

BRIDGE DESIGN MANUAL

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CHAPTER 5 • CONSULTANT CONTRACTS

5.01 GENERAL

(revised 9-28-2026)

This section is a brief overview of the bridge consultant process. For detailed information regarding consultant contracts, refer to MDOT's [Selection Guidelines for Service Contracts](#) for requirements on consultant selections, contracting, and administration.

It is the policy of MDOT to select consultants when the existing staff of the Design Support Area cannot meet the workload, or when the degree of difficulty of a project requires expertise that is not available within the Design Support Area engineering staff.

5.02 PROJECT OVERSIGHT

(revised 9-28-2026)

A Bridge Unit Project Manager will manage the consultant bridge projects. This oversight will be general in nature and involve acceptance rather than approval of the design package. Final responsibility for accuracy and quality of work rests with the bridge consultant.

Consultants shall use AASHTO standards and MDOT guidelines to design all bridge work for MDOT. (When required by specific designs, Consultants will use other related design standards and guides such as AREMA, ASTM, ACI, etc.) Where conflicts arise between standards, the MDOT Bridge Project Manager will be the final authority as to the applicable design standards.

5.03 CONSULTANT SELECTION PROCESS

5.03.01 Advertisement for Professional Services

(revised 9-28-2026)

MDOT advertises professional services through the MiLogin e-Proposal system. Consultants must have a MiLogin account to view Requests for Proposals (RFPs) and to submit proposals through e-Proposal. MDOT posts and administers RFPs in accordance with the [Selection Guidelines for Service Contracts](#) and the [Vendor and Consultant Services](#) website.

Follow the RFP instructions provided in the MDOT Selection Guidelines. When qualification forms are required, use the SF330, consistent with federal practice.

Some service classifications require Consultants to be prequalified as a prerequisite to submitting proposals for contracting. Prequalification must be approved on or prior to the proposal due date. Prequalification is no guarantee of being selected for a contract. The MDOT Contract Services Division (CSD) maintains the MDOT Consultant Prequalification Application Instructions. This information is available on the [MDOT Vendor and Consultant Services](#) website.

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5.03.02 Prime Consultant and Subconsultant

(revised 9-28-2026)

Follow the guidelines and requirements for Subcontracts located on the [MDOT Vendor and Consultant Services](#) website. The prime consultant is the party responsible for the project and will be the primary contact for the project. The prime consultant will be responsible for the performance of the subconsultant.

5.03.03 Scope of Work

(revised 6-24-2019)

The description of the scope of work shall list elements of the project that are the responsibility of the consultant and all elements that are the responsibility of MDOT (or others). Some of the items that should be addressed, depending on the nature of the project, are:

- A. A complete design of the structure using applicable standards and current engineering practice. (Give a brief description of the structure, and number of structures.)
- B. Preparation of contract plans and bid item quantities.
- C. Preparation of any specifications required to supplement MDOT's Standard Specifications for Construction.
- D. Any pickup survey or field measurements required to supplement the data provided by MDOT (e.g. camber in existing beams). Any survey required for a hydraulic analysis.
- E. A complete hydraulic analysis to determine the required waterway area at the structure and to determine scour potential. (Include a copy of MDOT's procedures). Normally, two comparative hydraulic analyses are required by the FHWA. For scope of work statement for hydraulic study and scour analysis, see BDM [Appendix 5.03.03 A.1.e.](#) and/or [PPD Task Manual](#) Section 3.3, Task 3520.
- F. Soil borings of sufficient depth and number and a geotechnical analysis to perform the foundation design and/or scour analysis. For scope of work statement for geotechnical services, see BDM [Appendix 5.03.03 A.1.f.](#) and/or [PPD Task Manual](#) Section 3.3, Task 3530.
- G. Preparation of permit requests. (MDOT will submit these.)
- H. Necessary contacts with concerned agencies: e.g. Michigan Department of Environment, Great Lakes and Energy (EGLE), municipalities, utilities, railroad, State Historic Commission.
- I. Participation in meetings and field reviews at the site.
- J. Solutions to any unique problems, e.g. utility interference, staging for part width construction.
- K. With concurrence from Region Traffic Engineer, provide plans and specifications for maintaining traffic during construction.
- L. Additional scope of work items for Rehabilitation Projects:

