

CHECKLIST TO DESIGNATE AREAS OF EVALUATION FOR REQUESTS FOR PROPOSAL (RFP)

	REQUISITION NUMBER		DUE DATE XXXXXXXXXX XXXXXXXXXX XXXXXXXXXX
MDOT PROJECT MANAGER	JOB NUMBER (JN)	CONTROL SECTION (CS)	
DESCRIPTION			
MDOT PROJECT MANAGER: Check all items to be included in RFP WHITE = REQUIRED GRAY SHADING = OPTIONAL Check the appropriate Tier in the box below		CONSULTANT: Provide only checked items below in proposal	
<input type="checkbox"/> TIER I (\$25,000-\$99,999)	<input type="checkbox"/> TIER II (\$100,000-\$250,000)	<input type="checkbox"/> TIER III (>\$250,000)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Understanding of Service
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Innovations</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Organizational Chart
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Qualifications of Team
Not required as part of Official RFP	Not required as part of Official RFP	<input type="checkbox"/>	Quality Assurance/Quality Control
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Location: The percentage of work performed in Michigan will be used for all selections unless the project is for on-site p=inspection or survey activities, then location should be scored using the distance from the consultant office to the on-site inspection or survey activity.
N/A	N/A	<input type="checkbox"/>	Presentation
N/A	N/A	<input type="checkbox"/>	Technical Proposal (if Presentation is required)
3 pages (MDOT Forms not counted) (No Resumes)	7 pages (MDOT Forms not counted)	14 pages (MDOT forms not counted)	Total maximum pages for RFP not including key personnel resumes. Resumes limited to 2 pages per key staff personnel.

PROPOSAL AND BID SHEET EMAIL ADDRESS – mdot-rfp-response@michigan.gov

GENERAL INFORMATION

Any questions relative to the scope of services must be submitted by e-mail to the MDOT Project Manager. Questions must be received by the Project Manager at least five (5) working days prior to the due date and time specified above. All questions and answers will be placed on the MDOT website as soon as possible after receipt of the questions, and at least three (3) days prior to the RFP due date deadline. The names of vendors submitting questions will not be disclosed.

MDOT is an equal opportunity employer and MDOT DBE firms are encouraged to apply. The participating DBE firm, as currently certified by MDOT's Office of Equal Opportunity, shall be listed in the Proposal.

MDOT FORMS REQUIRED AS PART OF PROPOSAL SUBMISSION

5100D – Request for Proposal Cover Sheet

5100J – Consultant Data and Signature Sheet (Required only for firms not currently prequalified with MDOT)

(These forms are not included in the proposal maximum page count.)

REQUEST FOR PROPOSAL

The Michigan Department of Transportation (MDOT) is seeking professional services for the project contained in the attached scope of services.

If your firm is interested in providing services, please indicate your interest by submitting a Proposal, Proposal/Bid Sheet or Bid Sheet as indicated below. The documents must be submitted in accordance with the latest (Consultant/Vendor Selection Guidelines for Services Contracts" and "Guideline for Completing a Low Bid Sheet(S)*, if a low bid is involved as part of the selection process. **Reference Guidelines are available on MDOT's website under Doing Business > Vendor/Consultant Services >Vendor/Consultant Selections.**

RFP SPECIFIC INFORMATION

BUREAU OF HIGHWAYS BUREAU OF TRANSPORTATION PLANNING OTHER

THE SERVICE WAS POSTED ON THE ANTICIPATED QUARTERLY REQUESTS FOR PROPOSALS

NO YES DATED _____ THROUGH _____

Prequalified Services – See page ____ of the attached Scope of Services for required Prequalification Classifications.

Non-Prequalified Services – If selected, the vendor must make sure that current financial information, including labor rates, overhead computations, and financial statements, if overhead is not audited, is on file with MDOT's Office of commission Audits. This information must be on file for the prime vendor and all sub vendors so that the contract will not be delayed. **Form 5100J is required with Proposal for firms not currently prequalified with MDOT**

Qualifications Based Selection – Use Consultant/Vendor Selection Guidelines

For all Qualifications Based Selections, the section team will review the information submitted and will select the firm considered most qualified to perform the services based on the proposals. The selected vendor will be contacted to confirm capacity. Upon confirmation, that firm will be asked to prepare a priced proposal. Negotiations will be conducted with the firm selected.

For a cost plus fixed fee contract, the selected vendor must have a cost accounting system to support a cost plus fixed fee contract. This type of system has a job-order cost accounting system for the recording and accumulation of costs incurred under its contracts. Each project is assigned a job number so that costs may be segregated and accumulated in the vendor's job-order accounting system.

Qualification Review / Low Bid – Use Consultant/Vendor Selection Guidelines. See Bid Sheet instructions for additional information.

For Qualification Review/Low Bid selections, the selection team will review the proposals submitted. The vendor that has met established qualification threshold and with the lowest bid will be selected. The selected vendor may be contacted to confirm capacity.

Best Value – Use Consultant/Vendor Selection Guidelines, See Bid Sheet Instructions below for additional information. The bid amount is a component of the total proposal score, not the determining factor of the selection.

Low Bid (no qualifications review required – no proposal required.) See Bid Sheet Instructions below for additional instructions.

BID SHEET INSTRUCTIONS

Bid Sheet(s) must be submitted in accordance with the "Guidelines for Completing a Low Bid Sheet(s)* (available on MDOT's website). Bid Sheet(s) are located at the end of the Scope of Services. Submit bid sheet(s) separate from the proposal, to the email address: mdot-rfp-response@michigan.gov. Failure to comply with this procedure may result in your bid being rejected from consideration.

**NOTIFICATION
MANDATORY ELECTRONIC SUBMITTAL**

Proposals submitted for this project must be submitted electronically.

The following are changes to the Proposal Submittal Requirements:

- Eliminated the Following Requirements:
 - Safety Program
 - Communication Plan
 - Past Performance as *a separate section*
 - Separate section for DBE Statement of goals. Include information in Qualification of Team section

- Implemented the Following Changes:
 - All proposals require an Organization Chart
 - Resumes must be a maximum of two pages
 - Only Key (lead) staff resumes may be submitted
 - Tier III proposal reduced from 19 to 14 pages
 - Forms 5100D, 5100I, and 5100G combined – 5100D
 - Forms 5100B and 5100H combined – 5100B
 - RFP's will be posted on a weekly basis -- on Mondays

The following are Requirements for Electronic Submittals:

- Proposals must be prepared using the most current guidelines
- The proposal must be bookmarked to clearly identify the proposal sections (See Below)
- For any section not required per the RFP, the bookmark must be edited to include “N/A” after the bookmark title.
Example: Understanding of Service – N/A
- Proposals must be assembled and saved as a single PDF file
- PDF file must be 5 megabytes or smaller
- PDF file must be submitted via e-mail to MDOT-RFP-Response@michigan.gov
- MDOT's requisition number and company name must be included in the subject line of the e-mail. The PDF shall be named using the following format:
 - Requisition#XXX_Company Name.PDF
- MDOT will not accept multiple submittals
- Proposals must be *received* by MDOT on or before the due date and time specified in each RFP

If the submittals do not comply with the requirements, they may be determined unresponsive.

The Consultant's will receive an e-mail reply/notification from MDOT when the proposal is received. Please retain a copy of this e-mail as proof that the proposal was received on time. **Consultants are responsible for ensuring the MDOT receives the proposal on time.**

****Contact Contract Services Division immediately at 517-373-4680 if you do not get an auto response****

Required Bookmarking Format:

- I. Request for Proposal Cover Sheet Form 5100D
 - A. Consultant Data and Signature Sheet, Form 5100J (if applicable)
- II. Understanding of Service
 - A. Innovations
- III. Qualifications of Team
 - A. Structure of Project Team
 - 1. Role of Firms
 - 2. Role of Key Personnel
 - B. Organization Chart
 - C. Location
- IV. Quality Assurance / Quality Control Plan
- V. Resumes of Key Staff
- VI. Pricing Documents/Bid Sheet (if applicable)

2/14/12

Michigan Department of Transportation

**SCOPE OF SERVICE
FOR
DESIGN SERVICES**

CONTROL SECTION(S): 11015

JOB NUMBER(S): 113585C

PROJECT LOCATION:

The project is located on I-94 westbound from Red Arrow Highway (Exit 16) to 0.45 miles west of I-94 BL (Exit 23) in Berrien County. The project length is 7.4 miles.

PROJECT DESCRIPTION:

Provide design services for HMA milling and resurfacing, shoulder reconstruction, interchange ramp resurfacing, culvert replacement, guardrail replacement, cable barrier replacement, right-of-way fence replacement, ditching, clearing, and freeway signs plans. Road design and maintenance of traffic plans associated with bridge deck replacement and widening for I-94 eastbound and westbound over Lost Dunes (R04) and Puetz Road (S16). **Bridge design for R04 and S16 is not included in this service.**

ANTICIPATED SERVICE START DATE: December 11, 2012

ANTICIPATED SERVICE COMPLETION DATE: March 30, 2016

PRIMARY PREQUALIFICATION CLASSIFICATION(S):

Roadway Rehabilitation & Rural Freeways

SECONDARY PREQUALIFICATION CLASSIFICATION(S):

Geotechnical Engineering Services
Road Design Surveys
Hydraulics
Structure Surveys
Maintaining Traffic Plans and Provisions
Right-of-Way Surveys
Pavement Marking Plans
Short & Medium Span Bridges
Permanent Freeway Traffic Signing Plans
Specialty Walls/Slopes

DBE REQUIREMENT: 7%

MDOT PROJECT ENGINEER MANAGER:

Name (include classification): Kyle Rudlaff, Transportation Engineer 13 Licensed Specialist
Region/TSC/Office: Southwest Region/Coloma TSC
Address: Coloma TSC, 3880 Red Arrow Highway, Benton Harbor, MI 49022
Phone Number: (269) 849-2347
Fax Number: (269) 849-1227
E-mail: rudlaffk@michigan.gov

CONSTRUCTION COST:

A. The estimated cost of construction is:

1. Hot Mix Asphalt	\$15,000,000
2. Grading, Base, Subbase	\$ 4,500,000
3. Drainage	\$ 3,000,000
4. Permanent Barrier	\$ 2,000,000
5. Maintaining Traffic	\$ 1,000,000
6. Permanent Pavement Markings/Signs	\$ 500,000
7. Mobilization/Staking	\$ 2,000,000
8. Restoration/Clearing/Fence	\$ 1,000,000
9. Contingency	<u>\$ 1,000,000</u>
CONSTRUCTION TOTAL	\$ 30,000,000

B. The estimated cost of real estate is: \$25,000

The above construction total is the amount of funding programmed for this project. The Consultant is expected to design the project within the programmed amount.

If at any time the estimated cost of construction varies by more than 5% of the current programmed amount, then the Consultant will be required to submit a letter to the MDOT Project Manager justifying the changes in the construction cost estimate.

REQUIRED MDOT GUIDELINES AND STANDARDS:

Work shall conform to current MDOT, FHWA, and AASHTO practices, guidelines, policies, and standards (i.e., Road Design Manual, Standard Plans, Drainage Manual, Roadside Design Guide, A Policy on Geometric Design of Highways and Streets, Michigan Manual of Uniform Traffic Control Devices, etc.).

NOTE: A process change mandated by federal audit of MDOT’s design process puts the Omissions and Errors Check Meeting after the Plan Completion. Please keep this in mind when preparing your schedule. See MDOT Road Design Manual, Chapter 14 – Procedures – Section 14.54 for corroboration.

Consultant is required to use MDOT’s current version of Bentley MicroStation for CADD applications and Bentley GEOPAK for road design. Consultant shall comply with all MDOT CADD standards and file naming conventions.

GENERAL PROJECT INFORMATION:

The design services requested consists of all design related to this I-94 westbound hot mix asphalt resurfacing project. The below listed items provide a supplemental description of the project and deliverables to be provided by the Consultant. The project includes, but is not limited to the following items:

1. The project work is described in the Scope Verification Meeting Agenda and Minutes. See Attachment D.
2. Design mainline resurfacing treatment according to the concept in Attachment D, Scope Verification Meeting Minutes. The pavement treatment includes crown point relocation, cross slope upgrade, shoulder widening, HMA base course spot correction, and shoulder widening. The leading maintenance of traffic (MOT) concept involves construction of the outside shoulder to level course, and then the placing two lanes of traffic on it and the outside lane while median shoulder and median lane is rebuilt. The work progresses to the outside lane and shoulder using the new surface for grade control of the paving operation. The plans shall provide construction grades to accomplish work such that the HMA paving elevation that starts on the inside edge of the median lane (yellow line) forms the proposed crown and is neither lower than the existing surface nor more than 3 inches higher than the existing surface at the outside pavement. The level of design effort is more intense in this instance than regular milling and resurfacing that uses slope control in the field to dictate grades.
3. The project limits for design extends for 7.4 miles. The Consultant shall reduce the project limits for the proposed fiscal year 2016 construction project after the Plan Review as directed by the MDOT Project Manager. The remnant of the design not included in the fiscal year 2016 construction project shall have the design completed as a second set of plans. The second set of plans shall be reviewed through the Pre-OEC meeting and have its own title sheet, job number labels, pay item files, and etc. that are necessary for it stand by itself as a finished product.
4. The Consultant shall provide an independent geometric element report with the base plans in a format similar to the one provided in Attachment D titled "Level One Design Criteria Checklist – Existing and Proposed." An updated report shall be provided by the Consultant with the Preliminary Plans and the OEC Plans.
5. The Consultant shall provide removal, construction, and profile sheets for this project.
6. Design ramp extensions for the I-94 westbound exit ramps at Exit 16 and Exit 22, and the I-94 WB entrance ramp at Exit 22 if necessary.
7. Pavement designs will be provided by MDOT.
8. The Consultant shall collect vertical clearance measurements for all bridges that carry roads over or under I-94. Vertical clearance diagrams shall be included in the plans for existing and proposed conditions for both bounds of I-94 at all locations.

9. Complete project drainage design.
 - a. Replace all small culverts under I-94 westbound as listed in the Scope Verification Meeting Agenda and replace all median draining culverts under I-94 westbound. For replacement of pipes continuous under both bounds of I-94, generally place a new drainage structure over the pipe in the center of the median and then replace the pipe under I-94 westbound with open cut construction. Special staging design will be required to maintain the drainage flows, protect traffic from excavations, and complete the construction while maintaining two lanes of traffic. Hydraulic calculations and designs of new drainage pipes are to be provided.
 - b. Note the locations of standing water on the roadside and propose ditching or other measures to improve roadway drainage.
 - c. Provide permit diagrams and permit information for MDEQ permit applications at all locations indicated by MDOT. The permit applications will be completed and submitted by MDOT.
 - d. Reconfigure existing drainage inlets in the median to conform to the proposed median ditch, which has a more shallow depth than the existing median ditch. It is anticipated that at the location of each existing culvert inlet draining the median, a box structure with grate inlet shall be installed so proposed median slopes can be constructed and ditch flows received into the drainage pipe. Unique box structure dimensions are required at median culverts under I-94 eastbound, so the proposed slopes and existing pipe both fit into the elevations of the box structure.
 - e. Clearing and channel excavation is to be employed to restore ditch grades that are lower than culvert outlet elevations.
 - f. Replace the existing corrugated metal pipe storm sewer that extends about 600 feet southwest from Puetz Road under the I-94 Bridge. The existing headwall is outside MDOT ROW. The first alternative explored will be locating the outlet within MDOT ROW, probably further to the southwest.
 - g. Storm flow from the western I-94 ditch is carried under the service road in shallow culverts. These culverts appear to have little capacity to drain the I-94 ditches. The Consultant shall study the culverts under the service road and their receiving waters to recommend the best treatment. The design solution could involve coordination with the Grand Mere State Park, new box culverts, and localized grade raises for the service road.
10. ROW plans are included in the design tasks to account for at least one existing outlet headwall located outside the ROW southwest of Puetz road. There is also a possibility that other drainage work requires a larger work area than is available in the existing ROW.
11. There are Consultant design tasks associated with bridge work. The tasks include the road design and maintenance of traffic design associated with deck replacement being done on both bounds of I-94 bridges over Lost Dunes Golf Course Drive (R04) and Puetz Road (S16). Such work includes road approach design, detour signing or maintenance of traffic for local roads, and maintaining traffic on both bounds of I-94.

