Clear Form

Michigan Department
Of Transportation
5100B (07/16)

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

REQUISITION NUMBER	DUE DATE	TIME DUE
2069	12/12/16	noon est

MDOT PROJECT MANAGER	JOB NUMBER (JN)	CONTROL SECTION (CS)
Jonathon Smith, P.E.	118792	11016, 11017, 11111

DESCRIPTION
Design services for R&R HMA milling and resurfacing at 4" depth to restore pavement surface on I-196 from I-94 to M-63.

MDOT PROJECT MANAGER: Check all items to be included in RFP

WHITE = REQUIRED
** = OPTIONAL

Check the appropriate Tier in the box below

CONSULTANT: Provide only checked items below in proposal. When applicable, Best Value scoring criteria is listed separately in the RFP.

☐ **TIER 1 ($50,000 - $150,000)**	☑ **TIER II ($150,000-$1,000,000)**	☐ **TIER III (>$1,000,000)**	
☐	☑	☐	Understanding of Service **
☐	☐	☐	*Innovations*
☐	☑	☐	Organizational Chart
☐	☑	☐	Qualifications of Team
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) Resumes will only be accepted for Best Value Selections	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 E-MAIL ADDRESS – mdot-rfp-response@michigan.gov

The Consultants 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 that MDOT receives the proposal on time.
*Contact Contract Services Division immediately at 517-373-4680 if you do not get an auto response.

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 for all firms performing non-prequalified services on this project.)

(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."

RFP SPECIFIC INFORMATION

☑ ENGINEERING SERVICES ☐ BUREAU OF TRANSPORTATION PLANNING ☐ OTHER

THE SERVICE WAS POSTED ON THE ANTICIPATED QUARTERLY REQUESTS FOR PROPOSALS

☑ NO ☐ YES DATED_____ THROUGH _____

☑ **Prequalified Services** – See 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, 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 all firms performing non-prequalified services on this project.

☑ **Qualification Based Selection** - Use Consultant/Vendor Selection Guidelines.

For all Qualifications Based Selections, the selection team will review the information submitted and will select the firm considered most qualified to perform the services based on the proposals. The selected 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 Based Selection / 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.

☐ **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.)

BID SHEET INSTRUCTIONS

Bid Sheet(s) are located at the end of the Scope of Services. Submit bid sheet(s) with 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.

PARTNERSHIP CHARTER AGREEMENT

MDOT and ACEC created a Partnership Charter Agreement which establishes guidelines to assist MDOT and Consultants in successful partnering. Both the Consultant and MDOT Project Manager are reminded to review the **ACEC-MDOT Partnership Charter Agreement** and are asked to follow all communications, issues resolution and other procedures and guidance's contained therein.

Proposals must be submitted for this project electronically. Proposal Submittal Requirements Can Be Found At the Following Link
http://www.michigan.gov/documents/MDOT_Consultant-Vendor_Selection_Guidelines-0106_145222_7.pdf?20150707153457

In *PART IV – INSTRUCTION FOR SUBMITTING PROPOSALS*

NOTIFICATION
E-VERIFY REQUIREMENTS
E-Verify is an Internet based system that allows an employer, using information reported on an employee's Form I-9, Employment Eligibility Verification, to determine the eligibility of that employee to work in the United States. There is no charge to employers to use E-Verify. The E-Verify system is operated by the Department of Homeland Security (DHS) in partnership with the Social Security Administration. E-Verify is available in Spanish.
The State of Michigan is requiring, under Public Act 200 of 2012, Section 381, that as a condition of each contract or subcontract for construction, maintenance, or engineering services that the pre-qualified contractor or subcontractor agree to use the E-Verify system to verify that all persons hired during the contract term by the contractor or subcontractor are legally present and authorized to work in the United States.
Information on registration for and use of the E-Verify program can be obtained via the Internet at the DHS Web site: http://www.dhs.gov/E-Verify.
The documentation supporting the usage of the E-Verify system must be maintained by each consultant and be made available to MDOT upon request.
It is the responsibility of the prime consultant to include the E-Verify requirement documented in this NOTIFICATION in all tiers of subcontracts.
9/13/12

Michigan Department of Transportation

SCOPE OF SERVICE
FOR
DESIGN SERVICES

CONTROL SECTION(S): 11016, 11017 and 11111

JOB NUMBER(S): 118792C

PROJECT LOCATION:
The project is located on I-196 from I-94 to north of M-63 (Exit 7). Project detail location is: On I-196 NB from I-94 to 0.5 miles south of M-63 (Hagar Shore Rd. Exit 7). On I-196 SB from I-94 for 3.5 miles to south of R01, just south of Coloma Rd. (Exit 4). The project is located in Berrien County with total project length is 8.089 miles.

PROJECT DESCRIPTION:
Work involved in the design of the project corridor consists of: HMA milling and resurfacing at 4" depth to restore pavement surface. Resurface median and outside shoulder based on condition. Some shoulder locations at M-63 bridge may require shoulder reconstruction for MOT. Apply treatment to all interchange ramps. Extend ramps. Replace culverts as necessary. Replace 900 ft culvert located under I-196, Riverside Road, and Mohmany Park Road.

