Michigan Department
Of Transportation
5100B (03/10)

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

Exhibit B

MDOT PROJECT MANAGER	JOB NUMBER (JN)	CONTROL SECTION (CS)
Munawar Azam	105127	03035

DESCRIPTION
Design Services for cold milling and HMA overlay with shoulder widening, guardrail, drainage improvements

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

☐ **TIER 1 ($25,000-$99,999)**	☐ **TIER II ($100,000-$250,000)**	☑ **TIER III (>$250,000)**	
☐	☐	☑	Understanding of Service
☐	☐	☑	*Innovations*
☐	☐	☐	*Safety Program*
N/A	☐	☑	Organizational Chart
☐	☐	☑	Qualifications of Team
☐	☐	☑	Past Performance
Not required As part of Official RFP	Not required As part of Official RFP	☑	Quality Assurance/Quality Control
☐	☐	☑	**Location:** The percentage of work performed in Michigan will be used for all selections unless the project is for on-site 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	☐	Presentation
N/A	N/A	☐	Technical Proposal (if Presentation is required)
3 pages (MDOT Forms not counted) **(No Resumes)**	7 pages (MDOT Forms not counted)	19 pages (MDOT Forms not counted)	Total maximum pages for RFP **not including key personnel resumes**

REQUEST FOR PROPOSAL

Clear Form

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 Service Contracts" and "Guideline for Completing a Low Bid Sheet(s)", if a low bid is involved as part of the selection process. **Referenced 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 1 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 Required with Proposal**)

☑ **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 RFP's that originate in Bureau of Transportation Planning only**, a priced proposal must be submitted at the same time as, but separate from, the proposal. Submit directly to the Contract Administrator/Selection Specialist, Bureau of Transportation Planning **(see address list, page 2)**. The priced proposal must be submitted in a sealed envelope, clearly marked **"PRICE PROPOSAL."** The vendor's name and return address MUST be on the front of the envelope. The priced proposal will only be opened for the highest scoring proposal. Unopened priced proposals will be returned to the unselected vendor(s). Failure to comply with this procedure may result in your priced proposal being opened erroneously by the mail room.

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.

☐ **Qualifications 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 and post the date of the bid opening on the MDOT website. The notification will be posted at least two business days prior to the bid opening. Only bids from vendors that meet proposal requirements will be opened. The vendor 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

A bid sheet(s) must be submitted in accordance with the "Guideline for Completing a Low Bid Sheet(s)" (available on MDOT's website). The Bid Sheet(s) is located at the end of the Scope of Services. Submit bid sheet(s) separate from the proposal, to the address indicated below. The bid sheet(s) must be submitted in a sealed manila envelope, clearly marked **"SEALED BID."** The vendor's name and return address MUST be on the front of the envelope. Failure to comply with this procedure may result in your bid being opened erroneously by the mail room and the bid being rejected from consideration.

Clear Form

PROPOSAL SUBMITTAL INFORMATION

REQUIRED NUMBER OF COPIES FOR PROJECT MANAGER	PROPOSAL/BID DUE DATE	TIME DUE
4 + 1 Electronic (CD)	8/16/11	12:00 PM

PROPOSAL AND BID SHEET MAILING ADDRESSES

Mail the multiple proposal bundle to the MDOT Project Manager or Other indicated below.

☑ MDOT Project Manager

Munawar Azam
1501 E. Kilgore Rd.
Kalamazoo, MI 49001

☐ MDOT Other

Mail one additional stapled copy of the proposal to the Lansing Office indicated below.

Lansing Regular Mail	OR	Lansing Overnight Mail
☑ Secretary, Contract Services Div - B470 Michigan Department of Transportation PO Box 30050 Lansing, MI 48909		Secretary, Contract Services Div - B470 Michigan Department of Transportation 425 W. Ottawa Lansing, MI 48933
☐ Contract Administrator/Selection Specialist Bureau of Transportation Planning B470 Michigan Department of Transportation PO Box 30050 Lansing, MI 48909		Contract Administrator/Selection Specialist Bureau of Transportation Planning B470 Michigan Department of Transportation 425 W. Ottawa Lansing, MI 48933

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 four (4) 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 Non-Prequalified Work)

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

MICHIGAN DEPARTMENT OF TRANSPORTATION

SCOPE OF SERVICE
FOR
DESIGN SERVICES

CONTROL SECTION(S): 03035

JOB NUMBER(S): 105127C

PROJECT LOCATION:

The project is located at I-196 starting just north of the 60th street bridge to the north Allegan County line (E. Ottagan St.) in Fillmore Township, City of Holland, Allegan County—6.5 miles long.