Bridge design for R04 and S16 is not a Consultant task included in this service. Short & Medium Span Bridges and Specialty Walls/Slopes prequalification categories are included in this scope for design of culvert headwalls for culvert sizes over 36 inch, and for a new headwall for of I-94 westbound over Wildwood Drive culvert (C01). Specialty slopes may be employed at the C01 location or other locations to accommodate I-94 widening within the existing ROW.

12. The design plans shall show vegetation being cleared from the edge of the I-94 shoulder to 12 feet outside the ditch bottom, or to the existing MDOT ROW line, whichever is least. The tree sizes shall be identified and clearing classes placed on the plans as specified in the Road Design Manual.
13. Design the maintenance of traffic for all project work. The Consultant shall complete a Mobility Analysis and Transportation Management Plan for this project as described in the MDOT Work Zone Safety and Mobility Manual. Two lanes of I-94 westbound traffic are to be maintained for all project work where this is feasible. One lane of I-94 westbound traffic may be maintained from 7:00 p.m. to 10:00 a.m. Monday through Thursday to complete work in the center lane. One lane of traffic may be maintained for an extended period on a Tuesday, Wednesday, or Thursday to accomplish each traffic stage change. Design traffic staging for culvert replacements to be made with an open cut trench method. Prepare different treatment alternatives and staging alternatives, including cost estimates, for culvert replacement work. The MOT signing plan will show the sign location and legend for each sign used in each sequence. The single lane closure convertible to a double lane closure will be located such that it will be in the same location for the entire project. Lanes shall always be closed starting from the left. Traffic shifts will be utilized to transition traffic to the left or right as necessary.
14. Completing the Design Survey is a Consultant Task. See Attachment A for details. Legal alignment, full topography, and terrain mapping are to be performed. A digital terrain model of the pavement and paved shoulder surface is required. This product will be used to regulate manageable differences between proposed and existing pavement surfaces. Vertical clearance measurements shall be collected at all grade separations, including those on I-94 eastbound. The Consultant survey width shall extend from the western ROW to the I-94 eastbound shoulder. The Consultant shall use MDOT provided photogrammetry to fill in graphics for the I-94 EB side of the roadway. The plans shall depict both bounds of I-94, even though design and construction activities are generally located on the I-94 westbound side of the roadway. One Consultant survey task associated with bringing in the antiquated photogrammetry product along I-94 eastbound is to spend a limited number of hours to review the topography graphics provided from the photogrammetry file, and reconcile it with on-site observations for landmark features such as large signs, bridge features, guardrail or etc. It is not intended that vegetation or other extensive topography updates be made. The Consultant shall either use aerial images or survey staff to graphically depict and label on the plans prominent landmarks located a short distance outside of MDOT ROW such as billboards, towers, structures, watercourses, and roads. Bridge surveys for both bounds of I-94 bridges over Lost Dunes Golf Course Drive (R04) and Puetz Road (S16) shall be performed for proposed work up to

a deck replacement treatment. This project shall install control points on a suitable interval for construction use.

15. All soil erosion control items must be shown on plan and profile sheets with associated key numbers and notes where applicable. The Consultant will provide the design for these measures. MDOT staff will review measures shown on preliminary plans and make comments. The Consultant shall adjust the plan according to the comments.
16. Cost estimates in *.csv format are to be developed at base plan, preliminary plan, and final plan process steps. Independent cost estimates for comparing design alternatives are to be provided upon request.
17. Plans are to show existing utilities. Existing utility information will be solicited by MDOT. Information is to be transferred to the plans by the Consultant. The Consultant shall provide electronic versions of plans as necessary for verification of utility locations with utility owners. MDOT shall print and distribute plans associated with the utility location solicitation and verification process. The Consultant is responsible for compiling detailed lists of all potential utility conflicts with project work and configuring the design to avoid utilities as directed by the MDOT Project Manager. MDOT will coordinate utility relocations, the Consultant shall attend, and take minutes for any utility relocation meetings scheduled by MDOT. The Coloma TSC Utility Engineer is Jarrett Burgess. He can be reached at phone number 269-849-1790.
18. All meetings with environmental resource specialists to address endangered species, water quality, soil erosion, phragmites control, or etc. shall be attended by the Consultant. Public involvement on this project is limited to supporting one public event by completing one flyer with graphics that describes the project, several displays depicting the project highlights, and attending one public meeting. The Consultant shall make allowance for two additional stakeholder meetings as may be scheduled to describe the project and discuss project impacts with emergency management agencies or other groups.
19. See “Geotechnical Tasks” section for details on soil borings.
20. MDOT shall perform reproduction and distribution of plan materials for all project reviews.
21. The OEC and final design package will be assembled and completed by the Consultant in the E-Plan and E-Proposal formats provided by MDOT. The matching *.csv file will accompany these items.
22. A period of approximately one half year is expected between Consultant Plan Turn-in and the MDOT Plan Turn-in for letting. An allowance of 20 hours will be set up in the Consultant work plan to refresh the final package with Standard Plan and Special Provision updates just prior to letting.

23. Interim Consultant deliverables include CADD files of cross sections and all files necessary to display each sheet for base plans, preliminary plans, and final plans. Additionally, *.PDF format of existing and proposed cross sections shall be provided at each of these steps.
24. Final deliverables, including the survey are to be provided in 100% electronic format to the Project Manager. A paper portfolio of survey material is to be sent to the Southwest Region Surveyor for review when complete. There shall be no paper documents provided in the final deliverables that are not provided in electronic submittal.
25. The Design Consultant must obtain prior approval from the MDOT Project Manager before charging of hours on a task in excess of the amount estimated in the work plan. The MDOT Project Manager reserves the option to delay approval of invoices when the cumulative amount charged exceeds the cumulative design progress, as determined by the MDOT Project Manager.

CONSULTANT RESPONSIBILITIES:

Complete the design of this project including, but not limited to the following:

The Consultant must adhere to all applicable OSHA and MIOSHA safety standards, including the appropriate traffic signs for the activities and conditions for this job and perform field operations in accordance with the Department's Personal Protective Equipment (PPE) policy as stated in the MDOT Guidance Document #10118.

Meet with the MDOT Project Manager to review project, location of data sources and contact persons, and review relevant MDOT operations. The Consultant shall review and clarify project issues, data needs and availability, and the sequence of events and team meetings that are essential to complete the design by the project plan completion date. Attention shall be given to critical target dates that may require a large lead time, such as geotechnical requirements, ROW submittal dates, Railroad coordination requirements, utility conflict resolution, local agency meetings, etc.

- A. Perform design surveys.
- B. Prepare required plans, typical cross-sections, details, and specifications required for design and construction.
- C. Compute and verify all plan quantities.
- D. Prepare staging plans and special provisions for maintaining traffic during construction.
- E. Provide solutions to any unique problems that may arise during the design of this project.

- F. The Consultant may be required to provide Design Services during the construction phase of this project. If Construction Assistance is required, then a separate authorization for those services will be issued.
- G. Maintain a Design Project Record which includes a history of significant events (changes, comments, etc.) which influenced the development of the plans, dates of submittals and receipt of information.
- H. If excavation is required, submit the excavation locations which may contain contamination. Project Manager then can proceed in requesting a Preliminary Project Assessment (PPA).
- I. The Consultant shall be required to prepare and submit a CPM network for the construction of this project.
- J. The Consultant representative shall record and submit type-written minutes for all project related meetings to the MDOT Project Manager within two weeks of the meeting. The Consultant shall also distribute the minutes to all meeting attendees. MDOT will provide and distribute official meeting minutes for the Plan Review Meeting.
- K. The Consultant will provide to MDOT at the scheduled submittal dates, copies of the required specifications and plan set materials for distribution by MDOT for all reviews for this project with the exception of The Plan Review. The Consultant shall contact the project manager prior to the submittal dates for the exact number of copies that will be required for submittal.
- L. Prepare and submit electronically (native format or Adobe PDF) any information, calculations, hydraulic studies, or drawings required by MDOT for acquiring any permit (ie. NPDES, DEQ, etc), approvals (i.e. county drain commission) and related mitigation. MDOT will submit permit requests.
- M. Attend any project-related meetings as directed by the MDOT Project Manager.
- N. Attend information meetings (i.e., public hearings, open houses, etc.) with the public and public officials to assist in responding to concerns and questions. May require the preparation of displays such as maps, marked-up plans, etc.
- O. The Consultant shall assist in the review of utility permit requests, incorporate the information in the design plans, and respond within 2 weeks from receipt of the permit.

- P. The MDOT Project Manager shall be the official MDOT contact person for the Consultant **and shall be made aware of all communications regarding this project**. The Consultant must either address or send a copy of all correspondence to the MDOT Project Manager. This includes all Subcontractor correspondence and verbal contact records.
- Q. The Consultant shall contact the MDOT Project Manager whenever discoveries or design alternatives have the potential to require changes in the scope, limits, quantities, costs, or right-of-way of the project.

UTILITIES

The Consultant shall be responsible for obtaining and showing on the plans the location and names of all existing utilities within the limits of the project. In the course of resolving utility conflicts, the Consultant shall make modifications to the plans or design details and provide assistance as directed by the MDOT Utility Permits Engineer and/or Project Manager. The Consultant shall attend any utility meetings called to ensure that the concerns are addressed on the plans involving utilities. The Consultant shall assist in the review of utility permit requests to ensure compatibility with the project. The Consultant will be responsible for miscellaneous staking of utilities.

TRAFFIC CONTROL

The Consultant shall be responsible for all traffic control required to perform the tasks as outlined in this Scope of Design Services. The Consultant will discuss the traffic control with the Coloma TSC Traffic and Safety Engineer prior to each work activity in the field. These operations are known to consist of survey operations, and culvert borings. The Traffic Control Typicals are found in Attachment B . The TSC Traffic and Safety Engineer is Gary Loyola. His contact information is Ph. 269-849-2346, and E-mail: loyolag@michigan.gov.

GEOTECHNICAL SERVICES

PPMS Task 3510 Roadway Geotechnical services consists of collection and analysis of the following:

1. Five soil borings for the estimated three ramp extensions.(5borings)
2. Two soil borings for each of 17 cross culvert locations for headwall foundation and culvert bedding recommendations. These shall be 15 feet deeper than the culvert. (34 borings)
3. Eight soil borings for checking stability underlying soils for outside shoulder widening. (8 borings)
4. 20 pavement cores (pavement only) at locations determined by Southwest Region Pavement and Soils Engineer to evaluate

existing pavement distress. Locations shall not be in the center lane.

5. Two Structure borings for C01 headwall/wingwall construction.

MDOT PERMITS

The Consultant shall be responsible for obtaining up to date access permits and pertinent information for tasks in MDOT Right of Way (ROW). This information can be obtained through Joe Rios, Utilities/Permits Section, Real Estate Division at (517) 241-2103.

MONTHLY PROGRESS REPORT

On the first of each month, the Consultant Project Manager shall submit a monthly project progress report to the Project Manager.

MDOT RESPONSIBILITIES:

- A. Schedule and/or conduct the following:
 1. Project related meetings.
 2. The Plan Review
 3. Utility Meetings.
 4. Quantity summary sheets and final item cost estimates.
 5. Packaging of plans and proposal.
- B. Furnish Special Details and pertinent reference materials.
- C. Furnish prints of an example of a similar project and old plans of the area, if available. Furnish the E.A.
- D. Obtain all permits for the project as outlined in previous section.
- E. Coordinate any necessary utility relocation.
- F. Furnish FTP site for software download and instructions for the MDOT Stand Alone Proposal Estimator's Worksheet (SAPW).

DELIVERABLES:

The Consultant shall deliver all computer files associated with the project in their native format (spreadsheets, CADD files, GEOPAK files, etc.) on DVD, CD or uploaded to ProjectWise, as directed by the MDOT Project Manager. All CADD/GEOPAK files shall be created and identified with standard MDOT file names as shown in Appendix A of the Road Design Manual. It is the Consultant's responsibility to obtain up to date MicroStation and GEOPAK seed/configuration files necessary to comply with MDOT's CADD standards which are posted to the bulletin board system. When the use of GEOPAK road design software is necessary to develop plans all pay items shall be placed into the CADD file using GEOPAK's Design and Computation Manager so that Quantity Manager can be used to

transfer pay item information to SAPW/Trns*port. Any CADD/GEOPAK files that do not conform to MDOT standards will be returned to the Consultant for correction at the Consultant's expense.

Proposal documents shall be submitted in their native format with standard naming conventions as well as combined into one Adobe PDF file in the sequence specified by MDOT. To provide text search capabilities the combined proposal shall be created by converting native electronic files to PDF. Scanning to PDF is discouraged except in instances where it is necessary to capturing a legally signed document or a hard copy version of a document is all that exists.

Plan files shall be submitted in their native dgn format with standard naming conventions as well as plotted into a combined Adobe PDF file. Plan sheets shall be plotted to Adobe PDF with full text search and level on/off capabilities in half size (11" x 17") formats. A full size title sheet shall be plotted stamped and signed then scanned for inclusion with the Adobe PDF set. The original title sheet will be sent to the MDOT Project Manager.

Stand Alone Proposal Estimator's Worksheet (SAPW) shall be used to generate the txt and csv files necessary for import into the Trns*port bid letting software. The SAPW files shall be transmitted electronically by the method specified by the MDOT Project Manager.

The project construction, removal and profile sheets will require a ratio (scale) of **1":100'** (**English Units**).

Other plan sheets that are required for this project shall be completed by the Consultant. These include, but are not limited to the following plan sheets:

- A. The title sheet. MDOT will provide a map of the area on a disk in our workstation format. If the map is not available, MDOT will provide a map that could be used. The Consultant shall be responsible for any revisions to the title sheet and the title sheet and map shall meet MDOT format and layout guidelines.
- B. Drainage Vicinity Sheets
- C. Alignment Sheets
- D. Note Sheet.
- E. Typical Cross-Sections.
- F. Project specific Special Details.
- G. Removal, Construction, and Profile Sheets
- H. Construction staging and traffic control plans.
- I. Workzone signing plan (s)

- J. Detail grade sheets for critical areas.
- K. Permanent signing plan(s).
- L. Pavement marking plan(s).
- M. Witness and benchmark sheet(s).
- N. Soil boring log sheet(s).

All plans, special provisions, estimates, and other project related items shall meet all MDOT requirements and detailing practices (i.e., format, materials, symbols, patterns, and layout) or as otherwise directed by the Project Manager. All plans, specifications, and other project related items are subject to review and approval by MDOT.

PROJECT SCHEDULE:

The Consultant shall use the following events to prepare the proposed implementation schedule as required in the Guidelines for the Preparation of Responses on Assigned Design Services Contracts. These dates shall be used in preparing the Consultant's Monthly Progress Reports.

	MDOT PRECONSTRUCTION TASKS CONSULTANT CHECKLIST	
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Please indicate with a check in the box next to each task number whether you believe that task will require consultant involvement on the job. Milestones (a specific event at a point in time) are italicized and underlined. See the [P/PMS Task Manual](#) for more details.