ANTICIPATED SERVICE START DATE: 1/1/2017

ANTICIPATED SERVICE COMPLETION DATE: 05/01/2019

DBE PARTICIPATION REQUIREMENT: 6%

PRIMARY PREQUALIFICATION CLASSIFICATION(S):
Design - Roadway: Intermediate

SECONDARY PREQUALIFICATION CLASSIFICATION(S):
Design – Traffic: Work Zone Maintenance of Traffic
Design – Hydraulics II
Design – Traffic: Pavement Markings
Design – Traffic: Signing - Freeway
Design – Geotechnical
Surveying: Road Design
Surveying: Hydraulics
Surveying: Right of Way

PREFERRED QUALIFICATIONS AND CRITERIA (FOR NON-CLASSIFIED SERVICES):

1) UTILITY COORDINATION
☒ MDOT shall be responsible for project Utility Coordination

MDOT PROJECT ENGINEER MANAGER:

Jonathon Smith, P.E.
Cost and Schedule Engineer
Design Engineer
Michigan Department of Transportation
Coloma Business Office
3880 Red Arrow Highway
Benton Harbor, MI 49022-9551
Office: 269-849-2396
Cell: 269-207-1599
Fax: 269-849-1227

CONSTRUCTION COST:

A. The estimated cost of construction is:

1.	Mainline Pavement	$17,000,000
2.	Geometric Improvement	$200,000
3.	Drainage	$500,000
4.	Maintaining Traffic	$ 1,000,000
5.	Permanent Pavement Markings/Signs	$275,000
7.	Miscellaneous	$1,000,000
	CONSTRUCTION TOTAL	**$20,000,000**

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.

A bridge replacement M-63 over I-196 JN 115754 will be packaged with this project. This project will be 100% in-house design and the selected consultant will be provided with relevant files to incorporate with the road project.

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, Published MDOT Design Advisories,

Drainage Manual, Roadside Design Guide, A Policy on Geometric Design of Highways and Streets, Michigan Manual of Uniform Traffic Control Devices, etc.).

The Consultant is required to use the MDOT Current Version of Bentley Microstation/GEOPAK or PowerGEOPAK (published at Section 2.2.2 of the Design Submittal Requirements) with the current MDOT workspace (published at Section 2.2.1 of the Design Submittal Requirements). 3D Models are required for all applicable projects. See Chapter 2 of the Design Submittal Requirements for a complete listing of applicable projects. The consultant shall comply with all MDOT CADD standards and file naming conventions.

MDOT RESPONSIBILITIES:

A. Schedule and/or conduct the following:
   1. Project related meetings
   2. Base Plan Review
   3. The Plan Review
   4. Omissions/Errors/Check
   5. Utility Coordination Meeting(s)
   6. Final Trnsport item cost estimates

B. Furnish 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, if applicable.

D. Obtain all permits for the project as outlined in previous section.

E. Coordinate any necessary utility relocation(s).

F. Furnish FTP site for software download and instructions for the MDOT Stand Alone Proposal Estimator's Worksheet (SAPW).

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, Railroad coordination requirements, utility conflict resolution, local agency meetings, etc.

A. Perform design, hydraulics and right of way 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 including but not limited to proposal for a crossover, if needed.

E. Perform drainage analysis and study for the 900 ft long 15 inch diameter culvert on Oscar Damon County Drain under I-196 at Riverside Rd and Mohamany Park Road which is an aged tile installed in 1961 and will be replaced as part of this project. Replace additional culverts as necessary.

F. Prepare Right-of-Way and Marked Final Right-of-Way plans as required, to locate, verify, and purchase real estate and/or obtain construction access permits for this project.

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

H. 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.

I. Maintain a Design Project Record in ProjectWise, which includes a history of significant events (changes, comments, etc.) which influenced the development of the plans, dates of submittals and receipt of information.

J. If excavation is required, submit the excavation locations which may contain contamination. Project Manager then can proceed in requesting a Project Area Contamination Survey (PACS).

K. The Consultant shall prepare and submit in ProjectWise (in PDF format) a CPM network for the construction of this project.

L. The Consultant representative shall record the minutes and submit in ProjectWise (in PDF format), 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.

M. The Consultant will provide to MDOT, by entering into MDOT ProjectWise at the scheduled submittal dates, electronic documents (in PDF format) of the required specifications and plan set materials for distribution by MDOT for all reviews for this project.

N. Prepare and submit electronically (native format or PDF) into MDOT ProjectWise, any information, calculations, hydraulic studies, or drawings required by MDOT for acquiring any permit (i.e. NPDES, DEQ, etc), approvals (i.e. county drain commission) and related mitigation. MDOT will submit permit requests.

O. Attend any project-related meetings as directed by the MDOT Project Manager.

P. 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.

Q. 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.

R. 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.

S. 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 Coordinator 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.

T. The Consultant shall be responsible for all traffic control required to perform the tasks as outlined in this Scope of Design Services.

U. 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, Development Services Division at (517) 241-2103.

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

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

DELIVERABLES:

The Consultant shall enter in MDOT ProjectWise, in the appropriate folders all electronic files associated with the project in their native format (spreadsheets, CADD files, GEOPAK files, Roadway Designer Templates etc.) as directed by the MDOT Project Manager. All CADD/GEOPAK files shall be created and identified with standard MDOT file names. 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 published monthly to the MDOT website. 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, to MDOT ProjectWise, in the appropriate folders, in their native format with standard naming conventions as well as combined into one 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 capture a legally signed document or a hard copy version of a document is all that exists.

Plan sheets shall be submitted to MDOT ProjectWise in the appropriate folders in a set in PDF 11" x 17" format. For final Plan Turn-In, a title sheet shall be printed, signed, sealed, and then scanned for inclusion with the PDF set. The original title sheet shall be sent to the MDOT Project Manager.

Reference Information Documents (RID) shall be entered into MDOT ProjectWise in the appropriate folder with standard naming conventions and content at milestone submittals as defined by Chapter 4 of the Design Submittal Requirements. The RID files included will depend on the design survey deliverables and project template (See Chapter 2 of the Design Submittal Requirements). These files range from CADD, existing terrain, proposed cross sections, 3D models and files generated for Automated Machine Guidance (AMG) and automated inspection/stakeout activities.