PROJECT DESCRIPTION:

This project will include coldmilling the existing pavement and a multiple course HMA overlay with shoulder widening, guardrail replacement, culvert rehabilitation / replacement (near 56th St.), and isolated drainage improvements as determined by existing conditions and road treatment. This project is for the rehabilitation of northbound I-196, but may require some work on southbound I-196 for culvert rehabilitation / replacement. This project also includes survey for southbound I-196 for future work.

ANTICIPATED SERVICE START DATE: October 1, 2011

ANTICIPATED SERVICE COMPLETION DATE: December 31, 2012

PRIMARY PREQUALIFICATION CLASSIFICATION(S)

Roadway Rehabilitation & Rural Freeways

SECONDARY PREQUALIFICATION CLASSIFICATION(S)

Road Design Surveys
Right of Way Surveys
Hydraulic Surveys
Maintaining Traffic Plans & Provisions
Pavement Marking Plans
Permanent Freeway Traffic Signing Plans
Hydraulics
Geotechnical Engineering Services

DBE REQUIREMENT: 10%

MDOT PROJECT MANAGER:

Munawar Azam
Southwest Region Office
1501 E. Kilgore Road
Kalamazoo, MI 49001
Phone: (269) 337-3920
E-Mail: AzamM@michigan.gov

All inquiries about this Request for Proposal should be directed to the MDOT Project Manager.

ADDITIONAL INFORMATION:

Consultants shall provide a conceptual maintaining traffic plan for this project considering general understanding of service. MDOT is seeking innovative ways to maintain traffic during the construction of this project.

MDOT seeks innovative surveying techniques to reduce overall survey time and costs. The proposed use of innovative surveying techniques will be considered favorable during the evaluation, but will not be exclusive.

CONSULTANT RESPONSIBILITIES:

Project includes, but not limited to the following tasks:

1. 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 project prior to submitting the Priced-Proposal.

2. Maintain a 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.

3. Provide project development schedule.

4. Perform design survey.

5. Perform drainage survey to identify isolated drainage issues and provide potential design solutions.

6. Perform geotechnical investigation for roadway and culvert.

7. Develop MOT concepts.

8. Prepare required plans, typical cross-sections, and details as required for design and construction.

9. Provide recommendations for private/public utility relocations.

10. Provide solutions to any unique problems that may arise during the study and design of this project.

11. Attend any project related meetings and informational meetings (i.e., public hearings, open houses, etc.) with the general public and public officials to assistant in answering any technical questions or concerns, or as directed by the MDOT Project Manager. Consultant will be required to provide displays and/or photo renderings.

12. The Consultant representative shall record and submit typed minutes for all project related meetings to the MDOT Project Manager within one (1) week of the meeting.

13. If excavation is required, submit the excavation locations which may contain contamination. The MDOT Project Manager then can proceed in requesting a Preliminary Site Investigation (PSI).

14. The Consultant will provide to MDOT at the scheduled submittal dates, copies of the required materials for distribution by MDOT for all reviews for this project. The Consultant shall contact the project manager prior to the submittal dates for the exact number of copies that will be required for submittal.

15. Prepare and submit electronically (native format or Adobe PDF) any information, calculations, drainage 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.

16. The Consultant shall assist in the review of utility permit requests, incorporate the information in the design plans, and respond within two (2) weeks from receipt of the permit.

17. The MDOT Project Manager shall be the official MDOT contact person for this project and should be made aware of all communications regarding this project. The Consultant must address or send a copy of all correspondences to the MDOT Project Manager.

18. Prepare and submit to the MDOT Project manager all items necessary for any design exception requests.

19. 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.

20. 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.

21. The Consultant will be required to attend a Pre-Price Proposal Meeting to discuss the project requirements, schedule, and survey requirements.

B. PPMS TASKS

For questions on specific tasks, refer to the PPMS Task Manual located on the MDOT Bulletin Board System. For assistance in accessing this manual, please contact the following:

Dennis Kelley
Phone: (517) 373-4614
E-Mail: KelleyD2@michigan.gov

C. MONTHLY PROGRESS REPORT

On the first of each month, the Consultant shall submit a monthly progress report to the MDOT Project Manager that details all the work completed that month, the work expected to be completed in the following month, and a project schedule including PPMS tasks.

