:djf CHECKED BY: BMM	JUNE 2006 PLAN DATE:	M0020a
FILE: K:/DGN/TSR/STDS/ENGLISH/MNTTRF/M0020a.dgn REV. 08/21/2006			





PLACE THROUGHOUT WORK AREA AS INDICATED AND AFTER ALL MAJOR CROSSROADS IF PERMANENT SIGNS ARE NOT IN PLACE.

PLACE THIS SIGN ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE APPROPRIATE TYPICAL M0030a-M0080a.

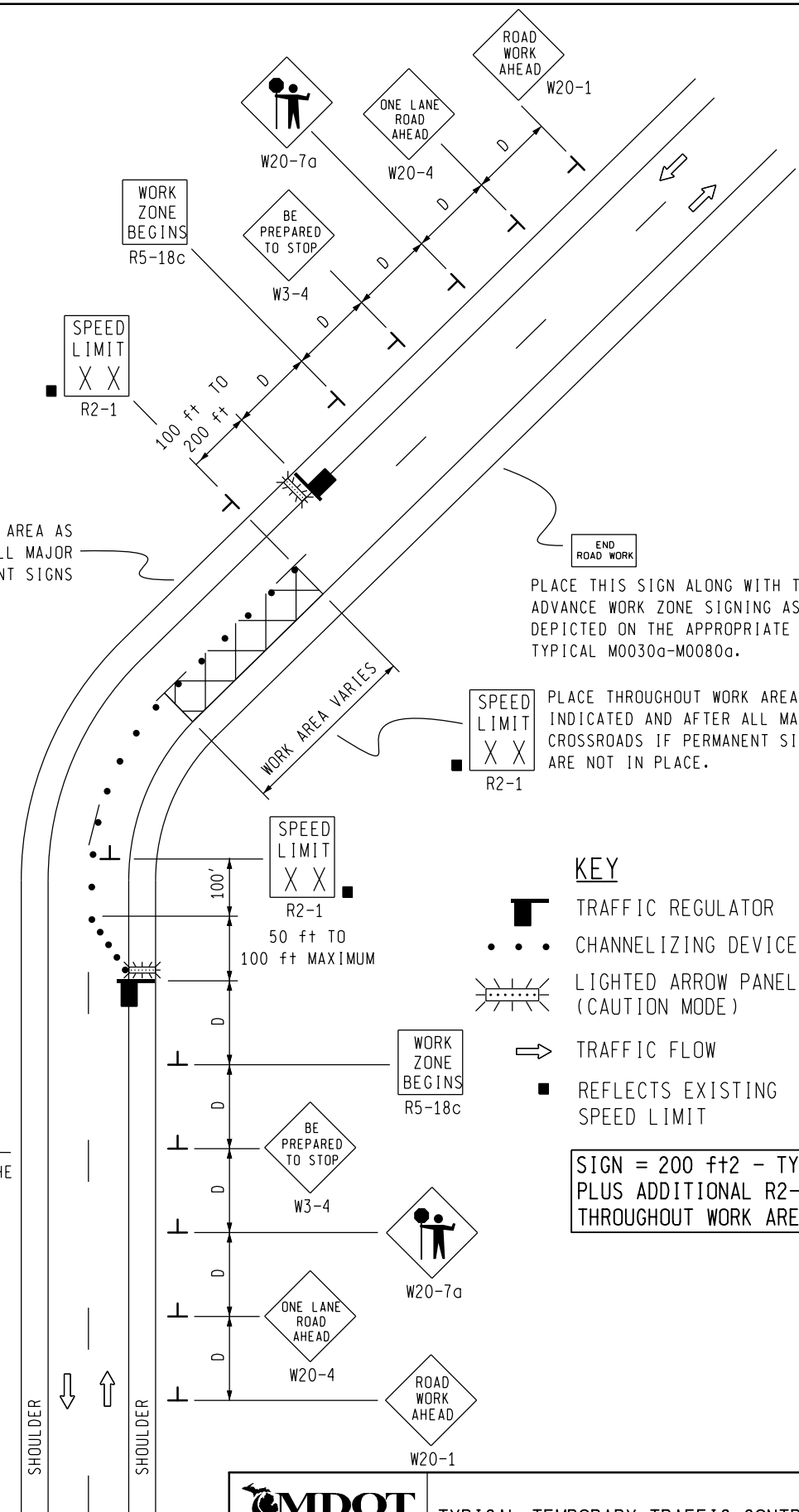
PLACE THROUGHOUT WORK AREA AS INDICATED AND AFTER ALL MAJOR CROSSROADS IF PERMANENT SIGNS ARE NOT IN PLACE.