Stand Alone Proposal Estimator's Worksheet (SAPW) shall be used to generate the txt and xml files necessary for import into the Trns*port bid letting software. The SAPW files shall be entered into MDOT ProjectWise in the appropriate folder.

The project removal, construction, and profile sheets will require a scale of **1"=80' or as approved by the Project Manager.** See Section 1.02.12 of the Road Design Manual for further direction.

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
P/PMS Form Only

MDOT PRECONSTRUCTION TASKS CONSULTANT CHECKLIST

Version 13
Updated
03-02-2015

For questions on specific tasks, refer to the P/PMS Task Manual located on the MDOT Website.
For assistance in accessing this manual, please contact:
Dennis Kelley: (517) 373-4614

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. Scheduling assistance may be accomplished with estimated completion dates. While not part of P/PMS, an Authorization Milestone and Post-Design Tasks have been included for your reference.

STUDY (EARLY PRELIMINARY ENGINEERING)

YES	NO	P/PMS TASK NUMBER AND DESCRIPTION		DATE TO BE COMPLETED BY (mm/dd/yyyy)	
		CONSULTANT CONTRACT AUTHORIZATION/EXECUTION		/	/
		INFORMATION GATHERING/STUDIES			
☐	X	1115	Traffic Data Collection for Studies	/	/
☐	X	1120	Prepare Traffic Analysis Report for Studies	/	/
☐	X	1125	Traffic Capacity Analysis for Studies	/	/
☐	X	1155	Request/Perform Safety Analysis for Studies	/	/
☐	X	1300	Traffic Impact Study	/	/
☐	X	1350	Determine Need for Interstate Access Change Request	/	/
☐	X	1400	Feasibility Study	/	/
☐	X	1500	Corridor Study	/	/
☐	X	1555	Interstate Access Change Request	/	/
☐	X	*155M*	*FHWA Approval of Interstate Access Change Request*	/	/
☐	X	1600	Access Management Study Plan	/	/
☐	X	1700	Other Miscellaneous Studies	/	/
		EPE SCOPING ANALYSIS			
☐	X	2100	Scope Verification and Initiation of EPE Activities	/	/
☐	X	2115	Prepare Traffic Analysis Report for EPE/Design	/	/
☐	X	2120	Traffic Data Collection for EPE/Design	/	/
☐	X	2125	Traffic Capacity Analysis for EPE/Design	/	/
☐	X	2130	Prepare Project Purpose and Need	/	/

☐	X	*213M*	*Concurrence by Regulatory Agencies with the Purpose and Need*	/	/
☐	X	2140	Develop and Review Illustrative Alternatives	/	/
☐	X	2155	Request/Perform Safety Analysis for EPE/Design	/	/
☐	X	2160	Prepare and Review EIS Scoping Document	/	/
☐	X	*216M*	*Public Information Meeting*	/	/

MDOT PRECONSTRUCTION TASKS CONSULTANT CHECKLIST

STUDY (EARLY PRELIMINARY ENGINEERING) (cont'd)

YES	NO	P/PMS TASK NUMBER AND DESCRIPTION		DATE TO BE COMPLETED BY (mm/dd/yyyy)	
		EPE DRAFT ANALYSIS			
☐	X	2310	Conduct Technical SEE Studies	/	/
☐	X	2311	Cultural Resources Survey	/	/
☐	X	2312	Recreational Survey – Section 4(f)/6(f)	/	/
		EPE DRAFT ANALYSIS (cont'd)			
☐	X	2313	Endangered Species Survey	/	/
☐	X	2314	Wetland Assessment	/	/
☐	X	2315	Wetland Mitigation	/	/
☐	X	2316	Other Technical Reports	/	/
☐	X	2321	Prepare for Aerial Photography	/	/
☐	X	2322	Finish/Print Aerial Photography	/	/
☐	X	2330	Collect EPE Geotechnical Data	/	/
☐	X	2340	Develop and Review Practical Alternatives	/	/
☐	X	*233M*	*Aerial Photography Flight*	/	/
☐	X	2360	Prepare and Review EA	/	/
☐	X	*236M*	*Approval of EA by FHWA*	/	/
☐	X	2370	Prepare and Review Draft EIS	/	/
☐	X	*237M*	*Approval of Draft EIS by FHWA*	/	/
☐	X	2380	Distribute EA	/	/
☐	X	*238M*	*Public Hearing for EA*	/	/
☐	X	2390	Distribute DEIS	/	/
☐	X	*239M*	*Public Hearing for DEIS*	/	/
		EPE FINAL ANALYSIS			
☐	X	2510	Determine and Review Recommended Alternative	/	/
☐	X	*250M*	*Concurrence by Reg Agencies with Recom Alternatives*	/	/
☐	X	2525	Prepare and Review Engineering Report	/	/
☐	X	2530	Prepare and Review Request for FONSI	/	/
☐	X	*252M*	*Approval of FONSI by FHWA*	/	/
☐	X	2540	Prepare and Review FEIS	/	/
☐	X	*254M*	*Approval of FEIS by FHWA*	/	/

☐	X	2550	Obtain ROD	/	/
☐	X	*255M*	*ROD Issued by FHWA*	/	/
☐	X	2570	ITS Concept of Operations	/	/
		CONTAMINATION INVESTIGATION			
☐	X	2810	Project Area Contamination Survey (PCS)	/	/
☐	X	2820	Preliminary Site Investigation (PSI) for Contamination	/	/