STUDY (EARLY PRELIMINARY ENGINEERING)

		P/PMS TASK NUMBER AND DESCRIPTION	DATE TO BE COMPLETED BY
YES	NO		(mm/dd/yyyy)
		<u>EPE SCOPING ANALYSIS</u>	
<input type="checkbox"/>	X	2120 Prepare Traffic Analysis Report	_ / _ / _
<input type="checkbox"/>	X	2130 Prepare Project Justification	_ / _ / _
<input type="checkbox"/>	X	<i><u>213M Concurrence by Regulatory Agencies with the Purpose and Need</u></i>	_ / _ / _
<input type="checkbox"/>	X	2140 Develop and Review Illustrative Alternatives	_ / _ / _
<input type="checkbox"/>	X	2155 Request/Perform Safety Analysis	_ / _ / _
<input type="checkbox"/>	X	2160 Prepare and Review EIS Scoping Document	_ / _ / _
<input type="checkbox"/>	X	<i><u>211M Public Information Meeting</u></i>	_ / _ / _
		<u>EPE DRAFT ANALYSIS</u>	
<input type="checkbox"/>	X	2310 Conduct Technical SEE Studies	_ / _ / _
<input type="checkbox"/>	X	2321 Prepare for Aerial Photography	_ / _ / _
<input type="checkbox"/>	X	2322 Finish/Print Aerial Photography	_ / _ / _
<input type="checkbox"/>	X	2330 Collect EPE Geotechnical Data	_ / _ / _
<input type="checkbox"/>	X	2340 Develop and Review Practical Alternatives	_ / _ / _
<input type="checkbox"/>	X	<i><u>233M Aerial Photography Flight</u></i>	_ / _ / _
<input type="checkbox"/>	X	2360 Prepare and Review EA or DEIS	_ / _ / _
<input type="checkbox"/>	X	<i><u>231M Draft Submission to FHWA</u></i>	_ / _ / _
<input type="checkbox"/>	X	2380 Circulate EA or DEIS	_ / _ / _
<input type="checkbox"/>	X	<i><u>232M Public Hearing</u></i>	_ / _ / _
		<u>EPE FINAL ANALYSIS</u>	
<input type="checkbox"/>	X	2510 Determine and Review Recommended Alternative	_ / _ / _
<input type="checkbox"/>	X	<i><u>250M Concurrence by Regulatory Agencies with Recommended Alternatives</u></i>	_ / _ / _
<input type="checkbox"/>	X	2525 Prepare and Review Engineering Report	_ / _ / _
<input type="checkbox"/>	X	2530 Prepare and Review Request for FONSI or FEIS	_ / _ / _
<input type="checkbox"/>	X	<i><u>252M Final Submission to FHWA</u></i>	_ / _ / _
<input type="checkbox"/>	X	2550 Obtain FONSI or ROD	_ / _ / _
		<u>CONTAMINATION INVESTIGATION</u>	

<input type="checkbox"/>	X	2810 Project Area Contamination Survey (PCS)	__/__/__
<input type="checkbox"/>	X	2820 Preliminary Site Investigation (PSI) for Contamination	__/__/__

MDOT PRECONSTRUCTION TASKS CONSULTANT CHECKLIST
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PRELIMINARY ENGINEERING - DESIGN

		P/PMS TASK NUMBER AND DESCRIPTION	DATE TO BE COMPLETED BY
YES	NO		(mm/dd/yyyy)
		<u>DESIGN SCOPE VERIFICATION AND BASE PLAN PREPARATION</u>	
X	<input type="checkbox"/>	3130 Verify Design Scope of Work and Cost	01/31/2013
<input type="checkbox"/>	X	3310 Prepare Aerial Topographic Mapping	__/__/__
<input type="checkbox"/>	X	3320 Conduct Photogrammetric Control Survey	__/__/__
<input type="checkbox"/>	X	3321 Set Aerial Photo Targets	__/__/__
X	<input type="checkbox"/>	3330 Conduct Design Survey	9/02/2013
X	<input type="checkbox"/>	3340 Conduct Structure Survey	9/02/2013
<input type="checkbox"/>	X	3350 Conduct Hydraulics Survey	__/__/__
X	<input type="checkbox"/>	3360 Prepare Base Plans	1/15/2014
<input type="checkbox"/>	X	<i>331M Utility Notification</i>	__/__/__
X	<input type="checkbox"/>	3361 Review and Submit Preliminary ROW Plans	3/20/2014
X	<input type="checkbox"/>	<i>331M Preliminary ROW Plans Distributed</i>	4/18/2014
<input type="checkbox"/>	X	3370 Prepare Structure Study	__/__/__
X	<input type="checkbox"/>	3375 Conduct Value Engineering Study	__/__/__
X	<input type="checkbox"/>	3380 Review Base Plans	2/14/2014
X	<input type="checkbox"/>	<i>332M Base Plan Review (Pre-GI Inspection)</i>	2/14/2014
X	<input type="checkbox"/>	3390 Develop the Maintaining Traffic Concepts	1/15/2014
		<u>PRELIMINARY PLANS PREPARATION</u>	
X	<input type="checkbox"/>	3510 Perform Roadway Geotechnical Investigation	9/06/2013
<input type="checkbox"/>	X	3520 Conduct Hydraulic/Hydrologic and Scour Analysis	__/__/__
X	<input type="checkbox"/>	3522 Conduct Drainage Study, Storm Sewer Design, and use Structural Best Management Practices	5/02/2014
X	<input type="checkbox"/>	3530 Conduct Structure Foundation Investigation	9/06/2013
<input type="checkbox"/>	X	3535 Conduct Structure Review for Architectural and Aesthetic Improvements	__/__/__
X	<input type="checkbox"/>	3540 Develop the Maintaining Traffic Plan	8/29/2014
<input type="checkbox"/>	X	3551 Prepare/Review Preliminary Traffic Signal Design Plan	__/__/__
X	<input type="checkbox"/>	3552 Develop Preliminary Pavement Marking Plan	8/29/2014
<input type="checkbox"/>	X	3553 Develop Preliminary Non-Freeway Signing	8/29/2014

		Plan	
X	<input type="checkbox"/>	3554 Develop Preliminary Freeway Signing Plan	8/29/2014
<input type="checkbox"/>	X	3555 Prepare/Review Preliminary Traffic Signal Operations	__/__/__
X	<input type="checkbox"/>	3570 Prepare Preliminary Structure Plans	8/29/2014
X	<input type="checkbox"/>	3580 Develop Preliminary Plans	8/29/2014
X	<input type="checkbox"/>	3581 Review and Submit Final ROW Plans	5/16/2014
X	<input type="checkbox"/>	<i>351M Final ROW Plans Distributed</i>	6/03/2014
X	<input type="checkbox"/>	3590 Review Preliminary Plans (Hold Plan Review Meeting)	10/15/2014
X	<input type="checkbox"/>	<i>352M THE Plan Review (Grade Inspection)</i>	10/15/2014

MDOT PRECONSTRUCTION TASKS CONSULTANT CHECKLIST
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PRELIMINARY ENGINEERING - DESIGN (cont'd)

		P/PMS TASK NUMBER AND DESCRIPTION	DATE TO BE COMPLETED BY
YES	NO		(mm/dd/yyyy)
		<u>UTILITIES</u>	
X	<input type="checkbox"/>	3610 Compile Utility Information	1/15/2014
<input type="checkbox"/>	X	3650 Coordinate RR Involvement for Grade Separations	__/__/__
<input type="checkbox"/>	X	3655 Coordinate RR Involvement for At-Grade Crossings	__/__/__
<input type="checkbox"/>	X	3660 Resolve Utility Issues	__/__/__
<input type="checkbox"/>	X	<i>360M Utility Conflict Resolution Plan Distribution</i>	__/__/__
X	<input type="checkbox"/>	<i>361M Utility Meeting</i>	11/13/2014
<input type="checkbox"/>	X	3670 Develop Municipal Utility Plans	__/__/__
<input type="checkbox"/>	X	3672 Develop Special Drainage Structures Plans	__/__/__
<input type="checkbox"/>	X	3675 Develop Electrical Plans	__/__/__
		<u>MITIGATION/PERMITS</u>	
<input type="checkbox"/>	X	3710 Develop Required Mitigation	__/__/__
X	<input type="checkbox"/>	3720 Assemble Environmental Permit Applications	11/13/2014
<input type="checkbox"/>	X	3730 Obtain Environmental Permit	__/__/__
		<u>FINAL PLAN PREPARATION</u>	
		<u>PRE-OEC Plans</u>	1/30/2015
		<u>PRE- OEC Meeting</u>	2/20/2015
<input type="checkbox"/>	X	3821 Prepare/Review Final Traffic Signal Design Plan	__/__/__
X	<input type="checkbox"/>	3822 Complete Permanent Pavement Marking Plan	4/03/2015
<input type="checkbox"/>	X	3823 Complete Non-Freeway Signing Plan	__/__/__
X	<input type="checkbox"/>	3824 Complete Freeway Signing Plan	4/03/2015

<input type="checkbox"/>	X	3825 Prepare/Review Final Traffic Signal Operations	/ /
X	<input type="checkbox"/>	3830 Complete the Maintaining Traffic Plan	4/03/2015
X	<input type="checkbox"/>	3840 Develop Final Plans and Specifications	4/03/2015
X	<input type="checkbox"/>	<i>380M Plan Completion</i>	4/03/2015
X	<input type="checkbox"/>	3850 Develop Structure Final Plans and Specifications	4/03/2015
X	<input type="checkbox"/>	3870 Hold Omissions/Errors Check (OEC) Meeting	5/01/2015
X	<input type="checkbox"/>	<i>387M Omissions/Errors Checks Meeting</i>	5/01/2015
X	<input type="checkbox"/>	<i>389M Consultant Plan Turn-In</i>	6/18/2015
<input type="checkbox"/>	X	3880 CPM Quality Assurance Review	/ /

MDOT PRECONSTRUCTION TASKS CONSULTANT CHECKLIST

PRELIMINARY ENGINEERING – RIGHT OF WAY

		P/PMS TASK NUMBER AND DESCRIPTION	DATE TO BE COMPLETED BY
YES	NO		(mm/dd/yyyy)
		<u>EARLY RIGHT OF WAY WORK</u>	
<input type="checkbox"/>	X	4120 Obtain Preliminary Title Commitments	_ / _ / _ _
<input type="checkbox"/>	X	4130 Prepare Marked Final Right Of Way Plans	_ / _ / _ _
<input type="checkbox"/>	X	<i>413M Approved Marked Final ROW</i>	_ / _ / _ _
<input type="checkbox"/>	X	4140 Prepare Property Legal Instruments	_ / _ / _ _
		<u>ROW ACQUISITION</u>	
<input type="checkbox"/>	X	4411 Preliminary Interviews	_ / _ / _ _
<input type="checkbox"/>	X	<i>441M Post-Decision Meeting</i>	_ / _ / _ _
<input type="checkbox"/>	X	4412 Real Estate Services Assignment Proposal and Fee Estimate (Form 633s) for Appraisal Work Authorization	_ / _ / _ _
<input type="checkbox"/>	X	4413 Appraisal Reports	_ / _ / _ _
<input type="checkbox"/>	X	4420 Appraisal Review Reports	_ / _ / _ _
<input type="checkbox"/>	X	4430 Acquire Right Of Way Parcels	_ / _ / _ _
<input type="checkbox"/>	X	4510 Conduct Right Of Way Survey & Staking	_ / _ / _ _
		<u>ROW RELOCATION</u>	
<input type="checkbox"/>	X	4710 Relocation Assistance	_ / _ / _ _
<input type="checkbox"/>	X	4720 Prepare Improvement Removal Plan	_ / _ / _ _
<input type="checkbox"/>	X	<i>442M ROW Certification</i>	_ / _ / _ _

FOR YOUR INFORMATION

For questions on specific tasks, refer to the P/PMS Task Manual located on the MDOT Bulletin Board System.

For assistance in accessing this manual, please contact
Dennis Kelley: (517) 373-4614

CONSULTANT PAYMENT – Actual Cost Plus Fixed Fee:

Compensation for this project shall be on an **actual cost plus fixed fee** basis. This basis of payment typically includes an estimate of labor hours by classification or employee, hourly labor rates, applied overhead, other direct costs, subconsultant costs, and applied fixed fee.

All billings for services must be directed to the Department and follow the current guidelines. The latest copy of the "Professional Engineering Service Reimbursement Guidelines for Bureau of Highways" is available on MDOT's website. This document contains instructions and forms that must be followed and used for billing. Payment may be delayed or decreased if the instructions are not followed.

Payment to the Consultant for services rendered shall not exceed the maximum amount unless an increase is approved in accordance with the contract with the Consultant. Typically, billings must be submitted within 60 days after the completion of services for the current billing. The final billing must be received within 60 days of the completion of services. Refer to your contract for your specific contract terms.

Direct expenses, if applicable, will not be paid in excess of that allowed by the Department for its own employees in accordance with the State of Michigan's Standardized Travel Regulations. Supporting documentation must be submitted with the billing for all eligible expenses on the project in accordance with the Reimbursement Guidelines. The only hours that will be considered allowable charges for this contract are those that are directly attributable to the activities of this project.

The use of overtime hours is not acceptable unless prior written approval is granted by the MDOT Region Engineer/Bureau Director and the MDOT Project Manager. Reimbursement for overtime hours that are allowed will be limited to time spent on this project in excess of forty hours per person per week. Any variations to this rule should be included in the priced proposal submitted by the Consultant and must have prior written approval by the MDOT Region Engineer/Bureau Director and the MDOT Project Manager.

The fixed fee for profit allowed for this project is 11.0% of the cost of direct labor and overhead.

ATTACHMENT A
SURVEY SCOPE OF WORK
I-94 Westbound from Bridgman to Stevensville
9/12

A. SURVEY PREQUALIFICATIONS: Road Design Surveys and Right of Way Surveys

B. MAPPING LIMITS: A PORTFOLIO as outlined in this section IS REQUIRED.

C. NOTES:

1. The Consultant shall discuss the scope of this survey with the MDOT Project Manager / Region Surveyor before submitting a Price Proposal:

- MDOT Project Manager: Kyle Rudlaff

(269) 337-3920
rudlaffk@michigan.gov

- MDOT Region Surveyor: Erik J. Schnepf, PS

(269) 327-4499
SchnepfE@michigan.gov

2. The Consultant surveyor must contact the Region Traffic & Safety Engineer for work restrictions and traffic control in the project area prior to submitting a proposal.

3. A **detailed Survey Work Plan** showing timeframe with a **spreadsheet estimate** of hours by specific survey task such as DTM creation, traversing, leveling, mapping, etc., **must** be included in the project Price Proposal.

4. It is the responsibility of the Professional Surveyor to safeguard all corners of the United States Public Land Survey System, published Geodetic Control and any other Property Controlling corners that may be in danger of being destroyed by the proposed construction project.

5. At the end of the project a submittal meeting will be set up between the Southwest Region Surveyor and other MDOT staff to review the survey

D. BI-WEEKLY PROGRESS REPORT

Every 2 weeks the Consultant shall submit a project progress report to the Region surveyor and the MDOT project manager. The progress report shall address the following items:

1. Work accomplished during the previous weeks.
2. Anticipated work and goals for the coming weeks.
3. Real problems which occurred during the weeks, and anticipated problems for the coming weeks.
4. Any updates on the project schedule including explanations for any delays or changes in schedule, scope, or work plan.
5. Any early reviews or submittals such as adjustments, computations, or alignment. For this project the timeline is critical. It is important to meet the proposed schedule as listed above.
6. Copy of Verbal Contact Records for the period giving details for the item discussed and date.

E. GENERAL REQUIREMENTS

1. Surveys must comply with **all Michigan law** relative to land surveying.
2. Surveys must be done under the **direct supervision** of a Professional Surveyor licensed to practice in the State of Michigan.

3. Work in any of the following categories of survey: Road Design, Bridge, Hydraulic, Right-of-Way, Ground Control (Photogrammetric), and/or Geodetic control, must be completed by a survey firm which is pre-qualified by MDOT.
4. Surveys must meet all requirements of the Michigan Department of Transportation (MDOT) Design Surveys *Standards of Practice* dated January 2012. Please contact the Design Survey office to clarify any specific questions regarding these standards.
5. The Consultant is responsible for using the latest MDOT GeoPak Feature Codes, files and tugboat (macro), available on the MDOT Design Survey File Transfer Protocol (FTP) site. **The Consultant must also use MicroStation Version 8i/ Power GeoPak with Data Acquisition or newer. Power Civil is also acceptable for survey.**
6. Consultants must obtain all necessary permits required to perform this survey on any public and/or private property. This includes an up-to-date permit from the MDOT Utilities Coordination and Permits Section
7. Prior to performing the survey, the Consultant must contact all landowners upon whose lands they will enter. The contact may be personal, phone or letter, but must be documented. This notice must include the reasons for the survey on private land, the approximate time the survey is to take place, the extent of the survey including potential brush cutting, and an MDOT contact person (the MDOT Project Manager).
8. The Consultant must contact any and all Railroads prior to commencing field survey on railroad property. The cost for any permit, flaggers and/or training that is required by the Railroad will be considered as a direct cost, but only if included in the Consultant's proposal.
9. The Consultant must adhere to all applicable OSHA and MIOSHA safety standards, including the appropriate traffic signs for the activities and conditions for this job.