D. TRAFFIC CONTROL

The Consultant will be responsible for all traffic control required to perform the tasks outlined in the Scope of Work.

E. MDOT PERMITS

The Consultant will be responsible for obtaining all up to date access permits and pertinent information for tasks in MDOT Right of Way. Any questions regarding MDOT permits should be directed to:

Dan Roberts – Utility & Permit Engineer
Kalamazoo TSC
5372 South 9th Street
Kalamazoo, MI 49009
Phone: (269) 375-8615
E-Mail: RobertsDan@michigan.gov

F. 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 Project Manager. The Consultant shall attend any utility meetings called to ensure that the concerns on the plans involving utilities are addressed. The Consultant shall provide for the survey staking of various proposed facilities, and existing ROW so as to locate potential utility conflicts and aid in the completion of utility relocation plans for all municipal and private utility companies. The consultant shall verify any utility information (location, size, type, etc.) through researching historical as-built information for the project area.

The Consultant shall provide plan sheets for distribution. MDOT Project Manager will distribute to utility companies.

G. DELIVERABLES

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

The Consultant shall deliver all computer files associated with the project in their native format (spreadsheets, Microstation files, GEOPAK files, etc.) on DVD, CD, or uploaded to ProjectWise, as directed by the MDOT Project Manager. It is the Consultant's responsibility to obtain up to date MicroStation and GEOPAK seed/configuration files necessary to comply with MDOT's drafting standards which are posted to the bulletin board system. 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 when a hard copy version of a document is all that exists. The use of digital signatures is encouraged when feasible.

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 bookmarks in half size (11" x 17") formats. A half 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.

All design for this project will be done in **English Units.**

All 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:

1. Title Sheet
2. Note Sheet(s)
3. Vicinity and Drainage Sheet(s)
4. Witness and Benchmark Sheet(s)

5. Alignment Sheet(s)
6. Project Specific Special Detail Sheet(s)
7. Typical Cross-Sections
8. Removal Sheet(s)
9. Construction Sheet(s)
10. Profile Sheet(s)
11. Detail Grade Sheet(s)
12. Construction Staging and Traffic Control Plans
13. Pavement Marking Sheet(s)
14. Temporary/Permanent Signing Sheet(s)
15. 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.

MDOT RESPONSIBILITIES:

A. MEETINGS

The MDOT PM will schedule and/or conduct all project related meetings.

B. DELIVERABLES

1. Special details and pertinent reference materials
2. As-built plans of project area, as available
3. Information on existing pavement structure, as available
4. Pavement core information, as available
5. Traffic Analysis
6. Crash Analysis
7. Safety Analysis
8. Traffic Management Plan (TMP)

C. ENVIRONMENTAL PERMITS

MDOT will be responsible for submitting all required permits.

D. COORDINATION

MDOT will provide coordination assistance with the following:

1. Utility Company(s)
2. Project Stakeholders
3. FHWA
4. Allegan County Drain Commissioner

5. Other MDOT Divisions (Bridge, Hydraulics, Geotechnical, ect.)

CONSULTANT PAYMENT:

A. 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
PPMS Task List

YES	NO	P/PMS TASK NUMBER AND DESCRIPTION	DATE TO BE COMPLETED BY (MM / DD / YYYY)
EARLY PRELIMINARY ENGINEERING – STUDY			
		EPE Scoping Analysis	
☐	☒	2120 Prepare Traffic Analysis Report	/ /
☐	☒	2130 Prepare Project Justification	/ /
☐	☒	*213M Concurrence by Regulatory Agencies with the Purpose and Need*	/ /
☐	☒	2140 Develop and Review Illustrative Alternatives	/ /
☐	☒	2155 Request/Perform Safety Analysis	/ /
☐	☒	2160 Prepare and Review EIS Scoping Document	/ /
☐	☒	*211M Public Information Meeting*	/ /
		EPE Draft Analysis	
☐	☒	2310 Conduct Technical SEE Studies	/ /
☐	☒	2321 Prepare for Aerial Photography	/ /
☐	☒	2322 Finish/Print Aerial Photography	/ /
☐	☒	2330 Collect EPE Geotechnical Data	/ /
☐	☒	2340 Develop and Review Practical Alternatives	/ /
☐	☒	*233M Aerial Photography Flight*	/ /
☐	☒	2360 Prepare and Review EA or DEIS	/ /
☐	☒	*231M Draft Submission to FHWA*	/ /
☐	☒	2380 Circulate EA or DEIS	/ /
☐	☒	*232M Public Hearing*	/ /
		EPE Final Analysis	
☐	☒	2510 Determine and Review Recommended Alternative	/ /
☐	☒	*250M Concurrence by Regulatory Agencies with Recommended Alternatives*	/ /
☐	☒	2525 Prepare and Review Engineering Report	/ /
☐	☒	2530 Prepare and Review Request for FONSI or FEIS	/ /
☐	☒	*252M Final Submission to FHWA*	/ /
☐	☒	2550 Obtain FONSI or ROD	/ /
		Contamination Investigation	
☐	☒	2810 Project Area Contamination Survey (PCS)	/ /
☐	☒	2820 Preliminary Site Investigation (PSI) for Contamination	/ /

YES	NO	P/PMS TASK NUMBER AND DESCRIPTION	DATE TO BE COMPLETED BY (MM / DD / YYYY)
PRELIMINARY ENGINEERING - DESIGN			
		Design Scope Verification And Base Plan Preparation	
☒	☐	3130 Verify Design Scope of Work and Cost	/ /
☐	☒	3310 Prepare Aerial Topographic Mapping	/ /
☐	☒	3320 Conduct Photogrammetric Control Survey	/ /
☐	☒	3321 Set Aerial Photo Targets	/ /
☒	☐	3330 Conduct Design Survey	/ /
☐	☒	3340 Conduct Structure Survey	/ /
☒	☐	3350 Conduct Hydraulics Survey	/ /
☒	☐	3360 Prepare Base Plans	/ /
☒	☐	*331M Utility Notification*	/ /
☒	☐	3361 Review and Submit Preliminary ROW Plans	/ /
☒	☐	*331M Preliminary ROW Plans Distributed*	/ /
☐	☒	3370 Prepare Structure Study	/ /
☐	☒	3375 Conduct Value Engineering Study	/ /
☒	☐	3380 Review Base Plans	/ /
☒	☐	*332M Base Plan Review (Pre-GI Inspection)*	/ /
☒	☐	3390 Develop the Maintaining Traffic Concepts	/ /
		Preliminary Plans Preparation	
☒	☐	3510 Perform Roadway Geotechnical Investigation	/ /
☐	☒	3520 Conduct Hydraulic/Hydrologic and Scour Analysis	/ /
☒	☐	3522 Conduct Drainage Study, Storm Sewer Design, and use Structural Best Management Practices	/ /
☐	☒	3530 Conduct Structure Foundation Investigation	/ /
☐	☒	3535 Conduct Structure Review for Architectural and Aesthetic Improvements	/ /
☒	☐	3540 Develop the Maintaining Traffic Plan	/ /
☐	☒	3551 Prepare/Review Preliminary Traffic Signal Design Plan	/ /
☒	☐	3552 Develop Preliminary Pavement Marking Plan	/ /
☐	☒	3553 Develop Preliminary Non-Freeway Signing Plan	/ /
☒	☐	3554 Develop Preliminary Freeway Signing Plan	/ /
☐	☒	3555 Prepare/Review Preliminary Traffic Signal Operations	/ /
☐	☒	3570 Prepare Preliminary Structure Plans	/ /
☒	☐	3580 Develop Preliminary Plans	/ /
☒	☐	3581 Review and Submit Final ROW Plans	/ /
☒	☐	*351M Final ROW Plans Distributed*	/ /
☒	☐	3590 Review Preliminary Plans (Plan Review Meeting)	/ /
☒	☐	*352M THE Plan Review (Grade Inspection)*	/ /