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1. The following additional items should be considered for agreements involving rehabilitation.
 - a. Inspect the existing bridge and job site to determine the extent and complexity of rehabilitation work and to determine the need for any additional work not included in the Description of Project.
 - b. Prepare a life cycle cost comparison between the intended rehabilitation and complete replacement. (This item may have to be presented as "Stage I" of the agreement as the scope of the remaining services may depend on the results of this comparison.)
 - c. Analyze the existing structure to determine if it conforms to current specifications and loading conditions.
 - d. Perform a deck condition survey to determine the location and proportions of visible spalls and patches and also subsurface delaminations. With concurrence from MDOT's Region Traffic Engineer, provide traffic control to permit this work.

M. Construction Services

1. When contract award is to be made soon after plan completion, the following items should be considered. It should be made clear that the fees for each of these is clearly defined and not combined with the fee for plan preparation.
 - a. Review of fabricator's shop drawings (structural steel, prestressed concrete beams, modular expansion joints).
 - b. Provide design assistance with problems that may arise during construction. (This does not include problems which result from plan errors or omissions.) MDOT will provide an estimate of the number of hours that a total fee can be based upon. Payment, however, will be based on actual number of hours required.

In addition to the required services, the proposal shall also acknowledge the consultant's responsibility to maintain office records, submit monthly progress reports, and submit MDOT vouchers with their billings. The technical proposal shall include a schedule of plan preparation. The schedule shall make provisions for MDOT and FHWA reviews and approvals prior to proceeding with preparation of final plans.

5.04 CONSULTANT COORDINATION

Coordination between the consultant and MDOT is the responsibility of the Design Engineer (Project Manager) to whom the project has been assigned.

5.04.01 Agreement Preparation

The Project Manager provides assistance when the agreement is being prepared and reviews the "Scope of Work" as prepared by the consultant. (The "Scope of Work" becomes an exhibit to the agreement.) He reviews the final agreement for form and completeness.

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5.04.02 Plan Information

A. MDOT Provided Materials

1. The Project Manager will provide the following material as needed by the consultant:
 - a. Engineering Reports and supplements
 - b. Supplemental Specifications and Special Provisions
 - c. Road Plans, survey notes, soil data
 - d. Plan materials; i.e., special detail sheets, expansion joint sheets, etc.
 - e. Coding for Payment Voucher
 - f. Payment Voucher forms
 - c. Prints of sample job for use as a guide

B. Consultant Purchased Materials

1. The following material is available to the consultant by purchasing from the Contracts Division:
 - a. Bridge Design Guides
 - b. Bridge Design Manual
 - c. Road and Bridge Standard Plans
 - d. Construction Specifications
 - d. Pay Item Code Book

5.04.03 MDOT Contacts

The MDOT Project Manager is the contact between MDOT and the consultant in matters regarding the preparation of bridge designs and plans. Contacts between consultants and other personnel should be avoided.

5.04.04 Consultant Identification on Plans

Use the following procedure for all plans that consultants prepare:

- A. The consultant shall seal the title sheet.
- B. The consultant shall revise the block on the title sheet labeled "Plans Prepared By" to read "Plans Reviewed By" and shall indicate the name of the coordinating MDOT Design Engineer.
- C. The consultant shall place its name or logo in or adjacent to the title block on all plan sheets.
- D. The consultant's personnel shall provide their initials in each sheet's title block

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5.04.05 Design Milestone Review Process

(revised 9-28-2026)

MDOT requires all design projects to follow the Milestone Review Process detailed in the [MDOT Development Guide](#). This process includes information on required milestone meetings and submittals.