10. Consultants are responsible for a comprehensive and conscientious research of all records, including MDOT records, essential for the completion of this project.
11. Measurements, stationing, recorded data, and computations must be in International Feet.
12. Coordinate values must be based on the Michigan Coordinate System of 1983 (MCS 83), Appropriate Zone. All elevations must be based on the North American Vertical Datum of 1988 (NAVD88).
13. Specific requirements concerning the Control, Alignment, property, mapping, misc., of each survey portfolio is described below.
14. Current MDOT QA/QC CERTIFICATION CHECK LIST dated Jan. 2012 will be used. This can be obtained on the MDOT Design Survey FTP site.
15. Current MDOT symbology must be used exclusively as shown on the MDOT FTP site.

The FTP site for consultants is:

<ftp://ftp.michtrans.net>

<ftp://ftpmdot.state.mi.us/>

For access contact Carolyn Kieft at 517-241-4634 kieftc@michigan.gov or Greg Guikema at 517-373-0060 guikemag@michigan.gov

username: survcons

password: \$urvcon\$

16. All data, whether electronic or paper, must be recorded on non-rewritable Compact Discs (CD's). All paper files, including MicroStation files, must be scanned and/or converted to Adobe Acrobat (.pdf) format. CD's must be organized in the same manner as the portfolio, such as by Administrative section, Control section, etc. A Table of Contents in Adobe Acrobat format is required that has all .pdf pages of the CD bookmarked/linked so each place in the .pdf archive can be accessed with a single click of the computer mouse. Specified format files such as ASCII text, and MicroStation must have separate access.

17. CD's must be labeled with the route, location, control section, job number, Consultant name, and data type.
18. Each category of survey must be packaged separately (i.e., Structure survey separate from Road survey). All sheets in a portfolio must be marked with the control section, job number, portfolio section name, and page number.
19. The Consultant representative shall record and submit typewritten minutes for all project related survey meetings to the MDOT Project Manager within two weeks of the meeting. The Consultant shall also distribute the minutes to all meeting attendees.
20. The MDOT Project Manager is the official contact for the Consultant. The Consultant must either address, or send a copy of all correspondence to the MDOT Project Manager. The MDOT Project Manager shall be made aware of all communications regarding this project. Any questions regarding this award or any subsequent project should be directed to the Region Surveyor.
21. Use static terrestrial laser scanning and mobile mapping (mobile terrestrial laser scanning or of LiDAR) methods must be used for completion of portions of this project providing a savings in schedule, time and costs, improved safety and reduced traffic control and costs. Any use of these technologies shall conform to and utilize the **2012 MDOT Standards of Practice for Design Surveys** and the existing terrestrial scanning standards in **MDOT Laser Scanning Standards and Guidelines** and the Specifications/Guidelines based on the **Caltrans Survey Manual Chapter 15 Terrestrial Laser Scanning Specifications** . **Project deliverables and reports shall include the information, electronic files and reports referred to in the Caltrans Specifications under MTLs Documentation.**
22. All field survey notes, all electronic data, and all research records obtained for this project will be considered the property of MDOT and must be sent to:

MDOT Design Division
Erik J. Schnepf, PS

1501 E. Kilgore,
Kalamazoo, MI. 49001

Please use MDOT's Form 222(3/99) 2001 entitled "SURVEY NOTES: RECEIPT AND TRANSMITTAL" for all transmittals. A copy of this transmittal form must also be sent to the MDOT Project Manager for Design.

F. WORK RESTRICTIONS

The Consultant must call the MDOT Region or TSC Traffic & Safety Engineer before submitting the Priced Proposal to discuss the Traffic Control and Safety plan for survey activities. A copy of the Traffic Control and Safety plan must be submitted with the Price Proposal and used as a basis of bid for traffic control devices by at least three sources.

Traffic shall be maintained by the Consultant throughout the project to the satisfaction of the Traffic & Safety Engineer at all times. Any deviation from the Traffic Control and Safety plan without the Traffic and Safety Engineer approval can result in project delays.

The Consultant must call the MDOT Region or TSC Traffic & Safety Engineer before beginning work to provide notification of surveying activity in the area. For this project there will be no lane closures allowed on I-94. It is anticipated that mobile scanning or other innovative method to collect roadway data remotely. This new method will be used to collect the hard surface data along Westbound I-94. Collecting the hard surface pavement by reflectorless methods using a total station will not be acceptable.

G. FIELD SURVEY

The purpose of the field survey is to obtain all information and data required by the project design engineer, to leave control in the field for future construction staking, and to provide a sufficient history of the area to enable the MDOT Design Survey Unit to perform dependable surveys in the future.

H. HORIZONTAL CONTROL

A three dimensional coordinate system must be established based on the North American Datum of 1983, NAD83 (CORS96), Michigan State Plane Grid Coordinates- South Zone (2113) in international feet units for this project. The horizontal least squares adjustment statistics must be reported at the 95% confidence level. Additional control will need to be set in this area following current MDOT standards.

The horizontal project control for this project will be classified as intermediate project control according to the MDOT Standards of Practice dated April 1, 1998. For the

placement of control the interstate project scenario shall apply. These control points are intended for mapping and should be located outside the proposed construction area to insure their availability for all phases of construction. Each control point must be accurately described and witnessed to at least four nearby features. Please refer to MDOT Standards of Practice for the minimum requirements for these points. Prior to any mapping the horizontal and vertical control must be approved by the Southwest Region Surveyor

OPUS positioning may be used, as long as there are checks, redundancies and controls built into the Consultant's horizontal control system. For any and all OPUS solutions, a RINEX format file with a minimum of two hours of GPS data must be included, as well as the OPUS solution from NGS. All OPUS solutions must be verified within 0.10 foot, either by a separate OPUS position from an independent occupation, or by a NGS/CORS adjustment. OPUS-RS is not acceptable for establishing the control on the project.

A closed traverse must be run and adjusted between two or more known points on the project control traverse. Open traverses are NOT acceptable. Unadjusted traverse measurements must produce an error of closure of not greater than 1:20,000. Any permissible error of closure shall be distributed throughout the traverse by means of a suitable least squares adjustment software program.

All data collection traverse points and the plan centerline alignment must be tied to the control established for this project. All field observations, unadjusted traverse computations and final adjusted coordinates must be included in the notes. A list of all horizontal control points must be developed which includes datum, point designations, descriptions, horizontal coordinates with standard errors, station and offset, witnesses and appropriate scale factors (grid to ground). This list must be printed on 8.5" x 11" sheets and placed on CD in ASCII format. All data relating to the horizontal component of the system must be included in the control section of the portfolio.

Before any mapping begins the control will be reviewed by the Southwest Region Surveyor. There are 2 primary control points near the project. The control for the project on these monuments will need to be verified with CORS via an OPUS solution.

11204 Primary Horizontal Control Point

MDOT disc in concrete monument stamped 11204 1992, on Southerly side East bound I-94, North side of Red Arrow on-ramp, East of Red Arrow bridge For Exit 23 and 98m West of centerline CSX Railroad at STA 982+78

X (East)	3822382.9001
Y (North)	61376.8172
Z (Orth. Elev.)	200.9270

11205	237d 20m	1429.03m
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MDOT disc in Southeast side CSX Railroad

Bridge	50d 25m	126.030m
PK in concrete	359d 46m	8.364m
PK in asphalt	164d 35m	7.534m
PK in asphalt	79d 16m	6.605m

11205 Primary Horizontal Control Point

MDOT disc in concrete monument stamped 11205 1992, on Northwesterly side West bound I-94, 0.27 km Northerly of Puetz Road

X (East)	3821179.9809
Y (North)	60605.4009
Z (Orth. Elev.)	200.0320

11204	57d 20m	1429.03m
Sign for Gas - Exit 23, North leg, Northwest Bolt chiseled "+"	109d 32m	63.670m
PK in top, Easterly post in guard rail	21d 22m	5.155m
6" Poplar, nail side	22d 52m	41.096m
10" Poplar, nail Northeast side	294d 57m	31.506m
Westerly edge, asphalt shoulder, West bound I-94	145d	3.80m

VERTICAL CONTROL

The vertical component of this project must be based upon the North America Vertical Datum of 1988 (NAVD 88). The vertical least squares adjustment statistics must be reported at the 95% confidence level.

New bench marks must be set on massive structures outside the proposed construction area. Each bench mark must be accurately described and its horizontal position referenced by measurement (Northing Easting) and by station plus and offset from the alignment stationing. Additional benchmarks per MDOT guidelines will be required for this project. For this project the benchmarks should be set on a variety of items. For example all the benchmarks should not be on signs bases. For this project vertical control from a previous MDOT photogrammetric project along I-94 beginning is available. The control information is listed below. This project will be based on this control datum. The vertical control will be converted from meters to international feet.

Z 326 NGS BM disc stamped Z 326 1985, set in concrete
 Bridge over Red Arrow Highway
 BM is on Northeasterly side I-94 and
 Northwesterly side Red Arrow Highway

Elevation: 198.733 meters (NAVD 88)

Centerline power pole	85d	8.80m
Northwesterly edge Red Arrow concrete pavement	110d	11.10m
Southwesterly end highway right-of way fence	20d	5.75m
Centerline East bound I-94 bridge	200d	
17.08m		

135 0.47 km Northerly of Red Arrow bridge
 Chiseled "+" in Northwest bolt, base billboard

Elevation: 194.557 meters (NAVD 88)

Easterly edge asphalt shoulder East bound I-94	290d	33.20m
Highway right-of-way fence	290d	8.20m
Centerline power pole #B 402 271	108d	
14.15m		
Centerline 6" Cedar	265d	10.30m

136 1.10 km Northerly of Red Arrow Highway
 Chiseled square on Easterly end 36" concrete culvert

Elevation: 196.939 meters (NAVD 88)

Easterly edge asphalt shoulder East bound I-94	300d	16.40m
Highway right-of-way fence	120d	8.60m

	Steel fence post	200d	0.80m
	20" Oak	50d	20.80m
137	0.49 km Northerly of Lake Street bridge Chiseled square in top, East end 36" concrete culvert		
	Elevation: 195.317 meters (NAVD 88)		
	Easterly edge asphalt shoulder East bound I-94	295d	13.20m
11.17m	Highway right-of-way fence	113d	
	Centerline quad 4" Oak	135d	7.80m
	Steel fence post	199d	0.70m
Y 326	NGS disc in top concrete wingwall for bridge stamped Y 326 1985, 1.14 km Northerly of Lake Street bridge BM is on West side I-94, South side crossing for Golf course		
	Elevation: 195.074 meters (NAVD 88)		
15.00m	Highway right-of-way fence	270d	
1.14m	Face concrete curb, West bound I-94	112d	
	Centerline bridge	15d	3.45m
	Centerline C.B.	184d	4.14m
138	1.64 km Northerly of Lake Street Chiseled square in top, Northeast corner concrete headwall		
	Elevation: 194.546 meters (NAVD 88)		
	Easterly edge asphalt shoulder East		

	bound I-94	303d	8.50m
16.20m	Highway right-of-way fence	113d	
	Centerline 4" Cherry	48d	18.80m
	Highway reflector	11d	25.60m
139	2.26 km Northerly of Lake Street Spike in Northeast side 16" Oak		
	Elevation: 200.136 meters (NAVD 88)		
	West edge asphalt shoulder West bound I-94		24.20m
	Highway	295d	0.45m
	Centerline 6" Oak	216d	10.40m
	Centerline 14" Oak	25d	5.00m
140	2.80 km Northerly of Lake Street Top of steel fence post in right-of-way fence		
	Elevation: 192.240 meters (NAVD 88)		
	Highway right-of-way fence	290d	0.00m
	East edge asphalt shoulder East bound I-94	275d	24.70m
	Centerline e12" Oak	5d	3.70m
	North end guard rail	240d	27.80m
X 326	NGS BM disc stamped X 326 1985, in Livingston Road Bridge BM is on West side I-94 and North side of Livingston Road		
	Elevation: 195.571 meters (NAVD 88)		

	West edge asphalt shoulder West bound I-94	90d	10.60m
6.00m	Centerline Livingston Road bridge	215d	
	Southerly end highway right-of-way Fence	37d	2.80m
3.35m	Northeast corner concrete wingwall	35d	
141	0.53 km Northerly of Livingston Road Spike in North side power pole		
	Elevation: 187.516 meters (NAVD 88)		
	West edge asphalt shoulder West bound I-94	120d	43.60m
18.70m	Highway right-of-way fence	120d	
	Centerline Service Road	120d	8.10m
	Centerline 12" Ash	175d	20.25m
W 326	NGS BM disc stamped W 326 1985, and set vertically In South face, Southerly column in I-94 median at CSX Railroad bridge and road to Cook Power Plant		
	Elevation: 187.057 meters (NAVD 88)		
	West edge asphalt shoulder East bound I-94	313d	5.25m
	East edge asphalt shoulder West bound I-94	133d	5.60m
	Centerline CSX Railroad	1d	2.30m
	Southerly end guard rail	142d	25.60m

142 0.60 km Northerly of CSX Railroad and road bridge
Spike in Northwest side 12" Ash

Elevation: 183.185 meters (NAVD 88)

Centerline 10" Ash 2.76m

Centerline 10" Ash 2.68m

Highway right-of-way fence 285d
10.80m

West edge asphalt shoulder West
bound I-94 105d 13.60m

143 1.1 km Northerly of CSX Railroad and road bridge
Chiseled "+" on Northwest bolt of highway billboard

Elevation: 182.433 meters (NAVD 88)

East edge asphalt shoulder East
bound I-94 295d 31.50m

Highway right-of-way fence 295d 8.00m

Centerline power pole 310d 6.50m

Centerline power pole 205d 35.40m

V 326 NGS driven rod monument stamped V 326 1985
1.72 km Northerly of CSX Railroad and road

Elevation: 182.185 meters (NAVD 88)

East edge asphalt shoulder East
Bound I-94 290d 7.20m

West leg sign "Exit 22 - Stevensville" 200d
47.30m

Highway reflector 355d 25.20m

Highway reflector 48.10m

144 2.23 km Northerly of CSX Railroad and Road bridge
Spike in North side 8" Willow

Elevation: 181.919 meters (NAVD 88)

East edge asphalt shoulder East bound I-94	285d	12.60m
8" Willow		2.10m
Highway reflector	300d	12.20m
8" Willow	20d	4.10m

145 2.70 km Northerly of CSX railroad and road bridge
Spike in North base 14" Ash

Elevation: 181.924 meters (NAVD 88)

Centerline 4" Poplar	15d	10.50m
Centerline 12" Ash	108d	1.05m
East edge asphalt shoulder East bound I-94	283d	15.15m
Reflector shoulder East bound I-94	293d	14.15m

146 3.32 km Northerly of CSX railroad bridge
Chiseled "X" in bolt of East 22 Highway sign

Elevation: 182.468 meters (NAVD 88)

East edge Asphalt shoulder East bound I-94	296d	6.19m
Highway reflector	3d	17.90m
East leg Highway sign	100d	3.77m

	Highway reflector	205d	43.25m
E 326	NGS BM disc in South side of John Beers Road bridge East wall of bridge set 1985, stamped NGS 1985 Do Not Disturb		
	Elevation: 189.587 meters (NAVD 88)		
	Centerline of road above I-99	330d	5.35m
	South end of concrete wall	200d	3.75m
	Centerline power pole	100d	2.08m
	Edge asphalt shoulder West bound I-94	275d	14.73m
147	0.52 km Northerly of John Beers Road bridge Spike set in base 14" Oak		
	Elevation: 182.802 meters (NAVD 88)		
	16" Oak	16d	2.70m
	Highway right-of-way fence	276d	5.70m
	East edge asphalt shoulder East bound I-94	271d	26.20m
	14" Oak	7d	8.90m
148	1.03 km Northerly of John Beers Road bridge Spike set in base 10" Ash		
	Elevation: 182.624 meters (NAVD 88)		
	Reflector	300d	21.50m
	East edge asphalt shoulder East bound I-94	285d	22.20m
	Highway right-of-way fence	120d	2.58m

	12" Ash	170d	4.50m
149	1.61 km Northerly of John Beers Road Set spike in West base 18" twin Poplar		
	Elevation: 197.157 meters (NAVD 88)		
	East edge asphalt shoulder East bound I-94	170d	13.25m
	East edge guard rail	160d	13.85m
	North leg train station sign	190d	12.95m
	Quad trunk Oak	277d	7.85m
150	2.10 km Northerly of John Beers Road Chiseled "X" in North bolt of Exit 23, Benton Harbor Highway sign		
	Elevation: 197.926 meters (NAVD 88)		
	East edge asphalt shoulder East bound I-94	345d	7.75m
	Highway right-of-way fence	140d	
			17.15m
	North edge guard rail	65d	31.85m
	South edge guard rail	208d	21.90m
D 326	NGS BM disc in Stevensville bridge set in North Face of North most column on East side Red Arrow Highway stamped D 326, vertical control mark		
	Elevation: 193.545 meters (NAVD 88)		
	Edge curb Red Arrow Highway	256d	

2.05m

Centerline power pole	25d	28.18m
Highway right-of-way fence	60d	14.55m
Centerline of bridge	170d	10.60m

3-83 MDOT disc in top of Easterly abutment step, Southeast corner bridge over CSX Railroad just East of Exit 23 at STA 986+89

Elevation: 200.946 meters (NAVD 88)

MDOT monument iron	250d	
126.03m		
Southeast corner, top step	120d	0.46m
Northerly end highway right-of-way Fence	160d	3.60m
Centerline CSX Railroad, parallel With I-94	240d	28.30m

151 0.38 km Northeasterly from bridge over CSX Railroad Set spike in Light pole on North face at STA 998+45

Elevation: 190.734 meters (NAVD 88)

Fire hydrant	92d	27.95m
Highway right-of-way fence	300d	2.50m
Edge concrete shoulder East bound I-94	330d	25.00m
8" Ash	340d	7.3

Any error of closure must be distributed throughout the level runs by means of a suitable least squares adjustment software program. Open level loops are NOT acceptable.