PLACE THIS SIGN ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE APPROPRIATE TYPICAL M0030a-M0080a.


KEY

-  TRAFFIC REGULATOR
-  CHANNELIZING DEVICES
-  LIGHTED ARROW PANEL (CAUTION MODE)
-  TRAFFIC FLOW
-  REFLECTS EXISTING SPEED LIMIT

SIGN = 200 ft± - TYPE B PLUS ADDITIONAL R2-1's THROUGHOUT WORK AREA



NOT TO SCALE

 Michigan Department of Transportation TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL		TYPICAL TEMPORARY TRAFFIC CONTROL FOR A TWO-LANE TWO-WAY ROADWAY WHERE ONE LANE IS CLOSED UTILIZING TRAFFIC REGULATORS, NO SPEED REDUCTION	
DRAWN BY: CON:AE:djf CHECKED BY: BMM:CRB	OCTOBER 2011 PLAN DATE:	M0140a	SHEET 1 OF 2
FILE: PW RD/TS/Typicals/Signs/MT NON Fwy/M0140a.dgn REV. 10/04/2011			


NOTES

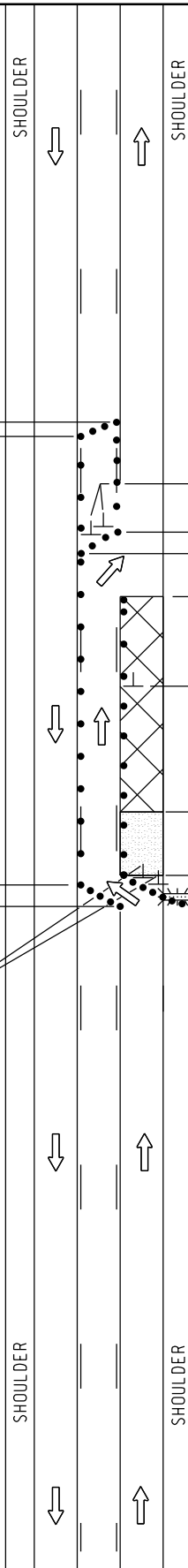
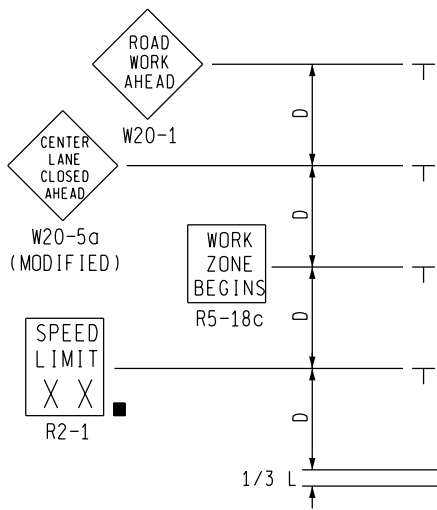
- 1H. D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES AND LENGTH OF LONGITUDINAL BUFFERS
SEE **M0020a** FOR "D" VALUES.
2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.
3. DISTANCES BETWEEN SIGNS, THE VALUES FOR WHICH ARE SHOWN IN TABLE D, ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.
- 3A. THE "WORK ZONE BEGINS" (R5-18c) SIGN SHALL BE USED ONLY IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE SHALL OMIT THIS SIGN AND THE QUANTITIES SHALL BE ADJUSTED APPROPRIATELY.
- 4A. THE MAXIMUM RECOMMENDED DISTANCE(S) BETWEEN CHANNELIZING DEVICES IN THE TAPER AREA(S) SHOULD BE 15 FEET AND SHOULD BE EQUAL IN FEET TO TWICE THE POSTED SPEED IN MILES PER HOUR IN THE PARALLEL AREA(S).
5. FOR OVERNIGHT CLOSURES, TYPE III BARRICADES SHALL BE LIGHTED.
6. WHEN CALLED FOR IN THE FHWA ACCEPTANCE LETTER FOR THE SIGN SYSTEM SELECTED, THE TYPE A WARNING FLASHER, SHOWN ON THE WARNING SIGNS, SHALL BE POSITIONED ON THE SIDE OF THE SIGN NEAREST THE ROADWAY.
7. ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING REQUIREMENTS SHALL MEET NCHRP 350 CRASHWORTHLY REQUIREMENTS STIPULATED IN THE CURRENT EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.
9. ALL TRAFFIC REGULATORS SHALL BE PROPERLY TRAINED AND SUPERVISED.
- 9A. IN ANY OPERATION INVOLVING MORE THAN ONE TRAFFIC REGULATOR, ONE PERSON SHOULD BE DESIGNATED AS HEAD TRAFFIC REGULATOR.
10. ALL TRAFFIC REGULATORS' CONDUCT, THEIR EQUIPMENT, AND TRAFFIC REGULATING PROCEDURES SHALL CONFORM TO THE CURRENT EDITION OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD) AND THE CURRENT EDITION OF THE MDOT HANDBOOK ENTITLED "TRAFFIC REGULATORS INSTRUCTION MANUAL."
11. WHEN TRAFFIC REGULATING IS ALLOWED DURING THE HOURS OF DARKNESS, APPROPRIATE LIGHTING SHALL BE PROVIDED TO SUFFICIENTLY ILLUMINATE THE TRAFFIC REGULATOR'S STATIONS.
- 12E. THE MAXIMUM DISTANCE BETWEEN THE TRAFFIC REGULATORS SHALL BE NO MORE THAN 2 MILES IN LENGTH UNLESS RESTRICTED FURTHER IN THE SPECIAL PROVISIONS FOR MAINTAINING TRAFFIC. ALL SEQUENCES OF MORE THAN 2 MILES IN LENGTH WILL REQUIRE WRITTEN PERMISSION FROM THE ENGINEER BEFORE PROCEEDING.
13. WHEN INTERSECTING ROADS OR SIGNIFICANT TRAFFIC GENERATORS (SHOPPING CENTERS, MOBILE HOME PARKS, ETC.) OCCUR WITHIN THE ONE-LANE TWO-WAY OPERATION, INTERMEDIATE TRAFFIC REGULATORS AND APPROPRIATE SIGNING SHALL BE PLACED AT THESE LOCATIONS.
14. ADDITIONAL SIGNING AND/OR ELONGATED SIGNING SEQUENCES SHOULD BE USED WHEN TRAFFIC VOLUMES ARE SIGNIFICANT ENOUGH TO CREATE BACKUPS BEYOND THE W3-4 SIGNS.
15. THE HAND HELD (PADDLE) SIGNS REQUIRED BY THE MMUTCD TO CONTROL TRAFFIC WILL BE PAID FOR AS PART OF FLAG CONTROL.
- 28E. THE TRAFFIC REGULATORS SHOULD BE POSITIONED AT OR NEAR THE SIDE OF THE ROAD SO THAT THEY ARE SEEN CLEARLY AT A MINIMUM DISTANCE OF 500 FEET. THIS MAY REQUIRE EXTENDING THE BEGINNING OF THE LANE CLOSURE TO OVERCOME VIEWING PROBLEMS CAUSED BY HILLS AND CURVES.

