

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

MDOT PROJECT MANAGER Rebecca Curtis			JOB NUMBER (JN) Various	CONTROL SECTION (CS) Statewide
PROJECT DESCRIPTION As Needed Bridge Load Rating Services - Standard Structures				
ESTIMATED COST PER JN			CONSULTANT: Provide only checked items below in proposal.	
ESTIMATED HOURS PER JN				
Check the appropriate Tier in the box below				
<input type="checkbox"/> TIER I (\$25,000-\$99,999)	<input type="checkbox"/> TIER II (\$100,000-\$250,000)	<input checked="" type="checkbox"/> TIER III (>\$250,000)	MDOT PROJECT MANAGER: Check all items to be included in RFP. WHITE = REQUIRED GRAY SHADING = OPTIONAL	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Understanding of Service	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<i>Innovations</i>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Safety Program</i>	
N/A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Organization Chart	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Qualifications of Team	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Past Performance	
Not required as part of official RFP	Not required as part of official RFP	<input checked="" type="checkbox"/>	Quality Assurance/Quality Control	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	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	<input type="checkbox"/>	Presentation	
N/A	N/A	<input type="checkbox"/>	Technical Proposal (if Presentation is required)	
3 pages (MDOT forms not counted) (No Resumes)	7 pages (MDOT forms not counted)	19 pages (MDOT forms not counted)	Total maximum pages for RFP not including key personnel resumes	

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 _____

<input checked="" type="checkbox"/> Prequalified Services – See page ___ of the attached Scope of Services for required Prequalification Classifications.	<input type="checkbox"/> 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)
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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.

PROPOSAL SUBMITTAL INFORMATION

REQUIRED NUMBER OF COPIES FOR PROJECT MANAGER 4	PROPOSAL/BID DUE DATE 7/16/10	TIME DUE 5pm
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PROPOSAL AND BID SHEET MAILING ADDRESSES

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

MDOT Project Manager MDOT Other

Rebecca Curtis
Michigan Department of Transportation
PO Box 30049
Lansing, MI 48909

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

The following two American Recovery and Reinvestment Act of 2009 (ARRA) notifications, **ARRA MONTHLY EMPLOYMENT REPORTS** and **REQUIRED CONTRACT PROVISIONS TO IMPLEMENT AMERICAN RECOVERY AND REINVESTMENT ACT (ARRA) SECTIONS 902 AND 1515**, are attached to this Request For Proposal for your understanding. These two notifications are only applicable for those projects/contracts funded with ARRA funds and will be included in contract Exhibits.

MDOT FORMS REQUIRED AS PART OF PROPOSAL SUBMISSION

5100D – Request for Proposal Cover Sheet

5100G – Certification of Availability of Key Personnel

5100I – Conflict of Interest Statement

5100J - Consultant Data and Signature Sheet (Required only for Non-Prequalified Work)

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

Notification
ARRA MONTHLY EMPLOYMENT REPORTS
Note: This Notification is only applicable for those projects/contracts funded with ARRA funds. If you have questions, please contact MDOT Contract Services Division at (517) 335-0071.

The American Recovery and Reinvestment Act of 2009 (ARRA), requires states receiving stimulus funds for highway projects to provide monthly reports to the Federal Highway Administration (FHWA) regarding the number of employees of the prime contractors, all-tier subcontractors and consultants on ARRA funded projects.

The cost for complying with this Notification must be borne by the prime contractor, and all-tiers of subcontractors and consultants, as part of their overhead and is deemed to be included in the payments made under this contract.

Within 10 days after the end of each month in which work is performed on this contract, all prime contractors and consultants must provide the Engineer a monthly report on MERS at <https://sso.state.mi.us/> providing employment information on each ARRA project, which will include, for work performed in that preceding month:

- The total number of employees who performed work on this contract.
- The total number of hours worked by employees who performed work on this contract.
- The total wages of employees who performed work on this contract.

Prime Consultants are responsible for reporting on all subconsultants' employment information in MERS, as the sub consultants will not have access to do so.

In addition, the prime contractor must provide a total payment amount made to any subcontractor who is a certified DBE in that preceding month.

This Notification shall be included as a part of each subcontract executed by the prime contractor, and all-tiers of subcontractors and consultants.

If necessary to conform to guidance provided by FHWA concerning the ARRA reporting requirements, the prime contractor, and all-tiers of subcontractors and consultants will revise their reporting as directed by the Engineer.

Failure to comply with the reporting requirements under ARRA would jeopardize the Department's continued receipt of ARRA funding.