MDOT PRECONSTRUCTION TASKS CONSULTANT CHECKLIST

PRELIMINARY ENGINEERING - DESIGN

YES	NO	P/PMS TASK NUMBER AND DESCRIPTION		DATE TO BE COMPLETED BY (mm/dd/yyyy)	
		DESIGN SCOPE VERIFICATION AND BASE PLAN PREPARATION			
X	☐	3130	Verify Design Scope of Work and Cost	/	/
☐	X	3310	Prepare Aerial Topographic Mapping	/	/
☐	X	3320	Conduct Photogrammetric Control Survey	/	/
☐	X	3321	Set Aerial Photo Targets	/	/
☐	X	3325	Geotechnical Structure Site Characterization	/	/
X	☐	3330	Conduct Design Survey	/	/
☐		3340	Conduct Structure Survey	/	/
X		3350	Conduct Hydraulics Survey	/	/
X	☐	3360	Prepare Base Plans	/	/
☐	☒	*311M*	*Utility Notification*	/	/
☐	X	3365	Pre-Conceptual ITS Design and Meeting	/	/
☐	X	3370	Prepare Structure Study	/	/
☐	X	3375	Conduct Value Engineering Study	/	/
X	☐	3380	Review Base Plans	/	/
☐	X	3385	Preliminary Load Rating	/	/
X	☐	*332M*	*Base Plan Review (Pre-GI Inspection)*	2/22/2017	
X	☐	3390	Develop the Maintaining Traffic Concepts	/	/
		PRELIMINARY PLANS PREPARATION			
X	☐	3500	Develop Transportation Management Plan	/	/
X		3510	Perform Roadway Geotechnical Investigation	/	/
X	☐	3520	Conduct Hydraulic/Hydrologic and Scour Analysis	/	/
X	☐	3522	Conduct Drainage Study, Storm Sewer Design, and use Structural Best Management Practices	/	/
☐	X	3530	Geotechnical Foundation Engineering Report	/	/
☐	X	3535	Conduct Str. Review for Arch. & Aesthetic Improvements	/	/
X	☐	3540	Develop the Maintaining Traffic Plan	/	/
☐	X	3551	Prepare/Review Preliminary Traffic Signal Design Plan	/	/
X	☐	3552	Develop Preliminary Pavement Marking Plan	/	/
☐	X	3553	Develop Preliminary Non-Freeway Signing Plan	/	/

X		3554	Develop Preliminary Freeway Signing Plan	/ /
☐	X	3555	Prepare/Review Preliminary Traffic Signal Operations	/ /
☐	X	3570	Prepare Preliminary Structure Plans	/ /
X	☐	3580	Develop Preliminary Plans	/ /
☐	X	3585	Final ITS Concept Design and Meeting	/ /
X	☐	3590	Review The Plans	/ /
X	☐	*352M*	*THE Plan Review Meeting*	2/16/2018
☐	X	3595	Conduct ITS Structure Foundation Investigation	/ /

MDOT PRECONSTRUCTION TASKS CONSULTANT CHECKLIST

PRELIMINARY ENGINEERING - DESIGN (cont'd)

YES	NO	P/PMS TASK NUMBER AND DESCRIPTION		DATE TO BE COMPLETED BY (mm/dd/yyyy)
		UTILITIES		
X		3610	Compile Utility Information	/ /
☐	X	3615	Compile ITS Utility Information	/ /
☐	X	3650	Coordinate RR Involvement for Grade Separations	/ /
☐	X	3655	Coordinate RR Involvement for At-Grade Crossings	/ /
X	☐	3660	Resolve Utility Issues	/ /
X	☐	*360M*	*Utility Conflict Resolution Plan Distribution*	/ /
X		*361M*	*Utility Meeting*	/ /
☐	X	3670	Develop Municipal Utility Plans	/ /
☐	X	3672	Develop Special Drainage Structures Plans	/ /
☐	X	3675	Develop Electrical Plans	/ /
☐	X	3680	Preliminary ITS Communication Analysis	/ /
☐	X	3690	Power Design (Power Drop in Field)	/ /
		MITIGATION/PERMITS		
☐	X	3710	Develop Required Mitigation	/ /
☐	X	3720	Assemble Environmental Permit Applications	/ /
☐	X	3730	Obtain Environmental Permit	/ /
		FINAL PLAN PREPARATION		
☐	X	3815	Geotechnical Structure Design Review	/ /
☐	X	3821	Prepare/Review Final Traffic Signal Design Plan	/ /
X	☐	3822	Complete Permanent Pavement Marking Plan	/ /
	X	3823	Complete Non-Freeway Signing Plan	/ /
X		3824	Complete Freeway Signing Plan	/ /
☐	X	3825	Prepare/Review Final Traffic Signal Operations	/ /
X	☐	3830	Complete the Maintaining Traffic Plan	/ /
X	☐	3840	Develop Final Plans and Specifications	/ /
X	☐	*380M*	*Plan Completion*	6/1/2018
☐	X	3850	Develop Structure Final Plans and Specifications	/ /

X		3870	Hold Omissions/Errors Check (OEC) Meeting	/ /
☐	X	3875	Final Load Rating	/ /
X	☐	*387M*	*Omissions/Errors Checks Meeting*	6/15/2018
X	☐	*389M*	*Plan Turn-In*	9/11/2018
	X	3880	CPM Quality Assurance Review	/ /
☐	X	3890	Final ITS Communication Analysis	/ /

MDOT PRECONSTRUCTION TASKS CONSULTANT CHECKLIST

PRELIMINARY ENGINEERING – RIGHT OF WAY

YES	NO	P/PMS TASK NUMBER AND DESCRIPTION		DATE TO BE COMPLETED BY (mm/dd/yyyy)
		EARLY RIGHT OF WAY WORK		
☐	X	4100	Real Estate Pre-Technical Work (combines 411M, 4120)	/ /
	X	4150	Real Estate Technical Work (combines 4130, 4140)	/ /
	X	*413M*	*Approved Marked Final ROW*	/ /
		ROW APPRAISAL		
☐	X	4350	Real Estate Appraisals (combines 4411, 4412, 4413, 4420)	/ /
		ROW ACQUISITION		
☐	X	4450	Real Estate Acquisitions (combines 4430, 4710, 4720)	/ /
☐	X	4510	Conduct Right Of Way Survey & Staking	/ /
☐	X	*442M*	*ROW Certification*	/ /