YES	NO	P/PMS TASK NUMBER AND DESCRIPTION	DATE TO BE COMPLETED BY (MM / DD / YYYY)
PRELIMINARY ENGINEERING – DESIGN (Cont'd)			
		Utilities	
☒	☐	3610 Compile Utility Information	/ /
☒	☐	3650 Coordinate RR Involvement for Grade Separations	/ /
☐	☒	3655 Coordinate RR Involvement for At-Grade Crossings	/ /
☐	☒	3660 Resolve Utility Issues	/ /
☒	☐	*360M Utility Conflict Resolution Plan Distribution*	/ /
☒	☐	*361M Utility Meeting*	/ /
☐	☒	3670 Develop Municipal Utility Plans	/ /
☐	☒	3672 Develop Special Drainage Structures Plans	/ /
☐	☒	3675 Develop Electrical Plans	/ /
		Mitigation/Permits	
☐	☒	3710 Develop Required Mitigation	/ /
☒	☐	3720 Submit Environmental Permit Applications	/ /
☐	☒	3730 Obtain Environmental Permit	/ /
		Final Plan Preparation	
☐	☒	3821 Prepare/Review Final Traffic Signal Design Plan	/ /
☒	☐	3822 Complete Permanent Pavement Marking Plan	/ /
☐	☒	3823 Complete Non-Freeway Signing Plan	/ /
☒	☐	3824 Complete Freeway Signing Plan	/ /
☐	☒	3825 Prepare/Review Final Traffic Signal Operations	/ /
☒	☐	3830 Complete the Maintaining Traffic Plan	/ /
☒	☐	3840 Develop Final Plans and Specifications	/ /
☒	☐	*380M Plan Completion*	/ /
☐	☒	3850 Develop Structure Final Plans and Specifications	/ /
☒	☐	3870 Hold Omissions/Errors Check (OEC) Meeting	/ /
☒	☐	*387M Omissions/Errors Checks Meeting*	/ /
☒	☐	*389M Plan Turn-In*	/ /
☐	☒	3880 CPM Quality Assurance Review	/ /

YES	NO	P/PMS TASK NUMBER AND DESCRIPTION	DATE TO BE COMPLETED BY (MM / DD / YYYY)
PRELIMINARY ENGINEERING – RIGHT OF WAY			
		Early Right of Way Work	
☐	☒	4120 Obtain Preliminary Title Commitments	/ /
☐	☒	4130 Prepare Marked Final Right Of Way Plans	/ /
☐	☒	*413M Approved Marked Final ROW*	/ /
☐	☒	4140 Prepare Property Legal Instruments	/ /
		Right of Way Acquisition	
☐	☒	4411 Preliminary Interviews	/ /
☐	☒	*441M Post-Decision Meeting*	/ /
☐	☒	4412 Real Estate Services Assignment Proposal and Fee Estimate (Form 633s) for Appraisal Work Authorization	/ /
☐	☒	4413 Appraisal Reports	/ /
☐	☒	4420 Appraisal Review Reports	/ /
☐	☒	4430 Acquire Right Of Way Parcels	/ /
☐	☒	4510 Conduct Right Of Way Survey & Staking	/ /
		Right of Way Relocation	
☐	☒	4710 Relocation Assistance	/ /
☐	☒	4720 Prepare Improvement Removal Plan	/ /
☐	☒	*442M ROW Certification*	/ /

ATTACHMENT B
SURVEY SCOPE

A. SURVEY PREQUALIFICATIONS: Road Design, Right of Way, and Hydraulic 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: Munawar Azam
     (269) 337-3920
     AzamM@michigan.gov

   - MDOT Region Surveyor: Erik J. Schnepp, PS
     (269) 337-3922
     SchneppE@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. This hour estimate will be reviewed by the selections team to aid in determining the consultant understanding of service expected for this project.

4. I**t is the responsibility o**f the Professional Surveyo**r to safeguard all c**orners 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.

D. BI-WEEKLY PROGRESS REPORT

Every two weeks the Consultant shall submit a project progress report to the Region surveyor. 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 March, 2009. Please contact the Design Survey office to clarify any specific questions regarding these standards.

5. The Consultant is responsible for using the latest MDOT CAiCE Feature Codes, files and tugboat (macro), available on the MDOT File Transfer Protocol (FTP) site. **The CAiCE software used must be Version 10.2 or newer. The Consultant must also use MicroStation Version 8 or newer.**

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 March 2009 will be used. This can be obtained on the MDOT 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
    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, CAiCE 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. 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. Schnepp, PS
    1501 E. Kilgore,
    Kalamazoo, MI. 49001

    Please use MDOT's Form 222(3/99) 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 inform him/her of surveying activity in the area. The Consultant must discuss a Traffic Control and Safety plan with the Traffic & Safety Engineer prior to submitting a proposal. 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 inform him or her of surveying activity in the area. The MDOT Region or TSC must be notified at least two weeks prior to lane closures so advance notice can be posted on the Web site.