Accordingly, if a contractor or any-tier of subcontractor or consultant fails to comply with this Notification, the Department may withhold contract payments until compliance is achieved. If the Department is compelled to incur costs because of such a breach, the amount of those costs may be deducted from payments otherwise to be made under this contract. Additional sanctions may include reduction or elimination of prequalification ratings and removal of bidding privileges.

**NOTIFICATION
REQUIRED CONTRACT PROVISIONS TO IMPLEMENT AMERICAN
RECOVERY AND REINVESTMENT ACT (ARRA) SECTIONS 902 AND 1515**

Note: This notification is only applicable for those projects/contracts funded with ARRA funds. If you have questions, please contact MDOT Contract Services Division at (517) 335-0071.

In accordance with requirements under section 902 of the American Recovery and Reinvestment Act of 2009 (ARRA), the following language is made a part of this contract and is to be made a part of all tier subcontracts or consultant contracts:

The U.S. Comptroller General and his representatives have the authority:

- (1) To examine any records of the contractor or any of its subcontractors, or any State or local agency administering such contract, that directly pertain to, and involve transactions relating to, the contract or subcontract; and
- (2) To interview any officer or employee of the contractor or any of its subcontractors, or of any State or local government agency administering the contract, regarding such transactions.

The Comptroller General and his representatives have the authority and rights provided under Section 902 of the ARRA with respect to this contract. As provided in section 902, nothing in section 902 shall be interpreted to limit or restrict in any way any existing authority of the Comptroller General.

In accordance with the requirements of section 1515(a) of the ARRA any representatives of the Inspector General have the authority:

- (1) To examine any records of the contractor or grantee, any of its subcontractors or sub-grantees, or any State or local agency administering such contract, that pertain to, and involve transactions relating to the contract, subcontract, grant, or sub-grant; and
- (2) To interview any officer or employee of the contractor, grantee, sub-grantee or agency regarding such transactions.

Nothing set forth in section 1515 of the ARRA shall be interpreted to limit or restrict in any way any existing authority of an inspector general.

Michigan Department of Transportation

**SCOPE OF SERVICE
FOR
SPECIALTY SERVICES**
“As Needed” Bridge Engineering Analysis
Bridge Load Rating Services for Standard Structures

CONTROL SECTIONS: Various

JOB NUMBER: Various

PROJECT LOCATION: Various locations throughout the State.

PROJECT DESCRIPTION:

This scope of service is to perform structural analysis on bridges on an as needed basis in conformance with National Bridge Inspection Standards (NBIS) and MDOT policies and procedures. Steel, reinforced concrete, and prestressed concrete bridges will be included. Arches and trusses will be excluded.

The Load Rating analysis consists of bridges and culverts, including calculating the Federal Inventory, Federal Operating, and Michigan Operating Load Ratings, Load Posting requirements and Overload Class. Should the initial rating determine that load posting or Overload Class reduction is necessary, more detailed analyses may be required. Services will be required as directed by the MDOT Project Engineer Manager; durations of time will be established at the time of request.

Full time services will not be required on all projects at all times. This scope is for “as needed” services, based on the intermittent needs of MDOT and is set up for approximately 400 structures (1600 Spans). It must be noted that this is not a guarantee that MDOT will use the Consultant’s services. Every attempt will be made to submit requests and schedule at least one week prior to the need for personnel, however it is expected that any requests made will be complied with within a 48 hour period. If the consultant is unable to fulfill the request, MDOT may utilize a secondary Consultant for the services.

Project meetings shall occur at the Lansing Construction and Technology Building.

Up to five (5) consultants will be chosen for “as-needed” contracts up to \$800,000 each. Number of structures assigned to each consultant will be determined by future needs.

DBE REQUIREMENT: N/A

ANTICIPATED PROJECT START DATE: September 1, 2010

ANTICIPATED PROJECT COMPLETION DATE: September 30, 2013

PRIMARY PREQUALIFICATION CLASSIFICATION:

Bridge Load Rating Analysis

SECONDARY PREQUALIFICATION CLASSIFICATION:

None

MDOT PROJECT ENGINEER MANAGER:

Rebecca Curtis, Load Rating Engineer
Construction and Technology, Bridge Management Unit
Secondary Complex
8885 Ricks Road
P.O. Box 30049
Lansing, MI 48909
Phone: (517)-322-1186
Fax: (517)-322-5664
Email: curtisre@michigan.gov

REQUIRED MDOT GUIDELINES AND STANDARDS:

Work shall conform to current MDOT, FHWA, and AASHTO practices, guidelines, policies, and standards (i.e., AASHTO Manual for Condition Evaluation of Bridges, AASHTO Standard Specifications for Highway Bridges, MDOT Bridge Analysis Guide, etc.).