MDOT PRECONSTRUCTION TASKS CONSULTANT CHECKLIST

POST LETTING/AWARD TASKS (for reference only)

YES	NO	P/PMS TASK NUMBER AND DESCRIPTION		DATE TO BE COMPLETED BY (mm/dd/yyyy)
☐	X	4810	Complete Acquisition Process	/ /
☐	X	4820	Manage Excess Real Estate	/ /
☐	X	4830	Provide Post-Certification Relocation Assistance	/ /
☐	X	4910	Conduct ROW Monumentation	/ /
☐	X	5010	Construction Phase Engineering and Assistance	/ /
☐	X	5020	Prepare As-Built Drawings	/ /

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

All billings for services must be directed to the Department and follow the current guidelines. 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.

MDOT will reimburse the consultant for **vehicle expenses and the costs of travel** to and from project sites in accordance with MDOT's Travel and Vehicle Expense Reimbursement Guidelines, dated May 1, 2013. The guidelines can be found at http://www.michigan.gov/documents/mdot/Final_Travel_Guidelines_05-01-13_420289_7.pdf?20130509082418. MDOT's travel and vehicle expense reimbursement policies are intended primarily for construction engineering work. Reimbursement for travel to and from project sites and for vehicle expenses for all other types of work will be approved on a case by case basis.

MDOT will pay **overtime** in accordance with MDOT's Overtime Reimbursement Guidelines, dated May 1, 2013. The guidelines can be found at http://www.michigan.gov/documents/mdot/Final_Overtime_Guidelines_05-01-13_420286_7.pdf?20130509081848. MDOT's overtime reimbursement policies are intended primarily for construction engineering work. Overtime reimbursement for all other types of work will be approved on a case by case basis.

ATTACHMENT A

SCOPE OF SERVICE
FOR
DESIGN SURVEYS
Version: June 2016

TYPE OF SURVEY:

X	Surveying: Road Design (3330)
	Surveying: Structure (3340)
X	Surveying: Hydraulics (3350)
X	Surveying: Right of Way (4510)

(Work in any of the above Survey Services Categories must be completed by a survey firm which is pre-qualified by MDOT for that category.)

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. The selected Survey Consultant must discuss the scope of this survey with an MDOT Survey Consultant Project Manager or an MDOT Region Surveyor before submitting a priced proposal.
4. The selected Survey Consultant must contact the Region or TSC Traffic and Safety Engineer for work restrictions and traffic control requirements. Costs for traffic control must be included in the priced proposal in order to be reimbursed as a direct cost.
5. A **detailed Survey Work Plan** **must** be included with the Priced Proposal. A **spreadsheet estimate** of hours by specific survey task such as horizontal control, leveling, mapping, alignment determination, etc., **must** be included in the **Priced Proposal**.
6. It is the responsibility of the Survey Consultant 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.
7. Surveys must meet all requirements of the *MDOT Design Surveys Standards of Practice* (link: http://mdotwiki.state.mi.us/design/index.php/Chapter_1_-_Survey_Manual_Introduction). Please contact the MDOT Design Survey Support Unit to clarify any specific questions regarding these standards.
8. Survey Consultants must obtain all necessary permits required to perform this survey on

any public and/or private property, including an up-to-date permit from the MDOT Utilities Coordination and Permits Section.

9. Prior to performing the survey, the Survey Consultant must contact all landowners upon whose lands they will enter in accordance with the *MDOT Design Surveys Standards of Practice*. A template letter can be found here: http://mdotwiki.state.mi.us/design/index.php/File:EXAMPLE_Right_of_Entry.pdf
10. The Survey 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 Survey Consultant's priced proposal.
11. The Survey Consultant must adhere to all applicable OSHA and MIOSHA safety standards, including the appropriate traffic signs for the activities and conditions for this job.
12. The MDOT Project Manager is the official contact for the Survey Consultant. The Survey Consultant must send a copy of all project correspondence to the MDOT Project Manager. The MDOT Project Manager shall be made aware of all communications regarding this project. Any survey related questions regarding this project should be directed to an MDOT Survey Consultant Project Manager or MDOT Region Surveyor. **The MDOT Project Manager must be copied on any and all correspondence.**

SURVEY PROJECT LIMITS:

If specific survey limits are not included, then the Survey Consultant must develop the survey limits based on the needs of the design team. A description of survey limits detailing length, width and cross roads must be included in the Survey Work Plan.

RESEARCH:

Survey Consultants are responsible for a comprehensive and conscientious research of all records, including MDOT records, essential for the completion of this project. The MDOT Design Survey Support Unit is available to assist in researching MDOT records.

CONTROL:

If not specified in this scope, Primary and Intermediate Horizontal Control Points and Benchmarks established for this project must meet the requirements specified in Chapter 3 of the *MDOT Design Surveys Standards of Practice*.

The Horizontal and Vertical datums and coordinate system must be clearly stated in the Survey Work Plan and subsequent submittals. For acceptable datums and coordinate systems refer to Chapter 3 of the *MDOT Design Surveys Standards of Practice*.

ALIGNMENT & ROW:

If not defined in this scope, the use of either a Legal or Non-legal Alignment and ROW must be determined from the needs of the design team. If it is determined that MDOT will need to acquire additional ROW with partial takes, then the **Legal** Alignment and ROW must be determined. If it is determined that there will be partial takes, the Survey Consultant may need to prepare a Certified Survey, refer to *Chapter 4 Section 6: Certified Surveys for Real Estate Acquisition* for requirements.

