MODERNIZED TOTAL PROJECT MANAGEMENT

REQUEST FOR PROPOSAL - Version 1.0 – October 2026

Terms of Reference

TO PROVIDE *insert type of services which will include Design and Construction Administration for the Modernized Total Project Management (MTPM) model of procurement*

Insert the Location of Project

Assignment Number: ***insert***

Insert Office Name (Region)

insert date

Ministry of Transportation

Ontario

Updates:

- *Accessibility in Procurement*
- *Intent of the Request for Proposal*
- *Proposal Bid Evaluation and Award*
- Phase II (RFP) – Technical and Financial Proposal

Instructions:

*Detailed **Notes to User** are provided in the accompanying document Modernized Total Project Management (MTPM) Request for Proposal (RFP) Version 1.0 - Notes to User.*

This is a generic document for Assignments for Planning, Engineering and Contract Administration Service Providers.

This document consists of eight Sections:

Part A – Proposal Instructions

Section 1: GENERAL INFORMATION AND INSTRUCTIONS, describes the proposal process, proposal requirements and the evaluation process. Some drafter input is required.

Section 2: TERMS AND CONDITIONS, provides the legal terms and conditions applicable to Services Providers when submitting a proposal. No drafter input is required.

Part B – Services to be Delivered

Section 3: PROJECT ADMINISTRATION, Quality Control and Performance describes the required MTPM administration deliverables. This mostly editable by the drafter, some mandatory content.

Section 4-7: TECHNICAL SERVICES TO BE DELIVERED, is to include a detailed description of the assignment. This section is fully editable by the user.

Section 8: TERM OF REFERENCE-CONSTRUCTION CONTRACT ADMINISTRATION is to include a detailed requirements of the construction contract administration services during the construction activities.

***Section 1**: Add or remove information specific to this Assignment in the areas of the document that are not protected or have fill in fields.*

Content that requires input by the document drafter is highlighted grey.

There is additional editable content that should be reviewed and modified as appropriate for the specific assignment. To view the editable areas within the Generic Documents after you open a document you must change the view to allow the highlights to appear.

Step 1 - click "Review", "Restrict Editing" and a side tool bar opens.

Step 2 - select the check box 'highlight the regions I can edit'.

Step 3 - now the highlighted areas will appear. You can use the "Find Next Region I Can Edit" button to scroll through editable areas.

NOTE: Unselect the 'highlight the regions I can edit' to see the grey highlighted text and before posting the document.

***Section 3** is partially editable and **Sections 4 through 8** are fully editable and should be revised to suit. Review all text provided for applicability. The text included in the Generic Document with "Normal Font" is recommended wording where applicable. The text included in the Generic Document with "Italic Font" is example text to be revised to the assignment. Text highlighted grey requires drafter input. Unselect the 'highlight the regions I can edit' when reviewing sections 4 to 8 to be able to see the grey highlighted text. Delete any text/bullets, or portions thereof, that do not apply. Insert content as required.*

Please refer to MTO Policy Memo DEB-2022-01, Engineering Staffing Requirements Matrix to assist the MTO project Team with scoping the consultant staffing needs.

Accessibility in Procurement

Under the Integrated Accessibility Standards Regulation, Section 5, the Government of Ontario shall incorporate accessibility design, criteria and features when procuring or acquiring goods, services, or facilities, except where it is not practicable to do so. If it is determined that it is not practicable, then an explanation shall be provided upon request.

The Ministry's Project Manager/Engineer shall be aware of and understand the requirements under the Integrated Accessibility Standards Regulation and shall include any applicable requirements in the RFP document. Refer to the Accessibility in Procurement Tip Sheet for guidance.

The Proponent's delivery of the Deliverables shall comply with all applicable requirements, specifications and standards for accessibility established in accordance with the Ontario *Human Rights Code (HRC) R.S.O. 1990, CHAPTER H.19,* the *Ontarians with Disabilities Act, S.O. 2001, CHAPTER 32,* and the *Accessibility for Ontarians with Disabilities Act, 2005*, S.O. 2005, c. 11 (Integrated Accessibility Standards), any regulations made thereto and any direction from the Ministry. The Proponent must meet the Government of Ontario's requirements on the Government of Ontario's schedule under the Integrated Accessibility Standards Regulation as directed by the Ministry.

To comply with the Accessibility for Ontarians with Disabilities Act (AODA) accessible customer service training requirements, Service Provider shall require that every employee, agent or volunteer, or other persons associated, with the Service Provider who deals with members of the public or other third parties on behalf of MTO, be trained about provision of goods or services to persons with disabilities.

The Service Provider shall keep records of such training, including the dates on which the training is provided and the number of individuals to whom it is provided, and shall provide documentation of the training to MTO upon request.

These training requirements can be fulfilled by completing the e-Learning course.

Bill 168, Occupational Health and Safety Amendment Act (Violence & Harassment in the Workplace)

Bill 168 is an Ontario legislation under the Occupational Health and Safety Act in 2010. It requires all employers to address and eliminate violence and harassment in the workplace by way of workplace risk assessments, the development of policies and programs, and mandatory training for all staff.

Additional information can be found online.

French Language Services designated area (- NA)

*[**NOTE TO USER:** include this language for work in a designated area. Delete this in its entirety if not in a* designated area*. Click designated areas or contact the MTO French Language Services office to identify the designated areas.]*

This Assignment includes work that is in a French Language Services designated area.

The Service Provider must comply with all provisions of the French Language Services Act, including but not limited to Third Party Regulation 284/11.

Follow the steps below to update the Table of Contents

1) *Highlight the Table of Contents by positioning the cursor over the table and pressing the left mouse button;*
2) *Click on "Update Fields";*
3) *Select what to update and click OK.*

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OVERVIEW

INTENT OF THE RFP

The Ministry intends to establish an agreement with an Engineering Service Provider to furnish professional and technical services for the assignment described in the Request for Proposal (RFP) Documents using a Modernized Total Project Management (MTPM) approach.

This Assignment includes **insert a general description of the project.**

A detailed description of the project scope and related project-specific requirements are set out in Part B.

For the purpose of this Assignment, the following definition applies:

U.S. Business means a supplier, manufacturer, or distributor of any business structure (includes a sole proprietorship, partnership, corporation, or other business structure) that:

1. has its headquarters or main office located in the U.S., and

2. has fewer than 250 full-time employees in Canada at the time of tendering the applicable procurement process.

If a Bidder is a subsidiary of another corporation, part 1 of the definition above is met if that Bidder is controlled by a corporation that has its headquarters or main office located in the U.S.

A Bidder's eligibility must be demonstrated before a Bid may be accepted. Bidder must not be a U.S. Business, as defined in this Assignment. Bidder shall submit a Declaration for Bidders Interested in Doing Business with the Government of Ontario (included with the procurement package).

The declaration shall be submitted, in PDF format, to the Qualification Control Unit (QualificationControl@ontario.ca) at the time of Bid Intent.

The ministry, in its sole discretion, shall have the right to reject any Bid in the event that it determines: (a) a Bidder has made a misrepresentation regarding the requirements of this RFP; (b) a Bidder is a "U.S. business" as that term is defined in this RFP; and/or (c) a Bidder fails to submit the declaration as noted above.

All Proponents approved in the Ministry's Registry, Appraisal and Qualification System (RAQS) in the Prime Specialty **insert the Prime Specialty** in Engineering category, and in the Prime Specialty **insert the Prime Specialty** in Contract Administration (CA) category are invited to submit Proposals. Only Service Providers registered for the Prime Specialties both in Engineering and CA categories will be considered. In addition, all Proponents must also meet or exceed the minimum CPR score in both Engineering and CA categories required to bid (posted on https://www.raqs.merx.com/public/main/whatsNew.jsf), and who are not a U.S business as declared on the Declaration for Bidders Interested in Doing Business with the Government of Ontario form. In addition, a Proponent must have prior registration in RAQS of their Core Plan and the corresponding Generic Category Plan. A reference document "Qualification

Procedures for Engineering and CA Service Providers" is available on Ministry of Transportation Technical Publications site.

RFP DOCUMENTS

The RFP Documents include:

Part A: Proposal General Terms and Conditions

Includes the **proposal** process, format, required content and terms and conditions.

Part B: Terms of Reference

Includes **project** requirements for this Assignment, including details and requirements for deliverables, schedules, and related details.

Part C: Appendix 1: Forms and Tables, Appendix 2: Technical Standards and Specifications, **Appendix 3:…**

Legal Terms and Conditions

Addenda / Clarifications prior to the Proposal Submission closing dates

The MTPM RFP Documents and the successful service provider's proposal will form the Legal Agreement for this Assignment.

MINISTRY SUPPLIED INFORMATION

The information / documentation not posted in the RFP Public Notice site is to be provided at a [Viewing Session] [will be distributed by the ministry] to all proponents with an approved bid intent. ***Delete sentence if not applicable***

The project data/plans not posted in the RFP Public Notice site, which constitute part of the reference documents, are available for viewing and/or pickup at the Ministry offices located at ***insert location or delete sentence if not applicable***

The following information shall be provided to Proponents as part of Phase I:

Document #	Document File Name /Document Description	Posted in the RFP Public Notice site (yes/no)

The following information shall be provided to shortlisted Proponents as part of Phase II:

Document #	Document File Name /Document Description

The following information shall be provided to the Preferred Proponent:

Document #	Document File Name / Document Description

The Ministry supplied information listed in this Section is provided solely for information purposes. The Ministry warrants that information provided can be relied upon for accuracy at the time and location that it was obtained but does not warrant any omissions or interpretations of the information. Proponents shall inform the Ministry of any inaccurate information identified.

This RFP may not contain all the information that Proponents might need to submit a Proposal. Proponents shall be responsible for obtaining any additional information that may be required. Each Proponent must satisfy itself as to the sufficiency of the information presented and obtain any updated or additional information, and perform any studies, analysis or investigations the Proponent deems necessary to deliver the requirements of this Assignment.

DEFINITIONS

“Agreement”, “legal agreement” means the formal written contract that will be entered into at the end of the procurement process which includes the RFP procurement documents, including any addenda; the Service Provider’s Proposal Submission; and any amendments executed in accordance with the terms of the Agreement.

“Agreement Administrator” refers to the Ministry’s MTPM Agreement Administrator, including the Project Manager; or Area Manager, Construction; or Contract Services Administrator as specified in this RFP.

“Functional category” or “Category” refers to the broad disciplines including Advanced Traffic Management Systems, Bridge Engineering, Electrical Engineering, Highway Engineering, Drainage and Hydrology Engineering, Engineering Materials, Environmental, Foundations

Engineering, Pavement Engineering, Surveying, Traffic Engineering, Value Engineering, Constructability Review, Transportation (Systems) Planning, Environmental Planning, Highway Planning as listed in the Ministry's Registry, Appraisal and Qualification System (RAQS).

"Joint Venture" is a collaborative undertaking by two or more firms for which the participant firms are both jointly and individually responsible.

"Ministry" or "MTO" refers to the Ontario Ministry of Transportation.

"Preferred Proponent" is the entity that is selected by the Ministry to enter into the executed Agreement.

"Principal" is an individual in a firm who possesses the legal responsibility for its management (owner, partner, officer, administrator, etc.).

"Proponent" includes firms qualified in the Prime Specialty for this Assignment that submit or intends to submit a proposal in response to this RFP prior to the specified submission closing dates.

"Proposal" refers to documents Proponents submit in response to this RFP.

"Project Key Staff" is an individual that will perform the key requirements, provide direction, assigns work and carry out the project management functions within the Specialty(ies) and/or for this Assignment on the overall. The Project Key Staff may/ may not be Key Personnel registered in the Ministry's RAQS.

"RAQS" refers to the Registry, Appraisal and Qualification System.

"RAQS ESP e-tendering portal" refers to the Ontario Ministry of Transportation's Registry, Appraisal and Qualification System for Engineering Services Providers electronic tendering application hosted by MERX.

"RFP" or "Request for Proposal" means the process and RFP documents described in the Section RFP Documents.

"ROW" or "Right of Way" means 1) Allocation of right of movement to a road user, with preference over other road users or 2) The width of the road allowance from the property line on one side to the property line on the opposite side of a roadway.

"Service Provider" refers to the successful proponent firm under agreement to provide Modernized Total Project Management services for this Assignment, also identified as the Prime firm under the RAQS Prime Specialty.

"Sub-Service Provider" refers to a firm or individual that has been hired by the Prime firm to perform specific tasks of this Assignment.

"Specialty" refers to a Work Type under a Category in RAQS. Firms are registered under specific specialties in RAQS.

“Specialization” refers to primary technological capability of a Project Key Staff. The academic degree, professional registration, certification and / or extensive experience in a particular field of practice normally reflect an individual’s primary technical expertise or the specialization in that area.

“MTPM” refers to Modernized Total Project Management.

“Modernized Total Project Management” refers to Total Project Management including planning, preliminary design, detail design, and construction contract administration services.

PART A: PROPOSAL INSTRUCTIONS

SECTION 1: PROPOSAL SUBMISSION PROCESS AND FORMAT

1.1 RFP Schedule

The following RFP schedule is tentative and is subject to change without penalty to the Ministry:

Activity	Date / Deadline
Distribution of RFP Documents (Posting Date)	***Insert Date***
Phase I: Deadline to Submit a Request for Clarification (Question Acceptance Deadline)	***Insert Date / Time***
Deadline for Proponents to submit a Bid Intent through the RAQS ESP e-tendering portal (Bid Intent Deadline), and U.S. Business Restriction Declaration Form	***Insert Date / Time Must be a Friday at 12:00:00pm (The Friday before the submission due date)***
Phase I: Scheduled Viewing Session / Distribution of additional material	***Insert Date / Time***
Submission of Phase I Proposals (Closing Date)	***Insert Date / Time***
Notification of shortlisted Proponents	***Insert Date***
Phase II Bid Intent Deadline for shortlisted Proponents (Bid Intent Deadline), and U.S. Business Restriction Declaration Form	***Insert Date / Time Must be a Friday at 12:00:00pm (The Friday before the submission due date)***
Phase II: Deadline to Submit a Request for Clarification (Question Acceptance Deadline)	***Insert Date / Time***
Phase II: Scheduled Viewing Session / Distribution of additional material	***Insert Date / Time***
Submission Deadline of Phase II Proposal (by shortlisted Proponents) (Closing Date)	***Insert Date / Time***
Preferred Proponent Notification (Planned Award Date)	***Insert Date***

Phase III Submission (by Preferred Proponent)	***Insert Date***
Anticipated Start Date (After signed and executed agreement)	***Insert Date***
Estimated Completion Date (For planning, preliminary design, detail design)	***Insert Date***

1.2 Enquiries

Each Proponent shall review all the RFP documents and shall promptly report and make a written request for clarification of any discrepancy, deficiency, ambiguity, error, inconsistency or omission contained therein.

Any Proponent who has questions as to the meaning of any part of this RFP or the Engineering and CA Services described herein must make a written enquiry requesting clarification, interpretation or explanation prior to the "Request for Clarification" deadlines provided in Section 1.1.

All Requests for Clarification are to be submitted electronically through the RAQS ESP e-tendering portal. Where such a request results in a change to the requirements of this RFP, the Ministry will prepare and issue an addendum to this RFP.

The Ministry will distribute to all Proponents all addendums, questions and clarifications regarding the RFP by posting them on the RAQS ESP e-tendering portal. It is not the intent of the Ministry to distribute to all Proponents any information on what the Ministry may consider as innovative ideas put forward by a Proponent.

It is the sole responsibility of each Service Provider to review the web posting on the RAQS ESP e-tendering portal up to the RFP Submission Deadline for clarifications and/or revisions to the schedule.

The Ministry reserves the right to answer questions of technical nature, at its discretion, during the Request for Clarification process of Phases I, II or III.

<u>A Proponent is NOT to make verbal enquiries to Ministry staff. No information given orally by Ministry staff will be binding on the Ministry, nor will it be construed as a factor in the evaluation of the Proposal</u>

In the event of conflicts or inconsistencies, documents with the most recent date shall prevail.

1.3 Proposal Submission and Award Process

All solicitations/assignments will require a submission of a Bid Intent, submitted by clicking the Bid Intent button on the RAQS ESP e-tendering portal posting notice. MTO will review the bid intent to confirm prequalification of the firm in RAQS and confirm the Corporate Performance Rating (CPR) of the firm meets or exceeds the minimum rating required to bid. MTO will

approve through the RAQS ESP e-tendering portal. A vendor/proponent will be unable to submit bid without an approved bid intent.

Proposals are to be submitted in three phases:

Phase I (EOI): Project Staffing and Organization Proposal

All Proponents approved in RAQS in the Prime Specialty and meet or exceed the minimum CPR required to bid, and who are not a U.S. business as declared on the Declaration for Bidders Interested in Doing Business with the Government of Ontario form may submit Proposals during Phase I. The Ministry will only accept proposals submitted through the RAQS ESP e-tendering portal. Guidelines for submitting an e-bid are available on the MERX website.

The Ministry will complete its Phase I evaluation of Proposals, as outlined in Section 1.6, and will shortlist up to **insert # of firms (#)**firms. ***{If not shortlisting during Phase I, delete this paragraph}***

Note to Proponents: The Ministry will not be shortlisting Proponents for this assignment. All Proponents approved in the Ministry's Registry, Appraisal and Qualification System (RAQS) in the Prime Specialty are invited to submit both Phase I and Phase II Proposals by the submission deadline specified in Section 1.1. **{If not shortlisting during Phase I, include this paragraph and make sure the Table in Section 1.1 corresponds. If shortlisting during Phase I, then delete}**

Phase II (RFP): Technical and Financial Proposal

The Proponents shortlisted in Phase I will be invited through the RAQS ESP e-tendering portal to submit Phase II Proposals. (***NA,*** *see* ***Note to Proponents*** *above)* ***{If not shortlisting during Phase I, include this sentence. If shortlisting during Phase I, then delete}***

Based on the Phase II selection process, as outlined in Section 1.6, the Ministry will select a firm who will be the Preferred Proponent.

A Proponent may withdraw its Phase I or Phase II Proposal through the RAQS ESP e-tendering portal at any time before the corresponding Proposal Phase I or Phase II Submission Deadline. A Proponent may re-submit their Proposal prior to the Proposal Submission Deadline. Each Proponent may only submit one (1) Proposal in response to this RFP where they are identified as the Prime firm.

Phase III: Award

Only the Preferred Proponent will submit the Phase III requirements.

1.4 Proposal Submission Format Phase I and Phase II

All pages of the Proposal (excluding staff resumes) shall have a header clearly indicating the Proponent's name and Assignment number.

All Proposal documents, where signature required, must include an electronic signature (secure/digital or scanned) of a Principal of the proponent firm with the authority to sign a

binding legal agreement on behalf of the Service Provider. The Ministry, without evaluation, will reject any Proposal with unsigned documents.

The Ministry may, if deemed necessary, verify any information provided in any Submission.

Standard letter (8.5"x11") size paper shall be used. The font type shall be "Arial" – No other font type shall be used. "Arial Narrow" is not permitted. Minimum font size shall be 12 point. All margins shall be a minimum of 2.5 cm.

Phase I Proposals shall not exceed **{insert page limit***, see "notes to user" document for guidance* **}** pages**.** *Standard letter (8.5"x11") size paper. Proponents may include one 11"x17" page for their Organization Chart, which will not be included within the page limit. The page limit excludes staff resumes, promotional material, Conflict of Interest Certification***.**

Phase II Technical Proposals shall not exceed **{insert page limit** *see "notes to user" document for guidance* **} pages.** *Standard letter (8.5"x11") size paper*

Failure by the Proponent to conform to the submission requirements specified in section 1.4 of this RFP may result in disqualification.

1.5 Proposal Documents to be Submitted Phase I, Phase II and Phase III

Refer to Part B, Sections 3 - 8 for a description of the Engineering and CA Services required under this Assignment. Proponents are encouraged to focus on providing information beyond the requirements detailed within this RFP.

1.5.1 Phase I (EOI) - Staffing and Organization Plan (Envelope No. 1)

The following must be uploaded to Envelope No.1 for the Phase I (EOI) submission:

(a) Transmittal Letter. The Transmittal Letter shall indicate the Proponent's intention to submit a proposal to provide Engineering Services for the project with the name, title, address and telephone number of the Principal who will serve as the contact for the project. The letter must be signed by a Principal of the proponent firm with the authority to sign a binding legal agreement on behalf of the Service Provider.

In addition to above, the letter shall include the following:

- Legal Name of Business,
- Owner(s); Partner(s); Corporate Officer(s)/Title,
- Business Address, Telephone Number, Facsimile Number and email address

(b) Staffing and Organization Plan

The Staffing and Organization Plan shall contain the following information:

(i) **Identify the key individual responsible for the role of the Project Manager for this Assignment** (includes project coordination, cost and schedule control, etc.). Terms or

Titles such as “Project Director”, “Project Sponsor” or “Project Assistant” will not be considered valid by the Ministry to identify the proposed “Project Manager” and will not be considered in the evaluation process.

Include a resume of the Project Manager. The resume should demonstrate the Project Managers qualifications through relative experience and past performance on projects of similar scope and size and if applicable, larger more complex projects. For reference projects, include a description of the project, the key individual’s responsibility on the project, the project owner’s name, the name of a contact person (reference), and a phone number to facilitate verification by the Ministry.

Minimum qualifications for the Project Manager are:

- **Be an employee of the Prime Firm. Mandatory requirement**
- Have [***input experience requirements***].
- Proven ability to manage projects of similar size and nature (and if applicable, larger more complex projects), and to deliver completed quality work on time and within budget.
- Proven ability to coordinate a multi-disciplinary team on projects of similar scope, size and nature (and if applicable, larger more complex projects).
- Proven ability to work cooperatively and effectively with a wide variety of interests / authorities including the public, levels of government, utility companies and special interest groups as demonstrated on projects of similar size and nature (and if applicable, larger more complex projects).
- Authority to act on behalf of the company.
- Have proven negotiation skills.
- Experience managing multiple projects concurrently within tight delivery timelines.
- Strong technical knowledge of MTO policies, practices and various delivery models.
- Strong experience in team leadership, collaboration, consensus building, working with external agencies to deliver results.

{Note to User: To include Succession Planning provisions for the Project Manager, please insert the text provided in the RFP Notes to User document. Then please delete the remaining generic TOR text in this sub-section (i)}

(ii) **Project Management Approach:**

Provide a thorough and detailed description of the project management approach for this Assignment including:

- the administration of the project
- project-specific issues requiring a specific management approach

- the functional categories and relative responsibility / authority of the Project Manager(s) and/or other staff
- Contract Administration approach during construction activities

The description should demonstrate exceptional thinking and possibility of adding value to the project and should include the Proponent's role and understanding.

Provide a summary of the Proponent's involvement in projects of similar size and complexity and if applicable, larger more complex projects. For the past projects other than MTO projects, the available performance records should be provided, or in their absence, the owner contact name, address and telephone number are to be provided. Performance Records will not be included in the page limit.

(iii) **Organization Chart:**

The Organization Chart shall show the key lead staff/sub-Proponents and the specialty staff that will carry out the work in their appropriate reporting relationships.

The Organization Chart shall clearly show:

- All the required specialties.
- Assignment of responsibility/accountability of all project staff (including Sub-Proponents).
- The reporting relationships within each and between all Categories.
- Transfer of engineering design responsibilities from the Engineering Team to the Contract Administration (CA) Team to support continuity of project delivery.The proposed structure and reporting relationships (including reporting relationships with the Ministry) for all project activities inclusive of the following activities:
  a. All components of the Assignment;
  b. Quality Control and Quality Assurance of the Services;
  c. Constructability Review; and
  d. Engineering Materials Testing and Evaluation

(iv) **A discussion of the Proponent's Technical Team (by Functional Category):**

RFP Sections 5.X.2 / 6.X.2 / 7.X.2 (Staff to be provided) includes staffing requirements that the Proponent shall respond to.

The following must be identified for each functional category identified in Sections 5 through 8, *within* the specified page limit:

- The project key individual(s) (functional category Lead and Key Technical Staff) responsible for each functional category, including proposed responsibilities and duties with respect to the project. Identify who will be responsible to do the work and identify who will be assigned to do what work.
- The assigned technical staff and proposed responsibilities/duties.
- Reporting relationships for all staff.

- Resume highlights relative to this Assignment including experience and past duties performed, with references, for projects of similar scope and size (and if applicable, larger more complex projects). For the past non-MTO projects, the available performance records should be provided or in their absence, the owner's contact name, address and telephone number are to be provided.

The Proponent shall also demonstrate how Construction Administration staff will contribute during the design phases and how Engineering staff will continue to support construction activities after design completion to maintain continuity of project delivery under the MTPM framework.

Any material or content provided beyond the page limit, including resumes, will not be reviewed, assessed or evaluated.

Note 1: Throughout the duration of the assignment, the Service Provider shall utilize the staff identified in their Proposal. No substitutions of staff shall be made without the express knowledge and written approval of the Ministry. The qualifications and experience of the staff proposed for replacement must be equivalent or better than the staff identified in the Service Provider's technical and management submission. The Service Provider shall, upon the request of the Ministry, remove any representative of the Service Provider who, in the opinion of the Ministry acting reasonably, is performing improperly, or is not performing in an acceptable manner and shall replace the representative in accordance with the provisions of Sections 4.7 and 4.8 of the Legal Terms and Conditions.

Note 2: The Ministry must be notified in writing of any changes to the availability of staff included in the Proponent's Phase I Proposal no later than five (5) business days after Proponents receive notification that they have been short listed. The Ministry reserves the right to terminate any further participation by the Proponent in the selection process if in the Ministry's opinion, acting reasonable:

- The changes in the submission affect the ability of the Proponent to meet the Ministry's requirements; and/or
- The proposed change is not equivalent to or better than the Phase I Proposal.

Table 1 defines mandatory qualifications for technical team members. Failure to meet these requirements will result in disqualification of the proposal.

Table 1: Mandatory Qualification Requirements for Team members:

Category, Specialty or Work Type	Qualification Requirements
Insert Category	<Position>

	• <Insert only qualification requirements that can be assessed as PASS or FAIL>
Project Management	Project Manager • Shall be an employee of the Prime Firm
Bridge Engineering	Bridge Engineering Lead • Shall be a licenced Professional Engineer in Ontario
Environmental	Phase One and Two ESA : P. Eng. Or P. Geo. (within the meaning of Section 5 of O. Reg. 153/04) Excess Soil Management: Qualified Person (QP) (O. Reg. 406/19 Section 1(1)) and section 5 of O. Reg.153/04 *Note to User: delete if not required*
Contract Administrator	Contract Administrator • Shall be an employee of the Prime Firm

Note: Consultant engineering staff with a Limited Licence designation (LEL – Limited Engineering Licensee or LET – Limited Engineering Technologist), from PEO, shall be deemed equivalent to a PEO member with their P. Eng. designation within that specialized field of their respective Limited Licence (i.e., 3-years' experience as a Limited Licence holder shall be deemed equivalent to 3-years' experience as a P. Eng.).