GENERAL INFORMATION:

The NBIS requires analyzing all highway bridges to determine load capacity. FHWA requires that analyses use the Load Factor or Load and Resistance Factor methods for those items reported to FHWA (see Attachment D), those being the Inventory Rating and Federal Operating Rating. MDOT requires that bridges be analyzed for ability to carry the higher legal loads in Michigan, and this analysis may be done using any accepted methodology (LF, WS, or LRFD) according to the 2005 Bridge Analysis Guide with Interims.

CONSULTANT RESPONSIBILITIES:

The work consists of the following major tasks:

- A. Meet with MDOT Project Engineer Manager to review project.
- B. Obtaining the AASHTOWare™ Virtis software, version 6.2 or current version
- C. Review the BSIR and plans to ensure that the information is current
- D. Creating a model of each structure in Virtis that can be included in the MDOT Virtis structure library where possible. Substructures are not included in this analysis.
- E. For structures that cannot be modeled in Virtis, to rate using alternate means (hand calculations or other software approved by MDOT Project Engineer Manager) with an additional “proposed” cross-section as determined by the MDOT Project Engineer Manager
- F. Notifying the MDOT Project Engineer Manager immediately of any structure that may require reduction to load posting or Overload Class status. Creating and

- providing to MDOT detailed explanations for any structures requiring any change to load posting or Overload Class status, including strengthening or repair recommendations as appropriate
- G. Compiling results and preparing summaries for MDOT as shown in the attached example
 - H. Quality Assurance and Quality Control
 - I. Tracking progress and prioritizing work based on MDOT Project Engineer Manager

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

- A. Meet with the MDOT Project Engineer Manager to review project, location of data sources and contact persons, and review relevant MDOT operations. The Project Kick-off Meeting will be held at the Lansing Construction and Technology Center. 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 bridge load ratings by the project completion date.
 - a. The CONSULTANT representative shall record and submit type-written minutes for all project related meetings to the MDOT Project Engineer Manager within two weeks of the meeting. The CONSULTANT shall also distribute the minutes to all meeting attendees.
 - b. Attend any project-related meetings as directed by the MDOT Project Engineer Manager.
 - c. The MDOT Project Engineer 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 Engineer Manager. This includes all Subcontractor correspondence, correspondence with Virtis Technical Support and verbal contact records.
 - d. MDOT will furnish the CONSULTANT with the following material for each bridge:
 - i. Structure Inventory and Appraisal (SI&A) form
 - ii. As Built Plans on CD in .tif format and/or hard copies of plans
 - iii. Bridge Safety Inspection Reports (BSIR)
 - iv. Detailed Bridge Inspection Reports, if applicable
 - v. XML file containing MDOT standard vehicles for analysis
 - e. In addition, MDOT will provide the following:
 - i. Bridge Analysis Guide 2005 Edition with Interims
 - ii. Bridge Analysis Assumption Form (electronic version)
 - iii. Bridge Analysis Summary Form (electronic version)
 - iv. Bridge Design Guides and Manual
 - v. Michigan Structure Inventory and Appraisal Guide
 - vi. Research Report R-1511