MAPPING:

Mapping shall include the objects and features as needed to meet the requirements of the proposed design. The Survey Consultant's Work plan shall clearly identify mapping items that will be included in the project.

The following should be considered when determining the mapping needs for the project:

- Roadway improvements, curbs, sidewalks, signs, guardrail, light poles
- Intersection signalization equipment
- Building structures and improvements on property adjacent to project
- Drainage appurtenances including ditches, culverts, structures
- Surface manifestations of utilities and connectivity
- Terrain surface mapping
- Trees and brush classification
- Bridge structure elements, measurements, elevations, and underclearance dimensions
- Hydraulics Survey of watercourses
- Use of Static Terrestrial Laser Scanning(STLS)
- Use of Mobile Terrestrial LiDAR Survey(MTL)
- Use of Photogrammetric Mapping

TRAFFIC & SAFETY:

The Selected Survey Consultant, and the Selected Survey Consultant only, is advised to discuss Traffic Control scenarios with the local MDOT TSC Traffic and Safety Engineer NAME at PHONE or EMAIL prior to submitting a priced proposal. Traffic Control costs not included in the priced proposal will not be paid by MDOT.

The Survey Consultant must submit an advanced notice 5-21 days prior to beginning any work activity through the MDOT Construction Permit System (CPS) (http://www.michigan.gov/mdot/0,4616,7-151-9625_72410---,00.html).

The Survey Consultant must adhere to all work restrictions and traffic control requirements detailed in the MDOT Advanced Notice Permit.

The Survey Consultant must have a vehicle with markings/logo that identifies the company within sight distance of survey activity and must have a 360 degree flashing strobe light on the top of the vehicle whenever they are working on or near the road.

Traffic control on city streets and county roads is under the jurisdiction of the local authorities

where the project is located.

COORDINATION WITH OTHER CONTRACTS IN THE VICINITY:

The Survey Consultant shall coordinate operations with contractors performing work on other projects within or adjacent to the Construction Influence Area (CIA).

MDOT maintenance crews and/or Contract Maintenance Agencies may perform maintenance work within or adjacent to the CIA. The Maintenance Division of MDOT and/or Contract Maintenance Agency will coordinate their operations with the MDOT Project Manager or Designate to minimize the interference to the Survey Consultant.

The Survey Consultant must contact the Operations Engineer at the local MDOT TSC for information regarding project coordination.

Other contracts or maintenance operations may occur during the life of the project. Contractors and other consultants involved with construction projects have similar requirements of cooperation and coordination of work as part of their projects as referenced in Article 104.08 of the *2012 Standard Specifications for Construction* (http://mdotcf.state.mi.us/public/specbook/2012/). Survey Consultants shall conduct their work with similar coordination efforts. The Survey Consultant will not be allowed claims for extra compensation or extensions of deadlines due to delays or failures of others to complete scheduled work.

POST SURVEY CLEAN-UP:

Once the survey is complete, all stakes must be removed from the MDOT median and ROW to aid the maintenance crews and adjacent property owners. All benchmarks and control points and their witnesses must remain in place.

DELIVERABLES:

The **MDOT Survey QA/QC Checklist** details the files that are to be submitted to MDOT (link: http://mdotwiki.state.mi.us/design/index.php/File:MDOT_Survey_Project_Checklist_2016.xlsm) . This document shall be signed and certified by the Professional Surveyor responsible for the project QA/QC. **Failure to use and include this document may result in the immediate return of the project portfolio for completion.**

Files submitted to MDOT may vary by project type and scope, the following files **must always** be submitted to MDOT unless explicitly omitted in writing by the following MDOT personnel: MDOT Region Surveyor, MDOT Survey Consultant Manager or MDOT Supervising Land Surveyor:

- Survey Portfolio PDF (XXXXXX_Survey_20YY-MM-DD.pdf)
- Survey Information Sheet (S-XXXXXX_Survey_Info_Sheet_20YY-MM-DD.doc)
- Alignment and ROW CAD file (S-XXXXXX_Align_ROW_20YY-MM-DD.dgn)
- 3D project map (S-XXXXXX_Survey_3D_20YY-MM-DD.dgn)
- When Mobile Terrestrial LiDAR (MTL) or Static Terrestrial Laser Scanning (STLS) techniques are used, three (3) copies of the entire point cloud must be delivered to the

MDOT Survey Support Unit on media with appropriate storage capacity to contain all the data on one device.

- When Photogrammetric Mapping techniques are used, three (3) copies of the raw digital imagery, ortho-imagery and photogrammetrically extracted points cloud data must be delivered to the MDOT Survey Support Unit on media with appropriate storage capacity to contain all the data on one device.

All submitted files must be scanned and/or converted to one PDF format file. A Table of Contents in PDF format is required that has all PDF files bookmarked/linked so each place in the PDF archive can be accessed with a single click. Items required to be included in the Survey Portfolio PDF can be found in the QA/QC Checklist. Specified format files such as Microsoft Word and MicroStation GEOPAK must have separate access in native format outside of the PDF file.

At the completion of this survey for this project, legible copies of all field survey notes, all electronic data, and all research records obtained for this project will be considered the property of MDOT. Please include MDOT's Form 222(5/01) entitled "SURVEY NOTES: RECEIPT AND TRANSMITTAL" for all transmittals. A copy of this transmittal form must be sent to the MDOT Project Manager for Design and the MDOT Supervising Land Surveyor.

Electronic submittal only. Survey deliverables must be submitted using ProjectWise. For file naming conventions and upload locations, refer to Chapter 10 of the *MDOT Design Surveys Standards of Practice*.