(c) Schedule and Cost Control:

Provide a description of the Proponent's approach and control mechanisms for schedule and cost control. Describe what action will be taken so that the Assignment schedule will be maintained and what will be done to restore the schedule if problems develop. Describe how the schedule updating requirements in Section 3 will be achieved. Describe how scope changes will be handled to minimize delays and describe how the Proponent's schedule will meet the Ministry's requirements for this Assignment.

(d) Conflict of Interest Declaration Forms

Complete and submit the **LIST OF SERVICE PROVIDER STAFF WHO PARTICIPATED IN PREPARATION OF THE RFP SUBMISSION** form, provided in Appendix 1: Forms and Tables. Include the names, addresses and telephone numbers of the persons who participated in the preparation of the Phase I proposal.

The Phase I submission must also include a statement regarding conflict of interest. Complete and submit either:

(i) The **CERTIFICATION – NO CONFLICT OF INTEREST** form, provided in Appendix 1: Forms and Tables, signed by a Principal of the proponent firm with the authority to sign a binding legal agreement on behalf of the Service Provider to declare no current or future conflict of interest (actual, perceived or potential) in submitting a Proposal, or, if selected, with the contractual obligations of the Service Provider under the Agreement and that the Proponent neither has, nor has access to, any Confidential Information as defined below.

Or,

(ii) The **CERTIFICATION –CONFLICT OF INTEREST** form, provided in Appendix 1: Forms and Tables, signed by a Principal of the proponent firm with the authority to sign a binding legal agreement on behalf of the Service Provider to declare any(all) situation(s) that may be a conflict of interest in submitting a Proposal or, if selected, with the contractual obligations of the Service under the Agreement.

"**Confidential Information**" refers to confidential information of the Crown (other than confidential information which is disclosed to the Service Provider in the normal course of the RFP process); the Confidential Information is relevant to the Services required by the RFP, their pricing or the RFP evaluation process; and the disclosure of which could result in prejudice to the Crown or an unfair advantage to the Service Provider.

The submission of any Proponent may be disqualified where the Proponent fails to provide confirmation or makes misrepresentations regarding any of the above. Further, the Minister shall have the right to rescind any Agreement with the successful Service Provider in the event that the Minister at his/her discretion determines that the successful Service Provider has made misrepresentation regarding any of the above, in addition to or in lieu of any other remedies that the Minister has in law or in equity.

(e) Additional Information

Provide additional information or description of resources supporting your firm's qualifications for the proposed project.

Engineering and Materials testing:
When a Company owns or operates more than one laboratory, or uses a Sub-Contractor, the laboratory(s) that the Company intends to use for this specific contract shall be listed separately. The requirements provided under submissions and qualifications of professional shall be fulfilled for each laboratory.

The following must be submitted as part of the Phase I Staffing Proposal in an Appendix

outside the page limit specified in Section 1.4.2:

- A statement to confirm which testing and evaluation categories each laboratory is capable of.
- A copy of all the required accreditation or certification documents for each laboratory or Sub-Contractor laboratory.
- A copy of the individual test and laboratory ratings reports from proficiency sample testing programs for the past two (2) years (where applicable). In addition, when required, letters or memoranda describing the investigation and resolution of low ratings shall also be attached.
- A copy of the description of the quality management/audit process that the Service Provider has in place so that any testing done by others is satisfactory; submitted in Phase III.
- A statement and demonstration that the Service Provider or his/her Sub-Contractor has qualified engineers, geologists and chemists to perform the required work.
- A statement that qualified/certified technicians, when required, will conduct the work and a copy of the appropriate certificates.
- In the case of aggregate resources prospecting and evaluation, a statement of experience and two references.
- A list of all former OPS staff who work for the firm within the last 12 months.
- A list of previous works, within each sub-category, carried out directly or indirectly for the Ministry in the past three (3) years. List contract number (if applicable), area, type of work performed, and completion date.

1.5.2 Phase II (RFP) – Technical and Financial Proposal (Envelopes No.1 & 2)

A Transmittal Letter is to be included in Phase II submission, which shall indicate the Proponent's intention to submit a Phase II proposal to provide Engineering and CA Services for the project with the name, title, address and telephone number of the Principal who will serve as the contact for the project. The letter must be signed by a Principal of the proponent firm with the authority to sign a binding legal agreement on behalf of the Service Provider.

In addition to above, the letter shall include the following:

- Legal Name of Business,
- Owner(s); Partner(s); Corporate Officer(s)/Title,
- Business Address, Telephone Number, Facsimile Number and email address1.5.2.1 Technical Proposal (Envelope No. 1 – Identity & Proposal)

The following must be uploaded to Envelope No.1 for the Phase II (RFP) submission.

Technical Proposals are to be prepared in as concise a manner as possible; however, they should provide sufficient information and detail to adequately address the various issues associated with the project.

The Technical Proposal shall include a **Project Overview,** including a Project Schedule, and **Functional Work Plans** (described below) that:

- Confirm that the Proponent will complete all the necessary tasks to successfully perform the work;

  The Proposal should make reference to Sections of the RFP and other documents to confirm they will adhere to established Ministry processes and procedures. Repeating the narratives, that are well documented in the RFP, Ministry manuals, and other readily available sources, is not required.

  and

- Demonstrate to the Ministry that the Proponent is competent in terms of knowledge, capability, commitment and expertise to deliver a quality product that is cost effective and innovative.

  The Proposal should identify, as they relate to each Functional Work Plan, how cost effectiveness, innovation and constructability considerations will be applied. The processes, procedures and methodologies must be well described in the Scope / Work Plan section of a Functional Plan.

(a) Project Overview

The Project Overview must include the following sections:

(i) Understanding of the project

Provide a narrative to demonstrate understanding of the requirements of the project including key issues, constraints and ideas/plans to meet the challenges of the project.

This section shall include a statement confirming that the proponent will comply with the requirements for project Administration, Quality Control and Performance, the General Terms of Reference, and the orderly transfer of design work, project knowledge, records, and deliverables from the Engineering Team to the Construction Administration (CA) Team.

transfer design work from engineering team to CA team.

(ii) project Approach

Provide a narrative to demonstrate understanding of how to undertake the Assignment, including a concurrent and sequential application of disciplines involved and their integration to deliver the product. The discussion may include but is not limited to the following:

- Disciplines/Specialties required to successfully complete this Assignment (this does not require an organization chart).
- Design process overview specific to this project identifying the proposed work plan to address the multi-disciplinary requirements and demonstrating how the integration of the disciplines will occur in the project.
- A proposed project Schedule must be included. The schedule shall be presented in a table with a maximum length of three pages and shall include the dates for key

activities, milestones, meetings, presentations and deliverables. The proposed project Schedule shall depict the entire project, showing the major milestones in the process, from project award through to submission of the deliverables. Refer to Section 3 for items which must be scheduled in the Phase II Proposal. The proposal may also include a preliminary GANTT chart with critical activities identified (In Sections 3-8)).

The mandatory milestone dates provided in Section 3 shall be met and if a Proposal does not meet these dates, the Proposal will be rejected.

In order to eliminate the possibility of the Ministry being designated as "Constructor" as defined in the Occupational Health and Safety Act, RSO, 1990, two (2) contractors (including utility companies and Service Providers) cannot have work progressing in the same area. The Proposed project Schedule must address how the situation of the Ministry being designated "Constructor" will be avoided during the Assignment.

Note: No work by the Proponent/Preferred Proponent/Service Provider shall be planned to start before the Agreement has been fully executed.

(b) Functional Category Plans

A separate Functional Category Plan must be submitted for **each** of the following Sections **list included sections** to address the category specific requirements detailed in Part B. Functional Category Plan(s) shall be of sufficient detail to clearly illustrate to the Ministry all of the required tasks and deliverables to complete the proposed scope of work. A Proponent may be asked for clarification(s) regarding the Functional Category Plans submitted. An incomplete or ambiguous submission may result in disqualification at the Ministry's discretion, acting reasonably.

Each Functional Category Plan shall be submitted in the following format:

6.X Functional Category Name (e.g. Foundations Engineering)

6.X.1 Scope/Work Plan

Outline the approach, methodology and work proposed to respond to the requirements outlined in the Terms of Reference.

The Work Plan shall include a statement to clearly confirm that the Proponent will carry out all the necessary tasks to perform the work.

The Work Plan shall demonstrate that the methodology proposed is well suited for this specific work, the level of understanding of the issues and key challenges related to each Discipline, and problem solving that will be used. Where applicable, outline investigative techniques that will be used to identify and evaluate new technologies

The work plan shall identify any external project teams (i.e.: media, emergency services, public, etc.); to be utilized.

Note: Discussion specific to Site Investigation and Field Testing and Materials Testing requirements must be in parts iii) and iv) respectively.

6.X.2 Deliverables

This section shall include a statement confirming that all the deliverables identified in the Terms of Reference for the specific functional work plan will be provided. It is not required to reiterate the details provided in Sections 3-8. Proponents may identify any additions or modifications to the deliverables they may deem necessary to complete the work and provide the rationale.

6.X.3 Site Investigation and Field Testing

Focus on the investigation and testing requirements related to the specific Functional Work Plan only. General Site Investigation and Field Testing requirements and compliance to General Requirements should be covered in the Project Overview as described above.

6.X.4 Engineering Materials Testing and Evaluation Requirements

Focus on material testing requirements related only to the specific Functional Work Plan.

(the "X" should correspond to the Functional Category # in Section(s) 5,6,7 or 8)

The following additional Information to be provided within Functional Category XX:
{insert functional category(ies) and requirements or delete if not applicable}

Functional Categories that do not require submission of a Plan:

The following Functional Categories will not receive a technical score in the evaluation of the Phase II submission. The following Functional Categories Plans only require a written statement confirming that the Terms for this functional category will be adhered to for this Assignment: ***{insert functional categories not scored or delete paragraph if not applicable}***

A Proponent may include any additional engineering work category as a supporting specialty (with a corresponding work plan) they deem necessary to complete the Assignment.

(c) Conflict of Interest Declaration Forms

If there are changes to the Proponent's Conflict of Interest Certification between the submission of the Phases I and II Proposals, Proponents shall include in their Phase II Proposal a resubmission of the Certification forms. If there are no changes in the status of the Proponent's Conflict of Interest Certification, no resubmission of the Certification forms is required within their Phase II Proposal.

1.5.2.2 Financial Plan (Envelope No. 2 - Pricing)

The following must be uploaded to Envelope No.2 for the Phase II (RFP) submission:

(a) Completed and signed Offer and Acceptance Form (Appendix 1: Forms and Tables).

The Lump Sum Price shown in the Offer and Acceptance Form shall be full compensation for all services, deliverables, equipment, materials and testing required to provide the services detailed in the RFP documents and the Proponent's proposal. The Lump Sum Price includes, but is not limited to salary, benefits, overhead (office, computer, cell phones, etc.), payroll burden and profits.

Proponents shall provide their billing office/address with their Financial Plan.

(b) Completed Proposed Bid Price Summary Form(s) as applicable for this Assignment (Appendix 1: Forms and Tables).

The Lump Sum Price shown in the Bid Price Summary forms shall be full compensation for all services, deliverables, equipment, materials, and testing required to provide the Services. The Lump Sum Price includes, but is not limited to salary, benefits, overhead (office, computer, cell phones, etc.), payroll burden, and profits.

Any incomplete financial Proposal shall be disqualified, and the Service Provider advised accordingly.

1.5.2.3 Innovation Proposal (Envelope 4 – optional)

An Innovation Proposal is optional and is to be submitted separate from the Basic Proposal which includes the Technical and Financial Proposal outlined in Section 1.5.2.2 above. Innovation Proposals may be submitted for one (1) or more areas.

An Innovation Proposal is to be *substantive* and beyond the normal Planning, Detail Design or Preliminary Design work to be carried out for a project. Project Delivery routinely involves assessing options, evaluating alternatives, recommending effective, practical and value-added solutions and delivering the design package, specifications, quantities, cost estimates and the related details / documentation. The items which are considered as part of the normal scope of highway planning, design, construction administration or other normal Services will not be considered under Innovation.

An Innovation Proposal submitted without the submission of a Basic Proposal will be disqualified and not considered. A Basic Proposal is to be sufficient to meet all the requirements for an Assignment and to provide all deliverables, in a timely manner. An Innovation Proposal if not accepted by the Ministry, shall not influence the Service Provider's obligations under a Basic Proposal. A Basic Proposal, which cannot independently deliver on the requirements without relying on the Innovation Proposal submitted, will be considered deficient and will be disqualified.

The Basic Proposal and Innovation Proposals will be evaluated and scored separately. The Basic Proposal will be evaluated first and an Innovation Proposal second. If a proponent's Basic Proposal is disqualified, an Innovation Proposal will not be considered.

All Innovation Proposals will be screened in relation to the Ministry's priorities for innovation within the scope of the project.

Innovation Proposals meeting the Ministry's screening criteria will be further evaluated and scored for: timeliness of delivery; the benefits from an Innovation Proposal; any risks to the project; the relative priority for the Ministry of an Innovation in relation to others submitted; and the qualifications of a Service Providers team to deliver a proposed Innovation and shall be kept confidential by the Ministry and not be shared or negotiated with the successful proponent.

The Ministry may disqualify an Innovation Proposal if the price of the Proposal, assessed by the Ministry, is not appropriate in relation to the overall scope and price of the Assignment and the scope of the innovation proposed.

The Technical Scores for a qualified Innovation Proposal will be added into the scores of the Basic Proposal, to obtain the total for Technical Scores. Where more than one Innovation Proposal is submitted, only the scoring of the Innovation Proposal receiving the highest score will be included in the total for Technical Scores. The price for an Innovation Proposal will not be added to the Price of the Basic Proposal submitted.

The Ministry may accept / not accept the Innovation submitted or may negotiate to revise the scope of an Innovation Proposal. The Innovation Proposals of non-winning Service Providers will not be further considered. The finalized Innovation Proposal shall be included in, and form part of the plan(s) to which the innovation applies.

Proposal Instructions

Each Innovation Proposal is to be submitted in two files (outside the basic proposal);

1) A file containing the Technical & Management component which must be uploaded to Envelope 1
2) A file containing the Price/Financial component which must be uploaded to Envelope 2.

An Innovation Proposal must outline the objective and scope of work proposed, clear deliverables, staffing and schedule and the estimated cost. The Proposal is to clearly identify the benefits to the Ministry and potential for any further work, which may be needed beyond an Innovation Proposal. The benefits of an innovation proposed may be reflected in process efficiencies, end-product, accelerated schedule, savings on capital costs and /or life cycle costs, drivers' safety and other similar but major considerations.

The Innovation Plan is to include the following sections for each Innovation Proposal:

Section 9.1 Innovation Proposal 1

9.1.1 Scope/Work Plans

9.1.2 Deliverables

9.1.3 Benefits and Risks

9.1.4 Schedule

Each Innovation Proposal is limited to a maximum of *five (5)* pages in length.

The Construction Administration (CA) Team shall document, monitor, and evaluate the implementation and outcomes of any approved innovation proposals during construction. The evaluation shall include an assessment of the innovation's effectiveness in achieving the intended objectives, including impacts on project cost, schedule, quality, safety, constructability, and risk management. The findings shall be documented and reported to the engineering team and the Ministry, including a comparison of the actual outcomes against the anticipated benefits identified at the time of the innovation proposal approval.

1.5.3 Phase III – Preferred Proponent only

The Preferred Proponent shall have five business days from receiving notification, or such longer time period as specified in the written notice, to provide the MTO Project Manager with the Phase III Forms and submissions as specified below:

(a) Provide the Service Provider address and Service Provider contact for all notices, documents, deliveries and Approvals required or permitted by this Agreement.

(b) Occupational Health and Safety Plan and OHSA Declaration Form

The Service Provider is to adhere to the requirements of **Article 4.12** of the Legal Terms and Conditions regarding Occupational Health and Safety.

The proposed Occupational Health and Safety Plan shall outline the Service Provider's general approach to Occupational Health and Safety.

As a minimum in the Phase III submission, the Service Provider's Plan shall include:

(i) Signed Occupational Health and Safety Statutory Declaration Form certifying that the signatory fully understands and intends to fulfill its obligations as "employer" as prescribed in the OHSA and its regulations (Appendix 1: Forms and Tables).

(ii) Valid corporate Health and Safety Policy as prescribed in the OHSA.

(iii) Description of the hazards inherent to the work of this Agreement and a description of how these hazards will be managed in compliance with the OHSA and all applicable Regulations.

(iv) Description of what provisions it has put (or will put) in place for providing an adequate number of supervisors and that they all satisfy the definition of "competent" as prescribed in the OHSA.

(v) Indication of whether a Preventative Maintenance Program for equipment is available (if required).

(vi) Description of traffic control provisions, specific to the Agreement, which demonstrate that the Service Provider is aware of relevant traffic standards and their obligations

and responsibilities under the OHSA to provide for public and employee safety for this Assignment.

(vii) Description of what information and instructions shall be provided to employees so that all employees are informed of the hazards inherent in the Work and understand the procedures for minimizing the risk of injury or illness.

(viii) Procedures for (i) responding to OHS issues identified by MTO; (ii) managing orders from Ministry of Labour, Immigration, Training and Skills Development (MLITSD); (iii) fulfilling MLITSD notification for critical injuries and fatalities; and (iv) notifying MTO of critical injuries/fatalities and MLITSD orders.

(ix) List of MLITSD orders that have been issued to the Service Provider within the past five (5) years and any conviction for OHSA violations if applicable.

(c) Insurance Certificate (Legal Terms and Conditions – Article 15) and Certificate of Insurance Form (Appendix 1: Forms and Tables).

Failure to comply with the Phase III requirements within the timeframe and requirements specified may result in disqualification of the Preferred Proponent.

(d) Additional Forms and Tables

Foundations Engineering

The Preferred Proponent shall complete and submit the Foundation Engineering Itemized Price Breakdown Table listed in Phase III Forms of Appendix 1 Forms and Table to the MTO Project Manager:

- One table for the works listed in Section 7.7 Foundations Engineering
- One table for the works listed in Section 7.16.1 Additional Biddable Work Items

The Foundation Engineering Itemized Price Breakdown Table shall be considered as a baseline for determination/negotiation of compensation for scope changes (extra work or deleted work). The sum of total costs of this table shall be consistent with the total cost of the Foundations Engineering services provided in the Financial Plan submitted in Phase III (Envelope No. 3). The Service Provider may add or modify the itemized list of major activities in this table to reflect project specific activities. ***{include if requested by Foundations or delete paragraph if not applicable}***

1.6 Proposal Evaluation and Award

1.6.1 Phase I (EOI) – Project Staffing and Organization

The Ministry will examine a Proponent's Phase I submission to determine if it meets the mandatory requirements prescribed in this document. A determination of non-compliance

(omitted or unacceptable items, evidence of misleading or false information) may result in disqualification of the submission from further consideration.

Proposals meeting the RFP requirements will be scored in accordance with the table below. A Proponent's Phase I Proposal score will be based solely on the content of the Proposal and the result of reference checks should the Ministry chose to do them.

Project Staffing and Organization Schedule/Plan	Maximum Score	Minimum Score*
Organization Chart	20	xx
Project Management Approach	10	xx
Schedule and Cost Control	20	xx
Project Manager	20	xx
Project Key Staff		
Functional categories:		
Advanced Traffic Management Systems	20	xx
Bridge Engineering	20	xx
Drainage and Hydrology Engineering	20	xx
Electrical Engineering	20	xx
Engineering Materials	20	xx
Environmental	20	xx
Foundations Engineering	20	xx
Highway Engineering	20	xx
Pavement Engineering	20	xx
Surveying	20	xx
Traffic Engineering	20	xx
Value Engineering	20	xx
Property/Corridor Management	20	xx

Project Staffing and Organization Schedule/Plan	Maximum Score	Minimum Score*
Constructability Review	**20**	xx
Environmental Planning	**20**	xx
Highway Planning	**20**	xx
Transportation (Systems) Planning	**20**	xx
Rockfall Engineering	**20**	xx
TOTAL SCORE	**20**	

**Where a minimum score is included, any Proponent that scores below the minimum score for any "project Staffing and Organization" Schedule/Plan, will be disqualified.*

Each Schedule/Plan will be evaluated on a set of predetermined individual components. The individual components within each Schedule/Plan will be scored on a 0/4/7/10 scale.

Qualified Proposals will be ranked according to their overall score. The overall score is calculated using a weight of 100% for the project Staffing and Organization Proposal Score (table above). The Proposal Score is rationalized out of 100 points to the highest scored submission and summed to provide an overall score for each Proponent.

The Ministry will then short-list up to five (5) firms based on the overall ranking to submit Proposals for Phase II of the RFP process.

Scores for the Proponents' Phase I Proposal will be carried forward into the evaluation of Phase II. Staffing substitutions prior to MTO completing the evaluation of Phase II will require the ministry re-evaluating and may result in re-scoring the Proponent's Phase I Proposals or disqualification of the Proponent's Phase II Proposal at the discretion of the Ministry. Substitutions after the award of the Agreement that do not comply with the terms may result in the termination of the Agreement with the Service Provider.

The Service Provider is responsible for ensuring the availability of proposed staff in the Proposal Submission for the term of the Agreement for the CA Assignment. The term of the Agreement for CA assignment will be from the date of the execution of the construction by MTO to the completion and submission of all the CA Services and Deliverables in a form acceptable to MTO. Proposed Staff substitutions may not be approved once site construction begins. In the situation where a staff person no longer is employed by the Service Provider, the Service Provider is to bring this to the ministry's attention immediately and a plan is to be developed to staff the assignment as required.

The evaluation of a Joint Venture proposal will consider the combined qualifications, experience, and resources of all participating firms, provided that the required expertise and accountability are clearly demonstrated within the proposal.

Staff changes by the Service Provider during the term of the Agreement for CA assignment shall require written approval from MTO, prior to any such change. The qualifications and experience of the proposed staff must be equivalent to that of staff proposed by the Proponents in the Proposal Submission. Determination of whether staff proposed for substitution meet the requirements of the CA assignment shall be at the ministry's discretion. Failure to comply may result in the termination of the agreement.

1.6.2 Phase II (RFP) – Technical and Financial Proposal

The Phase II Proposal is to be submitted in two (2) envelopes as described in Section 1.5.2. Envelope #1 will contain the Technical Proposal and Envelope #2 will contain the Financial Proposal. The Financial Proposal will remain sealed until the Technical Proposal (Phase II) evaluations are completed.

The Ministry will examine the Technical Proposal to determine if it meets the mandatory requirements prescribed in this document. A determination of non-compliance (omitted or unacceptable items, evidence of misleading or false information) may result in disqualification of the submission.

A Proponent's Phase II proposal will be scored in accordance with the table below and added to the Phase I score. The total of the maximum allowable points from Phase I and II will be added together.

Schedule/Plan	**Maximum Score**	**Minimum* Score**
Project Staffing and Organization Plan (Total Score from Phase I to be carried forward)	Phase I Total Maximum Score	Phase I Total Minimum Score
Project Overview		
Understanding of project	**25**	xx
Approach (including project Schedule)	**75**	xx
Functional categories:		
Advanced Traffic Management Systems	**100**	xx

Schedule/Plan	Maximum Score	Minimum* Score
Bridge Engineering	**100**	xx
Drainage and Hydrology Engineering	**100**	xx
Electrical Engineering	**100**	xx
Engineering Materials	**100**	xx
Environmental	**100**	xx
Foundations Engineering	**100**	xx
Highway Engineering	**100**	xx
Pavement Engineering	**100**	xx
Surveying	**100**	xx
Traffic Engineering	**100**	xx
Value Engineering	**100**	xx
Property/Corridor Management	**100**	xx
Constructability Review	**100**	xx
Environmental Planning	**100**	xx
Highway Planning	**100**	xx
Transportation (Systems) Planning	**100**	xx
Rockfall Engineering	**100**	xx
Innovation Plan	**100**	xx

Schedule/Plan	Maximum Score	Minimum* Score
TOTAL SCORE	**100**	xx

**Where a minimum score is included, any Proponent that scores below the minimum score for any schedule/plan, will be disqualified and the Financial Proposal (Envelope #2) will be returned unopened.*

Each Schedule/Plan will be evaluated on a set of predetermined individual components. The individual components within each Schedule/Plan will be scored on a 0/4/7/10 scale.

The Financial Envelopes pertaining to acceptable Technical Proposal submissions will be examined to confirm that the mandatory requirements prescribed in this document have been met. A determination of non-compliance may result in the disqualification of the submission from further consideration.

The Financial Envelopes shall contain one lump sum bid for the engineering assignments (planning, preliminary design, detail design), and one maximum ceiling price with fee schedule for the CA assignment.

Proponents that submit Tenders that contain unit prices that appear to be an Unbalanced Bid may be referred to the Ministry's Qualification Committee and any Tenders that are so unbalanced, in the sole discretion of the Ministry, that it may adversely affect the interests of the Ministry, may be rejected. In the event of a mathematical error or discrepancy in the Hourly Billing Rates Schedule form, the Ministry may request the Proponents to resubmit the Hourly Billing Rates Schedule form.

The qualified Proposals will be evaluated based on a weighting of 80% for the Technical Proposal, and 20% for the Service Provider's Price. The Proposal score is rationalized out of 100 points to the highest scored submission**.** The submitted Price is rationalized out of 100 points to the lowest submitted price. Each rationalized score is then multiplied by the relative weights and summed to provide an overall scoring for each Service Provider. The selection is on the basis of overall score and ranking. Prior to signing the Agreement, any additional clarifications required of the Proposal will be resolved with the Service Provider.

1.6.3 Phase III and Award

Once notified by the Ministry, the Preferred Proponent will have up to five (5) business days, or such longer time period as specified in the written notice, to complete and submit the Phase III requirements. Failure to provide the Phase III requirements as prescribed and within the timeframe specified may result in disqualification of the Preferred Proponent.

1.6.4 Debriefing Process

For Procurements with a value $30,300 or more, all unsuccessful Proponents who participated in the Procurement will be offered an opportunity for a debriefing. Proponents have a right to a debriefing only after the executed Agreement between the Preferred Proponent and the Ministry has been signed.

Once the Agreement has been executed, the Ministry, when requested, will debrief each Proponent at the Ministry's date and time of preference, relative to each Proponent's Proposal evaluation results for Phases I, II and III. Phase I Proponents not shortlisted for Phase II will only be debriefed for Phase I.

1.6.5 Payment for Services

As part of the Financial Proposal, the Proponent shall have submitted the appropriate Bid Price Summary Forms (Appendix 1 – Forms and Tables: Bid Price Summary Forms).

Upon award of this Assignment, the submitted Bid Price Summary Forms and Section 3.5 will become the Payment Schedule of the Service Provider and shall become part of the executed Agreement.

Detailed Price Breakdown Forms must be completed by the Successful Service Provider upon request by the Ministry's Project Manager.

SECTION 2: PROPOSAL TERMS AND CONDITIONS

2.1 Information Obtained by Service Provider

All requirements, designs, documentation, plans and information viewed or provided to Proponents in connection with this RFP are the property of the Ministry and must be treated as confidential and not used for any purpose other than replying to this RFP and the fulfilment of any subsequent Agreement. Upon request of the Ministry, all such designs, documents, plans and information shall be returned to the Ministry.

Notwithstanding the above, if the requirements, designs, documentation, plans and information obtained by the Proponent in connection with this RFP are obtained from the Ministry's publisher or similar agent, then these documents shall not be treated as confidential, and this provision shall not apply.