- f. The CONSULTANT will be responsible for obtaining the following:
 - i. AASHTO Manual for Condition Evaluation of Bridges, 2nd Edition with Interims
 - ii. AASHTO Standard Specifications for Highway Bridges, 2002 Edition with Interims
 - iii. AASHTO LRFD Bridge Design Specifications, 4th Edition with Interims
 - iv. AASHTO Guide Manual for Condition Evaluation of Bridges and Load and Resistance Factor Rating (LRFR) of Highway Bridges, 1st Edition with Interims
 - v. Adobe Acrobat Software
 - g. The Project Kick-off Meeting will be held within one week of Notice to Proceed.
- B. The CONSULTANT will contact Wendy Gagnier of AASHTO to arrange for the consultant licensing of Virtis. She is reachable at (202) 624-3610, or by e-mail at wgagnier@aaashto.org.
- C. The CONSULTANT shall compare the BSIR and SI&A forms to the provided plans for consistency. Inconsistencies shall be reported to the MDOT Project Engineer Manager prior to computing the load rating. The MDOT Project Engineer will locate incomplete plan sets and missing required information or the structure will be substituted.
- D. The CONSULTANT shall rate each bridge using the Virtis software wherever possible. The bridges shall be modeled using the “Girder System” method where the complete framing plan is described. The structure typical section shall be completely modeled as well. The Load Factor or Load and Resistance Factor method shall be used as described in Appendix D. The input into the Virtis program should reflect any significant deterioration indicated by the BSIR or the field inspection. Determination of significant deterioration should be reviewed with the MDOT Project Manager prior to performing the analysis. The following ratings shall be computed:
- a. The Inventory Rating (NBI Item 66)
 - b. The Federal Operating Rating (NBI Item 64)
 - c. The Michigan Operating Rating (MDOT Item 64M), in US tons - This rating shall be computed using truck selection and distribution factors from the 2005 MDOT Bridge Analysis Guide with Interims for LFR and as per MDOT Research Report R-1511 for LRFR.
 - d. The Michigan Overload Class (MDOT Items 193) including the S, R or unrestricted flag. This class is determined according to the Michigan Structure Inventory and Appraisal Guide and as follows:
 - i. Analyze the bridge for 20 trucks (Michigan Overload Truck 01-20 Class A. If the Rating Factor for each of these trucks is >1, then the bridge is Class A and steps b and c may be skipped. There is some room for engineering judgment, if only 1 or 2 of the trucks

- do not pass for Class A and the rating factor for each of them is > 0.97 , then the bridge may be classified as Class A.
- ii. If the bridge does not pass for Class A, then the bridge shall be analyzed for Class B trucks (Michigan Overload Truck 01-20 Class B). It is only necessary to analyze those vehicles where the rating factor for Class A was < 1 . For example, if only five trucks were found to have a Class A Rating Factor < 1 , then only five need be analyzed for Class B loads. There is some room for engineering judgment, if only 1 or 2 of the trucks do not pass for Class B and the rating factor for each of them is > 0.97 , then the bridge may be classified as Class B.
 - iii. If the bridge does not pass for Class B, then the bridge shall be analyzed for Class C trucks (Michigan Overload Truck 01-20 Class C). It is only necessary to analyze those vehicles where the rating factor for Class B was < 1 . For example, if only five trucks were found to have a Class B Rating Factor < 1 , then only five need be analyzed for Class C loads. There is some room for engineering judgment, if only 1 or 2 of the trucks do not pass for Class C and the rating factor for each of them is > 0.97 , then the bridge may be classified as Class C.
 - iv. If the bridge cannot pass for Class C, even allowing for engineering judgment, then the bridge will be classified as Class D. The bridge should be analyzed for the maximum axle loads allowed for each Overload Truck configuration, and this information should be given to the MDOT Project Engineer Manager immediately and included in the final submittal.
- e. Based on (a thru d) above, the CONSULTANT will recommend the correct coding for the following:
- i. Structure Open, Posted, or Closed (NBI Item 41)
 - ii. Bridge Posting (NBI Item 70)
 - iii. Operating Rating Method (NBI Item 63)
 - iv. Inventory Rating Method (NBI Item 65)
- E. If the structure is unable to be modeled using the Virtis software due to limitations of the software, then the CONSULTANT shall rate the structure using hand calculations or other software once approved by the MDOT Project Engineer Manager. The items required in (D) of this scope of work will need to be completed using this alternate method. Additionally, the CONSULTANT will perform a load rating assuming a proposed cross-section with new barriers. The maximum overlay load that will not change the Overload Classification or posting status of the structure will be calculated. This overlay will then be applied to the structure using the proposed cross-section to develop all of the items required in Part (D) of this scope of work. These results will be reported according to Part (G) and will visibly identify that they are for the proposed cross-section.

As per the MDOT Bridge Analysis Guide, decks with original designs of H15 or less should be load rated. This will be a separate hand calculation as the Virtis software does not analyze decks.