SIGN SIZES

DIAMOND WARNING - 48" x 48"
 R2-1 REGULATORY - 48" x 60"
 R5-18c REGULATORY - 48" x 48"

NOT TO SCALE

 TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL TEMPORARY TRAFFIC CONTROL FOR A TWO-LANE TWO-WAY ROADWAY WHERE ONE LANE IS CLOSED UTILIZING TRAFFIC REGULATORS, NO SPEED REDUCTION		
DRAWN BY: CON:AE:djf	OCTOBER 2011	M0140a	SHEET
CHECKED BY: BMM:CRB	PLAN DATE:		2 OF 2
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0140a.dgn REV. 10/04/2011			

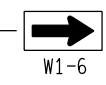


END ROAD WORK

PLACE THIS SIGN ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE APPROPRIATE TYPICAL M0030a-M0050a.

SPEED LIMIT XX R2-1

PLACE THROUGHOUT WORK AREA AS INDICATED AND AFTER ALL MAJOR CROSSROADS IF PERMANENT SIGNS ARE NOT IN PLACE.

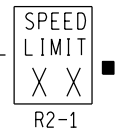


1/2 L
1/2 D

WORK AREA VARIES



W1-4



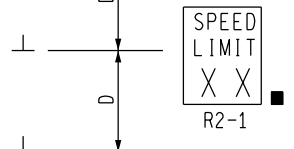
R2-1

PLACE THROUGHOUT WORK AREA AS INDICATED AND AFTER ALL MAJOR CROSSROADS IF PERMANENT SIGNS ARE NOT IN PLACE.