<u>The following are the time restrictions for I-196:</u>

Lane closures should be restricted to the hours between 9:00 a.m. and 3:00 p.m. Monday through Friday. Maintain a minimum of one lane of traffic in each direction during all other times.

<u>Local road time restrictions:</u>
Check with the Allegan County Road Commission.

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. For this project the selected consultant will tie into the horizontal control of a previous MDOT project Southerly of I-196. The previous project and this project will be on the same datum.

There will be two primary control monuments set for this project. 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.

I. 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.

Upon request, the MDOT Design Survey Unit will supply descriptions of nearby published NGS control bench marks.

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. In addition to the required benchmarks per MDOT guidelines, at 2 additional benchmarks must be set outside of the mapping limits. For this project the benchmarks should be set on a variety of items (e.g. all the benchmarks should not be on signs bases). For this project vertical control from a previous MDOT project along I-196 Southerly of this project will be given to the selected consultant for vertical control.

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.

J. ALIGNMENTS

Any alignment needed to compute the legal ROW of the project shall be a legal alignment.

Legal/Survey alignments are estimated to be needed for I-196 from station 62+49.28 on Eastbound I-196 and 57+05.97 on Westbound I-196 until station 408+81.80, M-40 from station 83+97.44 to station 149+79.22. Construction alignments are need for ramps A,B,C, & D by M-40 and I-196. A detailed write up will also be required in the Surveyor’s Project Report on how the legal/construction/survey alignments were determined.

Alignment Chains shall be given logical names in CAiCE. A table of chain names and descriptions shall be included in the Surveyor's Project Report

CAiCE Chain Name	Chain Description
I196WBCL1	I-196 West bound -Construction line
I196EBCL1	I-196 East bound-Construction line
I-196SL1	I-196 Survey line
I-196RACL1	I-196 Ramp A-Construction line
I-196RBCL1	I-196 Ramp B-Construction line
I-196RCCL1	I-196 Ramp C-Construction line
I-196RDCL1	I-196 Ramp D-Construction line

K. LEGAL ROW

All the legal ROW lines will be determined throughout the mapping project limits following MDOT design survey standards. Along I-196 this would be from station 81+29.92 to the county line near station 397+00. At the M-40 I-196 interchange this would include all the ROW at the interchange and along M-40 from station B04-03072 near station 115+00 to station 88+00. The limited access ROW line will also be determined between Ramp A and Frontage Road, This would also include the ROW line Northerly of Frontage Road. All legal ROW lines will be shown on the final deliverable PL drawing.

A detailed write-up will also be required in the Surveyor's Project Report on how the ROW lines were determined.

The selected consultant will obtain all deeds and excess sales to determine the ROW lines by all available resources (courthouse, MDOT records, city records, recorded plats, etc). Tax descriptions are not acceptable. The ROW line coordinates shall be determined every 500 feet, PT, PC, and angle point, by a Professional Surveyor. The ROW coordinates determination shall be made for both sides of the ROW. The selected consultant will also find any existing parcel corners (plat monuments, iron pipes, iron pines, capped irons, along the legal ROW line.

The coordinates for both the found monumentation and ROW coordinates as determined above, shall be shown on a separate ROW alignment dgn file. This would be for all areas were the legal ROW line is determined.

L. GOVERNMENT CORNERS / PARCEL LINES

Any government corner used to establish the legal alignment / legal ROW lines must meet the MDOT's Design Survey Standards. It is anticipated the following section corners will need to be obtained for the project:

M-5, M-6 of T4N, R16W

A-5, A-6,B-5, B-6,B-4,C-5, C-6,D-5, D-6,E-5,E-6,F-5,F-6,G-4,G-5,G-6,H-3,H-4,H-5,I-2,I-3,I-4,J-1,J-2,J-3,
K-1,K-2,L-1 of T4N, R15W,
J-13, K-13 L-13 of T5N, R15W.

This list will be verified between MDOT and the selected consultant prior to beginning work.