5.04.06 Waterway Permits

(revised 9-28-2026)

The consultant prepares the data required for the waterway permit and forwards it to the MDOT Region Permit Coordinator for review prior to sending the data to Michigan Department of Environment, Great Lakes and Energy (EGLE), U.S. Army Corps of Engineers or U.S. Coast Guard. For additional information regarding permits, see BDM [Chapter 12](#).

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**SCOPE OF WORK STATEMENT FOR HYDROLOGIC, HYDRAULIC, AND SCOUR
ANALYSES (PPD TASK 3520) (9-28-2026)**

1. SCOPE:

This procedure addresses the Consultant's duties in the preparation of the hydrologic and hydraulic analyses for waterway crossings (bridges and culverts) and scour analysis with scour countermeasure design for bridges.

2. WORK STEPS:

2.1 HYDROLOGIC ANALYSIS

A. For waterway crossings with **drainage areas equal to or greater than two square miles**, send a request for the 10%, 2%, 1%, 0.5%, and 0.2% flood frequency discharges to the Hydrologic Studies Unit, Land and Water Management Division, Michigan Department of Environment, Great Lakes, and Energy.

For waterway crossings with **drainage areas less than two square miles**, compute the 2% and 1% flood frequency discharges using the methodology outlined in [Chapter 4](#) of the Road Design Manual. If the crossing is classified as a bridge (this includes culverts with spans equal to or greater than 20 feet and no bottom slab), the 0.2% flood frequency discharge must also be computed for the scour analysis.

B. Submit a copy of the EGLE flood frequency discharge estimates or the discharge calculations to the MDOT Project Manager for review and approval by the Hydraulic Unit Supervisor prior to starting the Hydraulic Analysis in work step 2.2.

2.1 HYDRAULIC ANALYSIS

Conduct hydraulic analyses to compute water surface profiles for the existing and proposed waterway crossings, using the 10%, 2%, 1%, 0.5%, and 0.2% flood frequency discharges. The hydraulic analyses must show no harmful interference to adjacent riparian owners and upstream properties.

A hydraulic analysis is required for, but not limited to, any of the following conditions:

1. A new or replacement culvert or bridge
2. Bridge superstructure replacements
3. Culvert or bridge extensions
4. Proposed work on a culvert or bridge that has a drainage area greater than 2 square miles
5. A raise in road grade greater than the average thickness of a top course
6. Proposed bridge work that will potentially affect the energy grade line of the watercourse

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In addition to the hydraulic analysis, a hydraulic report must be submitted when any of the above has a drainage area greater than 2 square miles. The required format for a hydraulic report can be found in the Supplemental Information section of this task.

PROCEDURE:

- A. Obtain the results of the Hydraulic survey according to the work steps outlined in PPD TASK 3350 - CONDUCT HYDRAULIC SURVEY.
- B. Conduct and document a site investigation of the stream and surrounding area. Take photographs upstream and downstream of the site, including any existing structures modeled in the study and the upstream and downstream overbank areas at the crossing.
- C. For both existing and proposed conditions, determine the water surface profiles for the flood events listed in work step 2.1. Refer to RDM Section [4.05.03](#), Chapters 5 and 6 of the [Drainage Manual](#), and the Supplemental Information section of this task and for software modeling guidance.
- D. If a hydraulic report is not required, the results of the hydraulic analyses must be summarized in a table comparing data for existing and proposed conditions. A sample table is in Section 3.6 of the Supplemental Information.
- E. Submit copies of the hydraulic analysis, report, and certification to the MDOT Project Manager for review and approval by the Hydraulic Unit Supervisor prior to the Plan Review Meeting. Include all design assumptions with the hydraulic analysis.
- F. Receive any items returned by the MDOT Project Manager as incomplete or deficient.
- G. Make necessary changes and resubmit the entire package including a written response to all comments. Keep copies of the MDOT comments and the revised materials for the project record.
- H. Receive the MDOT Submittal Evaluation form. Contact the MDOT Project Manager if one is not received within two weeks of submitting the hydraulic analysis report.
- I. If the waterway crossing is classified as a bridge (see Section 2.1.A), proceed with work step 2.3.