1/2 L



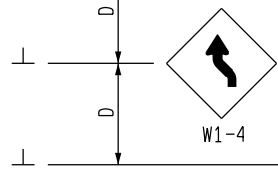
W1-6



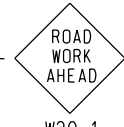
R2-1



R5-18c



W1-4



W20-1

END ROAD WORK

PLACE THIS SIGN ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE APPROPRIATE TYPICAL M0030a-M0050a.

KEY

- • • CHANNELIZING DEVICES
- ⚡ LIGHTED ARROW PANEL (CAUTION MODE)
- ➡ TRAFFIC FLOW
- REFLECTS EXISTING SPEED LIMIT

SIGN = 184 ft± - TYPE B PLUS ADDITIONAL R2-1's THROUGHOUT WORK AREA

NOT TO SCALE

MDOT
Michigan Department of Transportation

TRAFFIC AND SAFETY
MAINTAINING TRAFFIC
TYPICAL

DRAWN BY: CON:AE:DJF
CHECKED BY: BMM:CRB

TYPICAL TEMPORARY TRAFFIC CONTROL FOR CLOSING ONE LANE OF A THREE LANE ROADWAY WITH CLFLT0 AND SHIFTING ONE THROUGH LANE INTO THE CLFLT0 NO SPEED REDUCTION

OCTOBER 2011
PLAN DATE:

M0231a

SHEET 1 OF 2

FILE: PW: RD/T&S/Typicals/Signs/MT/MT nonFwy/M0231a REV. 10/18/2011


NOTES

- 1F. D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES
 $1/2 L$, AND $1/3 L$ = MINIMUM LENGTH OF TAPER
 B = LENGTH OF LONGITUDINAL BUFFER
 SEE M0020a FOR "D," "L," AND "B" VALUES
2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.
3. DISTANCES BETWEEN SIGNS, THE VALUES FOR WHICH ARE SHOWN IN TABLE D, ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.
- 3A. THE "WORK ZONE BEGINS" (R5-18c) SIGN SHALL BE USED ONLY IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE SHALL OMIT THIS SIGN AND THE QUANTITIES SHALL BE ADJUSTED APPROPRIATELY.
- 4E. THE MAXIMUM RECOMMENDED DISTANCE(S) BETWEEN CHANNELIZING DEVICES SHOULD BE EQUAL IN FEET TO THE POSTED SPEED IN MILES PER HOUR ON TAPER(S) AND TWICE THE POSTED SPEED IN THE PARALLEL AREA(S).
5. FOR OVERNIGHT CLOSURES, TYPE III BARRICADES SHALL BE LIGHTED.
6. THE TYPE A WARNING FLASHER SHOWN ON THE WARNING SIGNS SHALL BE POSITIONED ON THE SIDE OF THE SIGN NEAREST THE ROADWAY.
7. ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING REQUIREMENTS SHALL MEET NCHRP 350 CRASHWORTHY REQUIREMENTS STIPULATED IN THE CURRENT EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.
8. WHEN BUFFER AREAS ARE ESTABLISHED, THERE SHALL BE NO EQUIPMENT OR MATERIALS STORED OR WORK CONDUCTED IN THE BUFFER AREA.
21. ALL EXISTING PAVEMENT MARKINGS WHICH ARE IN CONFLICT WITH EITHER PROPOSED CHANGES IN TRAFFIC PATTERNS OR PROPOSED TEMPORARY TRAFFIC MARKINGS, SHALL BE REMOVED BEFORE ANY CHANGE IS MADE IN THE TRAFFIC PATTERN. EXCEPTION WILL BE MADE FOR DAYTIME-ONLY TRAFFIC PATTERNS THAT ARE ADEQUATELY DELINEATED BY OTHER TRAFFIC CONTROL DEVICES.