2.2 Changes to the RFP by the Ministry

The Ministry may, in its sole discretion, amend or supplement the RFP Documents prior to the final proposal submission deadline. The Ministry shall issue changes to the RFP Documents by Addenda only. No other statement, whether oral or written, made by the Ministry shall amend the RFP Documents.

The Ministry reserves the right to modify the RFP schedule, or cancel this RFP for any reason, without incurring any liability for costs, losses or damages incurred by any company invited to participate in the Proposal phase.

2.3 Irrevocable Proposal after Closing

No alteration or modification to the Proposal will be accepted after the specified closing date/time for submitting the Proposal.

A Phase I Proposal received on time by the Ministry open for acceptance by the Ministry for a period of six (6) months after the Phase I Proposal Submission due date. Where the short-listing is not completed within the above timeline, the Phase I competition may be cancelled unless all Proponents explicitly agree to extend their quotation(s) for a longer period.

A Phase II Proposal received on time by the Ministry is irrevocable by the Proponent and will remain in effect and open for acceptance by the Ministry for a period of ninety (90) calendar days after the Proposal Submission Deadline unless all Proponents explicitly agree to extend their quotation(s) for a longer period, subject to a modification of the assignment schedule (i.e., initiation of project).

2.4 Confidentiality of Proposal

The Ministry will consider all Proposals as confidential, subject to the provisions of and the disclosure requirements of the Freedom of Information and Protection of Privacy Act, R.S.O.

1990, c.F.31. The Ministry will, however, have the right to make copies of all Proposals received for its internal review and evaluation process.

Any innovative ideas expressed in any unsuccessful Proposal shall be considered proprietary to the respective Proponent.

By submitting Proposals, Proponents authorize the Ministry to conduct reference checks.

2.5 Clarifications

The Ministry reserves the right to seek any proposal clarification and supplementary information relating to a clarification regarding the Proponent's Phases I or II Proposal after the respective Proposal Due Date. Proponents are responsible to provide their written clarification(s) within three (3) Business Days.

The Ministry may request clarification where any Proponent's intent is unclear and may waive or request amendment where, in the opinion of the Ministry, there is a MINOR irregularity or omission in the information that has been submitted in a required document.

The Ministry, acting reasonably, reserves the right to accept or reject any written clarification(s) submitted by Proponents. The purpose of the clarification(s) is not to alter the content of the original submission and/or Competitive Cost/Lump Sum Price. The response received by the Ministry from a Proponent shall, if accepted by the Ministry, form an integral part of that Service Provider's proposal.

In the event that the Ministry receives information at any stage of the evaluation process which results in earlier information provided by the Proponent being deemed by the Ministry, acting reasonably, to be inaccurate, incomplete or misleading, the Ministry reserves the right to revisit the Proponent's compliance with the Mandatory Requirements and/or adjust the evaluation or scoring of the Phases I and/or II Proposals.

The Ministry reserves the right to interview any or all Proponents to obtain information about or clarification of their proposals.

2.6 Right to Accept or Reject

The Ministry, acting reasonably, reserves the right to accept or reject any and all Proposals, whether or not completed properly and whether or not it contains all required information.

In the event that any Proposal is not accepted, the Ministry will not be liable for any costs or damages incurred by any Proponent including, without limitation, any expenses incurred in the preparation and submission of the Proposal.

2.7 Misleading Information

The Proponent understands and agrees that the Ministry may, if deemed necessary, verify any information provided in any submission. If there is any evidence of misleading or false information having been given, the Ministry acting reasonably may, in its sole discretion, reject the submission.

2.8 Award to be in Writing

The award of an Assignment to the Preferred Proponent is subject to the required Ministry approvals.

The acceptance of the submission and the award of this Agreement will be made in writing and only in writing.

2.9 Execution of Agreement

The Legal Terms and Conditions attached to this RFP is substantially of the form in which the Ministry expects it to be executed. Only those changes which are necessary to reflect the options or variables set out in this RFP will be made to the Agreement

The successful Service Provider(s) will be required to comply with the fully executed RFP including the Legal Terms and Conditions, the Service Provider's Proposal and the RFP documents, which shall form the legal agreement with the Ministry after acceptance by the Ministry. Any subsequent changes to the legal agreement will be made only in writing.

The acceptance of a Proposal and the award of this assignment or any part thereof will be made in writing by the Ministry signing the acceptance portion of the submitted Offer and Acceptance Form (Appendix 1: Forms and Tables).

2.10 Failure to Execute Agreement

In the event that a Preferred Proponent fails to enter into and duly execute the written Agreement within the prescribed time, the Ministry reserves the right, at its sole discretion, exercising reasonably, to award this Assignment to another Proponent, not to accept any Proposal, or to call for a new Proposal, and the defaulting Preferred Proponent shall be liable for all losses, damages, costs and expenses (including direct consequential losses and damages, and legal fees on a solicitor and client basis) suffered or incurred by the Ministry as a direct result thereof, including but not limited to any increase in the price of performance over the price submitted by the defaulting Preferred Proponent in its Proposal.

2.11 No Liability for Expenses

All Proposals shall be prepared by and at the expense of the respective Proponent. The Ministry will not be liable for any loss or damage suffered by any Proponent including, without limitation, any expenses incurred in the preparation and submission of the Proposal.

The Ministry accepts no responsibility for any reason whatsoever, including computer system failures of either the Bidder or the Ministry Service Provider, if the Bidder is unable to submit its Bid before Tender Closing and the Bidder agrees that the Ministry shall have no liability for delays caused by internet/network traffic, degraded operation or failure of any computer system element, including, but not limited to: any computer system, power supply, telephone or data connection or system or software or browser of any type whatsoever.

It is the sole responsibility of the Bidder to ensure that it can access and exchange data with the Ministry Service Provider's computer systems electronically and that it allows sufficient time to successfully access and share data with the Ministry Service Provider's computer systems, having regard to the possibility of delays caused by internet/network traffic. Bidders are solely responsible to ensure that they plan their access to the Ministry Service Provider's computer/servers, so that the Bidders can reach the Ministry Service Provider's computers/servers before Tender Closing.

2.12 Non-Collusion

A Proponent shall not discuss or communicate with any other Proponent about the preparation of their RFP/RFQ submissions. Each Proponent shall participate in the RFP/RFQ process fairly and without collusion or fraud.

2.13 Occupational Health and safety

By submitting a Proposal, the Proponent attests that it is knowledgeable in the applicable Occupational Health and Safety Statutes and Regulations and that it will conform to all such Statutes and Regulations including, but not limited to:

(a) Occupational Health and Safety Act;
(b) WHMIS;
(c) Transportation of Dangerous Goods Act; and
(d) Workplace Safety and Insurance Act.

2.14 Accessibility

The Proponent's delivery of the Deliverables shall comply with all applicable requirements, specifications and standards for accessibility established in accordance with the Ontario *Human Rights Code (HRC) R.S.O. 1990, CHAPTER H.19,* the *Ontarians with Disabilities Act, S.O. 2001, CHAPTER 32,* and the *Accessibility for Ontarians with Disabilities Act (AODA), 2005*, S.O. 2005, c. 11 (Integrated Accessibility Standards), any regulations made thereto and any direction from the Ministry. The Proponent must meet the Government of Ontario's requirements on the Government of Ontario's schedule under the Integrated Accessibility Standards Regulation as directed by the Ministry.

2.15 Insurance Requirements

This assignment includes insurance requirements as described in the Legal Terms and Conditions Article 15. A successful Service Provider, including each firm of a Joint Venture, will be required to provide proof of insurance to the Ministry within five (5) business days, or such longer time period as specified in the written notice, of receiving the written notice from the Ministry that the Agreement is ready for execution.

A successful Service Provider shall provide evidence of the extension of such insurance to the Ministry prior to the expiration of any current policy.

Delivery to and examination by the Ministry of any policy of Insurance or Certificate thereof or other evidence of insurance shall in no way relieve the Preferred Proponent or Service Provider of any of its obligations pursuant to the provisions of the Legal Terms and Conditions **Article 15** and shall in no way operate as a waiver by the Ministry of any of its rights.

2.16 Quality Control Requirements

For all RFP agreements, a Proponent must have as a minimum, a prior registration in the Ministry's RAQS of the Core Plan and the Generic Category Plan for the category in which the Prime Specialty identified is located. The Proponents who do not meet this requirement shall not be considered

The successful service provider undertakes to be fully responsible for the quality and timeliness of deliverables and the Quality Control of all aspects of the assignment including the work of the Sub-Service Providers. The firm undertakes to provide the timely submission of the Quality Control Plans required and the Quality Audit reports to the Ministry's Project Manager.

2.17 Subcontracting services by the Service Provider

In submitting a Proposal, the Service Provider may not subcontract the following services, which must be provided by the Service Provider:

- Project Management for this Assignment
- Quality Control for this Assignment

Sub-contracting by the Service Provider shall not be construed to relieve the Service Provider from any obligation under this Assignment or impose any liability upon the Ministry. Nothing contained in the assignment documents between the Service Provider and its sub-service provider, shall create a contractual relationship between a Sub-Service Provider and the Ministry.

A Sub-Service Provider can become a Sub-Service Provider to another Prime firm or to a Joint Venture during the Phase I Proposal process.

2.18 Requirements from the Joint Venture

"Joint Venture" is a collaborative undertaking by two or more firms for which the participant firms are both jointly and individually responsible. A Joint Venture is limited to one (1) Phase I Proposal. A firm in a Joint Venture may form a Joint Venture with another firm and can provide a Proposal under that Joint Venture.

The Ministry will accept submissions from Joint Ventures. A Joint Venture submission shall identify a Lead Proponent and all participating firms. The Lead Proponent shall be authorized to act on behalf of the Joint Venture in all matters relating to the submission and any resulting Contract. The submission shall clearly describe the responsibilities of each Joint Venture member. If awarded the Contract, the members of the Joint Venture shall be jointly and

severally liable for all obligations under the Contract. The Ministry may require evidence of the Joint Venture arrangement prior to Contract award.

In accordance with MTO 'Qualification Procedures for Engineering Service Providers', Section 18, each participant in a Joint Venture shall be a Prequalified ESP firm and shall indicate their intent to form a Joint Venture prior to submitting a Bid Intent. A letter must be emailed, on a joint or individual basis, to the Ministry's Qualification Control Unit at QualificationControl@Ontario.ca, identifying each participant in a Joint Venture and the lead ESP firm. This letter shall be signed by a binding authority for each participant in a Joint Venture. The lead ESP firm shall:

- Meet the prequalification requirements for the prime Engineering Specialty and Quality Control Generic Category plan where the Specialty resides in the solicitation notice;
- Or meet the prequalification requirements for the prime CA Specialty and Quality Control Generic Category plan; and Coordinate and submit response, bid and all documents on behalf of the Joint Venture.

Upon approval from the Ministry's Qualification Control Unit, the lead ESP firm is responsible to submit the Bid Intent on behalf of the Joint Venture.

For a Joint Venture, the following information must be provided:

- Declaration that the Service Providers in a Joint Venture will be working as partners for the purposes of this Assignment.
- Specialties / areas of work that each individual Service Provider will be responsible for.
- The firm responsible for prime engineering specialty.
- The firm responsible for CA specialty.
- Lead firm to be the Ministry contact for the purposes of this Assignment. The Ministry will deal with the Lead firm on the contractual matters.
- Name, title and telephone number of the Principal of the Lead firm who will serve as the Contact for the project. The Principal must have the authority to sign the Joint Venture and make decisions on behalf of the Joint Venture on contractual matters.
- The lead firm approved in RAQS in the Prime Specialty has their Quality Control Core Plan approved in RAQS. The same firm has an approved Quality Control Generic Category Plan in RAQS for the Category where the Prime Specialty for this Assignment is located.
- Each Service Provider firm in a Joint Venture is responsible for the delivery and quality of work for the purposes of this Assignment.
- The lead Service Provider firm is responsible to administer the accepted Quality Control Plan, including the Plans for all Categories. The lead Service Provider firm is responsible

for timely submission of all Plans required and the Milestone Quality Reports (Quality Audit) to the Ministry's Project Manager.

- At the award of an Assignment, the Agreement Offer shall be signed by and shall be binding on all firms in a Joint Venture. All provisions and obligations of the Agreement shall apply equally to all Joint Venture Service Provider firms. All Service Providers shall receive the same performance appraisal score. In case of a breach of the Agreement, all the Service Providers may receive an infraction and related sanction.
- All firms in a Joint Venture are responsible for a completed and signed Declaration for No Conflict of Interest.
- In a Joint Venture, the Lead Project Manager is to be an employee of the designated lead Engineering Service Provider firm.
- Each firm in a Joint Venture will receive Performance Appraisal for this Assignment.

2.19 Price Adjustment for Contract Administration Services

Where Construction Administration Services are authorized to proceed more than thirty-six (36) months after the commencement of the MTPM assignment, the Construction Administration component of the Service Provider's compensation may be adjusted to account for inflation.

The adjustment shall be based on the percentage change in the Consumer Price Index (CPI), All-items, Ontario, as published by Statistics Canada.

For the purpose of calculating the adjustment:

a) the Base CPI shall be the most recently published CPI value for Ontario at the time Detailed Design Services are completed and accepted by the Ministry;

b) the Current CPI shall be the most recently published CPI value for Ontario immediately preceding the authorization of Construction Administration Services;

c) the adjusted compensation shall be determined using the formula:

Adjusted CA Compensation = Original CA Compensation × (Current CPI ÷ Base CPI)

The adjustment shall apply only to the Construction Administration Services portion of the Assignment and shall not apply to Engineering Design Services already completed.

No adjustment shall be made where Construction Administration Services commence within thirty-six (36) months from the commencement of MTPM assignment.

Any CPI adjustment shall be applied once at the commencement of Construction Administration Services and shall not be subject to further annual escalation unless specifically authorized by the Ministry.

The adjustment shall be applied only to labour-based portions of the Construction Administration Services and shall not apply to disbursements, allowances, or provisional items.

No adjustment shall be applied in respect of any period during which the commencement of Construction Administration Services is delayed as a result of the Service Provider's failure to perform the Services in accordance with the requirements of the Assignment.

PART B: SERVICES TO BE DELIVERED

SECTION 3: PROJECT ADMINISTRATION, QUALITY CONTROL AND PERFORMANCE

3.1 Project Schedule

3.1.1 Services Required

The Service Provider shall manage the project to adhere to the mandatory milestone dates, submission of deliverables dates, meetings and presentations dates specified below and as depicted in the project Schedule submitted in their Proposal. Any changes to the project schedule are subject to the approval of the Ministry.

The project Schedule must include the following:

(a) Mandatory Milestone Dates

The Service Provider shall meet the following milestone dates:

- Submission of Study Design Report **[Insert Date]**
- Submission of Planning Report **[Insert Date]**
- Submission of Preliminary Design Report **[Insert Date]**
- Submission of Transportation Environmental Study Report **[Insert Date]**
- Submission of Preliminary Design Report **[Insert Date]**
- Submission of Utility Relocation Plans **[Insert Date]**
- Submission of Property Request **[Insert Date]**
- Executive Presentation **[Insert Date]**
- Submission to Contract Tendering Section **[Insert Date]**

The dates above are critical to the delivery of the project and shall be met.

(b) Dates for Submission of Deliverables

- Draft General Arrangement Drawings
- Final General Arrangement Drawings
- Engineering Survey Deliverables
- Draft Geotechnical Design Report
- Final Geotechnical Design Report
- Draft Foundation Investigation and Design Report (FIDR)
- Final FIDR and Foundation Investigation Report (FIR)
- Service Provider's Internal QC Design Review(s)
- Culvert Recommendations
- Draft Hydrology Report

- Final Hydrology Report
- Draft Structural Design Report
- Final Structural Design Report
- Draft Design Criteria
- Final Design Criteria
- Public Information Centre(s)
- Operational Performance Review
- Safety Analyst Review
- Final Property Requirements (if required)
- Submit Specialist Environmental Reports (if required)
- Submit Federal/Provincial Approvals/Authorizations
- Transportation Environmental Study Report (Class EA Group A and B)
- Design and Construction Report (Class EA Group A and B)
- Environmental Screening Document (Class EA Group C)
- Constructability Review(s) – with related dates
- Submission of Design for Ministry Comments
- Written Comments provided by the Ministry (allow minimum of 2 weeks)
- Constructability Review Report
- Submission for Design Complete Presentation
- Design Complete Presentation
- Executive Presentation Package Delivered to the Ministry
- CRO (Contract Review Office) Submission
- Property Clearance Date
- Utility Relocation Plans (if required)
- Utility Clearance Date
- Design Synopsis (draft and final)
- Environmental Synopsis with Summary of Environmental Concerns and Commitments table
- Earth Management Plan
- Erosion and Sediment Overview Risk Assessment
- Erosion and Sediment Control Plan
- Environmental Clearance – Construction Start

(c) Meetings and Presentations Dates

Minimum meeting requirements to be included in the schedule are:

- Start-up Meeting with the Ministry
- Progress/Monthly Meetings (Monthly/Bi-monthly, includes 30% and 60% milestone meetings)
- X on-site meetings/Design support during construction
- Traffic Management Meeting

- Design Team Review Meeting
- Technical Review Meeting
- Pavement Engineering Design Presentation Meeting
- Design Complete Presentation
- Executive Presentation
- Design Turnover Meeting to Construction
- Design Package Evaluation Meeting
- Executive Presentation
- Construction Site Meetings
- Project team meeting and decision on a limited number of reasonable alternatives
- Site Visit Meetings
- Presentation to Senior Management/ Director
- Electrical Design Presentation Meeting
- Utility Coordination Meetings
- Construction Contract Administration Meeting Dates
- Progress/Site Meetings
- Appraisal Meetings
- Final Deliverable Meeting at the completion of Construction
- Final Presentation to Senior Staff (if required) – no later than sixty (60) days following the later of:
- The end date for Term of Agreement; or
- The date of submission of the final estimate package

The contract is to be available for an anticipated tender opening in the [Spring, Summer, Fall, Winter of Insert Year].

(d) Ministry Acceptance/Approvals

In addition to requirements outlined elsewhere in this Assignment, the Service Provider must secure specific approvals and acceptance of the Ministry. The anticipated turnaround time, upon submission of all required documentation, is 20 Calendar Days for Detail Design Assignments.

Ministry Acceptance/Approvals for Construction Administration

Ministry Acceptance/Approvals		Turnaround Time
Contract Package	Acceptance	20 Calendar Days
Contractor's Quality Control Plan	Acceptance	5 Calendar Days
Construction Contract Change Orders (<$15K only if precedent setting, >$15K and all changes to traffic operational constraints)	Approval	7 Calendar Days
Changes to Contractor's working days/completion date	Approval	**

Construction Contract – Contractor Initiated Change Proposals	Approval	**
Stop Work Order (non-safety related)	Approval	Same Day
Sub-contract Substantial Performance Acceptance	Approval	5 Calendar Days
Contract Substantial Performance Acceptance	Approval	5 Calendar Days
Issue of Certificate of Completion	Approval	5 Calendar Days

** To be agreed to by the Ministry and the Service Provider

Draft documents for design work shall be submitted and shall have the same turnaround time as stated above for final documents.

3.1.2 Deliverables

Project Schedule Reporting

Within ten (10) Business Days of Assignment award, the Service Provider shall submit a draft Generalized Activity Normalization Timetable (GANTT) chart. The GANTT chart shall include, as a minimum, the activities and dates in section 3.1 and other specified dates in Part B of this RFP.

The Service Provider shall submit an updated project GANTT chart within two (2) weeks after the Start Up Meeting. The GANTT chart shall be updated monthly and submitted to the Ministry along with a status report of the progress of the project. The updated GANTT chart shall show the actual start and end dates for activities along with the original schedule dates and any revised dates.

3.2 Documentation and Participants for Meetings

3.2.1 Services Required

There will be [X] number of in-person meetings during the design phase that will be held at a Ministry Office, with the exception of on-site Construction meetings. Office hours are between 8:30 a.m. and 5:00 p.m. All meetings shall be scheduled such that all issues are adequately covered and discussed within these hours.

All meetings shall be arranged with each individual team member and chaired by the Service Provider. Meeting dates are to be such that required team members are available. The Service Provider Project Manager shall be present at all meetings including meetings with Sub-Service Providers.

Construction Administration Participation During Design

To enhance constructability, continuity of project knowledge, and quality of project delivery under the MTPM framework, the Service Provider shall ensure that qualified personnel with Construction Administration experience participate in the preliminary design and detail design phases as appropriate.

Such participation shall include constructability reviews, input on construction staging and traffic management, identification of potential construction risks, review of contract documentation, and recommendations to improve the efficiency, safety, quality, and constructability of the proposed works.

Construction Administration personnel participating in design activities shall be considered members of the design team for the purposes of project delivery and shall work collaboratively with engineering staff throughout the development of the design. Compensation for such participation shall be included within the applicable engineering design services and shall not constitute a separate Construction Administration service.

3.2.2 Deliverables

An agenda and a copy of the documents and plans to be discussed shall be supplied to each member of the Ministry's Project Team, a minimum of five (5) Business Days prior to the meeting. The Service Provider shall provide sufficient staff at all meetings so that the proceedings are not unduly delayed for the purposes of taking minutes. Minutes shall be prepared for all meetings within five (5) Business Days and distributed in hard copy or e-mail as agreed to by the Ministry to all attendees, all team members and any invited persons that could not attend, and as necessary, make the appropriate changes, additions and deletions.

All distributions and documents for meetings sent to the Ministry by the Service Provider shall:

1) Allow a minimum of two (2) Business days for any Ministry's internal distribution, in addition to minimum timelines set forth in this RFP, for document distribution.
2) Be clearly marked on the outside of the box/package with the Ministry's Project Manager's name and with "**FOR DISTRIBUTION**".
3) Each contract package shall be bound and have a transmittal letter attached as a cover indicating the project/meeting details and contain a distribution list of everyone who is receiving a package.
4) For each package the recipient's name shall be highlighted in the distribution list so Ministry staff can distribute accordingly.
5) Documents intended for MTO Construction Management staff shall be mailed in a **separate** package and sent directly to that office at the following address: **[Insert Address]**

The following are the mandatory requirements for specific meetings:

30% Review Meeting

The Service Provider shall act to deliver the following for the 30% Review Meeting in accordance with the Highway Planning and Design Process Guidelines (September 2016):

1. Meeting Agenda with time & location details
2. Final Design Criteria (for approval and signing)
3. Draft Reports (as applicable to project)
4. Final Reports (as applicable to project)
5. Draft Contract Drawings
6. Draft Preliminary material/documentation (as applicable to project)
7. Updated Scope and Cost Report
8. Other documents applicable to project

Design Team Review Meeting

The Service Provider shall act to deliver the following Design Team Review Package for the Design Team Review Meeting:

1. A complete design package, ready for review by the Ministry Functional Offices
   i) All Constructability Reviews completed, and recommendations incorporated in design.
   ii) Signoff and tracking of Constructability Review completed.
   iii) All final revisions from the Traffic Management Plan and Pavement Design Report are incorporated into the contract package;
   iv) All endorsed non-standard special provisions and items, modified standard special provisions, and modified standard drawings to address project specific requirements shall be according to the Contract Design Estimation Documentation (CDED) manual;
   v) Fully completed design and related deliverables, with fully completed independent check of drawings, details, specifications, and all related items. The completed packages shall be forwarded to the Ministry's Project Team Members for review a minimum of **Fifteen (15)** business days prior to the meeting;
2. Meeting Agenda / Time & Location Details
3. Final Reports (applicable to project)
4. Final Approved Traffic Staging Design
5. Preliminary Cost and Working Day Estimate
6. A digital copy of the final OpenRoads Designer cross-sections (AutoCAD, PDF or other Ministry approved format) for the entire project to the Ministry's Project Manager
7. Draft Design Synopsis
8. Updated Scope and Cost Report
9. Internal Quality Review Meeting Notes
10. Written confirmation shall be provided by the Service Provider's Quality Auditor confirming that an internal review of the contract package has been completed and that

all necessary revisions have been incorporated prior to the Design Team Review Meeting.

Note: At this stage of the design the Service Provider shall have all recommendations from any reports and direction from MTO functional offices incorporated into the Contract Package. There should be nothing in the contract package or accompanying documents that is left blank. It is the responsibility of the Service Provider to obtain any and all information in a timely manner in order to submit a complete contract package. Only very minor changes may be required following the Design Team Review Meeting.

11. The Service Provider receives (and acts to incorporate) the comments received by the Ministry's Project Team.

Mandatory meeting attendance: The individual who was directly responsible for and completed the OpenRoads Designer work shall attend the Design Team Review Meeting in person.

Design Complete Presentation

The Service Provider shall provide copies of the Design Complete Presentation package to all appropriate offices no less **than ten (10) Business Days** prior to the meeting. The Ministry will provide a distribution list of the appropriate offices.

The Service Provider's Quality Auditor shall confirm in writing, at the time the Design Complete Presentation package is submitted, to the Ministry's Agreement Administrator that the Design Complete Presentation package has had the changes incorporated from the Service Provider's Internal Design Review(s) and if applicable, the comments by the Ministry's Project Team, including the Ministry's Project Manager. Written documentation from the Service Provider's Internal Design Review(s) shall be provided to the Ministry.

For the Design Complete Presentation, the project is required to be totally complete, and all drawings, documentation and special provisions completed in final form.

A digital copy (AutoCAD, PDF or another ministry approved format) of the final OpenRoads Designer cross-sections for the entire project shall be provided to the Ministry's Agreement Administrator at the time the Design Complete Presentation package is submitted.

The individual who was directly responsible for and completed the OpenRoads Designer work shall attend the Design Complete Presentation Meeting in person.

The Service Provider's Project Key Staff responsible for the *Bridge Engineering, Drainage and Hydrology Engineering, Electrical Engineering, Engineering Materials Testing and Evaluation, Environmental, Foundations Engineering, Highway Engineering, Pavement Engineering, Surveying and Plan Preparation, Traffic Engineering shall attend the Design Complete Presentation.*

Executive Presentation Meeting

The Design Synopsis shall be submitted for approval to the Ministry's Agreement Administrator **20 Business Days prior to the Executive Review Meeting**. Changes requested by the Project Manager shall be made and included in the Design Synopsis distributed with the Executive Review Package.

The Service Provider shall provide a copy of the Executive Presentation Package to all appropriate offices no less than **Ten (10) Business Days** prior to the Executive Presentation Meeting (allow one (1) to two (2) Business days for MTO internal distribution in addition to minimum timelines set forth for meeting document distribution).The Service Provider is to follow the direction in this RFP regarding the "Distribution of Meeting Documents" found in Section 3 for distribution of meeting documents and materials.