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2.3 SCOUR ANALYSIS AND SCOUR COUNTERMEASURE DESIGN FOR PROJECTS INVOLVING BRIDGES

The scope of this section is to prepare a scour analysis and design scour countermeasures for a bridge structure.

A. Obtain soil boring logs and test data.

- i. If PPD TASK 3530 - CONDUCT FOUNDATION STRUCTURE INVESTIGATION is a Consultant task, then coordinate the geotechnical investigation to include a minimum of three soil borings and representative samples of each stratum encountered to a depth of 25 feet. Obtain representative samples from each stratum encountered for identification and gradation analysis. Classify samples using ASTM D 2487-85 and determine particle size distribution using AASHTO T-88. Provide a cumulative particle-size plot for each sample tested.

Take one boring at the upstream face of the structure in the center of the channel; take the remaining borings at the abutments on the overbanks. These samples will provide data for estimating scour depths in work step 2.3.B. Site conditions, access restrictions, type and size of the structure, and engineering judgement may alter the location and number of borings; in general, the boring pattern shall be sufficient to determine the extent, thickness, and location in plan and profile of all soil layers within the potential scour zone.

Include a copy of all soil boring logs and test data as an appendix to the Scour Analysis Report of work step 2.3.B.

- ii. If PPD TASK 3530 - CONDUCT FOUNDATION STRUCTURE INVESTIGATION is **NOT** a Consultant task, then send a request for the soil boring logs and test data information to the MDOT Project Manager. Include a copy of all soil boring logs and test data as an appendix to the Scour Analysis Report of work step 2.3.B.

B. Do not finalize the scour analysis until approval is received from MDOT for the hydraulic analysis done in work step 2.2. Prepare a scour analysis for the scour design and check flood events noted in Chapter 6 of the MDOT Drainage Manual. using the most recent versions of the Federal Highway Administration's Hydraulic Engineering Circulars No's. 18 and 20. Complete the Level 2 worksheet as outlined in the "MDOT Guidelines For Evaluation of Scour at Structures" and include the worksheet in the Scour Analysis Report.

C. If potential scour is identified in work step 2.3.B., design scour countermeasures per HEC-18. The proposed countermeasures must not cause a harmful interference to adjacent riparian owners and upstream properties, which may require additional hydraulic analysis. The Consultant is responsible to ensure adequate lateral stability exists for the bridge structure under all scour conditions (see PPD Task 3570).

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- D. Do not finalize the scour analysis until approval is received from MDOT for the hydraulic analysis done in work step 2.2. Prepare a scour analysis for the scour design and check flood events noted in Chapter 6 of the MDOT Drainage Manual. using the most recent versions of the Federal Highway Administration's Hydraulic Engineering Circulars No's. 18 and 20. Complete the Level 2 worksheet as outlined in the "MDOT Guidelines For Evaluation of Scour at Structures" and include the worksheet in the Scour Analysis Report.
- E. If potential scour is identified in work step 2.3.B., design scour countermeasures per HEC-18. The proposed countermeasures must not cause a harmful interference to adjacent riparian owners and upstream properties, which may require additional hydraulic analysis. The Consultant is responsible to ensure adequate lateral stability exists for the bridge structure under all scour conditions (see PPD Task 3570).
- F. Submit copies of the Scour Report with final scour countermeasure design (see Section 3.8 in the Supplemental Information) to the MDOT Project Manager for review and approval by Hydraulic Unit Supervisor.
- G. Receive any items returned by the MDOT Project Manager as incomplete or deficient.
- H. Make necessary changes and resubmit the entire package including a written response to all comments. Keep copies of the MDOT comments and the revised materials for the project record.
- I. Receive the MDOT Submittal Evaluation form. Contact the MDOT Project Manager if one is not received within two weeks of submitting the Scour Analysis Report.
- J. Incorporate any review comments in the analysis and design of the bridge foundation (See PPD task 3530).