SIGN SIZES

DIAMOND WARNING	- 48" x 48"
W1-6 WARNING	- 48" x 24"
R2-1 REGULATORY	- 48" x 60"
R5-18c REGULATORY	- 48" x 48"

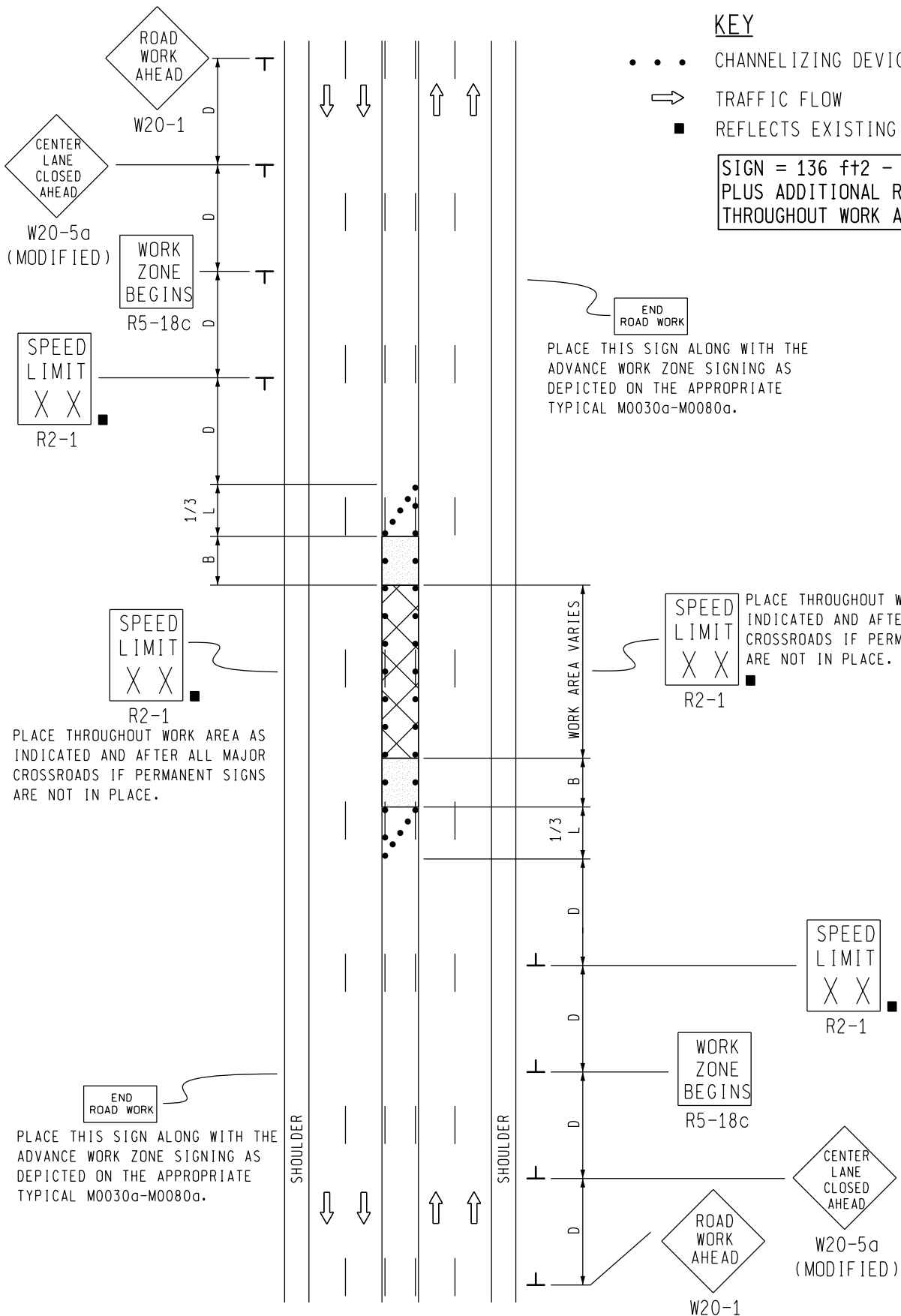
NOT TO SCALE

 MDOT Michigan Department of Transportation TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL TEMPORARY TRAFFIC CONTROL FOR CLOSING ONE LANE OF A THREE LANE ROADWAY WITH CLFLTO AND SHIFTING ONE THROUGH LANE INTO THE CLFLTO NO SPEED REDUCTION		
DRAWN BY: CON:AE:DJF	OCTOBER 2011	M0231a	SHEET
CHECKED BY: BMM:CRB	PLAN DATE:		2 OF 2
FILE: PW: RD/T&S/Typicals/Signs/MT/MT nonFwy/M0231a REV. 10/18/2011			

KEY

- • • CHANNELIZING DEVICES
- ⇒ TRAFFIC FLOW
- REFLECTS EXISTING SPEED LIMIT

SIGN = 136 f+2 - TYPE B PLUS ADDITIONAL R2-1's THROUGHOUT WORK AREA



END ROAD WORK
PLACE THIS SIGN ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE APPROPRIATE TYPICAL M0030a-M0080a.