At the Executive Presentation meeting, the Service Provider shall provide:

a) The 100% fully completed final contract package;
b) All drawings, specifications and quantity sheets;
c) Estimates, contractor payment items, etc.;
d) Final Design Synopsis;
e) Working day estimate along with the Operations working day memo;
f) Construction schedule (Critical Path Schedule format);
g) Environmental clearance memo/letter;
h) Property clearance memo/letter (if required);
i) Utility clearances and completion dates memo/letter (if required);
j) Any other critical clearances required for construction;
k) Design Synopsis*;
l) Final, signed Design Criteria;
m) Final Scope and Cost Report (to Project Manager only):

*****The Service Provider shall provide a written Design Synopsis and make a brief presentation about the project noting the following issues:

a) Brief description of the project;
b) Project construction cost;
c) Award schedule;
d) Brief overview of unique design issues;
e) Contentious issues that arose during design;
f) Engineering evaluations;
g) Pavement design alternatives and/or requirements;
h) Staging options;
i) Dewatering assumptions and/or requirements;
j) Key environmental concerns / constraints;

k) Policy issues that may arise from the project;
l) Contentious issues that may surface during construction;
m) Incentive / disincentive clauses (when included in the construction contract);
n) Provisions for Traffic Management;
o) At the end of the Design Synopsis, responses to the following six (6) questions shall be included, in plain language (not technical):
   i. Why is the work being performed?
   ii. What is the impact on traffic during construction? If there is an impact, provide an indication of how great the impact is: i.e. none, minor, major, severe).
   iii. What are the benefits of the completed work?
   iv. What are the main environmental protection and/or improvement features of this project?
   v. How does this project contribute to reducing the impact of climate change?
   vi. How does this project contribute to a sustainable environment?
p) Others.

Contract Preparation Software (CPS) Updates During Design and Contract Tender Submission

The Service Provider is expected to be responsible (unless otherwise informed by the Ministry's Project Manager) for any CPS updates during design and during the contract tender submission phase (prior to the specified advertising date). This shall include any required deletions, revisions, modifications or otherwise stated in the CPS update memo issued by Head Office periodically. This updating shall not be considered additional work and shall be completed by the Service Provider at the bid price for this Assignment. The Ministry will not accept any requests or change orders for extra work/payment for this task of CPS updates unless otherwise agreed to by the Ministry and Service Provider in accordance with the Change Order Process (as detailed in Article 12 of the Legal Terms and Conditions).

Contract drawings and engineering reports must be signed/dated and sealed by Professional Engineer(s) licensed in the province of Ontario at the contract tender submission phase.

The service Provider shall provide a digital copy of the Contract Package, and all required accompanying deliverables to the Contract Review Office a minimum of four weeks prior to Contract Tender Advertising for Head Office assignments or two weeks prior to advertising for the assignments. Submissions should be submitted **by 10:30AM** on the day of submission.

Contract Tender Advertising

The Service Provider is expected to be responsible (unless otherwise informed by the Ministry's Project Manager) to answer Bid Enquiries during the contract tendering advertising phase and Addendums as required.

Construction Site Meeting

During construction, the Service Provider's Project Manager, as a minimum, shall attend up to **three (3)** construction progress meetings as well as the Design Package Evaluation Meeting in person upon completion of construction to receive feedback on the working of the design package during construction.

3.3 Quality Control

3.3.1 Services Required

The Service Provider's Quality Control (QC) Plan shall become part of the executed Agreement.

The Service Provider / Sub-Service Provider will provide a senior level staff (Auditor) to be responsible to oversee the process of checking to resolve all problems / issues, and that all provisions of the QC Plans have been adhered to and provide an audit report to the Ministry Project Manager. The Ministry requires that Service Provider / Sub-Service Provider staff, directly involved with this Assignment, are not to be checking their own work for the purposes of Quality Control. The check / audit of quality control for all Specialties including the work of Sub-Service Provider(s) shall be conducted by staff of a Service Provider / Sub-Service Provider who have not been directly involved with that component of the work.

The Service Provider is fully responsible for the quality control of all services in accordance with the Quality Control Plans that have been approved by the Ministry on RAQS. The Prime Service Provider shall be responsible for the Quality Control Plans of all Specialties including the Plans of Sub-Service Provider(s) and take the appropriate corrective measures in order to maintain the quality of services. The Service Provider shall be solely and fully accountable for the quality of the deliverables, including grammar, wording and presentation. The Ministry reserves the right to recover costs which may result from errors, omissions or other actions or inaction of the Service Provider.

The performance of the Service Provider will include the adherence to the accepted Quality Control Plan, the timely delivery of Milestone Reports, the accuracy of check / audit reporting and any follow up clarification(s) or additional information requested by the Ministry Project Manager. The areas of conformance / non-conformance will be documented by the Service Provider. It is the responsibility of the Service Provider to correct the areas of non-conformance.

The Ministry may inform the Service Provider in writing to correct any major non-conformance / violation of the Quality Control Plans. If after written notice, the major non-conformance or violation is not corrected, the Ministry may at its own discretion issue an Infraction Report / financial consequences and / or stoppage of work, until the conformance is demonstrated or appropriate revisions to the plans are approved, such that any additional work to obtain conformance shall not constitute a scope change.

Upon request, the Ministry shall be given access at any time to all records produced in the performance of the Services including inspection records, test results and testing facilities, and to conduct sampling, direct observation of testing as necessary to enable the Ministry to monitor adherence to the Quality Control Plans for Services and other requirements of the Legal Terms and Conditions.

3.3.2 Deliverables

Quality Control Plan and Reports

The Quality Control Plan, submitted through RAQS, includes the following three components:

1. Core Plan
2. Generic Category Plan
3. Supplementary Specialty Plan (project specific)

As a requirement of prequalification in the prime specialty, an approved Core Plan and Generic Category Plan must have been submitted through the RAQS ESP e-tendering portal. The quality control measures included in these plans must be adhered to throughout this assignment.

A Supplementary Specialty Plan is project specific and must be submitted by the successful Service Provider in a timely manner following notification of award by the Ministry.

The detailed requirements, templates and the submission procedures in RAQS for Core, Generic Category Plan(s), Supplementary Specialty Plan and the Milestone Quality Report are listed in the following Document: Consultant QC Plan Process - Procedures Guide, Contract Management Office, MTO (the latest version). This document is available at the RAQS website.

Supplementary Specialty Plan:

The Supplementary Specialty Plan is to outline how the Service Provider / Sub-Service Provider shall provide for quality control for the individual Phases / Tasks for Specialties included in this Agreement. The Supplementary Specialty Plan is to identify dates for submission of the Milestone Quality Report(s) throughout the assignment.

Within ten (10) Business Days following notification of award by the Ministry, the Service Provider shall submit a completed Supplementary Specialty Plan, including Templates for each of the Specialties identified in their proposal.

The submitted Supplementary Specialty Plan will be reviewed for acceptance by the Ministry Project Manager. The Ministry Project Manager will provide comments on the Supplementary Plan submitted and request any clarification(s) or additional information as warranted.

Failure to deliver an accepted Supplementary Specialty Plan in RAQS within twenty (20) Business Days, may result in the cancellation of the award process for that Service Provider.

Milestone Quality Report(s):

During this Agreement, at the dates agreed in the supplementary plan and at completion, the Service Provider's Auditor shall certify that the Quality Control Plan Process has been duly executed and shall submit reports on Milestone Quality Report(s) to the Ministry Project Manager. The Milestone Quality Reports are subject to acceptance by the Ministry Project Manager. The Ministry Project Manager may request clarification or additional information as deemed necessary.

The Service Provider / Prime Service Provider who is signatory to the Agreement is fully responsible for all aspects of Quality Control including the Quality Control of work by Sub-Service Provider(s). The Service Provider will be responsible for the timely submission of the Milestone Quality Report(s) including those of Sub-Service Provider(s), the accuracy of check / audit reporting and any clarification(s) or additional information requested by the Ministry's Project Manager.

Special Requirements for Engineering Work:

All final engineering products, including contract drawings and engineering reports, must be signed/dated and stamped by Professional Engineer(s) licensed in the province of Ontario. In the case of foundations work, including the foundation drawing and foundation report, two (2) PEO stamps are required. One of the two (2) PEO stamps shall be the firm's Approved Key Personnel registered in the relevant RAQS design specialties.

Additional Requirements for this assignment:

The Service Provider shall submit to the Ministry a Monthly Status Report within five (5) Business Days after the end of each calendar month from and after the Service Provider's Commencement Date. **Delete if not applicable**

insert other project specific requirements or delete if not applicable

3.4 Performance of the Service Provider

3.4.1 Services Required

The Ministry will monitor the timeliness and quality of the services / deliverables over the course of this Assignment. The monitoring may involve items such as adherence to technical standards, value for money, adherence to the quality control of the Services.

Pursuant to **Article 10** of the Legal Terms and Conditions, the Ministry, or its delegate, reserves the right to visit the office of the Service Provider or Sub-Service Provider, including laboratory-testing facilities, to conduct an independent audit of the work currently completed. The Service Provider shall maintain Assignment records and make these available for review at the time of such audits. Any audits performed will be used in the assessment of the Service Provider's Performance.

Performance Appraisal:

The Ministry uses a quality based selection approach for Engineering and Related Services, and Contract Administration Services Assignments. The Service Provider will receive performance feedback and Performance Appraisal(s) for this Assignment to be included in the Service Provider's CPR. The following Performance Appraisal(s) will be issued:

- A Final Appraisal (assignment duration is less than two (2) years)
- An Interim and Final Appraisal (assignment duration is between two (2) and two and a half (2.5) years)
- Annual and Final Appraisals (assignment duration is greater than two and a half (2.5) years)

A separate performance appraisal will be carried out for CA assignment upon the onset of the assignment by using CA appraisal system. The CA performance appraisal score will be calculated for CA service Corporate Performance Rating.

Approved appraisals in RAQS will be used in calculating a firm's CPR (Corporate Performance Rating). Only the *approved* Interim, Annual and Final appraisals will be applied in the CPR. Only one appraisal per assignment will be applied in the CPR. (i.e. an approved final appraisal will replace an interim or annual)

A separate Corporate Performance Rating (CPR) is calculated for Planning, Engineering, Construction Administration, Area Materials Testing and Small Value Assignments.

For additional information refer to the latest version of Ministry's document "Engineering Services Performance and Selection System, Engineering Services Performance Appraisals Procedure Guide" which are available at the RAQS website under 'Additional Resources' – 'Technical Publications'.

Forms:

The following appraisal(s) in Draft Form are included as an attachment(s) to the RFP document:

- Planning – 2.
- Engineering and Related Services - 3 (both for Preliminary Design and Detail Design).
- Streamlined Engineering Appraisal (for Preliminary Design, Detailed Design & Bridge Engineering led by Project Delivery).

The following appraisal in Draft Form is included below:

If this is a planning assignment use the following breakdown and adjust accordingly:

Section		Weight (%)
1.0	**Project Management**	50
1.1	Planning, Scheduling and Timeliness of Delivery	15

1.2	Project Manager	20
1.3	Problem Identification/Solution	15
1.4	Prime and Subconsultant Management	10
1.5	Budget Control	10
1.6	Communication	10
1.7	Public and Stakeholder Relations	10
1.8	Cooperation	5
1.9	Occupational Health and Safety	5
2.0	**Quality of Deliverables**	50
2.1	Consultant Quality Control Plan	10
2.2	Quality of Specialty Deliverables	35
2.3	Constructability of Deliverables	15
2.4	Innovation	5
2.5	Contract Package/Final Deliverables	35

If this is a preliminary/detail design assignment use the following breakdown and adjust accordingly:

Activity Category	**Weight (%)**
Planning, Scheduling, Utilities and Timeliness of Delivery	10
Project Manager	15
Public, Stakeholder and External Agency Relations (note if there is no expected consultation required this can be 0)	10

Quality of Detail Design Contract Package (if this is a preliminary Design assignment this would be 0)	30
Quality of Final Deliverables (excluding contract package)	35
Occupational Health and Safety Plan	Not Satisfactory /Needs Improvement /Satisfactory

Note to User: Include a specialty breakdown and remove any that are not applicable. Note that the specialty breakdown can use the Phase I specialty breakdown as a base guideline and adjust if necessary (i.e if the total points for the functional categories are 1000 and highway is worth 250 than highway is 25%). If Highway is the prime specialty it should be worth the most, or if bridge is the prime specialty it should be worth the most and then go down from there. Use only whole numbers (no decimals)

Advanced Traffic Management Systems – X%

Bridge Engineering – XX%

Constructability Review – X%

Drainage & Hydrology – X%

Electrical – X%

Environmental – X%

Foundations Engineering – XX%

Highway Engineering – XX%

Pavement Engineering – XX%

Rockfall Engineering – X%

Survey & Plan Preparation – X%

Traffic Engineering – X%

3.4.2 Deliverables

Upon receipt of an Interim, Annual or Final Appraisal, the Service Provider will be allowed twenty-one (21) calendar days to sign and concur with the Final Appraisal or request a review. If the Service Provider does not respond within the twenty-one (21) calendar day deadline, the appraisal as issued, will be considered "*approved*" and will be binding and will apply for the

purpose of calculating the Service Provider's Corporate Performance Rating ("CPR") in the Ministry's Registration, Appraisal and Qualifications System ("RAQS").

3.4.2 Conflict of Interest

The Ministry will monitor the Conflict of Interest during the implementation of the Contract Administration Service. The Service Provider shall maintain the honour and integrity of the its profession and without fear, hesitation or favour disclose the design mistakes, negligence, oversight, errors, etc. which may lead to structural failures, budget overruns, assembly issues, etc. during the construction.

3.5 Payment Schedule

3.5.1 Services Required

The Lump Sum Price shown in the Service Provider's Offer and Acceptance Form shall be full compensation for all services, deliverables, equipment, materials and testing required to provide the services detailed in the RFP documents and the Proponent's proposal. The Lump Sum Price includes, but is not limited to salary, benefits, overhead (office, computer, cell phones, etc.), payroll burden and profits.

The payments will be made on a monthly basis over the duration of the assignment. The payment on an invoice shall be made on the approval by the Ministry (Legal Terms and Conditions **Article 13**). The final invoice shall not be approved for payment until all services are complete and deliverables are received in a form acceptable to the Ministry.

The Service Provider shall invoice and collect HST from the Ministry for the Deliverables in accordance with the provisions of the Excise Tax Act, R.S.C. 1985, c.E-15, as amended or replaced from time to time.

Change Order Process:

Any changes in the scope of work (e.g. extra/additional work or reduction in work, Agreement suspension or termination) shall be provided by written notice to the Service Provider in compliance with and are subject to the Ministry's Change Order process as detailed in Article 12 of the Legal Terms and Conditions. In the event that the assignment timeframe is shortened and/or the staffing complement required is less than anticipated for whatever reason, the Ministry reserves the right to claim cost savings through negotiations with the Service Provider.

The Payment for any "Approved" extra/additional work is subject to the Ministry's invoicing and payment procedures. The invoices for extra/additional work shall be clearly marked as "Extra". Any Compensation paid for Construction Contract Administration services provided for extra/additional work will be based on the actual number of hours approved by the Ministry.

The Ministry's prior approval is required for replacing any staff, equipment, deliverables or rates of payment listed in the Service Provider's Proposal.

3.5.2 Deliverables

The Service Provider shall submit monthly invoices throughout the term, on the basis of work completed each month together with a Monthly Progress Report. Monthly billings must be accompanied by a description indicating the status of the work and percent completed.

3.6 Occupational Health and Safety

3.6.1 Services Required

The Service Provider is to adhere to the requirements of **Article 4.12** of the Legal Terms and Conditions regarding Occupational Health and Safety.

The Ministry of Labour, Immigration, Training and Skills Development (MLITSD) has indicated that in some cases, certain engineering work may constitute "construction" work for the purposes of the OHSA. Proponents are advised that they shall be required to review their work activities to achieve compliance with the OHSA and applicable regulations. The Service Provider shall execute the terms of the Agreement in strict compliance with the OHSA and the applicable regulations there under.

3.6.2 Deliverables

The Service Provider shall be required to review its work activities to achieve compliance with the OHSA and applicable regulations with respect to traffic hazards and to reference the Ontario Traffic Manual Book 7 - Temporary Conditions, Office Edition for further direction on traffic control.

The Service Provider shall provide advance notice of the proposed starting date and time, estimated duration, and location of work to:

(a) The Ministry Contract Services Administrator,
(b) The Ministry Area Manager, Construction,
(c) The Ministry Project Manager, and
(d) The Ministry Head, Construction

3.7 List of Designated Substances in Ministry Workplaces

In accordance with the OHSA, a list of Designated Substances present in Ministry workplaces is provided in this section.

Ontario Regulation 490/09 lists the following eleven Designated Substances: Acrylonitrile, Arsenic, Asbestos, Benzene, Coke Oven emissions, Ethylene Oxide, Isocyanates, Lead, Mercury, Silica, Vinyl Chloride.

Of the above, MTO is aware that **Silica, Lead, Asbestos and Arsenic** were widely used in highway and bridge construction in the past and may be present within the project limits. In addition, there is a possibility that **Benzene** may be present in certain coating materials (such as coal tar epoxy) or as a result from a spill or from contamination from an adjacent property.

The remaining Designated Substances are not likely to be encountered in typical construction or maintenance activities of MTO infrastructure. Acrylonitrile and Vinyl Chloride are in Acrylonitrile Butadiene Styrene (ABS) and Polyvinyl Chloride (PVC) materials but are not considered Designated Substances once they have been polymerized and therefore do not need to be identified.

In accordance with the Occupational Health and Safety Act, R.S.O. 1990, c. 0.1, Proponents are advised of the presence of the Designated Substances presented in Table 2-1 to which the Service Provider may be exposed when working at the specified locations or while the specified work activities are being undertaken.

Table 2-1 Designated Substances In Ministry Workplaces

Designated Substance	Location or Work Activity
Silica	Handling sand or gravel. Handling road sweeping materials. Silica will be present on all projects. Present throughout the working area including, but not limited to, asphalt, concrete, and granular materials.
Lead	Lead is assumed to be present in the epoxy coating on the reinforcing steel within the concrete deck and the work shall be performed as though lead is present.
Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05)	Patrol yard building materials (i.e., pipe insulation, ceiling/beam insulation, ceiling tiles, acoustic wallboards, floor tiles, ducts in bridges, etc.). Located on the X Bridge in the Bearings identified as Transite Board. Material is non-friable. Reference report “Asbestos Analysis for the X Bridge” dated May 2013 and included elsewhere in the Contract Documents. The conduit in the sidewalk of the bridge is assumed to contain asbestos and is assumed to be non-friable; however it shall be re-assessed when the material is exposed. Asbestos may be found in some pavements, bridges, culverts, buildings, and electrical works: - Asbestos may be found in conduits/ducts, bearings as well as in coatings found on structures and culverts. - Asphalt Coated Asbestos Protected Corrugated Steel Culverts have been used in some projects. - Asbestos may also be present as insulation and in numerous other building materials in existing buildings. Examples include: caulking, drywall joint compound, tiles, etc. - Asbestos was used as a hot mix additive in some trials. - Asbestos cement pipes may also have been used.

Designated Substance	Location or Work Activity
Mercury	Manometers, thermometers or other pressure or temperature sensing devices may contain mercury. Steel Structure coatings may contain small concentrations of mercury. Mercury is not likely to be encountered as mercury vapour lamps have been replaced with high pressure sodium and LED for illumination. However mercury may be present in some electrical equipment and mercury vapour is present in fluorescent light tubes and other types of light fixtures in buildings.
Arsenic	Steel Structure coatings may contain small concentrations of arsenic. May be found in pressure treated lumber (e.g. sign supports and some guiderail posts) and some steel structure coatings.
Benzene	Benzene may be present in certain coating materials such as coal tar epoxy. Benzene may also be encountered in or adjacent to abandoned fuel storage facilities.
Vinyl Chloride, Coke Oven Emissions, Ethylene Oxide, Acrylonitrile and Isocyanates	Vinyl Chloride, Coke Oven Emissions, Ethylene Oxide, Acrylonitrile and Isocyanates are not normally present on MTO construction projects.

3.7.1 Services Required

See Section 7.8.2 and 7.8.3 for details.

SECTION 4: TERMS OF REFERENCE - GENERAL

4.1 Project Scope

This Assignment involves *Planning, Detail Design, Contract Preparation and Design Support during tendering and Construction* for the following *highway/bridge project.*

the Detail Design of Highway 17 from Highway 11 easterly 31.9 km. Also included in this Assignment is the replacement of three (3) structures over Blue Lake.

The scope of work includes all work necessary to deliver this Assignment as described in the RFP Documents. The Service Provider shall plan, design and construct all work in conformance with Ministry of Transportation standards, criteria and requirements any directives or specifications, and the Technical Standards and Specifications (Appendix 2). As well, when providing services under this Agreement, the Service Provider shall comply with all applicable legislation, regulatory standards, industry best management practices, and other guidelines and procedures relevant to conduct the work. The Service Provider shall also consult any existing applicable MTO guidance documents as appropriate.

This assignment includes work that is in a French Language Services designated area. The Service Provider must comply with all provisions of the French Language Services Act, including but not limited to Third Party Regulation 284/11. **{Note to User: Include this text for work in a designated area. Delete if not in a designated area. Click designated areas or contact MTO French Language Services office to identify the designated areas}**

The *Planning, Preliminary Design, and Detail Design* work includes engineering services in the following functional categories:

- Highway Planning
- Environmental Planning
- Transportation (Systems) Planning
- Advanced Traffic Management Systems
- Bridge Engineering
- Drainage and Hydrology Engineering
- Electrical Engineering
- Engineering Materials Testing and Evaluation
- Environmental (Preliminary Design and/or Detail Design)
- Foundation Engineering
- Highway Engineering
- Pavement Engineering
- Surveying
- Traffic Engineering
- Value Engineering
- Property/Corridor Management

- Constructability Review

In addition, the following services are required:

- Engineering materials laboratory testing services are required for the Construction Contract Administration portion of this Assignment.
- Additional biddable work

Ministry Work and Reimbursable Services

The Service Provider may request Ministry Technical Services in conformance with the Legal Terms and Conditions based on the following rates subject to negotiation:

b) Management and Professional Staff per diem rate = $1,500
c) Technical Staff per diem rate = $1,200

If the Service Provider requires any other services of the Ministry, these will be negotiated as required.

The Ministry will provide the following services during Construction, if applicable:

a) General guidance and direction of a Ministry Representative who will be making periodic visits to the Working Area and other design, estimating, materials or other Ministry specialists who may be available on a limited basis when circumstances warrant.

b) Testing services for the following specialized materials:
   - Asphalt mix design verification and acceptance for Open Friction Course and Electrically Conductive Mix only
   - Hot poured rubberized asphalt crack sealing compound
   - Portland cement, slag and fly ash
   - Curing compounds, air entraining and chemical admixture quality
   - Latex modifier quality
   - Quality testing for bridge deck waterproofing material properties
   - Quality testing of pavement marking materials, paint and reflectorized beads – material properties
   - Ministry or private sector referee testing services.
   - Anti-stripping additive Quality
   - Emulsion, Cutback or Primer Quality
   - Special Quality Testing of Aggregates for Physical Properties
   - Post tension cables
   - Shotcrete cores
   - Protection Board Quality
   - Membrane Reinforcement
   - Hot Poured Rubberized Asphalt Joint Seal Quality
   - Expansion Joint seals

- Elastomeric and Rotational Bearings
- Structural Steel Coating Material Quality
- Metal Wire Galvanizing
- Geotextile quality testing
- Quality Assurance Laboratory Testing

Test results provided by the Ministry shall be returned and communicated to the Contractor within two (2) Business Days of receipt.

4.2 Technical Services Required

The technical services requirements specific to each functional category are described in Section(s) 5 to 8. The following general terms apply to all categories and shall be adhered to:

The Service Provider shall:

- Carry out the required planning of the physical project requirements, including all field reviews, relevant tests, inspections and studies, with due regard for environmental, traffic accommodation and safety concerns, capital cost and operating efficiency, all in accordance with Technical Standards and Specifications (Appendix 2)
- Perform all field tests, surveys and studies, such as geotechnical investigations and testing, foundations investigations and testing including associated laboratory work, and any other site investigations and field testing required to support the planning of the project;
- Answer any *Planning/Preliminary Design* related questions during the *Planning/Preliminary Design/Detail Design* of this project in a timely manner.
- Correspond with governmental ministries, agencies and other public authorities for planning information;
- Attend and prepare the minutes of all meetings with Ministry staff and external agencies as detailed in Section 3. The Service Provider is responsible for making arrangements with appropriate Ministry staff for attendance at all meetings;
- Negotiate on behalf of the Ministry with external agencies and stakeholders relative to the TPM project, prepare draft agreements and secure all required clearances for commencement of any Design and Construction work;
- Keep the appropriate Ministry staff informed of project progress on a monthly basis, and as required;
- Respond to any Ministry inquiries within five (5) Business Days;
- Provide written response to all questions and concerns raised at Milestone meetings within five (5) Business Days;
- Label all correspondence to the Ministry with the GWP number, Assignment number, and any other appropriate Ministry File name and description of contents; and
- Obtain Municipal council resolution where required.

In the performance of site investigation and field testing (including surveys), the Service Provider shall:

- Provide for the safety of both the public and the staff involved in site investigations;
- The Service Provider shall comply with the Ontario Traffic Manual Book 7 - Temporary Conditions (Office Edition) and all signing shall be in accordance with Ontario Traffic Manuals. Specific site conditions may warrant additional safety measures. All vehicles of the Service Provider must be equipped with a vehicle-mounted 360-degree amber light.
- Protect utilities and property from damage;
- Restore the site as near to original conditions as practical;
- Submit property damage reports to the Ministry for unrestored damages;
- Adhere to the work constraints;
- Every effort shall be taken by the Service Provider to not have equipment, vehicles and staff on the shoulders when seasonal maintenance operations such as snow ploughing, grading, etc. are expected.
- Obtain permission to enter

The Service Provider shall adhere to the following work constraints:

- Field investigation shall be carried out in such a manner as to minimize disruptions to highway operations.
- Field investigation shall consider and address potential environmental impacts (e.g., heritage buildings, archaeological sites, species at risk and their protected habitat, etc.).
- Co-ordinate field work with other or separate construction contracts, highway maintenance activities, e.g. Area Maintenance Contracts (AMCs) and/or any other engineering Assignment(s) which may be ongoing adjacent to this project or within the limits of this project;
- Maintain a 500 m separation between separate operations at all times while undertaking field work, or delimit work zones by a physical barrier or fence as permitted under OHSA.
- Field investigation operations adversely affecting public traffic (e.g. lane restrictions) and the loading or unloading of materials and equipment onto and from the travelled portion of the highway and the shoulders shall not be carried out during the following periods:

  i) Friday or a Day Proceeding a Holiday: noon to midnight
  ii) Saturdays and Sundays: all day
  iii) Canadian Statutory Holidays and Civic Holiday: all day
  iv) From ___ hour before sunset to ___ hour after sunrise
  v) Any period of inclement weather (i.e., heavy fog, heavy rains, snow, ice)

- The Service Provider shall notify, in writing, the Construction Management Manager of Operations or an appointed staff member (e.g. Area Manager, Construction or Maintenance Superintendent) of the details of upcoming field work. This would include the extent and type of work, the work site location, and the anticipated duration of the work. For example: Highway 11, from Smalltown to Bigtown, two (2) survey crews working across the R.O.W. for the next three (3) weeks, December 1 - December 19.

The Service Provider must continue to inform the Construction Management Manager throughout the life of the Assignment. The Agreement Administrator shall be copied on all notifications.