- F. The CONSULTANT shall notify the MDOT Project Engineer Manager **immediately** if the structure requires reductions to the load posting or Overload Classification identified on the SI&A form. After MDOT Project Engineer Manager review, the MDOT Project Engineer Manager may ask the consultant to develop detailed explanations for any structures requiring any change to load posting or Overload Class status, including strengthening or repair recommendations as appropriate
- G. The CONSULTANT shall deliver the following printed output to MDOT for each bridge analyzed:
- a. Assumption Sheet - Any assumptions made in the analysis (material properties, section losses, etc.) shall be listed. See appendix for a blank example. This sheet will be given as a fillable pdf file. Non-redundant or fracture critical structures/elements should be identified on the assumption sheet.
 - b. Any hand calculations, spreadsheets, etc. used to determine input into Virtis. If formulas are hidden, a brief description of the procedure should be included.
 - c. Virtis program output (where inputted into Virtis) - This will be limited to that which directly documents the ratings and shall be limited to 50 sheets per structure, although as few sheets as possible is preferred. Intermediate output sheets that do not directly document the ratings may be omitted. Results of Overload Class do not need to be printed
 - d. Other program input and output (where Virtis cannot be used) - This will be limited to that which directly documents the ratings and shall be limited to 50 sheets per structure, although as few sheets as possible is preferred. Intermediate output sheets that do not directly document the ratings may be omitted. Results of Overload Class do not need to be printed
 - e. A completed Bridge Analysis Summary Form - See the appendix for a blank example form. MDOT will complete the "Reviewed By" and "Database Updated By" fields after the CONSULTANT's submittal. This sheet will be given as a fillable pdf file. This sheet shall be marked with the CONSULTANT's logo. Non-redundant or fracture critical structures/elements should be identified on the summary sheet.

The above printed input shall be submitted together, shall be paper-clipped and neither stapled nor permanently bound.

The CONSULTANT shall deliver the following electronic output to MDOT for each bridge analyzed:

- a. Assumption Sheet - Any assumptions made in the analysis (material properties, section losses, etc.) shall be listed. See appendix for a blank example. This sheet will be given as a fillable pdf file. This structure

should be input using Adobe Acrobat, and not scanned in, to limit file size. Typed signatures will be sufficient as the paper copy will be signed. This file will be submitted as a *.pdf. Non-redundant or fracture critical structures/elements should be identified on the assumption sheet.

- b. Any hand calculations, spreadsheets, etc. used to determine input into Virtis. If formulas are hidden, a brief description of the procedure should be included. Where possible, this information shall be printed as a *.pdf from the program used rather than scanned. Scanned images will be accepted as *.pdf when necessary.
- c. Virtis exported *.xml file (where possible)
- d. Virtis output or other Program input and output, as *.pdf. Intermediate calculations do not need to be provided. When other programs are used, load and capacity information should be provided at locations of interest, including but not limited to 10th points of the spans. Results from the Standard Analysis (Federal Inventory, Federal Operating, Michigan Operating and Michigan Legal Loads) should be in a separate file from the Overload Class results.
- e. A completed Bridge Analysis Summary Form - See the appendix for a blank example form. Printed signatures will be sufficient as the paper copy will be signed. This sheet will be given as a fillable pdf file. This structure should be input using Adobe Acrobat, and not scanned in, to limit file size. Typed signatures will be sufficient as the paper copy will be signed. This file will be submitted as a *.pdf.. This sheet shall be marked with the CONSULTANT's logo. Non-redundant or fracture critical structures/elements should be identified on the summary sheet.

The above electronic material shall be submitted on a cd. All files for a structure shall be located in a folder bearing the structure name.

Submittals shall be made in groups of 10 to 25 structures. If additional structures are not anticipated for more than 14 calendar days the CONSULTANT may submit the structures analyzed without meeting the 10 structure minimum.

At the request of the MDOT Project Engineer Manager, high-priority structures will be submitted as soon as completed or in accordance with deadlines set at the time of assignment.

- H. A separate structural engineer, the Reviewing Bridge Engineer, using whatever software and/or hand calculations preferred by the Reviewing Bridge Engineer, excluding the software used to rate the structure, and allowed under the LFR or LRFR method shall make a complete and thorough calculation comparison on a minimum of 10% of the structures. This engineer is required to have the same qualifications as the Primary Bridge Engineer. She or he will compose, sign, and seal a letter attesting to this work. The Reviewing Bridge Engineer will provide a copy of the assumption sheet checks, input verification checks, and output comparison for this QC check in a separate file for each structure reviewed.

The signed/sealed letter provided by the Reviewing Bridge Engineer shall identify and briefly report on each bridge reviewed. The brief report shall include and explain:

- a. Any significant differences in assumptions
- b. Any significant differences in inputs
- c. The percent of difference in the rating results
- d. The sampling parameters used in selecting the structure

Only the letter and summary sheet for the QC check should be submitted as a paper version. All other information in addition to the letter and summary sheet should be submitted electronically in *.pdf format.