The bench mark notes must include all field observations, the unadjusted loop closures and the final adjusted elevations. A bench mark list must be developed that includes datum, bench mark designations, descriptions, elevations, and station and offset (left or right) out from centerline. This bench mark list must be printed on 8.5"x 11 sheets and placed on CD, in ASCII format. All data relating to the vertical component of the system must be included in the control section of the portfolio.

The methods used to establish the horizontal and vertical components of the project coordinate control system must be fully discussed in the Surveyor's Project Report.

The consultant will prepare a Survey Information Sheet showing the witnesses and control point locations in relation to the legal alignment.

I. ALIGNMENT/ROW

A legal alignment for I-94 from 551+47.801 to station 746+20.55 has already been determined for this project. This alignment will be given to the selected consultant. A legal alignment from 746+20.55 until station 974+42.42 will need to be determined for this project.

The westerly legal ROW of I-94 will be determined from S12 of 11015-4 (exit 16) until the end of the mapping limits approximately 0.6 miles Northeasterly of Puetz Road.

A detailed write up will also be required in the Surveyor's Project Report on how the legal alignment and legal ROW was determined.

J. GOVERNMENT CORNERS/PROPERTY

Any government corner used to establish the legal alignment / legal ROW lines must meet the current MDOT's Design Survey Standards.

Any government corners/alignment points within the mapping limits will be located/witnessed following MDOT design survey standards.

K. MAPPING

1. Begin mapping at the Northerly reference line of S03 of 11015 (exit 16-Red Arrow) on I-94 Westbound. Mapping will end approximately 0.6 miles NE of Puetz Road 100' Northerly of the concrete pavement joint. Mapping will take place from the Eastbound median paved shoulder of Eastbound I-94 to the Westerly ROW of Westbound I-94. Hard

surface of Westbound I-94 will need to be obtained. A complete DTM will be made of the mapping area.

2. All drainage features will need to be obtained showing elevation, material, end treatment type, and water surface elevations of standing water. The date will be included for each water surface elevation. Survey data required for hydraulic analysis of culvert crossings shall be collected in accordance with this attachments coverage on "SCOPE FOR HYDRAULIC SURVEY CULVERTS UNDER 2 SQUARE MILES."
3. A sample of features to be collected would include: edge of shoulder bit, pavement marking lines, sidewalks, driveways, piers, wingwalls, abutments, all terrain points/lines, drainage features, all visible utilities (overhead electric lines, gas line markers, hydrants, etc), sanitary manholes, guardrail, every cable barrier foundation, etc. This list is but a short sample of the possible features/codes located within the mapping limits.
4. Vertical clearance measurements will be obtained for all bridges over I-94. The mobile scanning or other innovative technology will be used to collect only the hard surface visible mapping data. This method can also be used for the bridge under I-94 clearance measurements. The scanning technology will not be used to collect the vegetation areas.

L. DRAINAGE / SEWER

The following information is required for all surface and subsurface drainage and sewer structures:

1. **The station and offset, type, condition, location, size and invert elevation of each drainage structure and culvert.** End treatments must be noted for each culvert. This information must be printed on 8.5" x 11" sheets and submitted on a CD in **ASCII format or spreadsheet format.**
2. **The station and offset, type, condition, location, size and invert elevation of the pipes of each sanitary manhole.** This information must be printed on 8.5" x 11" sheets and submitted on a CD in **ASCII format or spreadsheet format.**
3. The **location and connectivity** of all catch basins, manholes, and culverts must be shown on the topographic map (PL.dgn). It may be necessary to prepare a separate plot to clearly show the surface drainage systems. Underground storm systems must be mapped to show the connectivity of the structures. Underground sewer lines must be mapped to show connectivity. This will be added to the CADD file and submitted on a separate topographic plot made specifically for this purpose.

4. **Photographs** must be submitted for each culvert, labeled by station and offset. Digital photographs are required.

M. FINAL REPORT

One complete portfolio and four complete sets of CD's or DVD's must be assembled and delivered in the format outlined in the *Standards of Practice* dated Jan. 2012. Scale will be 1"=100'. A copy of the MDOT Checklist dated Jan. 2012 must be included in the final report. This document shall be signed and certified by the Professional Surveyor responsible for the project. It is highly recommended that the consultant become familiar with this document prior to preparing the proposal and again prior to assembling the final portfolio. **Failure to use and include this document shall result in the immediate return of the project portfolio for completion.**

Copies of the final deliverables shall be provided to the Survey Project Manager and to Lansing Design Surveys and shall include the following:

- Project report describing the mobile mapping project, equipment used, and results.
- Complete listing of the Registration processing reports listed above.
- Comparison spreadsheet showing the differences (fit) of the final project DTM surface to the validation points. This spreadsheet shall include a resultant summary in NSSDA format showing the 95% difference in horizontal X and Y, and Vertical Z for the project. The check shot coordinates will be obtained independently.
- 3D Microstation DGN file containing all mapping named 113585PL.
- 3D Microstation DGN containing the terrain surface triangle file.
- Terrain surface saved as a Geopak .TIN file generated from the point cloud data.
- Terrain surface saved as an InRoads .DTM file.
- LiDAR data tiled and saved as .POD (Point Tools/Microstation point cloud file) files.
- LiDAR data collected shall be submitted in .LAS format with RGB values and intensity values.
- Photo mosaic/Images along route that support the LiDAR .LAS point cloud.
- When other methods of survey and mapping are also employed for the project, the data shall be combined and merged with the mobile mapping data and the merged information provided in the appropriate electronic files per the project's scope and requested deliverables.

The Consultant is responsible for using the latest MDOT Resource files, color table, and cell files, available on the MDOT File Library site under CAD_V8. The scale of the map

will be 1 inch to 100’.

For a comprehensive list of MicroStation level designations, contents and line attributes, refer to the “MDOTV8LEVEL.pdf” table located on the MDOT ftp site at <ftp://ftp.michtrans.net/>. The consultant Username is “survcons.” The consultant password is \$urvcon\$. This table replaces the former Attachments AA, C & D.

http://www.michigan.gov/mdot/0,1607,7-151-9625_21540_36037_54428---,00.htm

Any information that would not be appropriately placed in the control, property or mapping sections should be included in this section. General photographs, local newspaper articles and project-related comments from residents are example of miscellaneous data.

The surveyor must describe, in the final report, the data included in this section.

The final report for this project shall meet the current guidelines outlined in the MDOT Survey Standards of Practice dated Jan. 2012.

N. SURVEY INFORMATION SHEET

The Consultant shall prepare a MDOT Survey Information Sheet in Microsoft Word (.doc) named 113585_I194_SURVEY.doc. The Survey Information Sheet shall include the following, as applicable:

- Survey Notes (Coordinate system, Zone, Horizontal & Vertical Datum, etc.)
- Control Points (Primary & Intermediate)
- Control Point Witnesses
- Benchmarks
- Government Corners
- Alignment(s) Points

The MDOT Survey Information Sheet template can be found here:

http://www.michigan.gov/documents/mdot/MDOT_SURVEYINFOSHEET_302553_7.doc

ATTACHMENT B
CONSULTANT TRAFFIC CONTROL
I-94 Eastbound from Sawyer to Bridgman

MINIMUM MERGING TAPER LENGTH "L" (FEET)

OFFSET FEET	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)										TAPER LENGTH "L" IN FEET
	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	

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

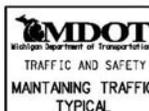
- MERGING TAPER
- SHIFTING TAPER
- SHOULDER TAPER
- TWO-WAY TRAFFIC TAPER

DOWNSTREAM TAPERS

(USE IS OPTIONAL)

TAPER LENGTH

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



TABLES FOR "L", "D" AND "B" VALUES

DRAWN BY: CON:AE:djf	JUNE 2006	M0020a	SHEET 1 OF 2
CHECKED BY: BMM	PLAN DATE:		
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: BMN	JUNE 2006 PLAN DATE:	M0020a
FILE: K:/DCM/TSR/STDS/ENGLISH/MNTTRF/M0020a.dgn REV. 08/21/2006			

NOTES

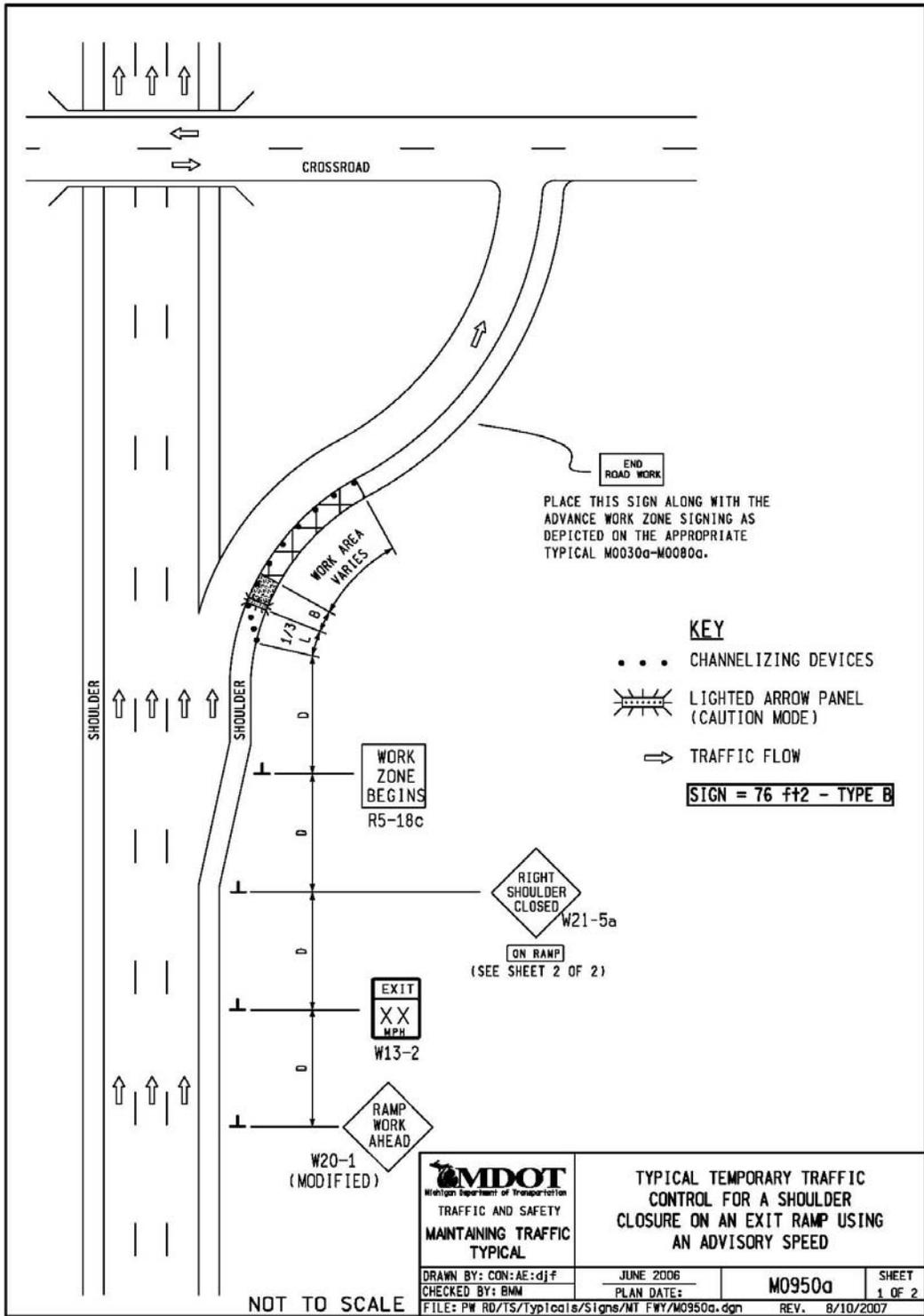
1. D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES
 1/3 L = MINIMUM LENGTH OF TAPER
 B = LENGTH OF LONGITUDINAL BUFFER
 SEE M0020a FOR "D," "L," AND "B" VALUES
2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.
3. DISTANCES BETWEEN SIGNS, THE VALUES FOR 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, CHANNELIZING DEVICES SHALL BE LIGHTED PLASTIC DRUMS.
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 2005 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 MDT WILL BE ALLOWED.
8. WHEN BUFFER AREAS ARE ESTABLISHED, THERE SHALL BE NO EQUIPMENT OR MATERIALS STORED OR WORK CONDUCTED IN THE BUFFER AREA.
- 29A. THE TYPE OF REFLECTIVE SHEETING USED FOR THE W20-1a PLAQUE SHALL BE THE SAME AS THE TYPE USED FOR THE PARENT SIGN.

SIGN SIZES

DIAMOND WARNING - 48" x 48"
 W20-1a PLAQUE - 48" x 36"
 R2-1 REGULATORY - 48" x 60"
 R5-18c REGULATORY - 48" x 48"

NOT TO SCALE

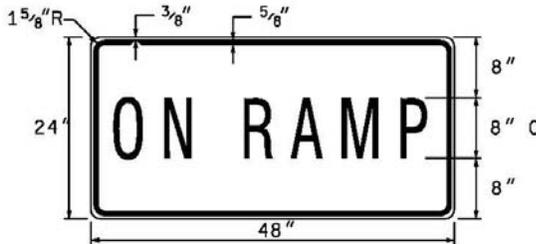
 TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL TEMPORARY TRAFFIC CONTROL FOR A SHOULDER CLOSURE ON A DIVIDED ROADWAY OR FREEWAY NO SPEED REDUCTION	
	DRAWN BY: CON:AE:djf CHECKED BY: BMM	JUNE 2006 PLAN DATE:
FILE: PW RD/TS/Typicals/Signs/NT NON FWY/M0880a.dgn REV. 08/21/2007		



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.
- 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, CHANNELIZING DEVICES SHALL BE LIGHTED PLASTIC DRUMS.
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 2005 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 MDTT WILL BE ALLOWED.
8. WHEN BUFFER AREAS ARE ESTABLISHED, THERE SHALL BE NO EQUIPMENT OR MATERIALS STORED OR WORK CONDUCTED IN THE BUFFER AREA.
29. THE TYPE OF REFLECTIVE SHEETING USED FOR THE "ON RAMP" PLAQUE SHALL BE THE SAME AS THE TYPE USED FOR THE PARENT SIGN.