3.0 SUPPLEMENTAL INFORMATION

Additional information on MDOT's policy and procedures can be found in the following references:

- A. MDOT Road Design Manual, [Chapter 4](#), Drainage
- B. MDOT [Bridge Design Manual](#) (various chapters)
- C. HYDRAULIC SURVEY PPD TASK 3350 FOR BRIDGES AND CULVERTS
- D. MDOT Guidelines for Evaluation of Scour at Existing Structures
- E. For an example table for culvert data see [Appendix 5-D in the MDOT Drainage Manual](#)
- F. For Hydraulic Report format and Certification form see [Appendix 6-C in the MDOT Drainage Manual](#)

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3.1 Scour Report Format (BRIDGE PROJECTS ONLY)

The scour analysis with proposed scour countermeasure design is a bound report. It contains a summary and recommendations for proposed scour countermeasures. This report includes a summary table, a plot of the potential scour, calculations with background data, and copies of the Level 2 worksheet from MDOT's "Guidelines for Evaluation of Scour at Existing Structures." Values automatically calculated by HEC-RAS are not acceptable. The calculations must be done by hand or using a spreadsheet, and printouts of the HEC-RAS or SMS output with the calculations parameters highlighted must be included in the report. The appendix of this report shall contain survey notes, soil borings, sieve analyses, protective treatment design, and plans. Any questions should be referred to the Hydraulic Unit Supervisor. See [Appendix 6-D of the Drainage Manual](#) for more information.

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**SCOPE OF WORK STATEMENT FOR
FOUNDATION STRUCTURE INVESTIGATION (PPD TASK 3520) (9-28-2026)**

1. SCOPE

(revised 7-29-2019)

This procedure describes the Consultant's responsibilities in performing the FOUNDATION STRUCTURE INVESTIGATION (PPD TASK 3530). This task is typically part of bridge projects.

This procedure covers a geotechnical investigation that must be in accordance with MDOT's [Geotechnical Manual](#). This investigation is necessary for all new structures and those existing structures that are to be widened or subjected to increased loads. The product of this task is a Geotechnical Report.

2. WORK STEPS:

(revised 7-29-2019)

Review and evaluate existing information such as existing borings, existing recommendations, etc., if available.

Plan any additional soil borings necessary.

Consultants must obtain all necessary permits, including an up-to-date permit from the MDOT Utilities Coordination and Permits Section, required to perform this survey on any public and/or private property.

For protection of underground utilities and according to Public Act 53, 1974, the Consultant shall place A FREE locate request for public facilities by using the online [e-Locate](#) application or dial Miss Dig (1-800-482-7171) a minimum of three full working days, excluding Saturdays, Sunday, and holidays, before beginning each excavation in areas where public utilities have not been previously located. Utility members will thus be routinely notified. This does not relieve the Consultant of the responsibility of notifying utility owners who may not be a part of the Miss Dig alert system.

The Department's freeway lighting system, the ITS, and other miscellaneous electrical systems are not a part of Miss Dig. Contractors must submit a staking request on [Form 5300](#) 72 hours before digging in or near MDOT freeway right-of-way.

Take soil borings, perform in-situ testing and collect soil samples.

Perform laboratory analyses.

Prepare the Geotechnical Report Submittal package. Contact the MDOT Project Manager if you have questions regarding submittal requirements. The submittal package shall include the following:

- A cover letter stating conformance to the MDOT [Geotechnical Manual](#).
- List of outstanding questions and/or considerations.

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Submit the report to the MDOT Project Manager.

Receive any items returned by the MDOT Project Manager as incomplete or deficient.

Make necessary changes and resubmit the revised materials. Keep copies of the MDOT Project Manager's comments and the revised materials for the project record.

Receive the MDOT Submittal Evaluation form. Contact the MDOT Project Manager if one is not received within two weeks of submitting the Geotechnical Report.

3. SUPPLEMENTAL INFORMATION

(revised 7-29-2019)

For mor information, refer to the following items available through the MDOT web site:

- MDOT [Geotechnical Manual](#)
- MDOT [Bridge Design Manual](#)