The selection of the review bridges shall not be random, but shall follow parameters that will help insure the most accurate results. Sampling parameters for selecting the minimum of 10% of structures should include, at a minimum:

- a. Posting Status
- b. Bridge Deficiency Status
- c. Rating or Posting Status Changes
- d. The Superstructure Material (steel, prestressed concrete, etc.)
- e. The Structural Model (for example simple, continuous, pin & hanger, etc)
- f. Era of original construction
- g. History of additional construction (widening, deck replacement, overlay, etc.)
- h. Unique structures selected by the engineering judgment of the Reviewing Bridge Engineer, the CONSULTANT Project Manager or the MDOT Project Engineer Manager

The review should happen with each submittal. If the CONSULTANT chooses to use multiple Primary Bridge Engineers, an equally complete and thorough QC review following the above sampling parameters will be performed for each Primary Bridge Engineer. This review is a separate, general process review and should not replace standard quality control that the CONSULTANT applies to the critical input and output for each and every structure.

- I. On the first of each month in which structures have been assigned to the CONSULTANT, the CONSULTANT Project Manager shall submit a monthly project progress report to Rebecca Curtis, MDOT Project Engineer Manager. The monthly progress report shall follow the guidelines in Attachment. The monthly progress report may be submitted electronically.

MDOT RESPONSIBILITIES:

- A. Schedule and/or conduct the following:
 - a. Project related meetings.

- B. Provide the following:
 - a. Structure Inventory and Appraisal (SI&A) form
 - b. As Built Plans on CD in .tif format and/or hard copies of plans
 - c. Bridge Safety Inspection Reports (BSIR)
 - d. Detailed Bridge Inspection Reports, if applicable
 - e. Bridge Analysis Guide 2005 Edition with Interims
 - f. Bridge Analysis Assumption Form (attached)
 - g. Bridge Analysis Summary Form (attached)
 - h. Bridge Design Guides and Manual
 - i. Michigan Structure Inventory and Appraisal Guide

- C. Make Project Assignments and Provide Deadlines as Needed.

- D. Providing known issues with the Virtis Software and work-a rounds as appropriate.

PAYMENT SCHEDULE:

Payment for this project work shall be by **unit price per pay item for those items listed below.**
A unit price payment will be made at the time each pay item is submitted.

Multi-Stringer Steel Structure	Cost/Span
Multi-Stringer Prestressed Concrete Structure	Cost/Span
Multi-Stringer Reinforced Concrete Structure	Cost/Span
Parabolic Concrete Tee Beam Structure	Cost/Span
Flared Beam Structure	Cost/Span
Girder Line – One Girder	Cost/Span
Stringer-Floorbeam Structure	Cost/Span
Reinforced Concrete Deck Structure	Cost/Span
Non-Virtis or QA Reinforced Concrete Structure	Cost/Span
Non-Virtis or QA Prestressed Concrete Structure	Cost/Span
Non-Virtis or QA Steel Structure	Cost/Span
Update Analysis – Rehabilitation Project	Cost/Span
Base Structure Analysis – LFR	Cost/Structure
Base Structure Analysis – LRFR	Cost/Structure
Quality Control Review – LFR	Cost/Structure
Quality Control Review – LRFR	Cost/Structure
Review Final Plans	Cost/Structure
H-15 or Less Deck Analysis	Cost/Structure
Substituted Structure (only task C performed)	Cost/Structure

Payment for the four miscellaneous tasks, **as identified below**, will be based on a fully loaded hourly rate, which shall be submitted with the CONSULTANT's Price Proposal after selection. Proposals of the number of hours will be submitted by the CONSULTANT for approval once the need for these services is approved by the MDOT Project Engineer Manager based on the specific structure.

*Project Meeting	Cost/Hour
*Miscellaneous Analysis	Cost/Hour
*Field Inspection	Cost/Hour
*Strengthening/Repair Recommendation	Cost/Hour

CONSULTANT PAYMENT:

Compensation for this project shall be on a **unit price basis as well as a full loaded hourly rate, as identified above**. **Unit price** basis of payment typically includes a maximum quantity of units and a maximum reimbursable cost per unit. **The fully loaded hourly rate** basis of payment typically includes an estimate of labor hours by classification or employee, and a "loaded" rate which includes an hourly labor rate, applied overhead, and fixed fee by classification or employee. In addition, other direct costs and subconsultant costs may be proposed and authorized, if necessary.

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.

ATTACHMENT A
CS Various - JN

MONTHLY PROGRESS REPORTS

The first page of this attachment is the necessary layout of the Monthly progress reports and the last three pages are a completed example.

Control Section 00000
Job Number 00000C
Structure Number S00
Date 00/00/00

MONTHLY PROGRESS REPORT

- A. Work accomplished during the previous month. Includes bridge number, pay item type and number of spans.