SIGN DETAIL



COLORS

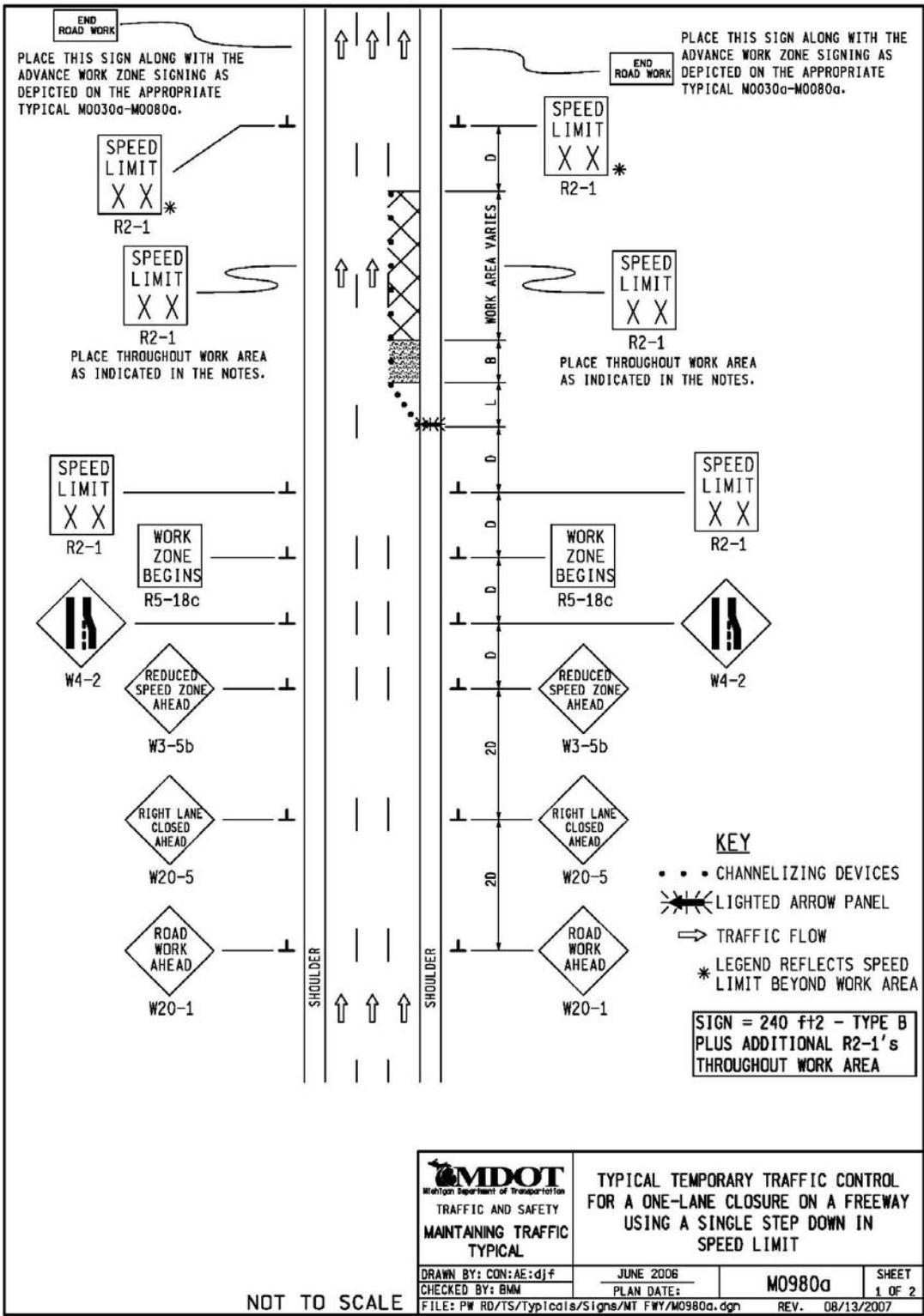
LEGEND AND BORDER - BLACK (NON-REFLECTORIZED)
 BACKGROUND - ORANGE (REFLECTORIZED)

SIGN SIZES

- | | |
|-------------------|-------------|
| DIAMOND WARNING | - 48" x 48" |
| W13-2 WARNING | - 48" x 60" |
| PLAQUE | - 48" x 24" |
| R5-18c REGULATORY | - 48" x 48" |

<p>TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL</p>	<p align="center">TYPICAL TEMPORARY TRAFFIC CONTROL FOR A SHOULDER CLOSURE ON AN EXIT RAMP USING AN ADVISORY SPEED</p>		<p align="center">SHEET 2 OF 2</p>
	<p>DRAWN BY: CON:AE:djf</p>	<p align="center">JUNE 2006</p>	
<p>CHECKED BY: BMM</p>	<p align="center">PLAN DATE:</p>	<p align="center">REV. 8/10/2007</p>	
<p>FILE: PW RD/TS/Typicals/Signs/MT FWY/M0950a.dgn</p>			

NOT TO SCALE



NOTES

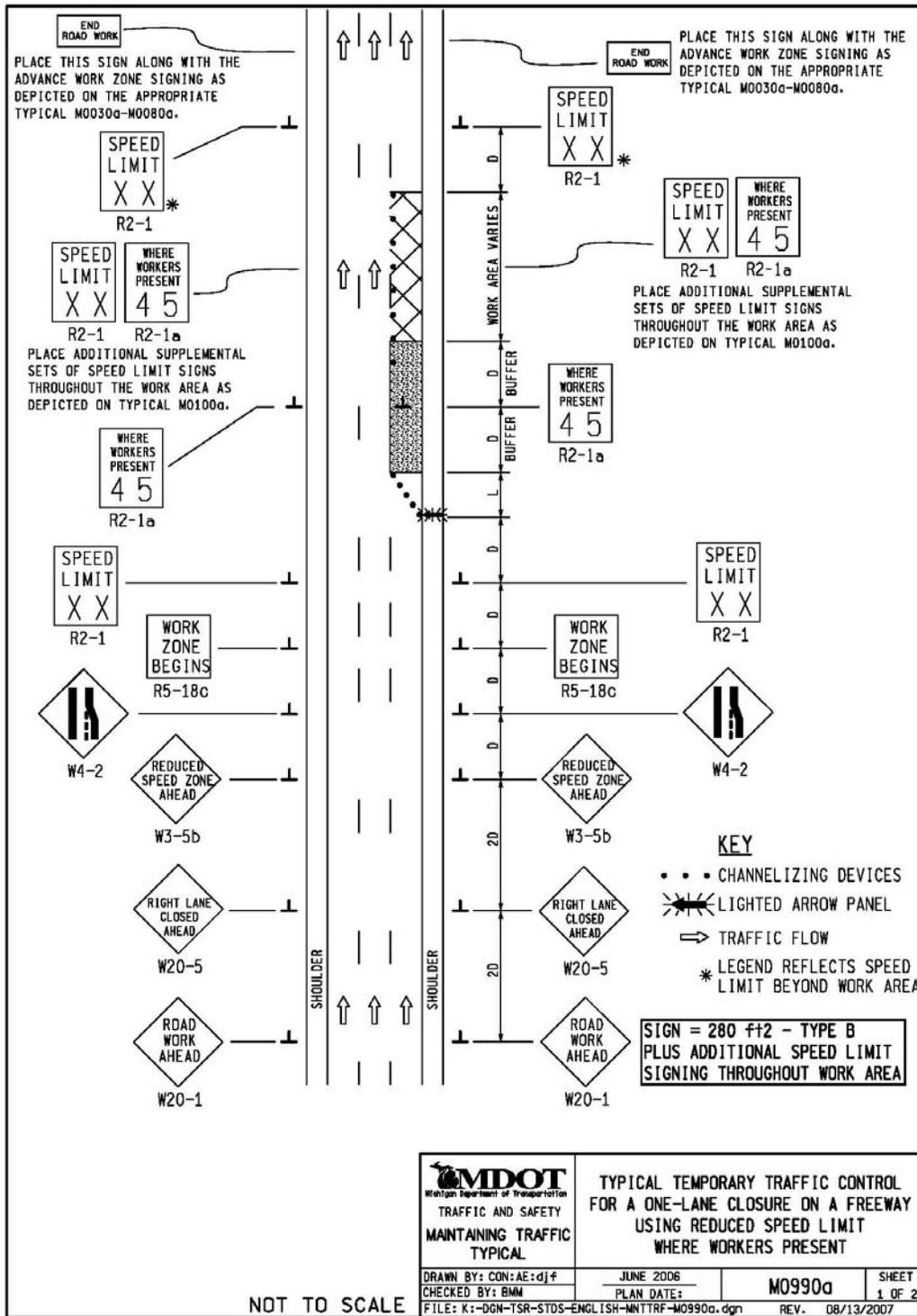
- 1B. D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES
L = MINIMUM LENGTH OF TAPER
B = LENGTH OF LONGITUDINAL BUFFER
SEE M0020a FOR "D," "L," AND "B" VALUES
- 2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.
- 3. DISTANCES BETWEEN SIGNS, THE VALUES FOR 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, CHANNELIZING DEVICES SHALL BE LIGHTED PLASTIC DRUMS.
- 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 2005 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 MDTOT WILL BE ALLOWED.
- 8. WHEN BUFFER AREAS ARE ESTABLISHED, THERE SHALL BE NO EQUIPMENT OR MATERIALS STORED OR WORK CONDUCTED IN THE BUFFER AREA.
- 16B. WHEN REDUCED SPEED LIMITS ARE UTILIZED IN THE WORK AREA, ADDITIONAL SPEED LIMIT SIGNS RETURNING TRAFFIC TO ITS NORMAL SPEED SHALL BE PLACED BEYOND THE LIMITS OF THE REDUCED SPEED AS INDICATED.
- 16D. ADDITIONAL SPEED LIMIT SIGNS REFLECTING THE REDUCED SPEED SHALL BE PLACED AFTER EACH ENTRANCE RAMP THAT COMES ONTO THE FREEWAY WHERE THE REDUCED SPEED IS IN EFFECT AND AT INTERVALS ALONG THE ROADWAY SUCH THAT NO SPEED LIMIT SIGNS REFLECTING THE REDUCED SPEED ARE MORE THAN TWO MILES APART.
- 16E. WHEN EXISTING SPEED LIMITS ARE REDUCED MORE THAN 10 MPH, THE SPEED LIMIT SHALL BE STEPPED DOWN IN NO MORE THAN 10 MPH INCREMENTS.
- 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.
- 26. THE LIGHTED ARROW PANEL SHALL BE LOCATED AT THE BEGINNING OF THE TAPER AS SHOWN. WHEN PHYSICAL LIMITATIONS RESTRICT ITS PLACEMENT AS INDICATED, THEN IT SHALL BE PLACED AS CLOSE TO THE BEGINNING OF THE TAPER AS POSSIBLE.

SIGN SIZES

- DIAMOND WARNING - 48" x 48"
- RECTANGULAR 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 ONE-LANE CLOSURE ON A FREEWAY USING A SINGLE STEP DOWN IN SPEED LIMIT		
	DRAWN BY: CON:AE:djf	JUNE 2006	M0980a
CHECKED BY: BMM	PLAN DATE:	REV. 08/13/2007	
FILE: PW RD/TS/Typicals/Signs/MT FWY/M0980a.dgn			



NOT TO SCALE

NOTES

11. D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES AND LENGTH OF LONGITUDINAL BUFFERS
L = MINIMUM LENGTH OF TAPER
SEE M0020a FOR "D" AND "L" 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.
- 4D. THE SPACING OF CHANNELIZING DEVICES SHOULD NOT EXCEED 45 FEET WHEN USED FOR TAPER CHANNELIZATION, AND SHOULD NOT EXCEED 90 FEET WHEN USED FOR TANGENT CHANNELIZATION.
5. FOR OVERNIGHT CLOSURES, CHANNELIZING DEVICES SHALL BE LIGHTED PLASTIC DRUMS.
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 2005 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 MDT WILL BE ALLOWED.
8. WHEN BUFFER AREAS ARE ESTABLISHED, THERE SHALL BE NO EQUIPMENT OR MATERIALS STORED OR WORK CONDUCTED IN THE BUFFER AREA.
- 16B. WHEN REDUCED SPEED LIMITS ARE UTILIZED IN THE WORK AREA, ADDITIONAL SPEED LIMIT SIGNS RETURNING TRAFFIC TO ITS NORMAL SPEED SHALL BE PLACED BEYOND THE LIMITS OF THE REDUCED SPEED AS INDICATED.
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.
26. THE LIGHTED ARROW PANEL SHALL BE LOCATED AT THE BEGINNING OF THE TAPER AS SHOWN. WHEN PHYSICAL LIMITATIONS RESTRICT ITS PLACEMENT AS INDICATED, THEN IT SHALL BE PLACED AS CLOSE TO THE BEGINNING OF THE TAPER AS POSSIBLE.

SIGN SIZES

DIAMOND WARNING - 48" x 48"
 RECTANGULAR REGULATORY - 48" x 60"
 R5-18c REGULATORY - 48" x 48"

 TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL TEMPORARY TRAFFIC CONTROL FOR A ONE-LANE CLOSURE ON A FREEWAY USING REDUCED SPEED LIMIT WHERE WORKERS PRESENT		
	DRAWN BY: CON:AE:dj:f	JUNE 2006	M0990a
CHECKED BY: BMW	PLAN DATE:		
FILE: K:\DGN\TSR\STDS-ENGLISH\MNTTRF-M0990a.dgn REV. 08/13/2007			

NOT TO SCALE

ATTACHMENT C

Utility Listing
I-94 Eastbound from Sawyer to Bridgman

JOB NUMBER(S): 113585
CONTROL SECTION(S): 11015

ANR Pipeline
Gas
Attention: Glen Merrill
11039 150th Avenue
Big Rapids, Michigan 49307
Plan Copies: 2

AT&T
Telecom
Attention: Chris O Brien
1435 Milton
Benton Harbor, Michigan 49022
Plan Copies: 1

Berrien County Drain Commissioner
County Drain
Attention: Roger Zilke
Berrien County Drain Commissioner
Co.Drain Department
701 Main Street
St Joseph, Michigan 49085
Plan Copies: 1

Chikaming Township
Water
Attention: Jeanne Dudeck
Supervisor
wat&san Department
13535 Red Arrow Hwy
Harbert, Michigan 49115
Plan Copies: 1

Comcast Cablevision
Cable
Attention: Jay Castello
1920 Mckinley Ave
Mishawaka, Indiana 46545
Plan Copies: 1

Frontier Communications
Telecom
Attention: Larry Speece
601 North US 131
Three Rivers, Michigan 49093
Plan Copies: 1

Lake Charter Township
Water
Attention: John Gast
wat&san Department
3220 Shawnee Rd
Bridgman, Michigan 49106
Plan Copies: 1

Level (3) Global Network Services
Telecom
Attention: Art Clemons
9071 South State Road 39
Union Mills, Indiana 46382
Plan Copies: 1

Lincoln Township
Water
Attention: Richard Stauffer
Township Supervisor
wat&san Department
2055 West John Beers Rd
Stevensville, Michigan 49127
Plan Copies: 1

Michigan Gas Utilities
Gas
Attention: Todd Subka
Engineer 3 NW District
1708 Eaton Drive
Grand Haven, Michigan 49417
Plan Copies: 2

New Buffalo Township
Water
Attention: Rosann Dudiak
wat&san Department
17425 Red Arrow Hwy
New Buffalo, Michigan 49117
Plan Copies: 2

SEMCO Energy Gas Company
Gas
Attention: Bill Coquillard
1000 Belle Road
Niles, Michigan 49120
Plan Copies: 2

St. Joseph Township
Water
Attention: Dick Beebe
Public Works Water & Sewer
3000 Washington Ave
St Joseph, Michigan 49085
Plan Copies: 1

ATTACHMENT D
Scope Verification Meeting Agenda & Minutes
I-94 Eastbound from Sawyer to Bridgman



MEETING AGENDA

DATE: June 5, 2012

FROM: Kyle Rudlaff
Coloma TSC Cost and Scheduling Engineer

SUBJECT: I-94 Scope Verification Meeting

DESCRIPTION: JN 113585C CS 11015: I-94 WB HMA Resurfacing from Red Arrow Highway (Exit 16) for 7.4 miles to East of Puetz Road

Meeting Date: June 20, 2012
Meeting Time: 9:30 A.M.
Meeting Location: Coloma TSC & On-Site

Purpose of Meeting: Verify Scope of I-94 project with FHWA & MDOT project participants.
Meeting results used to complete Consultant design RFP.