Acceptance of this survey by the MDOT Project Manager and/or the MDOT Supervising Land Surveyor does not relieve the Survey Consultant of any liability for the content of the survey.

ATTACHMENT B

SCOPE OF SERVICE
FOR
HYDRAULIC SURVEY
As of February 2016

C.S. 11111 Job No. 118792
I-196 over Riverside and Mohmanny Park Road
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 schedule a site visit with an MDOT Hydraulic Engineer by contacting the MDOT Hydraulics Unit Supervisor, Chris Potvin at 517-335-1919 or Assistant Hydraulics Unit Leader, Larry Wiggins at 517-373-1713. The purpose of the site visit is to discuss details of the survey and to clarify the intent of the survey. The Consultant must take notes at the site visit and submit them promptly to the MDOT Project Manager, MDOT Survey Coordinator and MDOT Hydraulic Engineer.

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 or Region Surveyor).

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

Cross-sections shall be taken at the limits and intervals specified by the MDOT Hydraulic Engineer as described in the Deliverables for Hydraulic Survey. Approximate cross section locations and survey limits are shown in Figure 1. Cross section locations, orientation, point spacing, and distance into the floodplain will be finalized during the site meeting between the MDOT Hydraulic Engineer and Consultant Surveyor. Channel cross-sections shall be taken normal to the direction of ***flood*** *flow* and tied to the 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 Hydraulic Engineer at the site visit. Shots must be taken at intervals through the stream as specified by the Hydraulic Engineer, and at significant break points. Any high water marks and date of occurrence (if available) shall be noted.

Figure 1

The Consultant shall meet the following requirements for hydraulic cross-sections:

1. Cross-sections shall be submitted electronically in a MicroStation/GEOPAK V8 software file.

2. Each cross-section shall be a separate chain named "HYDRO9, HYDRO2", etc. These **HYDRO** chain numbers need not be in sequence, but each HYDRO chain must have a description, labeled in MicroStation/GEOPAK, of 10, 20, 30, etc., in sequence, starting with 10 at the downstream end. Each individual point should have its own particular identifying MDOT Feature Code and the same alpha prefix, such as RBOT, VEGE, TB.

3. A profile of the **highpoints of all berms** such as roads, railroads, or driveways that cross the stream must be included as a separate chain in MicroStation/GEOPAK, with a Feature Code of "**HIPTC**" and named "HIPTC3, HIPTC1", etc. These HIPTC chain numbers need not be in sequence, but each HIPTC chain must have a description of 10, 20, 30, etc., in sequence, starting with 10 at the downstream end. Each HIPTC chain must also have a description, labeled in MicroStation/GEOPAK, that identifies the type of centerline, such as "railroad berm" or "farm drive." **HIPTC chains must be sequenced separately from the HYDRO Chains.** Each individual point should have its own particular identifying MDOT Feature Code and the same alpha prefix, such as CL, SW, WALLT.

4. Each HYDRO and HIPTC cross-section shall be submitted with the points in the chain running all left to right, looking downstream.

5. The cross-sections generally must extend a minimum of 100 feet into the floodplain from the stream top of bank, unless specified otherwise by the MDOT Hydraulic Engineer during the site meeting.

6. For each cross-section, the vegetation break point (the "friction point" between the natural channel and the surrounding vegetation) shall be shot with an alpha prefix and Feature Code of "**RBK**" or "**LBK**" on the right or left side of the waterway, looking downstream. It should have a description of "break point."

7. Subsequent vegetation break points, if applicable, shall be shot with an alpha prefix and Feature Code of "**VEGE**" with a description such as "friction point – grass to shrub," or "friction point – shrub to trees" as appropriate. The vegetation type closest to the stream shall be listed first.

8. The water surface elevations at each cross section shall have a Feature Code and alpha prefix and of "**LWS**" and "**RWS**", taken at the left edge of water and right edge of water looking downstream. All water surface elevations should be taken on the same day. If this is not possible, note the date taken and any event such as rainfall which may affect the water surface elevation. The Consultant must note if any stream bed cross sections were dry, and LWS/RWS shots were unavailable. The note should be shown on the

MicroStation/GEOPAK drawing. **These points are not to be included in the Hydro chains.**

The project surveyor must ensure that all required information is legible and in a form which is easily accessible to the MDOT Hydraulics Unit. A MicroStation/GEOPAK V8 software file, version **08.11.07.566** (as of October 1, 2012), or later, is acceptable. The project surveyor must ensure that all required information is legible and in a form which is easily accessible to the Hydraulics Unit. A HEC-RAS file is acceptable. A comma separated value (.csv), specifically formatted, is recommended. An example is available on the MDOT Design Survey ftp site, or by request of the MDOT Survey Project Manager. Other formats must be discussed in advance with the MDOT Survey Project Manager or MDOT Hydraulics Unit Supervisor.

Only one MicroStation/GEOPAK file per project is desired. The Consultant should not submit separate MicroStation/GEOPAK files for Hydraulics and Road/Structure, unless the Hydraulic Survey is required to be delivered first, in which case the Road/Structure Survey MicroStation/GEOPAK file would be continued/appended to the Hydraulic Survey file.

All elevations shall be referenced to the North American Vertical Datum of 1988 (NAVD88), unless a previously established project datum is required by the MDOT Hydraulic Engineer. If a project datum is used, the MDOT Hydraulic Engineer may require a reference to the North American Vertical Datum of 1988 (NAVD88), or the National Geodetic Vertical Datum of 1929 (NGVD29), or International Great Lakes Datum (IGLD). 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 Hydraulic 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 Hydraulic Survey. It is necessary to provide accurate elevations for underclearances, road and berm profiles, weirs, and anything that controls flow. It is not necessary to provide extremely accurate closures for vertical and horizontal control used for hydraulic cross-sections.