- B. Anticipated work items for the upcoming month.

- C. Real or anticipated problems on the project.

- D. Update of previously approved detailed project schedule (attached), including explanations for any delays or changes.

- E. Items needed from MDOT.

- F. Copy of Verbal Contact Records for the period (attached).

MONTHLY PROGRESS REPORT

- A. Work accomplished during the previous month.
1. During the last month we completed the bridge load rating analysis on the following 10 structures and submitted them to John Doe on 05/01/95:

B01-0-11111
Multi-Stringer Steel Structure – 1 Span
B02-0-11111
Multi-Stringer Steel Structure – 4 Spans
H-15 Deck Analysis – 1 Structure
B03-0-11111
Multi-Stringer Prestressed Concrete Structure – 1 Spans
10% Quality Control Review – 1 Span
R01-0-11111
Multi-Stringer Steel Structure – 4 Spans
R02-0-11111
Multi-Stringer Steel Structure – 1 Span
S01-0-11111
Multi-Stringer Steel Structure – 1 Span
S02-0-11111
Multi-Stringer Steel Structure – 4 Spans
H-15 Deck Analysis – 1 Structure
S03-1-11111
Multi-Stringer Prestressed Concrete Structure – 1 Span
S03-2-11111
Multi-Stringer Prestressed Concrete Structure – 1 Span
S04-0-11111
Flared Beam Structure – 3 Spans
- B. Anticipated work items for the upcoming month.
1. Complete analysis for:
S08-0-11111
B04-0-11111
 2. Attend the meeting regarding the Ameritech lines on the bridge, scheduled for 08/12/95.

- C. Real or anticipated problems on the project.
 - 1. We foresee no problems at this time.
- D. Update of previously approved detailed project schedule (attached), including explanations for any delays or changes.
 - 1. Structure S08-11111 was moved to the top of the priority list due to current need as identified by John Doe. on 6/01/95.
- E. Items needed from MDOT.
 - 1. Proposed Overlay thickness for S08-0-11111.
- F. Copy of Verbal Contact Records for the period (attached).
 - 1. Discussed bridge and ramp geometries with Jane Doe of MDOT Traffic and Safety Division on 07-24-95.

VERBAL CONTACT RECORD

Control Section 12345
Job Number 11111C
Structure Number S02
Date 07/31/95

Joe Engineer talked to Jane Doe and decided to use a 0.05'/ft super on ramp A leading into the bridge.

ATTACHMENT B
BRIDGE ANALYSIS ASSUMPTIONS

Bridge ID: _____ of _____ Most recent BIR date: ___ / ___ / _____

Is deterioration accounted for in load rating: no / yes: _____

Year Constructed/Reconstructed*: _____ Work performed: _____

Superstructure Component**: _____ Fy/fc': _____ / _____ ksi

Composite: yes or no Number of beams: _____ Shop Dwgs verified: yes / no

Size of Beams/Beam #'s and spans: _____

Deck thickness: _____ in fc': _____ ksi Fy: _____ ksi Deck Design load > H15: yes / no

Barrier Type/weight: _____ / _____ plf (L) _____ / _____ plf (C) _____ / _____ plf (R)

Wearing surface material/thickness/unit weight: _____ / _____ in / _____ pcf

Sidewalks or brush blocks width/thick: _____ / _____ in (L) _____ / _____ in (C) _____ / _____ in (R)

Clear roadway: _____ ft _____ in Design by LRFD: yes or no Rating Method: _____

Additional loads: _____

Unique factors that affect capacity: _____

* If the structure has been reconstructed, only include the information from previous constructions that is still relevant. Complete enough forms to identify all relevant information.

** See item 43 of the Michigan Structure Inventory and Appraisal Coding Guide

Analyzed By- Signature and Date _____

Checked By- Signature and Date _____

ATTACHMENT C

BRIDGE ANALYSIS SUMMARY

Bridge ID _____

The above structure was analyzed using:

Version or Other: _____

The analysis is based on field inspection dated: _____

The controlling component and failure mode are:

NEW INVENTORY CODING

NBI Item 63- Operating Rating Method	<input type="text"/>	1-LF in Metric Tons
NBI Item 64F- Federal Operating Rating	<input type="text"/>	Metric Tons
MDOT Item 64MA- Michigan Operating Method	<input type="text"/>	1-LF in Tons
MDOT Item 64MB- Michigan Operating Rating	<input type="text"/>	US Tons
MDOT Item 64MC and D- Michigan Operating Truck	18	D - Designated
NBI Item 65- Inventory Rating Method	<input type="text"/>	1-LF in Metric Tons
NBI Item 66- Federal Inventory Rating	<input type="text"/>	Metric Tons
NBI Item 41- Open Posted Closed	<input type="text"/>	
NBI Item 70- Bridge Posting	<input type="text"/>	
NBI Item 141- Posted Loading	<input type="text"/>	US Tons
MDOT Item 193A- Michigan Overload Class	<input type="text"/>	
MDOT Item 193C- Overload Status	<input type="text"/>	