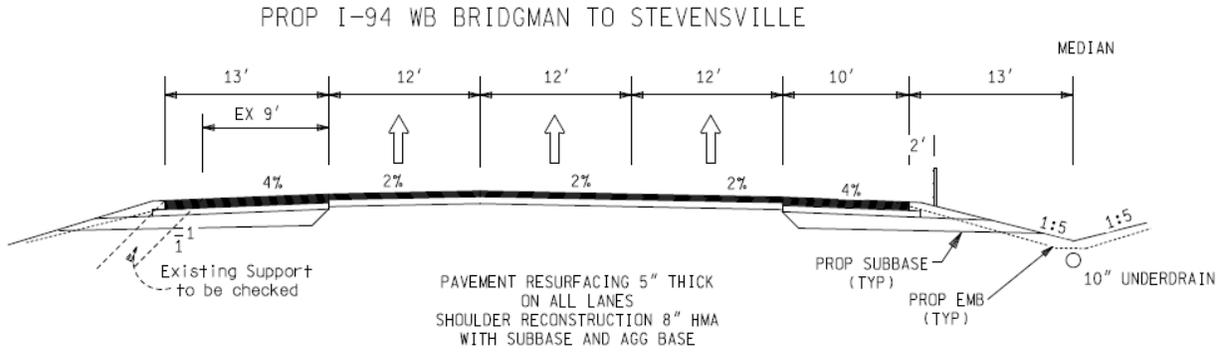
1. General Project Information

- a. Project Location: I-94 Westbound from Red Arrow Highway (Exit 16) for 7.4 miles easterly to East of Puetz Road.
- b. Project Scope: I-94 WB Resurfacing, Shoulder Reconstruction, Culvert Replacement, Ditching, Ramp Extensions, Crown point relocation, Cable Barrier Replacement, and ROW fence.
- c. Project Budget: \$12 M Construction, \$1.75M Preliminary Engineering, \$1M Construction Engineering. Design budget intended to fund design from Red Arrow Highway (Exit 16) for 7.4 miles northeasterly, while the construction budget is presently funded at a level to extend only 3 miles to Livingston Road.
- d. Project Schedule: Plan Completion: May 1, 2015
Letting: December 2015
Construction: 2016 Season
- e. This project has FHWA Oversight. Ruth Hepfer is the FHWA Area Engineer.
- f. MDOT Project Staff are:

TSC Manager: Pete Pfeiffer
Delivery Engineer: Chris Jacobs
Operations Engineer: Sarah Woolcock
Project Manager: Kyle Rudlaff

Traffic and Safety Review: Gary Loyola
Utility Coordination: Jarrett Burgess
Design: Consultant TBD

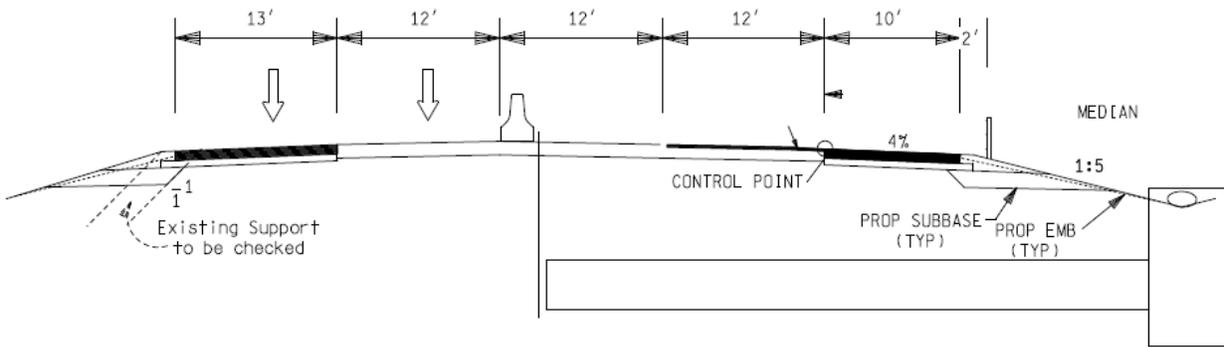
2. Pavement Design/Soils
 - a. HMA pavement existing condition, cores, and treatment.
 - b. Pavement Design:
 - i. Mainline Pavement:
 1. 2" Gap Graded Superpave top course
 2. 3" 3E30 Level course
 - ii. Shoulder Reconstruction:
 1. 2" 4E3 - Top
 2. 3" 3E3 – Level
 3. 3" 3E3 – Base
 4. 6" Agg Base
 5. 18" Subbase
 - iii. MOT Pavement:
 1. 3" 3E3- Top
 2. 3" 3E3 – Level
 3. 6" Agg Base
 4. 12" Subbase
 - iv. Ramp Reconstruction
 1. 2" 4E3 Top
 2. 3" 3E3 Level
 3. 3" 3E3 Base
 4. 6" Agg Base
 5. 18" Subbase
 - v. Ramp Resurfacing (Ramp Lane & shoulder) Exit 16 WB exit and entrance, and Exit 22 WB exit and entrance.
 1. 2" 4E3 Top
 2. 2" 4E3 Level
 - c. Crown Relocation from center of center lane to between center lane and outside.
 - d. Shoulder Reconstruction Items.
 - e. Construction Staging, Concept of milling control at yellow line.
 - f. Discuss additional Geotechnical to be obtained.
 - g. Similarities to 2012 I-94 EB Sawyer to Bridgman.



I-94 Mainline Treatment Concept.

Page 2
113585 Scope Ver

3. Maintenance of Traffic:
 - a. Two lanes maintained at all times except for night work. Hours TBD.
 - b. Staging Outline
 1. Reconstruct outside shoulder to top of level course.
 - a. Put traffic on Outside lane and shoulder.
 2. Reconstruct Median, Median shoulder and median lane resurfaced to level course. Build Culverts to center of center lane.
 - a. Place traffic on median shoulder and median lane.
 3. Finish Culverts on outside. Pave center lane, outside lane and outside shoulder to top course.
 - a. Place traffic on outside lane and shoulder.
 4. Pave Median lane top course and median remove widening and pave top course. Finished.



1. PLACE TRAFFIC ON OUTSIDE LANE & SHOULDER
2. DRIVE SHEETING & BUILD SEWERS EAST HALF

Culvert Construction Diagram

4. Drainage

- a. All culvert except Tanner Creek shall be replaced, lined, or have joints sealed. I-94 over Tanner Creek (84") and Thornton Drain (72") are the two large existing culverts in the project. Tanner Creek is good condition, Thornton Drain is Fair at last inspection.
- b. Outlet ends of some culverts on the west side of road are perpetually submerged. Ditch excavation will be employed to open up flow lines from proposed culvert ends installed at elevation about same as existing.
- c. Median grades are flat, mostly 0.2% or flatter from Livingston Road for 3 miles to John Beers Rd. Additional median inlet structures likely to be required to keep design flows in the new flatter sloped, shallower ditch section.
- d. 10" PVC underdrain is proposed in the median to maintain drainage at bottom of subbase and reduce occasions of saturated median. Design grades to be used to improve longitudinal grade.
- e. Flow capacity improvement under service road will be sought.

No.	Sta	Size	Material	Cover	Comments
1	567	36"	Conc	17 ft	Cured in place liner - 2013
2	573	36"	Conc	8 ft	Replaced under only EB 2013
3	596.5	36"	Conc	20ft	Replace WB or line entire pipe
4	615	84"	Conc	25 ft	Tanner Creek, Lined early 2000's, Insptd. Good
5	628	36"	Conc	11 ft	Replace under WB or line entire pipe.
5	637	36"	Conc	20 ft	Replace WB or line entire pipe
6	658	36"	Conc	20 ft	Replace WB or line entire pipe.
7	660.5	36"	Conc	20 ft	Replace WB or line entire pipe.
8	678	36"	Conc	20 ft	Replace WB or line entire pipe., Verify location
9	692	16'x16'	CMP	7ft	Wildwood Dr, Looks Good, Confirm w/Bridge

10	698	72"	Conc	22 ft	Thornton County Drain, Inspected, Fair Cond.
11	713	36"	Conc	2.5 ft	Replace under WB. 100 ft SW of Livingston Rd.
12	754	36"	Conc	5 ft	In Old Plans, not on GIS, Check in Field
13	786	36"	Conc	6 ft	75 deg. Replace under WB, Willow/Linco
14	796	36"	Conc	8 ft	75 deg. Replace under WB,
15	851	36"	Conc	6 ft	75 deg. Replace under WB, SW John Beers
WM	890.5				Watermain Encasement Crossing
16	891.5	36"	Conc	6 ft	Replace under WB.
SR1	785	36"	Conc	1 ft	Under Service Rd., Check Sediment
SR2	795	36"	Conc	1 ft	Under Service Rd. Ditch to Lake, Check Sedimt
SR3	851	45x29	Conc	1 ft	Under Service Rd. , Check Sediment
SR4	889	45x29	Conc	1 ft	Under Notre Dame Ave, Check Sediment.
No.	Sta	Size	Material	Cover	Comments
1E	569	15"	Conc		Median Drain East
2W.	577	15"	Conc		Median Drain West
3E	585	18"	Conc		Median Drain East
4W	610	18"	Conc		Median Drain West W. 100 ft SW Lake St.
D1	613	12"	CMP		Lake St. Downspouts
5W	618.5	18"	CMP		Median Drain W. 500 ft NE of Lake St
6W	626.5	18"	Conc		Median Drain West
7W	634	18"	Conc		Median Drain West
8W	647	18"	Conc		Median Drain W. 300 ft SE Lost Dunes.
D2	650	12"	CMP		Lost Dunes Downspouts
9W	652	18"	Conc		Median Drain West, 100 ft NE Lost Dunes
10E	663	18"	Conc		Median Drain East
11W	671	18"	Conc		Median Drain West
12E	680	18"	Conc		Median Drain East
13W	694	18"	Conc		Median Drain West, 200 NE Wildwood Dr. Culv
14W	714	18"	Conc		Median Drain West, 100 SE of Livingston
15W	722	15"	Conc		Median Drain W. 700 ft NE of Livingston
16E	729	18"	Conc		Median Drain E. Close to Crossover
17W	736	18"	Conc		Median Drain West
18W	745	18"	Conc		Median Drain West
19W	753.5	18"	Conc		Median Drain West
20W	761.5	18"	Conc		Median Drain West
21E	769	18"	Conc		Median Drain East
22W	778	18"	Conc		Median Drain West
23W	805	18"	Conc		Median Drain West

24W	815	18"	Conc		Median Drain West
25W	823.5	18"	Conc		Median Drain West
26W	832.5	18"	Conc		Median Drain West
27W	841.5	18"	Conc		Median Drain West
28W	854	18"	Conc		Median Drain West
29W	873	18"	Conc		Median Drain West, 400 Ft SW John Beers
30W	883	18"	Conc		Median Drain West, 700 ft NE John Beers
31W	891.5	18"	Conc		Median Drain West, Poss under ramp ext.
32W	900	18"	Conc		Median Drain West
33W	909.5	18"	Conc		Median Drain West, Close to Crossover
34W	917.5	18"	Conc		Median Drain West
35E	928	18"	Conc		Median Drain East, 100 ft NE Puetz Rd.
36W	932.5	18"	Conc		Median Drain West, Check outlet ditch
37W	948	18"	Conc		Median Drain West, 200 ft SW of Conc
Long	930	12"	CMP		200 ft Longit Downspout, Replace
Long	925	18"	CMP		600 ft Longit Sewer from Puetz, Replace.

5. Bridge Condition

Bridge	I-94	Sta	Deck	Super	Sub	Year
Red Arrow	Under	563	6	7	7	2004
Lake St.	Under	612	7	7	6	1961/98
Lost Dunes	Under	650	6	7	7	1961/79
Wildwood	Under	692	Pictures only	GIS 8		1961
Livingston	Over	715	6	6	7	1961
AEP-X06,R06	Over	754	7	7	6	1696
John Beers	Over	877	5	5	5	1961
Puetz	Under	927	6	5	6	1961/65
I-94BL Exit 23	Under		6	6	5	1960/78

Road	I-94 WB		Design Unit	Southwest Region
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6. Geometrics:

- a. See Below Geometric element table for compliance checks.

Notes:

Design Year AADT	2016 41600		CS11015	
Date	5/22/12		JN	113585
			Page	

Level One Design Criteria Checklist – Existing Conditions

Design Criteria (Provide numerical value for project, where indicated)	Reference	Do the existing conditions meet MDOT criteria?		
		Existing	Y/N	Proposed
1. Design Speed: mph Mainline: mph Ramps:	RDM 3.06 Posted	70 mph Posted	Y	75 mph Design
2. Lane Width Mainline: ft Ramps: ft Auxiliary lanes: ft	Design Stand. InterState S. AASHTO	12 feet	Y	12 Feet
3a. Uncurbed Sections – Shoulder Width adjacent to: Mainline: 10' ft Out ft Mainline: 10' In ft Ramps: 7 ft Out Ramps: 4 ft In Auxiliary lanes:	Design Stand. InterState S. AASHTO	9 ft Outside 5 ft Inside 7 ft Outside TBD	N N Y	13 ft Outside 10 ft Inside 7 ft Outside 4 ft Inside
3b. Curbed Sections – Curb Offset: Mainline: ft	NA		Y	
4. Bridge Clear Roadway Widths: 10 ft Outside 5 ft Inside	Design Stand. InterState S. AASHTO	S13 Lake Street: 12' Out 10' In R04 Lost Dunes: 10' Out 5.25' In S16 Puetz Rd 10' Out, 5.25' In	Y Y Y	S13 Lake St: 12' O 10' In R04 L. Dunes: 10' O 5.25' In S16 Puetz Rd 10' O 5.25' In
5. Structural Capacity HS 20	Design Stand. InterState S. AASHTO	S13 Lake Street: HS25 R04 Lost Dunes: HS20 S16 Puetz Rd:	Y Y Y	No Change

		HS 20 + Mod		
6. Horizontal Curvature (minimum Radius) Rmin=2344 ft	Item 7 below For listing.	Sta 915+70 R=2292'	N	Check Radii for WB. File DE for 70mph R=2292'
7. Super Elevation Rate	RDM 3.09.02 1. Straight L. 5.3% Straight L. 2.0% Straight L. 2.1% R-107 7%	Sta 576+20.65R R=2865' e=5.5% Sta 757+21L R=11459' e=2% Sta 875+70L R=7689' e=2% Sta 915+70 R=2292' e=5%	Y Y N N	R=2865'e=5.5% R=11459'e=2% R=7689'e=2.1% R=2292'E=6% File DE 70mph
8a. Stopping Sight Distance – Horizontal Curves	R=2000' MDOT SSD	Rmin=2292'	Y	All OK, Clear to 40' min.
8b. Stopping Sight Distance – Vertical Curves	75 mph K=206 Sag K=312 Crest MDOT SSD GUIDE	561+79C K=313 576+00S K=364 592+00C K=750 630+00C K=2222 649+00S K=722 688+00C K=632 718+00S K=1411 776+00S K=6250 824+00S K=5555 863+00C K=7692 887+00S K=3225 914+80S K=400 936+26C K=379	Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Retain Ex. Retain Ex.
9. Maximum Long. Grades	RDM 3.09.02 Retain Ex. +/-4%	Sta 576+00, +1.81% Sta 936+00, -2.74	Y Y	Retain Ex Retain Ex
10. Through Travel Lane Cross Slope	RDM 3.09.02 1.5%-2%	1.5% Crown in Center	No	2% Crown on Outside Lane line
11. Vertical Clearances	16' 0"	S14 Livingston 16' 10" R06 I&M 24' 10" S15 John Beers 16' 4"	Y Y Y	16' 7" 24' 7" 16' 1"

12. Accessibility Criteria for Handicapped Individuals	NA	No Sidewalk Ramps		
13. Ramp Accel/Decl	G. D. Guides	Exit 16 WB Off: Must be extended Exit 22 WB Off: Must be extended	N N	GEO-131 Compliant GEO-131 Compliant
14. Rollover	NA	NA	NA	NA
15.				

7. Crash Analysis/Reduction
 - a. Summary by Gary Loyola.

8. Utilities- Normal Solicitation Process.

Discussion Notes:

9. Environmental.

- Extensive clearing and ditch cleaning required along I-94 WB so culverts ends are no longer submerged. Ditch cleanout required and discussion on ditch cleaning/culvert replacement under service road needs to take place.
- Appears all culverts will have work or replacement except Tanner Creek.
- SESC measures to be included on Plan Review Plans.
- Dune Grass Planting areas need to be identified.
- Reports on the Endangered Species Survey are on-going.

Notes:

10. Surveys. Road Design Survey attachment for Consultant.
 - a. Legal Alignment.
 - b. Hard Surface DTM.
 - c. Full Terrain Mapping or cross section needed on this job.