If the Service Provider fails to comply with any of the above conditions, environmental legislation and regulations or the Occupational Health and Safety ("OHS") Act or its regulations and poses an **immediate danger** to the health or safety of a worker or the public, the Ministry will order the Service Provider to immediately cease all operations. The Service Provider shall then remove itself and any traffic control devices from the highway.

The Service Provider will not be allowed to gain access to the corridor until the Service Provider demonstrates that it is able to conform to the requirements of this section and provides written notification to the Ministry outlining how the situation has been rectified. The Service Provider will require the Ministry's permission to recommence work.

Immediate danger is defined as a violation of the OHS Act or its regulations where the violation poses a danger and any delay in stopping the work may result in a serious injury to a worker or the public. A situation of insufficient traffic control may pose an immediate danger.

4.3 Deliverables

All notices, documents, deliveries and approvals required or permitted by this Agreement shall be in writing and delivered to the Ministry at:

enter the Ministry address
Attention: *Ministry contact*
Email
Phone

Contract Management System

The Contract Management System (CMS) is a solution that provides a digital means to record, collect, transmit and store contract data.

CMS shall be used to administer the contract and manage the services and Deliverables for this Assignment as prescribed by the Contract. Prescribed services and Deliverables shall only be accepted through CMS unless otherwise specified by the Ministry contact.

The Ministry will provide the Service Provider with up to 5 unique annual CMS subscriptions at no cost. The Owner will provide subscription information and instructions to the successful Service Provider following Assignment Award.

Subscriptions will be provided continuously until the Service Provider achieves Contract Completion.

The Service Provider shall agree to the CMS terms of service at the time of confirming the subscriptions and abide by the terms and conditions for the duration of the Assignment's term.

The deliverables for each functional category are described in Section(s) 5,6,7,8. In addition, the following Documentation is to be delivered to the Ministry.

4.3.1 Planning Report Documentation - NA

4.3.2 Preliminary Design Report Documentation - NA

4.3.3 Detail Design Documentation - NA

The Ministry requires documentation summarizing the design details completed by the Service Provider during the Detail Design phase. Required reports and documentation are detailed in the functional category sections

In addition, the following documents shall be submitted in a format acceptable to the Ministry:

Contract Package and Design Documentation shall generally consist of the following:

- All drawings in AutoCAD (Ministry approved version) format adhering to the Ministry's "AutoCAD Standards Guide."
- All digital file names conforming to Ministry file naming conventions and layering standards.
- All Contract Tender Documents in Word (2003 xml) format using the following layout as identified in Chapter E of the CDED Manual.

The following documents shall be provided:

a) Letter of Transmittal to the Ministry's Contract Award Section, Contract Management Office, Standards and Contracts Branch, St Catharines.
b) Accomplishment Report Form;
c) Calculation of Liquidated Damages (based on the Memorandum "HOC#2006-05 Calculation of Liquidated Damages", August 22, 2006);
d) Design Synopsis; At the end of the Design Synopsis responses to the following questions should be included, in plain language (not highly detailed):
    i) Why is the work being performed?
    ii) What is the impact on traffic during construction? If there is an Impact, provide some indicator of how great the impact is (i.e. minor, major, and severe. If there will be no impact, note it).
    iii) What are the benefits of the completed work?
    iv) What are the main environmental protection and/or improvement features of this project?
    v) How does this project contribute to reducing the impact of climate change?
    vi) How does this project contribute to a sustainable environment?
e) Constructability Review Report
f) If a formal Constructability Review was not required for this Assignment, a report of an assessment indicating that the proposed design is constructible (staging, new construction techniques, and construction operations/sequence, etc.).

g) Minutes of the Progress Meetings, Milestone Meetings, and Design Complete Presentation;
h) Minutes of the Executive / Design Complete Presentation.
i) Permissions to Enter (to Construct);
j) Federal approvals and permits
k) Correspondence with government agencies and other stakeholders;
l) CASL/ASDL.
m) Contract Tender Package Review Checklist.
n) Quality Assurance Report
o) Revised Reports:
   - Revisions to the Preliminary Design Report, as required;
   - Revisions to the Structural Design Report, as required;
   - Revisions to the Design Criteria, as required;
   - Revisions to the Property Request, as required

Design Documentation for Contractor

Six (6) hard copies and *one (1)* digital copy of the following Reports:
- Top of Granular A;
- Top of Granular B;
- Top of Subgrade;
- Muskeg Excavation;
- Stripping Fill;
- Clearing Templates;
- Ditching Templates;
- Slope Flattening Templates;

One (1) hard copy and one (1) digital copy of the following Reports:
- Area and Volume Reports;
- Corrected Volumes Report.

One (1) hard copy of Final Design Cross Sections (end areas omitted); and

One (1) digital copy containing all AutoCAD data files for all drawings;

One (1) digital copy containing all OpenRoads Designer (ORD) data and files used in the preparation of the cross-section drawings, quantities, and reports. Project data should be identical to the contents presented in the contract book. MTO ORD configuration is posted on the File Transfer Application Download (Xfer) Site.

The Service Provider is to make the following documents available to the Ministry's Project Manager for provision to the successful construction contractor and/or Construction Contract Administrator:

- Pavement Marking Drawings
- Utility Work Orders
- Original Structure Drawings
- Overhead and Ground-Mount Message Sign Layouts
- Horizontal and Vertical Control Sheets

- Environmental Synopsis with Summary of Environmental Concerns and Commitments* table
- Transportation Environmental Study Report (TESR) or Design and Construction Report (DCR) or Environmental Screening Document (ESD)
- Environmental permits, approvals, and authorizations including draft Permits to Take Water obtained by the Ministry that the construction contractor must apply to the Ministry of the Environment and Climate Change to have issued in the construction contractor's name
- Design Reports
- Foundation Investigation Reports
- Geotechnical Reports
- Original Cross Sections (highways, side roads, entrances, culverts and sewers) (hardcopy)
- Original Plots (sub grade reports, template sheets, granular base reports (top of "B"), profile elevations (Top of "A") (digital files)
- Additional copies of tender documents and contract drawings
- Any other digital files (Detailed Calculation Sheets – reports)
- Traffic Signal Legal Drawing (PHM-125)
- Property Mark-up Plan
- MTO Project Engineer/Manager contact phone number and backup phone number
- Engineering Service Provider contact phone number(s)
- Copies of applicable applications / permits related to construction
- Cost Share Agreements

* For additional comments by the Construction Contract Administrator relative to the construction contractor compliance with the project-specific environmental mitigation, protection and monitoring measured described in the form and included in the Special Provision.

Working Days

The Service Provider shall be responsible for calculating the working time necessary to construct the project. The working time shall be calculated from the start of mobilization to final completion, including time for cleanup and demobilization.

Working time shall be based on what an average contractor can accomplish using average production and shall be adjusted accordingly for design criteria such as optimum award date, interim dates, incentives/disincentives, and desired completion date.

In calculating working time, the Service Provider is to take into consideration factors such as, but not limited to: temperature dependant operations and material, shift work, contract constraints, staging, and traffic considerations.

The Service Provider shall update the working day calculation on a quarterly basis (end of March, June, September, and December) and when there is a major increase/decrease in quantity or major change in the staging or character of the project, as well as those included with contract addenda.

Working time shall be calculated in working days and if appropriate for the type of project, be converted to calendar days or a completion date. The conversion calculation shall be documented, and a hard copy included with the contract package.

The Service Provider is responsible for justifying interim and final working time values by providing a detailed summary of the calculation in a bar chart format with accompanying calculations or details shown on the diagram, including major item quantities and production rates used.

The final version of the working time document shall be submitted to the Ministry with the Tender Document Submission package (sent to the Contract Review Officer (CRO)) in a Critical Path Schedule format.

Construction Cost Estimates

The Service Provider shall be responsible for completion and/or updating of the construction cost estimates in accordance with the Scope & Cost Report (SCR) Guideline including, but not limited to, mandatory milestones and Addenda/Status Reports requirements.

For bidding purposes the following SCR documents are included in the RFP:

1. Scope and Cost Report Guideline (current version)
2. Scope and Cost Report Template (current Regional master)
3. Scope and Cost Report for Project (where available)

The Scope and Cost Reports may be found on the Transportation Infrastructure and Management Division's Project Management Best Practices website.

The Service Provider shall develop and identify the project cost/schedule risk, risk mitigation, probability of risk occurrence and associated risk costs that are required for the cost estimate, in consultation with the Ministry's Project Manager, the Service Provider's and the Ministry's Project Team members.

A dedicated meeting is required to develop the risk register, costs and risk strategy. The Service Provider shall facilitate the Ministry's and Service Provider's Project Team members at the dedicated meeting and at other meetings, as required, to deal with risks, their costs and their management.

The Ministry's Project Manager will provide guidance and support to the Service Provider for completion of the SCR Risk Register.

The development and maintenance of the project scope, project schedule (including design, tendering, construction), risk register, costs and strategy is to be a standing item at project meetings.

When completing the construction cost estimate the Service Provider shall take into consideration those factors that may affect the parametric cost or individual unit prices such as, but not limited to: quantities for the individual items, site location and geography, crew sizes, equipment, production rates, aggregate sources, haul routes, material suppliers, job overheads, as well as contract specifications, standard and non-standard specifications/special provisions, and soil reports.

The individual item cost estimates in the electronic file may be derived from hand calculations, commercial software, Ministry software (HiCo or similar program), or in-house programs and/or

spreadsheets. Regardless of method used, hardcopy-supporting documentation must be produced and submitted with the final contract package.

When a Level 3 cost estimate is completed for the detail design phase of a project, the Service Provider shall produce an estimate file using the Highway Costing System (HiCo) or other Ministry defined software, with items and quantities identical to those in the final submission of the Contract Preparation System file.

The Service Provider shall satisfy the Ministry that due care and diligence was exercised in the preparation of their estimate.

It is the responsibility of the Service Provider to preserve the confidentiality SCR, its calculations and any and all information associated with the SCR, including but not limited to risks, costs and schedule.

Contract Package:

The Contract Package consisting of:

(iii) Tender Documents,
(iv) Contract Drawings,
(v) Construction Contract Estimates and
(vi) Other Documents,

are described below, shall be submitted to the Ministry.

***Note**: Merging of Contract Packages / Work Done By Others:*

The Service Provider shall take the steps necessary to incorporate work designed by others into the final contract package(s). If not specified in the Terms Of Reference found elsewhere in this agreement, this work shall be considered extra/additional work and change order will be issued to the Assignment unless otherwise agreed to by the Ministry and Service Provider in accordance with the Change Order Process (Section 3.5.1).

The Service Provider shall be responsible for the completeness, quality, accuracy and compatibility (e.g. specifications, page numbers, approvals, PTTW) of the final contract package to be submitted to the Ministry, including merging other Assignment's contract details. It is the responsibility of the Service Provider for this Assignment to contact, correspond, and coordinate with other Service Provider(s) throughout this Assignment.

The Service Provider for this Assignment is not responsible to update contract documents outside this Assignment, or for stamping any contract documents submitted from other Service Providers.

i) Tender Documents

Tender Documents shall be submitted, in both hard copy and digital, in CPS.net format, and shall contain:

- Addenda, as required
- Foundation Investigation Report

- Tender Cover Page
- Instructions to Bidders
- Contractor Declaration of Offer to Tender
- Tender Item List
- Form of Tender (e.g. Proposed Work, Sundry Estimates, Force Accounts, Materials Supplied, Schedule of Materials, Extra Work)
- Price Preference for Canadian Content including variations for A+B bidding where applicable
- Schedule of Provisions, Plans, Standard Drawings, Specifications, and General Conditions (with appropriate fill-ins) including Signed Statement by Bidder
- Supplemental General Conditions of Contract
- Part A: Special Provisions (as per warrants), placed in the following order:
  - Notices to Contractor
  - Instructions to Contractor
  - Operational Constraints
  - Standard Special Provisions;
  - Interim Special Provisions (e.g. Task Force Special Provisions)
  - General Special Provisions
  - Item Standard Special Provisions and
  - Item Non Standard Special Provisions
- Part B: Fair Wage Program Special Provision (pink);
- Part C: Liquidated Damages Special Provision with appropriate fill-ins (pink);
- Special attachments (white) as required, e.g. CPM Information to Tenderers, Bell Canada Specifications, project specific Modified Standard Drawings
- Contract Drawings.

ii) Contract Drawings and Quantity Sheet

The Contract Drawings shall be submitted in hard copy with one (1) set of half size (27.94 cm x 43.18 cm) and for Structural Drawings, one (1) set of full size (55.88 cm x 86.36 cm) on high quality bond paper.

All Contract Drawings shall be provided in electronic file format, “to scale” in PDF format (1 PDF File per book of drawings, each file not to exceed 20 MB, not password protected stored in compact disc(s)) and submitted with the hard copy. The drawings will generally include:

- Cover Sheet;
- Key Plan;
- Index (containing both Drawing & Q-Sheet References);
- Grading Drawings including:
  - Horizontal & Vertical Control Sheets in areas of revised horizontal alignments;
  - Removals;
  - Study Plans;
  - New Construction;
  - Staging and Detours (including traffic control measures);
  - Pavement Markings Drawings;
  - Signage Plans;

  - Overhead Sign Layout Drawings;
  - Soils and Pavement Data;
  - Modified OPSD's, MTOD's and non-standard drawings;
  - Typical Sections and details;
  - Drainage Profiles;
  - Quantity Sheets;
  - Landscape Drawings;
  - Landscape Quantity Sheets;
  - Erosion and Sediment Control Plan Drawings; and
  - Etc. as required.
- Electrical Drawings including:
  - Electrical Layout;
  - Electrical Quantity Sheets;
  - Wiring Diagrams;
  - Electrical Details;
  - Temporary Electrical Work;
  - Removals; and
  - Etc. as required.
- Structural Drawings including:
  - General Arrangement;
  - Details;
  - Structural Quantity Sheets;
  - Overhead Sign Support Structure Drawings and
  - Etc. as required.
- ATMS Drawings including:
  - Supplementary Legend;
  - ATMS Layout;
  - Communications Schematics;
  - Wiring Diagrams;
  - Trunk Cable Designation Charts;
  - ATMS Details;
  - Removals;
  - ATMS Quantity Sheets; and
  - Etc. as required.
- Foundation Drawings
- Architectural Drawings
- Q-Sheets (indicating Book # on cover sheet)
- Back Cover

Note: The Service Provider shall verify the suitability, completeness and compatibility of drawings and other documentation prepared by others that are to be included in their contract submissions and final contract deliverables.

iii) Construction Contract Estimates

The working time documents shall consist of:

- A critical path schedule (i.e. for construction)

A summary sheet containing conversion calculations from working days to calendar days or completion date *(if applicable)*. The construction cost documents shall consist of:

- A cost estimate report showing all item numbers, item description, unit, quantity, unit

price, and extension;
- Sundry Costs;
- Force Accounts;
- Utility Relocation costs;
- Construction Administration cost;
- Construction Contingency Allowance cost; and
- Any detail calculations supporting unit prices listed in the cost estimate report.

iv) Other Documents

One (1) hard copy and one (1) digital copy in Adobe PDF format stored in compact disc(s) (1 PDF File per report, each file not to exceed 20 MB, not password protected) of the following are required:

- Foundation Reports (not required for tendering purposes)
- Foundation Investigation Reports (required for tendering purposes)
- Aggregate Sources List
- Pavement Design Reports
- Design Synopsis
- Tender Submission Form
- Tender Submission Checklist
- PTTW (Draft), EASR documentation
- Environmental Synopsis, with Summary of Environmental Concerns and Commitments table provided in an editable Microsoft Word format
- Earth Management Plan
- Copies of permits, etc.

Reproduction Services

The Service Provider shall provide the following:

Hard Copy (Sets)	Digital Copy	Item
0	2	Operational Performance Review
0	2	Pavement Design Report
0	2	Utility Relocation Plan
0	2	Tender Package and half sized Contract Drawings for the Design Complete Team Review Meeting submission
0	2	Tender Package and half sized Contract Drawings for the Design Complete Presentation
0		Cross-section Rolls
	1	Cross-section Rolls in AutoCAD format for the entire project to be submitted with the Contract Drawings for the Design Complete Presentation;
0		Tender Package and half sized Contract Drawings for Executive Presentation

Hard Copy (Sets)	Digital Copy	Item
0		Tender Package and full-sized set Contract Drawings for structural drawings only for Executive Presentation
0	2	Final Cross-Section Rolls and CD at the Contract Section date, with one copy (hard copy and CD) showing quantities;
0		Full size sets of structural drawings at the Contract Tendering Section date
0	1	Charts detailing Rate of Superelevation for all Horizontal Curves
0		Final Contract Packages
0		Tender Package and half sized Contract Drawings for RDIS
0		Commercial entrance drawings
0		Templates and Expanded Volumes Reports;
0	1	Draft Foundation Investigation and Design Report (FIDR) and/or Technical Memorandum
0	1	Final Foundation Investigation and Design Report (FIDR) and/or Technical Memorandum (Digital shall include PDF, AutoCAD, gINT (.gpj))
0	1	Final Foundation Investigation Report (FIR) (Digital shall include PDF, AutoCAD, gINT (.gpj))
0	1	Each factor-specific Environmental Technical Report as may be specified in Section 5.1/6.6/7.6;
0	1	Summary of Environmental Conditions Reports
0	1	Environmental Synopsis
0	2	Summary of Environmental Concerns and Commitments (one digital copy in PDF and one digital copy in Microsoft Word format)
0	1	Eligible for Environmental Clearance– Construction Start Letter
0	5	(plus one (1) signed original, digital copy in PDF format) Environmental assessment process documentation (one of Transportation Environmental Study Report, Design and Construction Report, Combination Transportation Environmental Study Report Addendum / Design and Construction Report, Environmental Screening Document) as specified in Section 5.1/6.6/7.6;

All drawings/materials required for each team member for meetings, etc.

All materials as stated elsewhere and/or as required for the delivery of the project, such as PIC brochures and copies of PIC display material.

Note: Where there is a discrepancy in the above numbers and others in the RFP, the higher shall be deemed correct. In case of more than one (1) contract, the above numbers apply to each one of those contracts.

4.4 Reference Documents

This project shall be carried out, designed and constructed in accordance with the project Requirements outlined in this RFP, the Ministry's current directives, accepted standards,

specifications, practices, policies and procedures, and memoranda. The Technical Standards and Specifications define the standards to be used in the design and contract administration, and the minimum quality for materials that shall be specified.

A general list of reference documents is provided on the RAQS public website/Appendix 2. In the event of any conflict or inconsistency between documents, documents with the most recent date shall prevail.

In addition to the general list, the following guidelines, standards and specifications to be referenced include but are not limited to:

A general list of reference documents is included in Appendix 2. Include in this table documents to be referenced specific to this project. Delete if not applicable.

Document	Distributor

Additional reference documents specific to a functional category are included in the Terms of Reference, Section(s) 5,6,7 and 8.

SECTION 5: TERMS OF REFERENCE – FUNCTIONAL CATEGORIES PLANNING ASSIGNMENT (N/A)

5.1 Environmental Planning - N/A

5.1.1 Project Scope

A dedicated individual shall be identified as the lead for the environmental portion of this study and will be responsible for the entire environmental component of this study. They must have experience/education related to the undertaking.

MTO Projects/Undertakings are subject to the provincial Environmental Assessment (EA) Act RSO (1990) and Regulations made under that Act.

A comprehensive EA is prepared for large-scale, complex projects with the potential for significant environmental effects, and follows a two-stage approval process. The first stage is the development and approval of an EA Terms of Reference which outlines the process that must be followed to complete the second stage which is a planning, preliminary design and EA study. Approvals are required from the Minister of Environment, Conservation and Parks. **Delete Paragraph if your Assignment has no comprehensive EA requirements.**

The Transit Project Assessment Process (TPAP) (Ontario Regulation 231/08-Transit Projects and Metrolinx Undertakings) outlines a time-limited, streamlined approval process for transit projects. **Delete Paragraph if your Assignment has no TPAP requirements.**

The 'Class Environmental Assessment for Provincial Transportation Facilities' document establishes an EA process that has been pre-approved by the Ministry of Environment, Conservation and Parks (MECP) Minister for a defined set of undertakings. The MTO Class EA document outlines a pre-approved, self-assessment process that applies to routine projects with predictable and manageable environmental effects.

Project notices for Class EA undertakings must be sent to the appropriate MECP regional notification email account. The list of MECP regional notification email accounts and the current MECP Project Information Form are listed at 'https://www.ontario.ca/page/preparing-environmental-assessments#section-5'. If the project spans more than one MECP region, notify the MECP regional office where the majority of the project falls within.

Emails sent to the MECP regional notification email account must include a copy to the MTO Environmental Planner and require a subject line that identifies: '*project location'*, 'MTO Class EA', and '*project name'*. Note: if the project spans multiple municipalities, select 'several' from the Project Information Form drop-down menu for 'project location'. Include highway number and GWP or WP as part of 'project name'.

- Where a Notice of Study Commencement (PDF) is issued to MECP, a completed MECP 'Project Information Form' must also be attached to the email, in both Excel and PDF formats.

- Where required, a Notice of Completion (PDF) and a Notice of Addendum (PDF) must also be sent to the MECP regional notification email account. Do not include the Project Information Form as part of this notification.
- All correspondence (including copies of TESR/DCR/Addendum documents for public and/or MECP review) and other project notices (e.g. Step-down, PIC) must be sent directly to the MECP Regional EA Coordinator by the usual method, and is not to be sent to the MECP regional notification email account. Do not include the Project Information Form as part of this notification.

Under the 'Class Environmental Assessment for Provincial Transportation Facilities', this project is classified as a Group **Insert category of** project at the time of project initiation. **Delete Paragraphs 5-11 if your Assignment has no Class EA requirements.**

The federal EA process may also apply to projects that are subject to the Ontario EA Act. The Canadian Impact Assessment Act (IAA) is administered and enforced by the Impact Assessment Agency of Canada and applies to projects that are designated by the Physical Activities Regulations (SOR/2019-285), or projects that have been specifically designated by the Minister of Environment and Climate Change Canada. Where both the Ontario EA Act and IAA apply to a project, all efforts should be made to follow one coordinated process. Appropriate documentation shall be prepared and submitted for approval at a time suitable to the project schedule if the IAA requirements are anticipated.

The environmental schedule requirements for this project are the following:
Insert requirements

The anticipated level of importance to project delivery of factor-specific environmental services is as outlined below:

Insert outline

The environmental deliverables that will be provided by the Ministry are the following:

Insert deliverables

5.1.2 Technical Services Required

Staff to be provided

include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1

Project Specific Environmental Requirements

Where a project-specific Scope of Environmental Services has been prepared, its content shall be deemed to be a project requirement.

Additional project-specific environmental requirements are the following:

Insert requirements

Statutory Advertisements and Environmental Assessment Notices

An advertising agency has been selected to place all statutory advertisements in newspapers for the Ministry, such items as tender notices, public notices, road closures and certificates of substantial completion. The advertising agency also places any Environmental Assessment notices that are placed in newspapers, such as notices of Commencement, public information centres, and Completion in accordance with the applicable requirements in the MTO Class EA.

Meetings

The Service Provider Environmental Planner shall attend all Meetings ([X] number in person as approved by the Ministry). Environmental Specialist / key technical environmental staff shall be involved in meetings as necessary to discuss the progress/design requirements associated with environmental investigations and to assist in assessing project alternatives.

Project Website **(include as required)**

The Service Provider shall develop and maintain a project specific website.

French Language Services Act

The Service Provider shall follow all requirements of the *French Language Services Act* and maintain a project specific website.

Contamination Overview Study (COS): **(include as required)**

A Contamination Overview Study shall be completed.

Requirements for completing the COS are detailed in Section 1.2.2 Step 1 of the Guide.

Assessment of Past Uses: **(include as required)**

The Service Provider shall complete an Assessment of Past Uses (APU) in compliance with *Ontario Regulation 406/19 On-Site and Excess Soil Management* and as indicated below:

- The APU shall be completed in accordance with the requirements provided in Section B of Part I of the Soil Rules;
- Where existing environmental reports are available, update as necessary to ensure that the objectives of an APU are achieved, and the 18-month validity of an APU is met; and
- Where excess soil is to be excavated from a project area, the APU shall include all information as required, including but not limited to, the identification of Potentially Contaminating Activities (PCAs), Areas of Potential Environmental Concern (APECs), and Contaminants of Potential Concern (COPCs) in relation to the proposed excavation area to support the development of a Sampling and Analysis Plan (SAP).

Indigenous Community Consultation and Engagement

All direct correspondence with Indigenous communities shall be drafted by the Service Provider and submitted to the MTO Environmental Planner for review, signature, and distribution.

A draft version of the letters must be sent to the MTO Environmental Planner for review prior to sending. MTO will be responsible for sending the letters to any Indigenous community. Final letters to the Conservation Authority and the Municipality shall be sent by the consultant, and the must be sent by regular mail, fax, or an email copy.

NOTICE to Service Providers: INDIGENOUS ENVIRONMENTAL COMMUNITY FIELD LIAISONS

MTO recognizes Indigenous communities' interest in environmental protection and, at times, in monitoring the potential environmental impacts of MTO projects.

MTO considers the participation of Indigenous Environmental Community Field Liaisons (E-CFLs) on MTO projects on a case-by-case basis when requested by Indigenous communities.

An E-CFL is any person(s) from or representing an Indigenous community who will participate in on-site observation of potential environmental impacts during environmental field activities in the planning and design stage of a MTO project.

The Service Provider is advised that if the Ministry receives any requests from an Indigenous community for the inclusion of an E-CFL for any environmental field activities associated with this project, and the request is determined to be appropriate by MTO, the Ministry will issue a Change Order to the Service Provider for the participation of E-CFLs. The Service Provider will take the necessary actions to coordinate and accommodate E-CFL activities and compensation for services using MTO approved E-CFL established rates.

5.1.3 Deliverables

The environmental assessment process documentation that must be prepared during this project is **Insert one of** *"Comprehensive Environmental Assessment Report", "Study Design Report", "Transportation Environmental Study Report", "Transportation Environmental Study Report Addendum".*

In addition to the environmental assessment process documentation, the following environmental technical reports are required:

Insert technical reports required, or delete this requirement.

The minimum number of rounds of public information centres required for this project is **insert #** with **insert #** venues for each round. Public Information Centres for this project will be in person.

The environmental schedule requirements for this project are the following:

Insert requirements

Completion of a Class EA Monitoring questionnaire may be required for this Assignment upon clearance of the Transportation Environmental Study Report (TESR); TESR Addendum or Environmental Screening Document (ESD). If this Assignment is selected for completion of a Class EA Monitoring questionnaire, a blank questionnaire will be provided by MTO. Submission of the completed questionnaire to MTO will be required within 2 weeks of the above-noted clearance at no additional cost to the Ministry. **Delete Paragraph if your Assignment has no Class EA requirements.**

5.1.4 Reference Documents

All MTO environmental policy documents are collectively titled Environmental Standards and Practices (ESP). These ESP documents are referenced in Appendix 2: Technical Standards and Specifications.

The ESP documents provide the Ministry's staff and its agents with the requirements, guidance and tools to protect the environment during all stages of provincial highways management. All of the ESP documents are available electronically on the MTO public website at: Environmental Standards and Practices or from Service Ontario - Publications.