Analyzed By- Signature and Date RLC 4/15/10

Checked By- Signature and Date _____

Database Updated By- Initials and Date _____

ATTACHMENT D
RATING METHODS FOR COMPUTING AND REPORTING CODING GUIDE
ITEMS 63, 64, 65 AND 66

LRFR = Load and Resistance Factor Rating

LFR = Load Factor Rating

ASR = Allowable Stress Rating

RF = Rating Factor

MT = Metric Tons

DESIGN OR RECONS. SPEC. USED	EXIST. AND VALID LOAD RATING	LOAD RATING OR RE-RATING METHOD OPTIONS	LOADING	CODING GUIDE ITEMS			
				63	64	65	66
LRFD	None or Invalid	LRFR	HL-93	8	RF	8	RF
		LRFR	MS18 ⁵	3 ²	MT	3 ²	MT
		LFR ¹	MS18	6	RF	6	RF
		LFR ¹	MS18	1	MT	1	MT
		ASR ⁴	MS18	7	RF	7	RF
		ASR ⁴	MS18	2	MT	2	MT
	LRFR	LRFR	HL-93	8	RF	8	RF
		LRFR	MS18 ⁵	3 ²	MT	3 ²	MT
	LFR or ASR	LRFR	HL-93	8	RF	8	RF
		LRFR	MS18 ⁵	3 ²	MT	3 ²	MT
		LFR	MS18	6	RF	6	RF
		LFR	MS18	1	MT	1	MT
		ASR ^{3,4}	MS18	7	RF	7	RF
		ASR ^{3,4}	MS18	2	MT	2	MT
	Load Testing	Load Testing	Equiv.MS18	4	MT	4	MT
	LFD or ASD	None or Invalid	LRFR	HL-93	8	RF	8
LRFR			MS18 ⁵	3 ²	MT	3 ²	MT
LFR			MS18	6	RF	6	RF
LFR			MS18	1	MT	1	MT
ASR ⁴			MS18	7	RF	7	RF
ASR ⁴			MS18	2	MT	2	MT
LRFR		LRFR	HL-93	8	RF	8	RF
		LRFR	MS18 ⁵	3 ²	MT	3 ²	MT
LFR or ASR		LRFR	HL-93	8	RF	8	RF
		LRFR	MS18 ⁵	3 ²	MT	3 ²	MT
		LFR	MS18	6	RF	6	RF
		LFR	MS18	1	MT	1	MT
		ASR ^{3,4}	MS18	7	RF	7	RF
		ASR ^{3,4}	MS18	2	MT	2	MT
Load Testing		Load Testing	Equiv.MS18	4	MT	4	MT

ATTACHMENT D Continued

DESIGN OR RECONS. SPEC. USED	EXIST. AND VALID LOAD RATING	LOAD RATING OR RE-RATING METHOD OPTIONS	LOADING	CODING GUIDE ITEMS			
				63	64	65	66
Comb. of Specs. (LRFD, LFD, ASD) or Unknown	None or Invalid	LRFR	HL-93	8	RF	8	RF
		LRFR	MS18 ⁵	3 ²	MT	3 ²	MT
		LFR	MS18	6	RF	6	RF
		LFR	MS18	1	MT	1	MT
		ASR ⁴	MS18	7	RF	7	RF
		ASR ⁴	MS18	2	MT	2	MT
		Load Testing	Equiv.MS18	4	MT	4	MT
	LRFR	LRFR	HL-93	8	RF	8	RF
		LRFR	MS18 ⁵	3 ²	MT	3 ²	MT
	Load Factor Rating (LFR) or Allowable Stress Rating (ASR)	LRFR	HL-93	8	RF	8	RF
		LRFR	MS18 ⁵	3 ²	MT	3 ²	MT
		LFR	MS18	6	RF	6	RF
		LFR	MS18	1	MT	1	MT
		ASR ^{3,4}	MS18	7	RF	7	RF
		ASR ^{3,4}	MS18	2	MT	2	MT
	Load Testing	Load Testing	Equiv.MS18	4	MT	4	MT