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

A list containing at least two benchmarks, one on either side of the bridge, with descriptions, elevations and datum, must be provided. Since these benchmarks may well be used for road/bridge design and construction, least squares analysis is required.

THE PORTFOLIO FOR THE HYDRAULIC SURVEY MUST BE DELIVERED ELECTRONICALLY IN PROJECTWISE in the External Partnerships section, in the JN-specific Hydraulics folder. All field measurements, notes, sketches, and calculations must be included in the final transmission.

C.S. << >> Job No. << >>

<<Route>> over <<Stream>>
<< >> County , <<Section>>, <<Town>>, <<Range>>

DELIVERABLES FOR HYDRAULIC SURVEY

1. The **riparian owners** and addresses in the four quadrants of the structure and stream, clearly shown. It may be necessary to draw the stream on an Equalization map.

2. **First water access** of all buildings within the survey limits. These shots should use Feature Code **FF** in MicroStation/GEOPAK. A description should be included noting exactly what element is depicted, such as basement window, walkout basement, or first floor.

3. All **pertinent structure data** including water surface elevations, flow lines, invert or footing elevations, opening widths, structure width, pier dimensions, and underclearance elevations, both upstream and downstream, **at the stream structure**. Include an elevation view sketch of both sides of the structure showing this information. Note structure width (measured parallel to stream) across the roadway or railroad.

4. All pertinent **structure data** including water surface elevations, flow lines, invert or footing elevations, opening widths, structure width, pier dimensions, and underclearance elevations, both upstream and downstream, at any **other structures** encountered within the reach of the survey. Include **elevation view sketches** of both sides of **all such structures** showing this information. Note structure width (measured parallel to stream) across the roadway or railroad.

5. Water surface elevations at each section must be provided, with the date taken. The water surface elevations at each cross section shall be taken at the left edge of water and right edge of water. **All water surface elevations should be taken on the same day if possible.** If not, note the date taken and any event such as rainfall which may affect the water surface elevation

6. A **profile of the highpoints of all berms** such as roads, railroads, or driveways that cross the stream must be included as separate chains in MicroStation/GEOPAK, with a Feature Code of "HIPTC" and labeled as "HIPTC3, HIPTC1", etc. These HIPTC chains need not be in sequence, but each HIPTC chain must have a description of 10, 20, 30, etc., in sequence, starting with 10 at the downstream end. Each HIPTC chain must also have a description that identifies the type of berm, such as "railroad berm" or "farm drive." The HIPTC chains are to have descriptions of 10, 20, 30, etc., sequenced separately from the HYDRO chains. Each individual shot in the HIPTC chain should have its own identifying Feature Code and alpha prefix such as CL, SW, or WALLT. Profile shots must be taken at the approximate reference lines of the structure, with an appropriate Feature Code and a description of "approximate reference line."

7. One **road profile** for a minimum of 600 feet along the **highpoints of the state trunkline**, as determined by the MDOT Hydraulic Engineer, with a description or "**M-xx centerline**" if the actual centerline is used. The chain Feature Code must be HIPTC, with a description of "10", or as sequenced in #6 above if there are berms downstream in the survey area. Each

individual shot in the HIPTC chain should have its own identifying Feature Code, such as CL, SW or WALLT. Shots must be taken at the approximate reference lines of a structure, with an appropriate Feature Code and/or point name, such as DECK or SW, and a description of "approx reference line." In the case of a culvert, a road profile shot must be taken at the highpoint at the approximate center of the culvert, with a description of "centerline culvert" and be shown on the MicroStation/GEOPAK file.

8. For the **HYDRO** chains, HEC-RAS format or a comma separated value (.csv) file, in specific MDOT format, must be provided. The CSV must contain columns for River, Reach, X, Y, Z, Feature Code, and Description. The shots for each cross section must be grouped together in the same order that they are in the chain, and the cross section designation (10, 20, 30, etc.) noted. An example is available on the MDOT Design Survey ftp site, or by request of the MDOT Survey Project Manager. Other formats must be discussed in advance with the MDOT Survey Project Manager or MDOT Hydraulics Unit Supervisor.

9. For the **HIPTC** chains, a Microsoft Excel file, in specific MDOT format, must be provided. The Excel file must contain columns for X, Y, Z, Station, and Elevations. Station values must be determined using the Pythagorean equation for the X and Y values between shots. The shots for each chain must be grouped together in the same order that they are in the chain. Examples can be found on the MDOT Design Survey ftp site, or contacting the MDOT Hydraulics Unit, or the MDOT Design Survey Project Manager.

10. A MicroStation/GEOPAK V8 file of the Hydraulics Survey utilizing MDOT Feature Codes and showing the relationship of the cross sections to the structure and the road, and noting the distance between cross sections. The HYDRO and HIPTC chains must show the description numbers of 10, 20, 30, etc. Point numbers must also be shown in small text. RBK and LBK shots, and others (EW) as necessary, must be connected to show the stream footprint. First water access locations and elevations must be shown, along with a notation of what the first water access point is, for example: basement window.

11. A MicroStation/GEOPAK V8 file of the area at the stream crossing, saved to .pdf format, showing a basic map of the bridge including abutments, the road(s), and cross section shots at the upstream and downstream faces of the structure (elevations in small text).

12. **Benchmark list** with descriptions, elevations, and datum; and least squares analysis for benchmarks at the structure.

13. **Two HYDRO cross sections**, one at the **upstream face** and one at the **downstream face** of the structure, excluding roadway embankment.

14. **Upstream** of the structure, hydraulic **cross-sections must be defined by the MDOT Hydraulics Unit.**

15. **Downstream** of the structure, hydraulic **cross-sections must be defined by the MDOT Hydraulics Unit.**