The ESP documents shall represent the minimum expectations for the work that the Service Provider must follow. It is the responsibility of the Service Provider to verify which of the documents specifically apply to the work, unless otherwise specified. The latest version of all referenced and posted ESP documents shall be used.

The project-specific environmental references are the following:

Insert references

5.2 Highway Planning - N/A

5.2.1 Project Scope

5.2.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

5.2.3 Deliverables

5.2.4 Reference Documents

5.3 Transportation (Systems) Planning - N/A

5.3.1 Project Scope

5.3.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

5.3.3 Deliverables

5.3.4 Reference Documents

SECTION 6: TERMS OF REFERENCE–FUNCTIONAL CATEGORIES PRELIMINARY DESIGN ASSIGNMENT (NA)

6.1 Advanced Traffic Management Systems - N/A

6.1.1 Project Scope

The study will involve reviewing previous studies and developing the future ATMS Plan on Highway **XXX** from **XXX** to **XXX**, based on the existing communications infrastructure of the COMPASS System.

The Ministry of Transportation currently operates the COMPASS Advanced Traffic Management System (ATMS) from the Transportation Management Centre /Traffic Operations Centre. Within the limits of the Highway xxx identified in the PDR, the following ATMS equipment has been installed as part of the system:

(RFP Project Manager to confirm the existing subsystems)

- Communications network with fibre-optic cables and wireless equipment as well as power cables;
- Vehicle Detection Station (VDS) sub-system including loops and/or Non-intrusive Traffic Sensors;
- Closed-Circuit Television Camera (CCTV) sub-system
- Variable Message Sign (VMS) sub-system including pole-mount VMS;
- Ramp Metering Station (RMS) sub-system;
- Managed Lane (ML) sub-system;
- Travel Time (TT) sub-system; and
- Queue Warning Sign (QWS) sub-system.

The introduction of road widening and/or rehabilitation along Highway **XXX** will impact all the existing COMPASS system. The principles objectives of the ATMS preliminary design effort required under this RFP are:

(RFP Project Manager to select the applicable design effort)

- Feasibility with Cost/Benefit Analysis;
- Take advantage of all reasonable opportunities to expand the COMPASS System as a result of the Highway widening and/or rehabilitation including the analysis of RMS with and without HOV bypass lane on ramps.
- Retention of ATMS operations during various construction stages;
- Protect and relocate all existing COMPASS plant in order to minimize their operational downtime

6.1.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

The Service Provider shall be aware of existing advanced traffic management systems and planning within the project limits. Where new lanes of freeway are being constructed and/or lanes being modified, a preliminary design layout is required to include all existing and new COMPASS equipment and all the necessary civil provisions including but not limited to controller cabinets, maintenance holes, under-pavement crossings, and junction boxes.

The Service Provider shall perform the following in accordance with the LEGAL TERMS AND CONDITIONS and the RFP. All proposed designs shall be consistent with the 'Technical Standards and Specifications' listed in Appendix 2: Technical Standards and Specifications and current MTO practices.

As part of the scope of work for this project, the Service Provider shall be responsible to identify and assess all potential impacts to the existing ATMS facilities resulting from the implementation of the various widening and/or rehabilitation alternatives. The Service Provider shall also be responsible to develop a Cost/Benefit Analysis and recommendations for avoiding and/or mitigating the impacts to these facilities wherever possible. The recommendations must take into account the different widening and/or rehabilitation alternatives and construction staging scenarios identified by the Highway designer. The preliminary design recommendations shall also include cost estimates and schedules referencing to the widening and/or rehabilitation alternatives and construction staging scenarios.

The - Service Provider shall:

- Undertake impact assessments to existing COMPASS system;
- Conduct field investigations to review field equipment and trench location considerations and to verify impacts of proposed work elsewhere in RFP;
- Develop assessments and proposals for ATMS preliminary design for the subject area including addition of new ATMS plant, protection and/or relocation of existing ATMS plant, identify locations for new equipment and civil infrastructure in support of ATMS requirements;
- Conduct migration/transition analysis of the COMPASS system for the widening and/or rehabilitation construction; and
- Provide overall coordination and integration of this component of the work with the roadwork such that all negative impacts to the existing COMPASS system are minimized and a seamless operation is maintained throughout the construction phase.

The study will involve reviewing previous studies and contract documents as well as developing the future ATMS Plan within the project limits. This project will be divided into 4 stages:

Stage 1	Study Design (Proposal)
Stage 2	Concept Development

Stage 3 Preliminary Design

Stage 4 Report Preparation

The following is a description of each stage.

Stage 1 Study Design (Proposal)

As part of the proposal for this assignment, the Service Provider shall have prepared an outline which described the scope and approach that the Service Provider will use to investigate the ATMS component of this assignment.

In order to define the study design the consultant will be required to co-ordinate with the Highway Engineering Section to ensure that the objects of this assignment are met. This outline shall be reviewed and finalized prior to the start of ATMS design work.

Stage 2 Concept Development

The intent of this stage is to get the consultant to investigate the following:

- Corridor traffic patterns, and how they relate to the Advanced Traffic Management Systems;
- Traffic Management Strategies;
- The justification for ATMS sub-system(s);
- An investigation of the available ATMS equipment for the following systems;
  - i. Closed-Circuit Television Camera (CCTV);
  - ii Vehicle Detection Station (VDS) including…;
  - iii Variable Message Sign (VMS) including pole-mount VMS;
  - iv Ramp Metering Station (RMS) with and without HOV by-pass lanes; Managed Lane (ML);
  - v Travel Time (TT);
  - vi. Communications/power; and
  - vii Queue Warning Sign (QWS).
- Identify all environmental factors, including the biological, social and cultural that relate to ATMS; and
- Consider to integrate of Road Weather Information System (RWIS) with the ATMS system to provide accurate weather data and pavement temperature information.

In terms of developing traffic management strategies and the justification of the associated sub-systems, simulation models shall be used to analyze the impacts of the various alternatives. Simulations shall be applied, but not limited, to the analysis of: RMS with and without HOV by-pass lanes; effectiveness of VMS, and Queue Warning System. The simulation models to be used shall be consistent with the overall project. (NOTE: the simulation work is needed only if the traffic management strategies are new, and a justification report is required for the new strategy)

To ensure that the ATMS provides the most benefit to the public, the Service Provider will be required to investigate the potential partnerships with other government agencies, emergency

services, media and the private sector. The Service Provider should identify the opportunities for cost sharing and the required coordination between various public and private organizations.

Regular meetings will have to be held during this phase to ensure that all the interested parties will have an opportunity to express their opinions on the ATMS work.

Stage 3 Preliminary Design

Using the conceptual designs from Stage 2 the Service Provider will be required to prepare a preliminary design for the ATMS equipment. The design will be done on appropriate scale consistent with the overall project base plans and will include the design recommendations that will result from the Highway Engineering recommendations.

The Service Provider will be required to list the performance guidelines and location criteria for each of the ATMS subsystems included in the preliminary design.

In order to ensure the advanced traffic management system is installed in the most efficient method possible the Service Provider will be required to outline the staging for implementing the system.

Stage 4 Report Preparation

The final report shall be integrated into the overall preliminary design studies. The ATMS component must include a comprehensive description of the study, plans of the recommended system and comments from the external agencies, service groups and the public.

6.1.3 Deliverables

Preliminary Design Report

Technical memorandums

Meeting minutes

6.1.4 Reference Documents

6.2 Bridge Engineering - N/A

6.2.1 Project Scope

This assignment includes preliminary design services for the following structures:

GWP	WP	Structure Name	Site No.	Hwy	Location
####-##-##	####-##-##	Bridge Name	###-####	###	x.x km North of Hwy xx

Site-Specific Requirements

Insert site-specific requirements for each bridge as follows:

Structure Name, Site No.

Provide a written summary of the bridge here, including at a minimum: structure type, span length(s) and arrangement, overall bridge width, travelled width, general articulation, year of construction, year(s) of rehabilitation, a general description of each rehabilitation, and an overall comment on the condition of the bridge.

If the structure has been pre-screened and does not have provincial heritage, include the following:

This structure has been determined not to have Provincial Heritage Significance. The Service Provider will proceed with no further requirements under the Ontario Heritage Bridge Guidelines.

For the purposes of bidding, the anticipated scope of work is as follows:

- *Note the anticipated major work type here if known (rehabilitation, replacement, etc.)*
- *Add any other relevant assumptions for bidding purposes as required.*

6.2.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

6.2.2.1 General

1. The Service Provider shall complete all structural work in accordance with the latest version of the following documents:
    a. Canadian Highway Bridge Design Code (CHBDC) CSA-S6.
    b. All applicable MTO manuals, reports, memos, guidelines, standards, and relevant publications.
2. The requirements of any other applicable manual and any exceptions to any applicable MTO manual, report, memo, or guideline shall be clearly justified, documented, and approved as appropriate.
3. All electronic drawings shall be prepared in AutoCAD DWG format using the latest version of the IES (Integrated Engineering System) layering standards. Drawing prototypes, layering structure, symbols, pen sizes, etc., shall be used as described in the latest version of DGS (Design Graphics System).

The technical services above apply to the following sites, along with additional site-specific requirements as listed below:

- **ALL SITES**
  - No additional requirements.

6.2.2.2. Preliminary Design & Planning

1. The Service Provider shall perform preliminary structural design and planning as follows:
   - Identification and evaluation of at least three feasible options. Consideration shall be given to various traffic staging scenarios for each option (i.e. existing alignment, offset alignment, temporary traffic signals, detour, etc.)
   - Existing structures shall be evaluated for the need to rehabilitate or replace the structure.
   - Bridges without expansion joints shall be evaluated and considered wherever possible.
   - The Service Provider shall propose structure configurations that minimize complexity for both design and construction whenever possible. Skewed and square bridge geometries shall be considered at skewed crossings.
   - The Service Provider shall present all proposed options to the Ministry for acceptance prior to proceeding with evaluation.
2. Structural design shall be in accordance with all area-specific requirements in addition to the general requirements. Area-specific requirements shall take precedence in the event of a conflict.
3. The Service Provider shall coordinate with all relevant MTO functional offices as required to support the design.
4. The Service Provider shall liaise with local Municipalities, Counties, Townships, Conservation Authorities, other provincial Ministries, and all other stakeholders as required to support the design.
5. The Structural Engineer responsible for the design shall visit the site(s) to review and familiarize themselves with the site conditions, and identify any potential conflicts with the proposed work.
6. The Service Provider shall provide investigative services to confirm topographical features and local conditions for each site and shall incorporate this information into the design for each structure.
7. The Service Provider shall provide investigative services to locate and confirm the location of any/all utilities for each site, and identify conflicts with the proposed work.
8. Any deviations from standard design practices shall be clearly noted in the project's Design Synopsis.
9. The Service Provider shall consider and include any necessary design provisions under the Canadian Navigable Waters Act.
10. The Service Provider shall investigate and give consideration to the aesthetic appearance of the bridge structure and its appurtenances, and their compatibility to the surroundings and context. The fundamental principles of bridge aesthetics for the bridge layout, detailing of superstructure and substructure and finishes shall be taken into account.

11. In determining bridge width, the Service Provider shall consider width needed for traffic staging during future bridge rehabilitation activities. The width shall allow sufficient future temporary lane and shoulder width for the traffic volumes estimated at that time, plus provision for any roadway protection that may be necessary at the approaches, plus the staging overlap required to allow 2 or more temporary concrete barrier positions with sufficient space between to allow proper splicing of rehabilitation materials (reinforcing steel, bridge deck waterproofing, etc). The type of temporary concrete barrier considered for the future rehabilitation shall not require pinning to the deck, unless pinning is absolutely necessary (due to unavoidable space restrictions at the site) and approved by MTO Structural. Necessitating widening of bridges to accommodate traffic staging for future bridge rehabilitation is to be avoided.
12. The Service Provider shall prepare HICO construction cost estimates for all options considered. Supplementary information and quotes as required to complement historical data shall be obtained as necessary.
13. The Service Provider shall prepare an estimate of working days required to do the work for all options considered.

The technical services above apply to the following sites, along with additional site-specific requirements as listed below:

- ***Structure Name, Site No.***
    - *List additional site-specific requirements here*

6.2.2.3 Additional Technical Services Required

Note: Delete this section if not applicable to the assignment.

1. *List the requirements of any additional technical services required here (i.e. cultural heritage, underwater inspections, etc.)*

The technical services above apply to the following sites, along with additional site-specific requirements as listed below:

- ***Structure Name, Site No.***
    - *List additional site-specific requirements here*

6.2.3 Deliverables

6.2.3.1 General

1. A digital copy of all drawings in AutoCAD DWG and PDF formats at the time of the final submission.
2. Submission of two (2) hardcopies and one (1) digital copy of each draft and final deliverable.

The deliverables above apply to the following sites, along with additional site-specific requirements as listed below:

- **ALL SITES**
  - No additional requirements

6.2.3.2 Structural Design Report

1. The Service Provider shall provide a Structural Design Report (SDR) for the preliminary design of each bridge.
2. The SDRs shall follow the MTO Structural Planning Guidelines and have the Group WP, Sub-WP, Site Number, and date on the title page.
3. The SDRs shall include, but are not limited to, discussions on the following:
   a. Existing conditions
   b. Proposed work
   c. Alignments and cross-sections
   d. Evaluation and ranking of feasible alternatives (including results of Life Cycle Cost Analysis)
   e. Traffic data and management during construction (including detour staging or detour structure if necessary)
   f. Environmental concerns and proposed mitigation measures
   g. Brief summary of foundations and hydrology recommendations
   h. Temporary water management measures during construction
   i. Construction limitations, constructability and other relevant issues (utilities, property, etc.)
   j. Estimated working days and construction costs to do the work
4. The SDR shall incorporate all recommendations from the Foundation Investigation and Design Reports and Hydrology Reports.
5. The Service Provider shall include a Preliminary General Arrangement drawing for the recommended option in each SDR.
6. The Service Provider shall summarize and document the findings of all inspections, investigations, evaluations, and all other pertinent findings in the SDR.
7. A *Level 2 (Residual value)* Life Cycle Cost Analysis shall be performed in accordance with the MTO Structural Financial Analysis Manual for all feasible options considered. The Service provider shall present the results of this analysis to the Ministry for review, and discussion.
   a. All feasible and realistic rehabilitation/replacement options considered shall be included in the analysis.
   b. A sensitivity analysis shall be carried out by varying the discount rate in the analysis. The rates to be used for this purpose shall be 4%, 5%, and 6%.
   c. A 50-year time period shall be used for calculating residual values when required, or as directed by the area structural section.
8. A decision-making matrix shall be prepared for all options considered and included in the SDR. The matrix shall be numerically based with varying weights for the factors involved.

9. An appendix shall be included containing a summary of the alternatives considered, including detailed cost estimates.

Include the following if necessary:

The Service Provider shall consider the following alternatives as a minimum:

- ***Structure Name, Site No.***
    - *List minimum alternatives to be considered here*

6.2.3.3 Additional Technical Services Required

Note: Delete this section if not applicable to the assignment.

1. *List the deliverable requirement for any additional technical services required here if needed.*

6.2.4 Reference Documents

- Latest OSIM inspection report, dated **insert date**
- Previous OSIM inspection reports (upon request after award of assignment, and if available)
- Original design drawings *(Contract* **xxxx-xxxx***)*, dated **insert date** *(if available)*
- Rehabilitation design drawings *(Contract* ***xxxx-xxxx****)*, dated **insert date** *(if available and/or applicable)*
- *List any other relevant reference documents to be made available to bidders here.*

6.3 Drainage and Hydrology Engineering - N/A

6.3.1 Project Scope

This assignment includes the preliminary drainage design services for the *select scope for this project from bridge, culvert(s), and/or highway drainage system* within the limits of the project. **{Depending on the amount of information a separate report can be provided for each bridge and structural culvert(s). The drainage study for a number of non-structural culverts and the highway drainage system can be included in a single report.}**

6.3.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

6.3.2.1 General

1. The Service Provider shall complete all drainage design work in accordance with the latest version of the following documents:
    a. MTO Drainage Management Manual, 1997
    b. MTO Drainage Design Standards, 2008
    c. MTO Gravity Pipe Design Guidelines, 2014
    d. MTO IDF Curve Lookup online application, 2016
    e. Provincial Engineering Memoranda:
        - Implementing the New Unified Ontario Flood Method
        - Implementation of the Ministry's Climate Change Consideration in the Design of Highway Drainage Infrastructure Policy
        - Implementing new Gravity Pipe Trenchless Technologies Design Guides and Gravity Pipe Design Approvals
    f. All other applicable reports, manuals, directives, guidelines, standards, and relevant publications.
2. The requirements of any other applicable manual and any exceptions to any applicable MTO manual, report, memo, or guideline shall be clearly justified, documented, and approved as appropriate.
3. Applicable design software used in design shall be as reviewed and documented in the MTO Evaluation of Drainage Management Software online manual. The use of any other software, not reviewed by MTO shall be clearly justified and documented.

The technical services above apply to the following sites, along with additional site-specific requirements as listed below:

- **ALL SITES**
    - No additional requirements.

6.3.2.2. Preliminary Design & Planning

1. The Service Provider shall perform preliminary drainage design and planning as follows:

    For Water Crossings:
    a. Identification and evaluation of all feasible options.
    b. Existing structures shall be evaluated for the need to reline or replace.

    For Highway Drainage System:

    a. preliminary layout and design of the roadside ditches, storm sewers, other minor flow channels, pump stations and any other ancillary flow elements to convey the highway runoff to a sufficient outlet
    b. accommodation of major overland flow requirements on the road surface and other major flow paths
    c. preliminary layout and design of culvert opening, erosion protection and associated structures that are part of the surface drainage system
    d. identify the location of the outlet and preliminary design of outfall, connections to outlets and outfall protection

e. preliminary selection, layout and design of storm water management control facility

2. The Service Provider shall coordinate with all relevant MTO functional offices as required to support the design.
3. The Service Provider shall liaise with local Conservation Authorities, Municipalities, Counties, Townships, other provincial Ministries, and all other stakeholders as required to support the design.
4. The Drainage Engineer responsible for the design shall visit the site(s) to review and familiarize themselves with the site conditions, lead the field investigation and identify any drainage issues and potential conflicts with the proposed work.
5. The Service Provider shall provide field and desktop investigative services to confirm topographical and stream catchment features, stream flow and rainfall data, local conditions upstream and downstream including the stream channel and floodplain, local roadside ditches, embankments and road surface at each site and shall incorporate this information into the design for each structure.
6. The Service Provider shall provide investigative services to locate and confirm the location of any/all upstream and downstream in-stream structures, utilities and other structures that can interfere with the work, for each site.
7. Any deviations from standard design practices shall be clearly noted in the project's Design Synopsis.
8. The Service Provider shall consider and include any necessary design provisions under the Canadian Navigable Waters Act.

6.3.3 Deliverables

6.3.3.1 General

1. A digital copy of all drawings in AutoCAD DWG and PDF formats at the time of the final submission.
2. Submission of two (2) hardcopies and one (1) digital copy of each draft and final deliverable.

The deliverables above apply to the following sites, along with additional site-specific requirements as listed below:

- **ALL SITES**
  - No additional requirements

6.3.3.2 Hydrology and Drainage Reports

For Water Crossings:

1. The Service Provider shall provide a Hydrology and Drainage Report for the preliminary design of each bridge, culvert or a set of culverts.

2. The Report shall include, but are not limited to, discussions on the following:
    a. Existing conditions
    b. Brief summary of field investigation, desktop data collected and geotechnical data relevant to the drainage and hydrology design
    c. A summary of all the applicable design standards and identification of the design service life for each structure
    d. Hydrology analysis with climate change considerations
    e. Stream and structure alignments; stream cross-sections upstream and downstream; MTO right-of-way boundaries
    f. Proposed work
    g. Hydraulic analysis and evaluation of the different alternatives including liner and replacement options with future considerations for culverts, bridge spans and openings, piers, abutments and footing configuration.
3. The Report shall include the following drawings (*Include as applicable*):
    a. Preliminary bridge opening layout and bridge deck drainage requirements
    b. Preliminary culvert opening layout
    c. Preliminary watercourse modification layout
    d. Preliminary protection requirements
    e. Layout of fisheries measures at required watercourses
4. The Report shall include a summary of the results on the following:
    a. Computer modelling used in the hydrologic and/or hydraulic design
    b. Erosion analysis and control measures for the stream channel and embankment
    c. Scour analysis and protection measures at bridge foundations and culvert inlet and outlet.
    d. Fisheries concerns, analysis and proposed mitigation measures
    e. Construction limitations, constructability and other relevant issues (utilities, property, etc.)
5. The Report shall incorporate all recommendations from geotechnical reports if applicable.
6. A decision-making matrix shall be prepared for all options considered and included in the Report. The matrix shall be numerically based with varying weights for the factors involved.
7. Appendices shall be included containing supporting documentation for the alternatives considered, hydrology, hydraulic analysis and modelling outputs.

For Highway Drainage System:

1. The Service Provider shall provide a Hydrology and Drainage Report for the preliminary design of each surface drainage system network and associated stormwater management components.
2. The Report shall include, but are not limited to, discussions on the following:
    a. Existing conditions

   b. Brief summary of field investigation, desktop data collected and geotechnical data relevant to the drainage and hydrology design
   c. A summary of all the applicable design standards and identification of the design service life for each pipe run, associated structures and stormwater management facility
   d. Hydrology analysis with climate change considerations
   e. Pipe network layout with locations of all outlets and associated structures and connections; MTO right-of-way boundaries
   f. Hydraulic analysis and evaluation of the different alternatives including liner and replacement options for all pipes, structures and stormwater management facilities used.
3. The Report shall include the following drawings (*Include as applicable*):
   a. Accommodation of major overland flow requirements
   b. Preliminary ditch and channel layout
   c. Preliminary culvert opening layout
   d. Preliminary storm sewer layout
   e. Preliminary outfall protection requirements
   f. Preliminary storm water management control facility layout
   g. Layout of fisheries measures at required watercourses
4. The Report shall include a summary of the results on the following:
   a. Erosion analysis and control measures at all outlets
   b. Computer modelling used in the hydrologic and/or hydraulic design
   c. Construction limitations, constructability and other relevant issues (utilities, property, etc.)
5. The Report shall incorporate all recommendations from the geotechnical reports.
6. A decision-making matrix shall be prepared for all options considered. The matrix shall be numerically based with varying weights for the factors involved.
7. Appendices shall be included containing supporting documentation for the alternatives considered, hydrology, hydraulic analysis and modelling outputs.

6.3.4 Reference Documents

- *Any field inspection report, dated [insert date] (if available)*
- *Previous Drainage Report, dated [insert date] (if available)*
- *Environmental Assessment Study Reports [Insert date]*
- *Previous watershed or sub-watershed Reports, dated [insert date] (if available)*
- *Original design drawings (Contract xxxx-xxxx), dated [insert date] (if available)*
- *List any other relevant reference documents to be made available to bidders here.*

6.4 Electrical Engineering - N/A

6.4.1 Project Scope

This project includes the preliminary design study of electrical requirements within the project limits. Electrical design study includes, full and partial lighting for highways, municipal roads, bridges, commuter parking lots, truck inspection services, service centres, remote airports, patrol yards, marine docks, roundabouts, etc.; traffic signals; counting stations; electrical vehicle charging stations; electrical embedded work in structures/underpass lighting; electrical removals; and all associated electrical work. **Select project-specific information.**

6.4.2 Technical Services Required

The electrical engineering preliminary design services shall include the following.

Select applicable information below

- Arrange and conduct site meetings, liaise and prepare agreements with all utility / agencies (Hydro, Telephone, Cable TV, Gas, Oil, water main, sewer, etc.) regarding relocations to resolve / avoid electrical conflicts, to obtain utility locates, to obtain preliminary services layouts, and to acquire utility crossing permits.

- The ministry's electrical project manager and electrical coordinator shall be invited to attend all the meetings.

- Arrange and conduct meetings, liaise and prepare draft agreements with local municipalities, private owners, and agencies regarding municipal and private lighting, traffic signals and other electrical systems. The ministry's electrical project manager shall be invited to attend the meetings.

- Prior to the 90% meeting, arrange and conduct an electrical presentation meeting to present the electrical report to the Ministry. Draft electrical reports together with QC check lists shall be submitted to the Ministry a minimum of one week prior to the meeting.

- The Consultant's electrical key staff shall attend all design team progress meetings with electrical items on the agenda.

- The Consultant's electrical key staff shall attend, all required Public Information Centres to explain and present the Ministry's intent to install high mast lighting and to identify mitigation measures regarding light trespass concerns.

The electrical preliminary design study report shall include the following.

- Detailed inventory including ownership, age, and assessment of the performance and condition of all existing electrical systems such as lighting, traffic signals and flashers.

- Existing high mast pole inspection, testing and evaluation.

- Performance of existing lighting systems. This shall be determined by lighting calculations and/or field measurements to verify if the existing systems meet current standard lighting criteria.

- Recommendation of improvement work to the existing electrical systems.

- Evaluation of lighting and traffic signal warrants, if required, shall be carried out according to Section 6.11, Traffic Engineering. Prepare preliminary PH-M-125 drawings.

- Identification of all existing electrical plants/systems affected by the recommended civil improvement alternative(s).

- Recommendation of temporary and permanent electrical work required for the recommended improvement alternative(s), including conceptual design with preliminary layouts.

- Evaluation and recommendation of appropriate lighting alternatives.

- Preparation of conceptual lighting design with preliminary layouts and lighting calculation plans showing lighting levels, uniformities and light trespass levels for the recommended interim and ultimate highway improvements. All lighting calculations shall be generated by MTO approved lighting software. The lighting design shall accommodate more than one supplier's luminaires.

- Recommendation of lighting and electrical work required for commuter parking lots and electrical vehicle charging stations.

- Identification of any constraints associated with the implementation of the recommended electrical improvements.

- Identification of all design concerns such as airports, astronomical observatories, navigational waters, hydro crossings, and all other above or belowground utilities.

- Preparation of estimated construction costs and number of working days for all recommended electrical work.

6.4.3 Deliverables

- The electrical preliminary design study report shall form an integral part of the main project report.

- Lighting calculation program files and lighting layout drawings in AutoCAD format.

- Submit (2) hard copies and a digital copy of the electrical report to the Electrical Engineering Section.

6.4.4 Reference Documents

Fill in as applicable

6.5 Engineering Materials Investigations - N/A

6.5.1 Project Scope

6.5.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

6.5.3 Deliverables

6.5.4 Reference Documents

6.6 Environmental - N/A

6.6.1 Project Scope

A dedicated individual shall be identified as the lead for the environmental portion of this study and will be responsible for the entire environmental component of this study. They must have experience/education related to the undertaking.

This project may generate excess soil, as defined under O. Reg. 406/19. The service provider shall prepare a design package in conformance with O. Reg. 406/19 for excess soil management, meeting excess soil planning requirements. A Qualified Person as defined under O. Reg. 406/19 shall be retained and identified to complete an Assessment of Past Uses report for the environmental portion of the study in accordance with O. Reg. 406/19 and the associated *Rules for Soil Management and Excess Soil Quality Standards*. **Delete Paragraph if your project will not generate excess soils that will be removed from the project area.**

MTO Projects/Undertakings are subject to the provincial Environmental Assessment (EA) Act RSO (1990) and Regulations made under that Act.