PLACE THROUGHOUT WORK AREA AS INDICATED AND AFTER ALL MAJOR CROSSROADS IF PERMANENT SIGNS ARE NOT IN PLACE.

PLACE THROUGHOUT WORK AREA AS INDICATED AND AFTER ALL MAJOR CROSSROADS IF PERMANENT SIGNS ARE NOT IN PLACE.

PLACE THIS SIGN ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE APPROPRIATE TYPICAL M0030a-M0080a.

<p>TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL</p>		<p>TYPICAL TEMPORARY TRAFFIC CONTROL FOR A CENTER-LANE FOR LEFT TURN ONLY CLOSURE ON A MULTI-LANE UNDIVIDED ROADWAY, WORKERS NOT PRESENT NO SPEED REDUCTION</p>	
<p>DRAWN BY: CON:AE:djf CHECKED BY: BMM:CRB</p>	<p>OCTOBER 2011 PLAN DATE:</p>	<p>M0330a</p>	<p>SHEET 1 OF 2</p>
<p>FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0330a.dgn REV. 10/18/2011</p>			

NOT TO SCALE


NOTES

1. D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES
 $1/3 L$ = MINIMUM LENGTH OF TAPER
 B = LENGTH OF LONGITUDINAL BUFFER
 SEE M0020a FOR "D," "L," AND "B" VALUES
2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.
3. DISTANCES BETWEEN SIGNS, THE VALUES FOR WHICH ARE SHOWN IN TABLE D, ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.
- 3A. THE "WORK ZONE BEGINS" (R5-18c) SIGN SHALL BE USED ONLY IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE SHALL OMIT THIS SIGN AND THE QUANTITIES SHALL BE ADJUSTED APPROPRIATELY.
- 4E. THE MAXIMUM RECOMMENDED DISTANCE(S) BETWEEN CHANNELIZING DEVICES SHOULD BE EQUAL IN FEET TO THE POSTED SPEED IN MILES PER HOUR ON TAPER(S) AND TWICE THE POSTED SPEED IN THE PARALLEL AREA(S).
5. FOR OVERNIGHT CLOSURES, TYPE III BARRICADES SHALL BE LIGHTED.
6. WHEN CALLED FOR IN THE FHWA ACCEPTANCE LETTER FOR THE SIGN SYSTEM SELECTED, THE TYPE A WARNING FLASHER, SHOWN ON THE WARNING SIGNS, SHALL BE POSITIONED ON THE SIDE OF THE SIGN NEAREST THE ROADWAY.
7. ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING REQUIREMENTS SHALL MEET NCHRP 350 CRASHWORTHLY REQUIREMENTS STIPULATED IN THE CURRENT EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.
8. WHEN BUFFER AREAS ARE ESTABLISHED, THERE SHALL BE NO EQUIPMENT OR MATERIALS STORED OR WORK CONDUCTED IN THE BUFFER AREA.
- 25A. THIS SEQUENCE SHOULD ONLY BE USED WHEN WORKERS ARE NOT PRESENT, E.G., FOR CURING CONCRETE OVERNIGHT, ETC. WHEN WORK IS BEING CONDUCTED IN THE CENTER LANE, AN ADJACENT LANE (IN ONE OR BOTH DIRECTIONS) SHOULD ALSO BE CLOSED UTILIZING THE APPROPRIATE TYPICAL SIGNING SEQUENCE.

SIGN SIZES

DIAMOND WARNING - 48" x 48"
 R2-1 REGULATORY - 48" x 60"
 R5-18c REGULATORY - 48" x 48"

NOT TO SCALE

 TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL TEMPORARY TRAFFIC CONTROL FOR A CENTER-LANE FOR LEFT TURN ONLY CLOSURE ON A MULTI-LANE UNDIVIDED ROADWAY, WORKERS NOT PRESENT NO SPEED REDUCTION		
DRAWN BY: CON:AE:djf CHECKED BY: BMM:CRB	OCTOBER 2011 PLAN DATE:	M0330a	SHEET 2 OF 2
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0330a.dgn REV. 10/18/2011			