Within the project mapping limits parcel lines will be determined/surveyed by the selected consultant. At this time they will not be staked in the field. If no deeds are available the parcels lines can be plotted based on the tax description. Tax maps/descriptions will be obtained for the parcels within the mapping limits. This would include the tax parcel ID, name, address, etc. The tax descriptions maps used must be submitted with the survey portfolio.

M. MAPPING

1. Begin mapping along I-916 at station 81+29 and end mapping at station 399+00 with shots taken every 50 feet. Mapping shall take place from ROW line to ROW line for both Westbound and Eastbound I-196.

2. Begin mapping along M-40 at station 88+00 and end at B04 of 03072 near station 115+00 with shots every 50 feet. Mapping shall take place from ROW line to ROW line.

3. Map the complete M-40 and I-196 interchange from ROW to ROW. This would include ramps A, B, C, and D . Shots shall be taken every 50 feet. Mapping will not be needed on Frontage Road and M-40. Mapping can stop at the limited access ROW line between the Ramp A and Frontage Road

4. For the (I-196 at 60th Street, S04-03035, I-196 at 56th Street, M-40 at I-196, 146th at I-196, and I-196 at Ottogan) the following will be obtained for the bridges: all reference points elevations/grid coordinates including elevations, bridge seat elevations, under clearance elevations, reference point stationing, photographs, piers, abutment walls, bride schematic (Plan and elevation views showing both substructure and superstructure elements, mapping should also be obtained 200 feet in each direction from both of the reference lines on top of the structure

5. For the 2 railroad structures under I-196 near stations 283+00 and 205+16. Map the windwalls and determine the reference lines/points of the structure. It is currently anticipated that no mapping will be obtained on the railroad tracks.

6. Sample features for all mapping areas include the following items: any road features (edge of pavement bit, edge pavement concrete, edge of bit shoulder, pavement marking lines, etc) walkways, driveways, all terrain points/lines, drainage features, all visible utilities (overhead electric lines, gas line markers, hydrants, etc), sanitary manholes, guardrail. This list is but a short sample of the possible features/codes located within the mapping limits.

N. 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.

O. DTM

The Consultant must submit a **CAiCE software file, named MDOTjob#.zip**, utilizing CAiCE's built-in archive feature, of all survey mapping points and data files for the mapping area. A properly edited Digital Terrain Model (DTM), named EXRD and created in CAiCE, must be included for the mapping area. The Consultant is responsible for using the latest MDOT CAiCE Feature Codes, files and tugboat, available on the MDOT File Transfer Protocol (FTP) site. The tugboat can be used to convert CAiCE files into Geopak and MicroStation formats. **The CAiCE software used must be Version 10.5 or newer.**

The Consultant must also submit **files created from CAiCE that are formatted for design in Geopak** software. This can be accomplished by using the MDOT Plans Production CAiCE Tugboat available on the MDOT Design Survey FTP site. The Consultant must submit a 3D MicroStation Triangle file, a Survey Chain (TIN Boundary) around the edited Triangle file with the name and Feature "CLIP", a Job#.dat file, and a Job#.ALI file. Each alignment must be computed separately and uniquely named. These files must be submitted electronically **in a subdirectory outside of the CAiCE archive file** named "Geopak."

P. FINAL REPORT

One complete portfolio and three complete sets of CD's or DVD's must be assembled and delivered in the format outlined in the *Standards of Practice* dated March, 2009. A copy of the

MDOT Checklist dated March, 2009 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.**

The Consultant must provide an electronic **MicroStation Intergraph Version 8 format file** of the mapping area. This must be named MDOTjob#PL.dgn, for example **105127cpl.dgn,** and must be submitted **in a sub-directory outside of the CAiCE archive file** named "MicroStation." The MicroStation file will be a 2-D file of the planimetric features including contours. This file must be sized appropriately, utilizing the appropriate seed file with working units of 1000, 1., and be compiled in standard MDOT format. 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. Go to http://mdotwas1.mdot.state.mi.us/public/bbs/

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. Also in the ftp site, the Consultant should refer to the V8GROUP&ALPHA LIST.pdf file for Data Collection Codes.

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 March 2009.

Q. SURVEY INFORMATION SHEET

The Consultant shall prepare a MDOT Survey Information Sheet in Microsoft Word (.doc) named 105127_I196_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 C
HYDRAULIC SURVEY SCOPE

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 and include the ordinary high water mark. 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:

Station **186+50**

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.