A comprehensive EA is prepared for large-scale, complex projects with the potential for significant environmental effects, and follows a two-stage approval process. The first stage is the development and approval of an EA Terms of Reference which outlines the process that must be followed to complete the second stage which is a planning, preliminary design and EA study. Approvals are required from the Minister of Environment, Conservation and Parks. **Delete Paragraph if your Assignment has no comprehensive EA requirements.**

The Transit Project Assessment Process (TPAP) (Ontario Regulation 231/08-Transit Projects and Metrolinx Undertakings) outlines a time-limited, streamlined approval process for transit projects. **Delete Paragraph if your Assignment has no TPAP requirements.**

The 'Class Environmental Assessment for Provincial Transportation Facilities' document establishes an EA process that has been pre-approved by the Ministry of Environment, Conservation and Parks (MECP) Minister for a defined set of undertakings. The MTO Class EA document outlines a pre-approved, self-assessment process that applies to routine projects with predictable and manageable environmental effects.

Project notices for Class EA undertakings must be sent to the appropriate MECP regional notification email account. The list of MECP regional notification email accounts and the current MECP Project Information Form are listed at 'https://www.ontario.ca/page/preparing-environmental-assessments#section-5'. If the project spans more than one MECP region, notify the MECP regional office where the majority of the project falls within.

Emails sent to the MECP regional notification email account must include a copy to the MTO Environmental Planner and require a subject line that identifies: '*project location'*, 'MTO Class EA', and '*project name'*. Note: if the project spans multiple municipalities, select 'several' from the Project Information Form drop-down menu for 'project location'. Include highway number and GWP or WP as part of 'project name'.

- Where a Notice of Study Commencement (PDF) is issued to MECP, a completed MECP 'Project Information Form' must also be attached to the email, in both Excel and PDF formats.
- Where required, a Notice of Completion (PDF) and a Notice of Addendum (PDF) must also be sent to the MECP regional notification email account. Do not include the Project Information Form as part of this notification.
- All correspondence (including copies of TESR/DCR/Addendum documents for public and/or MECP review) and other project notices (e.g. Step-down, PIC) must be sent directly to the MECP Regional EA Coordinator by the usual method, and is not to be sent to the MECP regional notification email account. Do not include the Project Information Form as part of this notification.

Under the 'Class Environmental Assessment for Provincial Transportation Facilities', this project is classified as a Group **Insert category of project** at the time of project initiation. **Delete Paragraphs 5-11 if your Assignment has no Class EA requirements.**

The federal EA process may also apply to projects that are subject to the Ontario EA Act. The Canadian Impact Assessment Act (IAA) is administered and enforced by the Impact Assessment Agency of Canada and applies to projects that are designated by the Physical Activities Regulations (SOR/2019-285), or projects that have been specifically designated by the Minister of Environment and Climate Change Canada. Where both the Ontario EA Act and IAA apply to a project, all efforts should be made to follow one coordinated process. Appropriate documentation shall be prepared and submitted for approval at a time suitable to the project schedule if the IAA requirements are anticipated.

The environmental schedule requirements for this project are the following:
Insert requirements

The anticipated level of importance to project delivery of factor-specific environmental services is as outlined below:

Insert outline

The environmental deliverables that will be provided by the Ministry are the following:

Insert deliverables

6.6.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

Project Specific Environmental Requirements

Where a project-specific Scope of Environmental Services has been prepared, its content shall be deemed to be a project requirement.

Additional project-specific environmental requirements are the following:

Insert requirements

Statutory Advertisements and Environmental Assessment Notices

An advertising agency has been selected to place all statutory advertisements in newspapers for the Ministry, such items as tender notices, public notices, road closures and certificates of substantial completion. The advertising agency also places any Environmental Assessment notices that are placed in newspapers, such as notices of Commencement, public information centres, and Completion in accordance with the applicable requirements in the MTO Class EA.

Meetings

The Service Provider Environmental Planner shall attend all Meetings in person as approved by the Ministry. Environmental Specialist / key technical environmental staff shall be involved in meetings as necessary to discuss the progress/design requirements associated with environmental investigations and to assist in assessing project alternatives.

Project Website **(include as required)**

The Service Provider shall develop and maintain a project specific website.

French Language Services Act

The Service Provider shall follow all requirements of the French Language Services Act and maintain a project specific website.

Contamination Overview Study (COS):

A Contamination Overview Study shall be completed.

Requirements for completing the COS are detailed in Section 1.2.2 Step 1 of the Guide.

[Note to User: Delete the above paragraph if a COS has already been completed]

Phase One Environmental Site Assessment (Phase I ESA)

The information gathered through the COS should be used to complete a Phase One ESA under the direction of a QP.

Requirements for completing the Phase I ESA are detailed in Section 1.2.4 Step 3 of the Guide.

[Note to User: Delete the above paragraph if COS indicates Phase I ESA not required]

Excess Soil Management

The Service Provider shall complete the following work in compliance with *Ontario Regulation 406/19 On-Site and Excess Soil Management* and the *Rules for Soil Management and Excess Soil Quality Standards.*

The Service Provider's QP shall review any existing background information and environmental reports, such as Contamination Overview Study (COS), Preliminary Site Screening Reports (PSSRs), Phase One/Two Environmental Site Assessments (ESAs), geotechnical investigations and/or remediation reports, to determine if the project area is or has ever been, in whole or in part, an "enhanced investigation project area" as defined by O. Reg. 406/19.

The Service Provider's QP shall review the design and excavation details and potential reuse options of the excavated soil to determine if the project is exempt from the reuse planning and registry rules of O. Reg. 406/19 as per Section 8 and Schedule 2 of the regulation. If the project is determined to be exempt from the reuse planning and/or registry rules, the Service Provider shall review the project exempt status and any proposed due diligence soil management scope with MTO prior to the commencement of any field sampling program.

INSERT THE FOLLOWING IF AN ASSESSMENT OF PAST USES HAS NOT BEEN COMPLETED FOR THE PROJECT AND IS REQUIRED UNDER THE EXCESS SOIL PLANNING REQUIREMENTS (I.E., THE PROJECT IS NOT EXEMPT):

The Service Provider shall complete an Assessment of Past Uses (APU) as indicated below:

- The APU shall be completed in accordance with the requirements provided in Section B of Part I of the Soil Rules;
- Where existing environmental reports are available, update as necessary to ensure that the objectives of an APU are achieved, and the 18-month validity of an APU is met; and
- Where excess soil is to be excavated from a project area, the APU shall include all information as required, including but not limited to, the identification of Potentially Contaminating Activities (PCAs), Areas of Potential Environmental Concern (APECs), and Contaminants of Potential Concern (COPCs) in relation to the proposed excavation area to support the development of a Sampling and Analysis Plan (SAP).

FOR PROJECTS THAT ARE NOT EXEMPT

WHERE APPROPRIATE, INSERT THE FOLLOWING IF AN ASSESSMENT OF PAST USES HAS BEEN COMPLETED, BUT A SAMPLING AND ANALYSIS PLAN HAS NOT BEEN COMPLETED FOR THE PROJECT:

Sampling and Analysis Plan:

The Service Provider shall complete a Sampling and Analysis Plan (SAP) based on the findings of the Assessment of Past Uses, as indicated below:

- The SAP shall be completed in accordance with the requirements provided in Section B of Part I of the Soil Rules;
- The scope of the SAP shall comply with all requirements provided in the Soil Rules, including but are not limited to the sampling frequency and analyzing parameters. The sampling location and depth shall represent both the horizontal extent and vertical profile of the excavation areas and/or APECs;
- The SAP shall include tables and figures which clearly demonstrate the proposed borehole locations, soil sample locations and depths, and analyzign parameters, in relation to the APEC's and excavation areas (and proposed sample depth).
- The SAP shall include soil sampling and analysis for waste characterization purposes (i.e., impacted or contaminated) for potential disposal of contaminated soil (if present); and
- If an in-situ sampling approach is not considered practical or feasible, an alternative sampling approach shall be provided.

The APU and the SAP shall be submitted to and approved by MTO prior to the implementation of the SAP or commencement of the soil investigation program.

The completion of the soil investigation program or implementation of the SAP shall be completed in accordance with the requirements provided in Section B of Part I of the Soil Rules, O. Reg. 153/04 and any other applicable legislation.

In-situ environmental soil sampling shall be incorporated as much as possible into geotechnical investigations to be cost effective. Any required sampling locations and depths that cannot be completed in conjunction with geotechnical investigations may be completed by an independent environmental drilling and sampling program.

Soil Characterization Report:

The Service Provider shall complete an interim Soil Characterization Report (SCR) based on the findings of the Sampling and Analysis Plan, as indicated below:

- The interim SCR shall be completed in accordance with the requirements provided in Section B of Part I of the soil Rules.
- Preparation of a Soil Characterization Report for the project area shall include APECs identified within the project area, investigation methods including drilling, excavating test

pits, soil sampling, sediment sampling, field screening measurements, analytical testing, with necessary modifications; stratigraphy from ground surface to the deepest planned excavation, approximate depth to water table, borehole logs, figures with cross sections, tables and laboratory certificate of analysis.

- The SCR shall include the estimated volumes for soil that is feasible to be reused onsite within the project area and offsite on beneficial reuse sites that meet different tables of generic excess soil quality standards (and generic leachate screening levels for excess soil reuse), and the estimated volume of contaminated soil (if any) that cannot be reused for beneficial reuse and must be disposed of at a landfill or Class 1 Soil Management Site. The areas with soil quality meeting different excess soil quality standards shall be illustrated on figures.

FOR PROJECTS THAT ARE EXEMPT

WHERE APPROPRIATE, INSERT THE FOLLOWING FOR PROJECTS THAT ARE EXEMPT FROM THE PLANNING REQUIREMENTS OF THE EXCESS SOIL REGULATION:

The Ministry has determined that Section 8 of O.Reg.406/19 does not apply to the project because the reason for excavating the soil that will become excess soil is [insert reason, e.g., "maintaining infrastructure in a fit state of repair."] As such, the decisions, recommendations, and requirements being implemented as part of the Ministry's due diligence to meet the intent of the regulation and follow applicable guidance (i.e., Rules for Soil Management and Excess Soil Quality Standards) shall be documented in the Earth Management Plan referenced in Section 6.8.

The Service Provider shall undertake Environmental Due-diligence Sampling to ascertain the quality of the earth material being excavated and managed both on-site and off-site, as per the following requirements:

- Insert requirements (to be discussed at Scoping Meeting).

Indigenous Community Consultation and Engagement

All direct correspondence with Indigenous communities shall be drafted by the Service Provider and submitted to the MTO Environmental Planner for review, signature, and distribution.

A draft version of the letters must be sent to the MTO Environmental Planner for review prior to sending. MTO will be responsible for sending the letters to any Indigenous community. Final letters to the Conservation Authority and the Municipality shall be sent by the consultant, and the must be sent by regular mail, fax, or an email copy.

NOTICE to Service Providers: INDIGENOUS ENVIRONMENTAL COMMUNITY FIELD LIAISONS

MTO recognizes Indigenous communities' interest in environmental protection and, at times, in monitoring the potential environmental impacts of MTO projects.

MTO considers the participation of Indigenous Environmental Community Field Liaisons (E-CFLs) on MTO projects on a case-by-case basis when requested by Indigenous communities.

An E-CFL is any person(s) from or representing an Indigenous community who will participate in on-site observation of potential environmental impacts during environmental field activities in the planning and design stage of a MTO project.

The Service Provider is advised that if the Ministry receives any requests from an Indigenous community for the inclusion of an E-CFL for any environmental field activities associated with this project, and the request is determined to be appropriate by MTO, the Ministry will issue a Change Order to the Service Provider for the participation of E-CFLs. The Service Provider will take the necessary actions to coordinate and accommodate E-CFL activities and compensation for services using MTO approved E-CFL established rates.

6.6.3 Deliverables

The environmental assessment process documentation that must be prepared during this project is **Insert one of** *"Comprehensive Environmental Assessment Report", "Transportation Environmental Study Report", "Transportation Environmental Study Report Addendum", "Environmental Screening Document" etc.*

In addition to the environmental assessment process documentation, the following environmental technical reports are required: **Insert technical reports required, or delete this requirement**

The minimum number of rounds of public information centres required for this project is **insert #** with **insert #** venues for each round. Public Information Centres for this project will be in person.

The environmental schedule requirements for this project are the following: **Insert requirements**

Completion of a Class EA Monitoring questionnaire may be required for this Assignment upon clearance of the Transportation Environmental Study Report (TESR); TESR Addendum or Environmental Screening Document (ESD). If this Assignment is selected for completion of a Class EA Monitoring questionnaire, a blank questionnaire will be provided by MTO. Submission of the completed questionnaire to MTO will be required within 2 weeks of the above-noted clearance at no additional cost to the Ministry. **Delete Paragraph if your Assignment has no Class EA requirements.**

6.6.4 Reference Documents

All MTO environmental policy documents are collectively titled Environmental Standards and Practices (ESP). These ESP documents are referenced in Appendix 2: Technical Standards and Specifications.

The ESP documents provide the Ministry's staff and its agents with the requirements, guidance and tools to protect the environment during all stages of provincial highways management. All of the ESP documents are available electronically on the MTO public website at: Environmental Standards and Practices or from Service Ontario - Publications.

The ESP documents shall represent the minimum expectations for the work that the Service Provider must follow. It is the responsibility of the Service Provider to verify which of the documents specifically apply to the work, unless otherwise specified. The latest version of all referenced and posted ESP documents shall be used.

The project-specific environmental references are the following:

Insert references

6.7 Foundation Engineering - N/A

6.7.1 Project Scope

6.7.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

6.7.3 Deliverables

6.7.4 Reference Documents

6.8 Highway Engineering - N/A

6.8.1 Project Scope

6.8.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

Earth Management

To support the Government of Ontario's objectives for the conservation of resources and the diversion of reusable earth material from landfill, the Service Provider shall strive to be proactive and innovative during design by considering all possible options and incorporating reasonable measures to confirm that the generation of excess material is minimized on Ministry's projects. Excess material includes earth material that is surplus to the project and may include muskeg or rock.

Soil, crushed rock or soil mixed with rock or crushed rock, that has been excavated as part of a project and removed from the project area is deemed **Excess Soil** under O. Reg. 406/19 and must be managed in accordance with the requirements under the regulation. Refer to Section 6.6 for further details. The Service Provider shall make all reasonable effort to beneficially reuse excess soil. The beneficial purpose for reuse, as defined under section 5.(1). 3 of O. Reg. 406/19, should be taken into consideration.

On projects where excess material (e.g., soil, muskeg, rock) will be generated, opportunities for earth management should be explored in accordance with the "**MTO Earth Best Practices and Recommendations for Design and Construction**".

The Service Provider shall produce and maintain an **Earth Management Plan** describing the management of earth and proposing measures to minimize earth borrow and excess material generation, and maximize reuse of excess material on the project. The **Earth Management Plan** shall also include recommendations on how any **Excess Soil**, as defined by O. Reg. 406/19, is to be managed to meet the requirements of the regulation.

Details to be provided in the **Earth Management Plan** include, but are not limited to, the following:

- Details on the activities and locations which may generate excess material, including excess soil.
- Options for reuse of excess material including excess soil suitable for engineered purposes within the project area.
- Options for reuse of excess material suitable for other purposes within the project area (e.g., slope flattening, berms).
- Options for stockpiling of excess material including excess soil on MTO property within the project area.
- Options for Excess Material Management Areas (EMMAs) within and/or adjacent to the project area for disposal of earth is needed.
- Options for reuse of excess material suitable for rehabilitating MTO pits or quarries.

- Preliminary estimates of the quantities and quality of excess material suitable for each of the above options, along with locations of their final placement.

The **Earth Management Plan** shall be included in the Preliminary Design Report, along with a summary of items to be addressed during detail design.

6.8.3 Deliverables

Erosion and Sediment Control

The Service Provider shall undertake an Erosion and Sediment Control Overview Risk Assessment in accordance with Section 3.13 of the MTO *Environmental Reference for Highway Design* (ERD) and the MTO *Envir*onmental *Guide for Erosion and Sediment Control during Construction of Highway Projects* (ESC Guide).

6.8.4 Reference Documents

6.9 Pavement Engineering - N/A

6.9.1 Project Scope

6.9.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

6.9.3 Deliverables

6.9.4 Reference Documents

6.10 Surveying & Plan Preparation - N/A

6.10.1 Project Scope

6.10.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

6.10.3 Deliverables

6.10.4 Reference Documents

6.11 Traffic Engineering - N/A

The assignment will include traffic engineering requirements in support of the preliminary design components of this project. The requirements include a review of existing and projected highway operations, traffic volumes and characteristics and the preparation of an Operational Performance Review Report for the highway(s) and roadway(s) within the project limits. The purpose of this Report is to identify and review any operational and safety issues and provide recommendations of improvement options.

The report shall include, but not limited to, a review and analysis of:

- traffic data
- collision analysis,
- signing requirements,
- construction phasing / staging / detour and access,
- preliminary traffic management plan
- intersection control / traffic control signals,
- illumination,
- guide rail,
- roadside safety / roadside hazards
- operational impacts
- a review of correspondence

6.11.1 Project Scope

The Service Provider is required to develop and establish an appropriate level of detail and documentation for the preparation and completion of the Operational Performance Review Report.

Using the information provided by the Ministry, the Service Provider shall define and justify the study area for the analysis and define and justify the criteria that will be utilized for evaluating alternatives. Review and analysis is required to assess both the impacts of alternatives that are to be developed by the Service Provider and to address existing and future deficiencies and their impact on the highway and all intersecting public roads, including detour routes.

The Operational Performance Review Report shall include an appendix. The Appendix shall include all supporting documentation and calculations (i.e. LOS (Level of Service) calculations, traffic control signal warrants, auxiliary lane analysis, traffic volume information, etc.)

The Service Provider shall submit to the Ministry **insert #** copies of the draft Operational Performance Review Report for review and comment. The report shall be submitted a minimum of 15 business days prior to finalizing the Report.

The Service Provider shall submit to the Ministry **insert #** copies of the final Operational Performance Review Report and present it to Ministry for approval. The approved Operational Performance Review Report shall also be included in an appendix contained within the Preliminary Design Report.

Ministry Standards and area Policies and Practices

The Service Provider shall undertake all works for this discipline in conformance with the following Ministry standards and area policies and practices (the latest publication or release):

- Geometric Design Guide for Canadian Roads
- MTO Geometric Design Supplement
- Ontario Traffic Manuals (OTM) Book Suite
- Roadside Design Manual
- Roadside Evaluation Manual
- MTO Traffic Data Collection and Processing Procedures and Standards
- Guideline for Operational Performance Reviews
- Traffic Management Guidelines for Structure Rehabilitation Projects
- Traffic Control Signal Timing and Capacity Analysis at Signalized Intersections
- Portable Temporary Traffic Signals Policy
- Commercial Site Access Policy and Standards Manual
- Full Road Closures Policy
- Applicable Ministry and area Standards, Directives and Guidelines

For any deviation of the above Ministry standards and area practices, the Service Provider shall provide recommendations and rationale for Ministry acceptance.

The Service Provider shall employ AutoCAD Standards complying with the requirements as indicated elsewhere in the Agreement.

6.11.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Refer to the Note to User document for draft qualifications. Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

Traffic Data

All raw traffic data collected and processed for this project shall be provided to the Ministry as per the applicable Guidelines. The Service Provider shall format all data as per the "Header and Filename Convention for Data Collection" requirements.

Data collection details will be provided to the Service Provider by the Ministry.

Traffic Volumes

The Ministry will provide sectional traffic volume information and projections as described in Section 6.11.4 (Reference Documents).

The most current mainline counts completed by the Ministry will be made available to the Service Provider.

Using the information provided by the Ministry and data to be obtained by the Service Provider, the Service Provider shall be required to use standard analytical techniques to assess the general traffic movement as well as the volumes and capacity within the study area.

The Service Provider shall determine the projected AADT, SADT, LOS and DHV(s) for low growth and high growth scenarios using 5, 10 and 20 year horizon forecasts relative from the planned construction year and shall provide justification for the use of any DHV chosen to determine LOS. Historical growth rates will be provided to the Service Provider.

Traffic Data Collection

The Service Provider shall:

- *acquire 7-day directional volume information on mainline Highway XXX*
- *acquire 7-day directional volume information on all public and private roads*
- *acquire 7-day directional volume information on all commercial entrances and/or accesses within the study area*
- *conduct 8-hour turning movement counts during the am & pm peak hours at roads and at all entrances.*
- *conduct 10-hour turning movement counts during the am & pm peak hours at roads and at all entrances.*

The Service Provider shall collect, analyze and summarize the following in addition to the information as provided above:

- *Localized speed studies*
- *Side road counts*
- *Ball banking*

Level of Service (LOS) and Capacity Analysis

The Service Provider shall determine the existing LOS and shall provide justification for the use of any DHV chosen to determine LOS. The Highway Capacity Manual (HCM), Highway

Capacity Software (HCS) 2010, ARCADY 7 and Synchro 10 shall be utilized for LOS and capacity analysis.

Freeway Macro Modelling Analysis

- Perform Transportation Modelling & Transportation Demand Forecasting in the immediate and surrounding area by contacting the Ministry of Transportation's System Analysis and Forecasting Office for information on EMME forecast modelling data requirements as outlined in the Transportation Planning Section.
- While analyzing interchange alternatives, the Service Provider shall conduct capacity analysis for nearby access roads and also calculate delays (queue lengths) based on expected future traffic volume on these roads.
- Conduct LOS calculations for all future alternatives, freeway and highway segments, weaving sections, ramp and ramp terminals and signalized intersections at acceptable horizon years up to year **20XX**. The Service Provider shall apply the appropriate criteria and / or warrants, which govern geometric and cross section improvements (i.e. auxiliary lanes) and the installation of traffic control signal, illuminations, etc., to determine the need for any improvements.

Micro Modelling / Queuing / Freeways

- Using VISSIM or AIMSUN micro simulation software package, conduct Level of Service calculations and assess existing basic freeways and highway segments, weaving sections, ramp and ramp terminal operations under existing conditions.
- Calibrate and validate existing conditions.
- Simulate future **20*XX*** and **20XX** conditions in both directions based on information from macro modelling analysis. Evaluate ITS scenarios, as detailed in the ATMS section of the Terms of Reference, if any. Conduct evaluation for construction sequencing and staging alternatives. The limit of the micro-simulation model shall be discussed and agreed upon at the start of the project but shall extend as a minimum one interchange on both sides from the study limit.
- Traffic shall be modelled for the a.m. and p.m. peak weekday & weekend periods (3 hours/period). The model should provide a reliable estimate of the entire study area operation. The consultant shall investigate using the model and other tools all possible scenarios to identify and assess all proposed geometric configurations and show improvements (before and after). Where required, identify / recommend preferred scenarios with Managed Lanes and summarize advantages / disadvantages, including identification of optimal locations for *Managed Lanes* weave/merge zones and start / termination points.
- Prepare a 3D graphical traffic microsimulation model (VISSIM or AIMSUN) of the freeway within the identified study area to show expected future traffic operations for the selected preferred design alternative for presentation to MTO Senior Management and display at Public Information Centres.
- The simulation model input and output files, assumptions used in the models, calibration results, documentation of any model limitation, and snapshots (with road name labels) and traffic operation summaries of key simulation findings under various scenarios shall be provided.
- The traffic operation summaries shall include at a minimum documentation of the average vehicle speed along various sections of the network, travel time, average delay, levels of

service, weaving, queuing or slow moving vehicles (due to difficult lane changes) that are observed on the network, etc. under the various scenarios.

- All input and output files shall be submitted in both electronic and hardcopy formats for review.

The projected LOS deficiencies shall be identified, indicating the time period for such deficiencies for all sections of highway within the project limits including mainline, ramps, ramp terminals and intersections or roundabouts. The LOS calculations shall include existing highways and all intersections. The LOS calculations shall also include comparisons for each highway segment and for seasonal and daily variations.

The Service Provider shall document the following for each LOS improvement option:

- the type of improvement,
- the proposed timing for the improvement
- the life expectancy of the LOS improvement.

Inventory Count Stations

The Service Provider shall confirm and document the location of existing traffic data collection stations within the project limits. The Service Provider shall determine and advise the Ministry if any existing stations will be impacted.

Collision Data

The Service Provider will be provided general collision data for the most recent and complete five (5) year period.

The Service Provider shall contact the County of **XXX** / Municipality of **XXX**, Township of **XX** and any other local road authorities, as necessary, regarding traffic volume information, collision information and future development proposals which may have an influence on the project.

Collision Analysis

The Service Provider shall conduct a comprehensive Operational Performance Review. The analysis shall be completed applying the Ministry's Guidelines for Operational Performance Reviews, Ministry standards and area practices.

The Service Provider shall undertake a Safety Improvement Benefit/Cost Review to assess the safety benefits of proposed highway improvements within the project limits utilizing the Transportation Engineering Software (TES) and applying the Highway Safety Manual methodology, with available data, provided by the ministry, to evaluate alternative countermeasures within the context of the project. A summary and recommendations of the review included Operational Performance Review Report.

Permanent Signing

Permanent signs include highway signing and sign support structures (including ground mounted signs, overhead, cantilever and bridge-mounted type sign support structures).

Existing Conditions

The Service Provider shall identify and document the type of sign, the message, and locations of all existing signs, identify any missing signs and recommend additional signs in locations where signing does not conform to current Ministry policies.

Future Conditions

The Service Provider shall complete the following with respect to the proposed or recommended highway improvements:

- identify the impacts to all existing signs
- identify the need and provide justification for additional permanent signing requirements
- discuss the signage for consistency (i.e. sign size, language, location, etc.)
- discuss compliance with the French Language Services Act (FLSA)
- identify and discuss impacts to Tourist-Oriented Directional Signs (TODS) / LOGO Signing
- provide recommendations and rationale for all permanent signs throughout the project limits.

All recommended permanent signing (location and type) are to be reviewed and approved by the Ministry.

The Service Provider shall prepare and submit the following to the Ministry for review:

- Recommended Preliminary Permanent Sign Layout
- Detailed rationale for the Recommended Preliminary Permanent Sign Layout
- Concept Plan of the approved Preliminary Permanent Sign Layout for the highway improvements.

Construction Staging / Detour

The Service Provider shall be responsible for determining all preliminary construction staging / detour requirements. The alignment and cross sections of the stages/detours shall be determined based on safety, effectiveness, costs and environmental impact.

The Service Provider shall analyse and develop preliminary detour/staging drawings for all design options. The detour/staging drawings should consider items such as:

- Detours that direct traffic onto roads or affect existing traffic on roads not under Ministry jurisdiction, the Service Provider shall contact the appropriate road authorities to confirm detours are viable and shall include possible detour options in public notices
- A detour preliminary design criteria
- Recommended detour route plans on 1:1000 scale drawings
- Documented notification of the appropriate agencies
- Documentation confirming the detour route option is both viable and appropriate and was included in Public Notices.