11. ROW

- a. ROW issue SW of Puetz road where it appears existing drain outlet is beyond the ROW Fence.
- b. Otherwise no ROW anticipated.

12. Misc.

- a. ROW Fence Replace is necessary in this job (KFR). End
- b. Maintenance Issues.
- c. Other.

ATTACHMENT F

SCOPE FOR HYDRAULIC SURVEY CULVERTS UNDER 2 SQUARE MILES

C.S. 11015 Job No. 113585C
I-94 and Service Road over 18 Cross Culverts
Berrien County

The Consultant shall perform a hydraulic survey, which provides geometric data on the stream channel upstream and downstream of the structure. **Two weeks** prior to starting the hydraulic survey, the Consultant surveyor shall contact the Design Engineer or the Assistant Design Engineer-Hydraulics/Hydrology to schedule a site visit with an MDOT Hydraulics engineer. The purpose of the site visit is to discuss details of the survey and to clarify the intent of the survey. Contact the Design Engineer-Hydraulics/Hydrology Chris Potvin at 517-335-1919 or Larry Wiggins at 517-373-1713. Notes must be taken at the site visit and submitted promptly to the MDOT Survey Coordinator or Region Surveyor.

Prior to performing the survey, the Consultant must contact all landowners upon whose lands they will enter. The contact may be personal, phone or letter, but must be documented. This notice must include the reasons for the survey on private land, the approximate time the survey is to take place, the extent of the survey including potential brush cutting, and an MDOT contact person (the MDOT Project Manager or Consultant Survey Coordinator/Region Surveyor).

The Consultant must make every effort to minimize brush cutting on private property. The use of paint on private property is prohibited.

Channel cross-sections shall be taken normal to the direction of *flood* flow and tied to the roadway alignment baseline established for the structure or a project coordinate system so they can be accurately plotted. The sections shall be extended to the edge of the floodplain, to the elevation of the top of the road at the structure, or to a distance beyond the river bank agreed upon with the MDOT Hydraulics engineer at the site visit. Shots must be taken at significant break points on the banks and channel bottom. Any high water marks and date of occurrence (if available) shall be noted.

Since the hydraulic analysis is to be performed by Consultant staff, the Consultant shall meet the following requirements for hydraulic cross-sections:

1. Cross-sections shall be submitted electronically in a format acceptable to the Design Engineer-Hydraulics/Hydrology.
2. The centerline of all berms such as roads, railroads, or driveways that cross the stream must be included as a separate chain. Each centerline chain must also have a description or comment that identifies the type of centerline, such as “railroad berm” or “farm drive.”

3. Each cross-section shall be submitted with the points in the chain running all left to right, looking downstream.
4. The cross-sections generally must extend 50 feet past the top of the slope up from the stream.
5. The water surface elevations at each cross section shall be taken at the left edge of water and right edge of water looking downstream. The Consultant must note if any stream bed cross sections were dry, and water surface elevation shots were unavailable.

The project surveyor must ensure that all required information is legible and in a form which is easily accessible to the Hydraulics/Hydrology Unit. The consultant shall deliver the following three files:

- A three dimensional microstation file containing only Hydraulic survey data including labeled cross sections.
- The CAiCE file supporting the microstation file.
- A Microsoft Excel file with each set of cross sectional station and elevation data separated and labeled.

Other formats must be discussed in advance with the Survey Project Manager or MDOT Hydraulics Engineer.

All elevations shall be referenced to the North American Vertical Datum of 1988 (NAVD88), or project datum, if established and different. If a project datum is used, the MDOT Hydraulics Engineer may require a reference to NAVD88 or National Geodetic Vertical Datum of 1929 (NGVD29). Two benchmarks must be established at the stream crossing, one on each side of the stream. All benchmarks must be accurately described. Benchmark leveling shall be a closed loop of at least third-order accuracy, which requires an error of closure between known benchmarks of not more than 0.06 feet times the square root of the distance in Miles.

Note: It is not necessary to provide least squares analyses for horizontal and vertical control for a Hydraulics Survey upstream and downstream from the structure. Electronic evidence of horizontal and vertical closure is required. The surveyor must use professional judgment to determine whether the closures are acceptable for use on a Hydraulics Survey. It is necessary to provide accurate elevations for underclearances, road profiles, weirs, and anything that controls flow. It is not necessary to provide extremely accurate closures for vertical and horizontal control used for hydraulics cross-sections.

It is not necessary to provide a witness list of horizontal control points set for hydraulics cross-sections.

THE NOTES FOR THE HYDRAULIC SURVEY MUST BE PACKAGED IN A SEPARATE PORTFOLIO. All field measurements, notes, sketches, and calculations must be

included in the final transmission. Two separate, identical, and complete portfolios must be provided.

Specifically, the following data shall be delivered for each of the following locations:

No.	Sta	Size	Material	Cover	Comments
1	567	36"	Conc	17 ft	Cured in place liner – 2013
2	573	36"	Conc	8 ft	Replaced under only EB 2013
3	596.5	36"	Conc	20ft	Replace WB or line entire pipe
4	615	84"	Conc	25 ft	Tanner Creek, Lined early 2000's, Insptd. Good. Note: This is over 2 square miles. Culvert not being replaced. Collect data for potential work on inlet/outlet conditions.
5	628	36"	Conc	11 ft	Replace under WB or line entire pipe.
5	637	36"	Conc	20 ft	Replace WB or line entire pipe
6	658	36"	Conc	20 ft	Replace WB or line entire pipe.
7	660.5	36"	Conc	20 ft	Replace WB or line entire pipe.
8	678	36"	Conc	20 ft	Replace WB or line entire pipe., Verify location
9	692	16'x16'	CMP	7ft	Wildwood Dr, Looks Good, Confirm w/Bridge
10	698	72"	Conc	22 ft	Thornton County Drain, Inspected, Good Cond. Note. This is over 2 square miles. Culvert not being replaced. Collect data for potential work on inlet/outlet conditions.
11	713	36"	Conc	2.5 ft	Replace under WB. 100 ft SW of Livingston Rd.
12	754	36"	Conc	5 ft	In Old Plans, not on GIS, Check in Field
13	786	36"	Conc	6 ft	75 deg. Replace under WB, Willow/Linco
14	796	36"	Conc	8 ft	75 deg. Replace under WB,
15	851	36"	Conc	6 ft	75 deg. Replace under WB, SW John Beers
WM	890.5				Watermain Encasement Crossing
16	891.5	36"	Conc	6 ft	Replace under WB.
SR1	785	36"	Conc	1 ft	Under Service Rd., Check Sediment
SR2	795	36"	Conc	1 ft	Under Service Rd. Ditch to Lake, Check Sedimt
SR3	851	45x29	Conc	1 ft	Under Service Rd. , Check Sediment
SR4	889	45x29	Conc	1 ft	Under Notre Dame Ave, Check Sediment.

1. Four cross sections of the stream:

- a. One at the upstream face of the culvert,
- b. One at the downstream face of the culvert,
- c. One cross section downstream where the channel returns to its natural state (outside the influence of the road embankment and ditch line),
- d. One cross section upstream where the channel returns to its natural state.
- e. If the culvert is to be extended beyond these limits, take a section at the location of the proposed upstream and downstream face of the culvert.
- f. Take sections left and right approximately 50 feet outside the top of bank.

2. Ten water surface elevation and stream flow line (bottom) elevations:
 - a. 5 at 50-foot intervals upstream of the most upstream cross section, starting 50 feet from the cross section.
 - b. 5 at 50-foot intervals downstream of the most downstream cross section, starting 50 feet from the cross section.
3. A sketch of the structure with length, dimensions, and type (RCP, CMP, etc.) of culvert, as well as invert elevations, crown elevations, channel flow line elevations, and footing elevations (if applicable) at both ends. Use culvert data sheets.
4. A road profile along the crown of the highway
5. Top width of roadway, shoulder to shoulder.
6. Pictures looking upstream and downstream of the culvert, pictures of the upstream and downstream face, and pictures looking up and down the road.
7. Names and addresses of the riparian owners in the four quadrants of the structure.



MEETING MEMORANDUM

DATE: June 21, 2012

FROM: Kyle Rudlaff
Coloma TSC Cost & Scheduling Engineer

SUBJECT: CS 11015 JN 113585C Scope Verification Meeting Minutes

REF: I-94 WB HMA Resurfacing from Red Arrow Highway (Exit 16) for 7.4 miles
northeasterly to the pavement change west of I-94 BL (Exit 23).

Meeting Date: June 20, 2012
 Meeting Time: 9:30 A.M.
 Meeting Location: Coloma TSC Port Conference Room

Attendees:	Ruth Hepfer	FHWA, Michigan Division
	Ann Lawrie	Environmental Section (by phone)
	Nick Van Woert	Southwest Region
	Jack Klee	Southwest Region
	Greg Bills	Southwest Region
	Pete Pfeiffer	Coloma TSC
	Sarah Woolcock	Coloma TSC
	Gary Loyola	Coloma TSC
	Jarrett Burgess	Coloma TSC
	Lisa Marsh-McCarty	Coloma TSC

DISCUSSION

The meeting followed the agenda, discussion items are documented below:

1. Pertaining to the Scope, Budget, Schedule, and Project Limits.
 - a. The MPINS limits had covered the 3.0 mile construction limits at the time of the meeting. This is shorter than the desirable design limits. After discussion with Ruth Hepfer on this subject, an MPINS request has been submitted to make the MPINS limits match the 7.4 mile design limits.
 - b. A RFP for Consultant Design will be produced as an outcome of this meeting.
2. Pavement Treatment & Soils
 - a. Paving Pretreatment: Prior to placement of level course, Greg Bills recommended that deep transverse crack locations receive 3” deep milling and roller compaction of hand patching . This follows from the observation that pavement cores located at transverse cracks have unstable HMA Base. Additional cores will be obtained at transverse cracks to assist in design estimating the locations and quantities for base spot repairs.
 - b. The pavement design is expected to follow the 2013 construction of I-94 EB from Sawyer to Bridgeman, except the use of base course paving will not be employed on this project (I-94 WB), as it was on the 2013 I-94 EB project. Kyle will request a preliminary pavement design from Greg.
 - c. A large coring/boring project done recently will provide the bulk of the soils information for this project. Further discussion on soil borings to be collected will take place between Greg and Kyle. Soil borings for ramp extensions, culvert replacements, and checking transverse cracks are to be arranged.
3. Maintenance of Traffic:
 - a. The maintenance of traffic concept is generally to maintain two lanes of I-94 traffic on I-94 WB during the selected daytime period, while one lane of traffic will be maintained on I-94 WB during selected night work periods.

- b. The traffic staging will be similar to the 2013 project, which will act as a pattern for this project and also be used to collect feedback for improvements.
 - c. The Mobility analysis and Traffic Management Plan are Consultant design tasks.
4. Drainage
- a. All project culverts will be inspected and treated to achieve at least 20 years of service life beyond the project. The agenda did not contain a listing of culverts under ramps. These culverts will be video recorded and evaluated for treatment along with all other project culverts.
 - b. The 72" concrete culvert for Thornton Drain is in fair condition. David Gauthier has been invited here for a site visit to evaluate the proper treatment.
 - c. The field visit observed that the Thornton valley drain is in the I-94 ROW for several hundred feet under in the vicinity of the AEP bridge, and it is clogged with sediment and vegetation. Coordination will be sought with Berrien County Drain Commission on excavating a channel for this segment of drain. Culvert ends at present are submerged into the sediment and standing water, even during this exceptionally dry period of their being little rain for a month.
 - d. On the field review it was seen that Thornton Road and Notre Dame Drive (I-94 WB service road) is not much higher than the drainage courses that cross it while the I-94 roadway is a few feet higher than the service road. During a flood event water will flow over the service road before I-94 is jeopardized. Restoration of original ditch depth and culvert capacity under the service road will continue to be sought in this project.
5. Bridge Condition:
- a. R04, I-94 over Lost Dunes Golf Course Drive, plans are being made for a deck overlay combined with this project. Depending on the scope of bridge work, it may be required to widen the bridge shoulders from existing 5 ft inside and 10 ft outside values.
 - b. S16, I-94 EB & WB over Puetz Road, plans are being made for a deck overlay and railing replacement. Gary Loyola recommended that detour plans or temporary traffic signals be included in the road design for Puetz the deceleration lane.
 - c. Mike Halloran and Zhizhen will have a field review of all bridges in the project limits and complete reporting on the expected bridge work by July 20th. The road job for the RFP will account for the bridge work to be combined in the same contract.
6. In review of the Geometric Element table, the following items were discussed:
- a. Substandard elements to be upgraded in this project include:
 - i. Inside shoulder from 5 feet paved to 10 feet paved.
 - ii. Outside shoulder from 9 feet paved to 13 feet paved.
 - iii. Superelevation upgrade to 2.1% on curve PI Sta 875+70.
 - iv. Superelevation upgrade to 6% on curve PI Sta 915+70
 - v. Crown point relocated to lane line and at 2% slope.
 - vi. I-94 WB exit decels extended at Exit 16 & 22.

- b. Bill Taylor pointed out the agenda chart superelevation rate for curve PI Sta 576+20 is incorrectly shown as 5% and needs to be revised to 5.5%.
 - c. Bill Taylor confirmed that file only design exception for curve radii at PI Sta 915+70 is required. This curve will meet minimum radii & super rate for 70 mph.
 - d. Bridge inside shoulder width on S16, Puetz Rd and R04, Lost Dunes is 5 feet. The condition and treatment to be done on these bridges will be examined to determine whether the bridges shoulders will be widened.
7. Safety Review.
- a. Gary noted that curve northeast of Livingston Road has recorded an abnormally high number of “run-offs.” Prospects are good that this project will decrease the number of “run-offs” by establishing a 2% superelevation rate and perhaps correcting what may be remnants of a normal crown shape appearing on the pavement surface.
 - b. The horizontal curve southwest of Puetz Road is another crash concentration area on the project. The superelevation rate of existing pavement surface will be evaluated after the survey and crash reduction sought in assignment of the proposed superelvation rate.
 - c. Gary recommended that delineation for prevention of “Wrong Way” driving at ramp terminals will be implemented on the ramps in this project.
 - d. Gary recommended all signs impacted by construction be salvaged as the freeway signing job is occurring in 2014.
 - e. Kyle has requested a Form 1730 (TAR) for this project.
8. Utilities. Lisa reported that in the vicinity of bridges over I-94 communication cable normally aligned along the ROW fence deflects to an alignment near the outside shoulder. Culverts have been damaged during the cable installation and this will be a utility coordination issue when replacing existing culverts.
9. Environmental.
- a. Pertaining to culvert work under the service road. Ann indicated that should ROW be required to construct the culverts, long lead times will be involved with making the acquisition from the State Park.
 - b. Pertaining to the clearing and channel excavation proposed in the I-94 ditch from Puetz Road to Livingston Road, Nick commented that the Army Corps of Engineers may have regulatory jurisdiction over this area. The plans to impact this area should be solidified early in the design project so there is time in the project schedule for ACE to review and for possible measures to be implemented in the project. Wetland mitigation is a possibility on this project as the need to re-establish drainage ditches is a high priority and the area impacted will be large.
 - c. Nick reported that extension of the I-94 WB exit ramp will probably impact existing wetland area.

- d. Field delineation of endangered species and wetland areas will be done by MDOT. The design effort must use survey staff to record the areas to be shown on the plans. Silt fence or protective fence installation will need to precede other activities to protect the resources. Ann added that design details, such as limits on clearing, or otherwise may be required to prevent or minimize impacts to endangered species.
 - e. Access to the State Park must be maintained at all times. During culvert work under the service road either a signed detour or maintenance of traffic through the work zone must be provided.
 - f. A PACS report is not yet available. Kyle will request one.
10. Survey. This survey will be a full survey, and include cross section/terrain mapping, topography, all drainage features, hard surface DTM, bridge vertical clearance, and legal alignment.
11. Real Estate
- a. The 600 ft enclosed sewer picking up storm flow from Puetz road under the I-94 bridge has an outlet location that needs to be determined whether it is inside MDOT ROW.
 - b. Culvert work on the I-94 WB service road is a possible ROW impact.
12. Other.
- a. This project will include new ROW fence as Lisa confirmed existing ROW fence is down along parts of this project.
 - b. There are no truck parking considerations involved in this project.
 - c. There are no existing Intelligent Transportation System components on the project site and none are being added in the project. (End)