- Written approval from the appropriate road authorities for the use of their roads
- Adequate vertical and lateral clearances are to be maintained. A minimum lane width of 3.5 metres and offsets between traffic and temporary concrete barrier of no less than 0.5 metres shall be maintained at all times. If this cannot be met, the Service Provider shall propose options to address inadequacies.
- Illumination must remain operational throughout the staging
- Temporary traffic signal requirements
- Queue and delay analysis shall be completed for all proposed lane closures
- All temporary detours or lane shifts shall be designed to the same speed as the main lanes
- Identify and assess detour options for any proposed alternatives, with emphasis on conditions imposed by extended closure of freeway ramps. Assess the traffic operation and safety aspects of all staging proposals.
- Recommended lane closure time restrictions are based on General Guidelines on Vehicle Capacity Through Work Zones NCHRP #280 or as recommended by the area Traffic Section.
- All temporary detours or lane shifts shall be designed to the same speed as the main lanes
- *Assess the impact of ramp metering on the freeway, ramp and ramp terminal operation. The Service Provider shall confirm if ramp metering will be suitable for deployment in the study area from a traffic operations perspective.*
- *Review all alternatives to determine the effect to local roads as a result of traffic infiltration / cut through traffic.*

Preliminary Traffic Management Plan

The Service Provider shall prepare a Preliminary Traffic Management Plan. The purpose of this Traffic Management Plan is to:

- determine the impact of any staging schemes for the safe and efficient movement of traffic
- aid in the selection of preliminary staging schemes that will safely and adequately facilitate efficient operations without creating undue delay to the travelling public.
- aid in proposing methods to inform the travelling public, emergency response agencies and other stakeholders of the potential impacts of staging/detour.

OTM Book 7, Ministry standards and area practices shall be used, as a minimum, to plan and implement traffic management for this project.

The Service Provider shall make provisions for the Preliminary Traffic Management Plan to be discussed and the appropriate documents to be reviewed before the draft Preliminary Design Report is submitted to the Ministry.

Permanent Traffic Signals

The Service Provider shall review and provide recommendations for all permanent traffic control signals or alternatives (i.e. roundabouts) within the project limits.

For existing permanent traffic signal systems within the project limits, the Service Provider is required to use OTM Book 12, Highway Capacity Manual (HCM) Methodology, Highway Capacity Software (HCS) 2010 and Synchro 10 for the analysis of the signalized intersections.

For each intersection where traffic control signals are warranted or nearing warrants, the Service Provider shall also evaluate a roundabout an alternative to a signalized intersection. Refer to Highway Engineering Section of this Agreement for further details.

Conduct an operational analysis of all existing traffic control signals on a network basis using existing and any proposed roadway configuration, by using the Synchro 9 and SIM Traffic software packages and provide operational and safety recommendations for the improvement of existing traffic control signals The inputs & outputs of the analysis must be submitted to the Ministry in a CD and hardcopy format.

The Service Provider shall utilize 5, 10 and 20 year projected traffic volumes (relative to the planned construction year) to ascertain future traffic control signal warrant needs for all intersections / ramp terminals as defined in OTM Book 12. If traffic control signals are warranted at any of the intersections, the Service Provider shall define the appropriate geometric improvements based on the projected traffic volumes.

For new traffic signal locations, the Service Provider shall develop preliminary traffic signal timing. The Service Provider is required to use OTM Book 12, HCM Methodology, HCS 2010, and Synchro 8 to develop the signal timing at signalized intersections.

*The Service Provider is advised that traffic control signals are required for the intersection of Highway **XX** and **XXX** Drive. Installation of traffic control signals at this location will be part of the project.*

The Service Provider shall prepare and submit preliminary drawings (at a scale of 1:500) which depict the recommended geometric improvements and preliminary traffic control signal design for Ministry review.

Temporary Traffic Signals

The Service Provider shall identify and analyze locations within the study limits which may require the installation of temporary traffic signals. The Service Provider shall also make recommendations regarding any temporary traffic signal installations required in conjunction with anticipated construction staging.

Illumination Requirements

The Service Provider shall inventory and document all existing illumination within the project limits and identify ownership (i.e. Ministry, Municipal, Private, Utilities, etc.), and conformance to Ministry standards and warrants. The Service Provider shall confirm existing field conditions are accurately documented in the drawings (to be completed in conjunction with the Electrical Engineering Section of this Agreement).

The Service Provider shall identify, analyze and recommend locations within the study limits which warrant illumination (partial, full, or temporary). This may include:

- upgrading existing illumination
- installation at additional locations to achieve partial or full illumination
- temporary illumination for staging, detour, traffic management, and construction access..

The Service Provider shall provide recommendations and details for the justification of illumination. The Service Provider shall include illumination warrant calculations in an appendix of the report.

The Service Provider shall submit to the Ministry preliminary design drawings for:

- full and/or partial illumination upgrades;
- future full and/or partial illumination;
- illumination at lane transitions, future signals, etc.;
- temporary illumination required for traffic staging.

Highway Geometrics

Refer to Highway Engineering Section.

Guide Rail

The Service Provider shall review all guide rail within the project limits and confirm that it satisfies Ministry standards and area practices including the required platform for deflection and length of need. Any locations that have been identified in the operational and safety review must be included in the Guide Rail Report and provide a summary of findings.

Refer to the Highway Engineering Section for additional requirements.

One (1) copy of the Guide Rail Report shall be forwarded to the Ministry's area Traffic Section for review and comment prior to finalizing.

Roadside Safety

The Service Provider shall review and analyze all roadside hazards throughout the project limits and provide recommendations for adequate mitigation measures in conformance with Ministry standards and area practices. The review shall include, but not be limited to, an analysis and inventory of the types and offsets of existing poles, culverts, signs, rock cuts, guide rail installations and associated end treatments, etc., within the right-of-way.

Elimination of guide rail through slope flattening shall be the preferred method of disposing of excess material.

The Service Provider shall recommend remedial measures to address roadside hazard conditions. The recommendation shall include cost estimates with benefit/cost analysis applying the MTO Roadside Evaluation Manual. All recommendations shall be in accordance with Ministry standards, area practices and AASHTO Roadside Design Guide and documented in the Preliminary Design Report.

Refer to the Highway Engineering Section for additional requirements.

Rumble Strips

The Service Provider shall review existing shoulder, transverse and/or longitudinal rumble strips within the project limits and shall make recommendations concerning their continued use by performing a benefit/cost analysis.

The Service Provider shall also review the need for additional shoulder, transverse and/or longitudinal rumble strips and shall make recommendations concerning their use by utilizing a benefit/cost analysis.

Operational Impacts

The Service Provider shall identify and make recommendations for any required operational and safety improvements. The Service Provider shall review, analyze and document the existing geometrics (addition of thru lanes / auxiliary lanes / HOV Lanes), safety and operations of all public and private road intersections as well as at all residential and commercial entrances/accesses to determine the impacts of any improvements to Highway **XX** will have on local roads as well as all affected properties along Highway **XX**. Impacts to pedestrians and cyclists shall also be reviewed.

The Service Provider shall field measure sight distances at all connecting highways, intersecting roads, ramps and residential and commercial entrances / accesses. The information shall be listed in chart format showing existing sight distances corresponding to design speed (km/hr) and what improvements are required to meet the design speed of the highway.

The Service Provider shall review, analyze and provide recommendations incorporating Human Factors improvements taking into consideration The Science of Highway Safety and Ontario Traffic Manuals. This shall apply to existing, new, and/or improved (intersections/highways/freeways/corridors). A completed report is required including all elements.

The Service Provider shall identify and make recommendations on all intersections and entrances/accesses with a high incidence of collisions, featuring such things as the intersection angle, sight distance, alignment, width and turning radii or any other geometrics that do not conform to Ministry standards, area practices and the Commercial Site Access Policy and Standards Manual.

The Service Provider shall formulate, analyze and provide alternative options to correct the deficiencies, detail all impacts and benefit/cost of each of the options, and provide a recommended course of action. The Service Provider shall detail how the improvement will specifically address the identified concerns.

- Reference and incorporate findings of any related Managed Lanes study to provide the needs and justification for Managed Lanes in the Preliminary Design Report.
- The Service Provider shall identify all impacts and costs for the options and provide a recommended course of action. Special attention is required for areas of substandard alignment and vertical curves. The Service Provider shall determine if warrants are met for improvements such as additional through lanes, slip-around and/or right turn tapers at all intersections and commercial entrances.

- The Service Provider shall review and integrate (as appropriate) local public transit into the alternative analysis. Refer to Highway Engineering Section for further details.

Commuter Parking Lots

*The Service Provider shall identify potential locations for and improvements to existing commuter parking lot(s) in the vicinity of the Highway **XXX** interchange. Integration with local transit within the proposed locations shall be considered and analyzed.*

6.11.3 Deliverables

Traffic Operations and Safety Report

Preliminary Traffic Management Plan

PHM-125 draft and final drawings

Guide Rail Report

6.11.4 Reference Documents

The following available information will be provided to the successful Service Provider and if additional data is required, it is to be collected as described in Section 6.11.2 Technical Serviced Required - Traffic Data:

- Projected sectional traffic volumes (5, 10, 20 year)
- Design hour volumes (DHV), AM & PM peak hour volumes, % commercial
- Turning movement / side road volume counts
- Collision data
- *latest AWD and hourly volumes for ramps and side roads;*
- *directional split*
- *inventory counts*
- *FTMS hourly mainline counts on XX, year1-year2*
- *Existing Traffic related correspondence*
- *HOV Study*

Only the successful Service Provider will be allowed access to hard copy collision reports of Highway **XXX** at the Ministry located at the MTO's **XXX** at a time and date convenient to both parties. The Ministry will provide suitable access and workspace for the Service Provider to retrieve data from the collision reports. At no time will the Service Provider be allowed to photocopy or otherwise remove original copies of the hard copy collision reports from the Ministry.

6.12 Value Engineering - N/A

6.12.1 Project Scope

6.12.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

6.12.3 Deliverables

6.12.4 Reference Documents

SECTION 7: TERMS OF REFERENCE – FUNCTIONAL CATEGORIES DETAIL DESIGN PLAN (NA)

7.1 Advanced Traffic Management Systems - N/A

7.1.1 Project Scope

The Highway **XXX** Rehabilitation project includes the detail design for the Advanced Traffic Management System (ATMS) protection and relocation of the existing ATMS plant. This project also includes, but is not limited to civil and electrical provisions for new ATMS plant such as concrete pads, footings, maintenance holes and detector stations, etc.) (*IF COMPASS EXPANSION IS REQUIRED) The ATMS portion of this project covers the Highway **XXX** between **XXX** and **XXX**. At present, the following ATMS equipment has been installed as part of the system: **SELECT THE APPLICABLE SUB-SYSTEMS**

- Communications network with fibre-optic cables and/or wireless equipment as well as power cables;
- Vehicle Detection Station (VDS) sub-system including Non-intrusive Traffic Sensors (NITS);
- Variable Message Signs (VMS) sub-system;
- Ramp Metering Station (RMS) sub-system;
- Closed-Circuit Television Cameras (CCTV) sub-system;
- Queue Warning Signs (QWS) sub-system and ;
- Travel Time Subsystem

The subject highway rehabilitation works will impact some or all of the existing COMPASS system. As such, the principle objectives of the ATMS detail design effort required under this RFP are:

(a) Retention of ATMS operations to the fullest extent possible during various construction stages. All proposed operational interruptions will be reviewed and approved by the Advanced Traffic Management Section before finalizing the design.
(b) Relocate all existing COMPASS plant impacted by the proposed rehabilitation works and protect all other existing COMPASS plant elsewhere in order to minimize their operational downtime.
(c) Replace the impacted ATMS vehicle detector loops and install permanent /temporary NITS for construction duration;
(d) Utilize all reasonable opportunities to expand the COMPASS system between XX and XX as a result of the expansion work

7.1.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

As part of the scope of work for this project, the Service Provider shall be responsible to identify and assess all potential impacts to the existing ATMS facilities resulting from the implementation of the various rehabilitation alternatives. The Service Provider shall also be responsible to develop an analysis and recommendations for avoiding and/or mitigating the impacts to these facilities wherever possible. In addition, the Service Provider shall be responsible to identify any new civil and electrical provisions based on the ATMS Provisions Guidelines. The recommendations must take into account the different construction staging scenarios identified by the Highway designer. The detail design recommendations shall also include cost estimates and schedules referencing to the construction staging scenarios.

The detail design for ATMS installations shall include all relevant removal, installation, relocation and protection of existing equipment as well as adding new ATMS provisions with the following minimum activities:

- Conduct field investigations to review field equipment, equipment access, barrier protection, slope/drainage concerns and trench location as to verify impacts of proposed rehabilitation work elsewhere in RFP;
- Protection of trunk/spur communications cables/equipment and power within the project limits;
- Protection of all enclosures (e.g. cabinets, pedestals, etc.) and associated electronics within the project limits;
- Verify impacts to existing conditions as to identify equipment relocations and possible locations for new ATMS equipment as required; and
- Identify and resolve potential conflict of the new ATMS equipment with other utilities.

VDS

The Service Provider shall design locations where existing VDS will be replaced or relocated as a result of the highway rehabilitation. It is understood that there will be downtime between the removal of existing VDS and the re-installation of the VDS. Such downtime shall be minimized and well designed into the construction staging. For extended downtimes of detector stations, temporary off-road detection systems will be required and the design for implementing these stations will be carried out by the Service Provider. The Service Provider shall also design locations as well as the associated civil and electrical provisions of the new VDS. The new VDS design guideline including loops and NITS units should be applied to the design.

VMS

The Service Provider shall prepare a detail design to protect **XXX** VMS sites and relocate **XXX** VMS sites. It is understood that there will be downtime between the removal of existing VMS

and the re-installation of the VMS. Such downtime shall be minimized and well designed into the construction staging. The Service Provider shall also design locations as well as the associated civil and electrical provisions of the new VMS (if required).

CCTV

The Service Provider shall prepare a detail design to protect **XXX** CCTV sites and relocate **XXX** CCTV site. The Service Provider shall conduct bucket-truck survey to identify the optimal location for the new CCTV site(s). The new CCTV site shall be designed with a maintenance site for camera lowering system. Relocation of the camera shall be designed so that it will be operational before the existing camera is removed. The Service Provider shall also design locations as well as the associated civil and electrical provisions of the new CCTV site.

Travel Time

The Service Provider shall prepare a detail design to protect **XXX Bluetooth** Reader sites and relocate **XXX** Bluetooth Reader site. The Service Provider shall conduct a field survey to identify the optimal location for the new Bluetooth Reader site(s). The new Bluetooth Reader site shall be designed with a maintenance site for camera lowering system. Relocation of the existing Bluetooth Readers shall be designed so that they will be operational before the existing Bluetooth Readers are removed. The Service Provider shall also design locations as well as the associated civil and electrical provisions of the new Bluetooth Reader sites based on the Travel Time Design Guideline.

The Service Provider should employ temporary PVMS(s) designated in the detail design during construction stages if the existing VMS and or Pole-mount VMS designated for Travel Time Services are impacted by the construction project.

Communications

This rehabilitation project will protect all communications equipment within the project limits. For the section impacted by the proposed rehabilitation work, the Service Provider is responsible for designing all temporary and permanent communications solutions to allow for continued operations of the COMPASS plant during all stages of the construction. The Service Provider shall also design new locations as well as the associated civil and electrical provisions of the communications conduits including the conduits layout and Under-pavement crossings.

Power

The design shall include the protection of all ATMS power plant within the project limits. For the section impacted by the proposed rehabilitation work, the Service Provider shall design the appropriate temporary and permanent power facilities to ensure the COMPASS field equipment can operate throughout all stages of construction. The Service Provider shall also design new locations as well as the associated civil and electrical provisions of the power conduits including the conduits layout and Under-pavement crossings.

COMPASS Operations

During construction, should the level of COMPASS operations be lower than normal, benefit/cost analysis must be conducted with the COMPASS stakeholders to determine what level of compromise is acceptable. It is understood that there will be downtime between the removal of existing vehicle detector loops and the re-installation of the loops. Such downtime shall be minimized and well designed into the construction staging.

This work shall be undertaken in consultation with representatives from the Ministry's)ITS Section, and documented in the Design Report.

COMPASS Traffic Operations Centre

The Service Provider shall be responsible for the introduction of new ATMS equipment at the COMPASS TOC if required as a result of installing temporary and permanent COMPASS plant.

7.1.3 Deliverables

ATMS deliverables should be submitted according to the project milestones and the required documentations should include, but are not limited to, the following list:

- Site investigation report including photos, field logs, drawing mark-ups, etc.
- ATMS placement memorandums including VMS, CCTV, Pole-mount signs, Bluetooth Readers
- Structure certification report on the existing mounting structures
- Aerial survey report for CCTV sites
- Wireless Interference Clearance report if wireless equipment is adopted in the design
- Wireless modem coverage report if wireless modems are adopted in the design
- 30%, 60% and 90% ATMS design and other required documents for milestone reviews
- Final contract package and AutoCAD DWG file
- Meeting minutes

7.1.4 Reference Documents

7.2 Bridge Engineering - N/A

7.2.1 Project Scope

7.2.1.1 General

This assignment includes detail design services for the following structures:

GWP	WP	Structure Name	Site No.	Hwy	Location
####-##-##	####-##-##	Example Bridge Name	###-####	###	x.x km North of Hwy xx

Site-Specific Requirements

Insert site-specific requirements for each bridge as follows:

Structure Name, Site No.

Provide a written summary of the bridge here, including at a minimum: structure type, span length(s) and arrangement, overall bridge width, travelled width, general articulation, year of construction, year(s) of rehabilitation, a general description of each rehabilitation, and an overall comment on the condition of the bridge.

If the structure has been pre-screened and does not have provincial heritage, include the following:

This structure has been determined not to have Provincial Heritage Significance. The Service Provider will proceed with no further requirements under the Ontario Heritage Bridge Guidelines.

For the purposes of bidding, the anticipated scope of work is as follows:

- *Note the major work type here (rehabilitation, replacement, etc.)*
    - *List any specific assumptions to the work type here, such as: assumed new structure type, semi-integral conversion, major items as part of rehabilitation (i.e. bearing replacement, overlay, etc.)*
- *Note the anticipated staging methodology here (full closure, single lane w/ signals, offset alignment, etc.)*
- *Add any other relevant assumptions for bidding purposes as required.*

7.2.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

7.2.2.1 General

1. The Service Provider shall complete all structural work in accordance with the latest version of following documents:
    a. Canadian Highway Bridge Design Code (CHBDC) CSA-S6.
    b. All applicable MTO manuals, reports, memos, guidelines, standards, and relevant publications.
2. The requirements of any other applicable manual and any exceptions to any applicable MTO manual, report, memo, or guideline shall be clearly justified, documented, and approved as appropriate.
3. All electronic drawings shall be prepared in AutoCAD 2013 DWG format using the latest version of the IES (Integrated Engineering System) layering standards. Drawing

prototypes, layering structure, symbols, pen sizes, etc., shall be used as described in the latest version of DGS (Design Graphics System).

The technical services above apply to the following sites, along with additional site-specific requirements as listed below:

- **ALL SITES**
  - No additional requirements.

7.2.2.2 Detail Design

1. Structural design shall be in accordance with all area-specific requirements in addition to the general requirements. Area-specific requirements shall take precedence in the event of a conflict.
2. The Service Provider shall prepare and submit a complete contract package, including all drawings, specifications, special provisions and non-standard special provisions, necessary to supplement the specifications of the Ministry. The contract package shall be prepared using the Ministry's Contract Preparation System (CPS).
3. Corrections and revisions to the Drawings and Documents, as is typical for assignments of this nature, resulting from Ministry reviews shall be made by the Service Provider at no additional cost to the Ministry prior to the submission of final documents.
4. The Service Provider shall coordinate with all relevant MTO functional offices as required to support the design.
5. The Structural Engineer responsible for the design shall visit the site(s) to review and familiarize themselves with the site conditions, and identify any potential conflicts with the proposed work.
6. The Service Provider shall provide investigative services to confirm topographical features and local conditions for each site and shall incorporate this information into the design for each structure.
7. The Service Provider shall liaise with local Municipalities, Counties, Townships, Conservation Authorities, other provincial Ministries, and all other stakeholders as required to support the design.
8. The Service Provider shall provide investigative services to locate and confirm the location of any/all utilities for each site, and identify conflicts with the proposed work.
9. The latest version of all Ministry specifications and standard drawings shall be used for all final drawings at the time of submission.
10. The need for existing or proposed bridge deck drains shall be evaluated as necessary. Removal or modification of bridge deck drains for rehabilitation projects shall be considered in the design.
11. Any deviations from standard design practices shall be clearly noted in the project's Design Synopsis.
12. The Service Provider shall include any necessary design provisions and obtain all necessary approvals from Transport Canada under the Canadian Navigable Waters Act.

13. The Service Provider shall investigate and give consideration to the aesthetic appearance of the bridge structure and its appurtenances, and their compatibility to the surroundings and context. The fundamental principles of bridge aesthetics for the bridge layout, detailing of superstructure and substructure and finishes shall be taken into account.
14. The Service Provider shall prepare HICO construction cost estimates, and shall obtain any supplementary information and quotes as required to complement historical data.
15. The Service Provider shall prepare an estimate of working days required to do the work.
16. The Service Provider shall respond to all requests for clarifications, change proposals, and submissions related to structural work during construction when necessary. The Service Provider shall correct any errors or omissions in the design by issuing sketches and/or revisions to the drawings, specifications or other components of the package in a timely manner.
17. The Service Provider shall support the Ministry by providing construction liaison services for the structural component of the Contract, and shall include, when necessary:
    - Review shop drawings for information purposes only*
    - Review and respond to Contractor Requests for Clarification, Change Proposals and submissions related to structural work as requested
    - Investigate and resolve changed conditions and on-site issues; provide written reports of problems, and written instructions and details for proposed remedial action, to the Ministry as requested
    - Prepare justification and details for Extra Work Orders, as requested.
    - Respond to questions from the Ministry relating to the Service Provider's design in a timely manner (within one working day, unless instructed otherwise).
    - All other services necessary to resolve issues and problems during construction, which in the opinion of the Ministry, may impact the Service Provider's design.
    - *the term "for information purposes only" means a review by the SP is required but this review does not relieve the CA team of their responsibility for review.

The technical services above apply to the following sites, along with additional site-specific requirements as listed below:

- ***Structure Name, Site No.***
    - *List additional site-specific requirements here*

Note: Delete the following section if not applicable to the assignment.

7.2.2.3 Detailed Bridge Condition Survey

1. The Service Provider shall conduct a detailed bridge condition survey for the structures listed at the end of this subsection in accordance with the latest version of the MTO Structure Rehabilitation Manual.

2. The number of concrete cores, sawn asphalt sample and concrete tests required for bridge decks shall be as specified in the Structure Rehabilitation Manual for a *First Time Survey*. Additional concrete cores and sawn samples may be required based on the area of High Corrosion Potential concrete found during the corrosion potential survey, which shall be determined in the field.
3. The minimum number and location of concrete cores for elements other than bridge decks shall be as follows:
    - *Abutments: # from each*
    - *Wingwalls: # from each*
    - *Culvert Soffit: #*
    - *Culvert Walls: # from each*
    - *The above are examples only; modify elements and number of cores as required.*
4. All cores shall be 100 mm diameter. Testing of cores for elements other than bridge decks shall be as follows:
    - Compressive Strength: *# from abutments, # from wingwalls, etc.…*
    - Chloride content: *# from abutments, # from wingwalls, etc.…*
    - Air entrainment: *# from abutments, # from wingwalls, etc.…*
    - *The above are examples only; modify elements and number of cores for each test as required.*
5. A minimum of *3* samples of reinforcing steel shall be extracted and tested for yield and ultimate tensile strengths from each of the following locations:
    - *List the locations which the minimum number of rebar samples are to be extracted and tested. Delete this requirement if necessary.*
6. A minimum of *3* samples of structural steel shall be extracted and tested for yield and ultimate tensile strengths from each of the following locations:
    - *List the locations which the minimum number of structural steel samples are to be extracted and tested. Delete this requirement if necessary.*
7. The Service Provider shall include the following as part of the Detailed Condition Survey:
    - Surface Deterioration Survey of the wearing surface
    - Delamination and Surface Deterioration Survey of all exposed concrete surfaces
    - Concrete Cover Survey of the interior face of the barrier wall, curbs, sidewalks, and at all asphalt sawn samples
    - Corrosion Potential Survey of the following elements:
        - *Element 1*
        - *Element 2*
        - *Etc.…*
    - Expansion Joint Survey
    - Concrete coring and testing of the deck, abutments, wingwalls, and other elements as listed.
    - Sawn asphalt samples
    - Detailed visual inspection of entire structure, and
    - Digital photographs of all components surveyed

- A Surface Deterioration Survey shall include an up-close visual inspection, measurement, and recording of observed visual defects.
- A Delamination Survey shall include hammer sounding, measurement, and recording of associated defects.
- Surfaces shall include, but are not limited to: barrier walls, wingwalls, abutments, piers, pier caps, footings, soffit, fascia, girders, and expansion joint end dams.
- Modified procedure for epoxy coated reinforcing steel where present, in accordance with the Structure Rehabilitation Manual.

8. The Service provider shall be responsible for providing adequate access equipment to perform the detailed condition surveys as required.
9. Traffic control for all condition survey activities shall be in accordance with the Ontario Traffic Manual Book 7, and shall be the sole responsibility of the Service Provider.

The technical services above apply to the following sites, along with additional site-specific requirements as listed below:

- ***Structure Name, Site No.***
  - *List additional site-specific requirements here*

Note: Delete the following section if not applicable to the assignment.

7.2.2.4 Structural Steel Fatigue Inspection & Analysis

1. The Service Provider shall conduct a structural steel fatigue inspection for the structures listed at the end of this subsection.
2. The Service Provider shall Identify all fracture critical members, fatigue prone details and fatigue prone connections based on original drawings (if available), site inspection, and field measurements as required.
3. The Service Provider shall develop a Visual Inspection and Non-destructive Testing (NDT) Plan, which shall be submitted for information a minimum of one week prior to starting the work. The Visual Inspection and Non-Destructive Testing Plan shall include at a minimum:
   a. The general procedure the inspector will follow during inspections
   b. Types of details that will be identified for inspection under the categories of fracture critical members, fatigue prone details and fatigue prone connections
   c. Specific locations, including any damaged areas and areas of significant corrosion that the engineer/inspector will inspect during the visual inspection
   d. Locations where NDT is required
   e. Type of NDT required
   f. Proposed inspection schedule.
4. The Service provider shall be responsible for providing adequate access equipment to perform the Structural Steel Fatigue Inspections as required.

5. The Service Provider shall prepare a traffic control plan for each structure in accordance with the Ontario Traffic Manual Book 7. All traffic control measures shall be the sole responsibility of the Service Provider.
6. Visual inspection and NDT testing requirements shall be as follows:
    a. Visual inspection of any damaged areas, areas of significant corrosion and all category D and above (i.e. D, E, E1, ...) details, including fracture critical members, fatigue prone details and fatigue prone connections. The Visual Inspector shall be certified by CWB for inspection of welds in accordance with CSA W178.2, Certification of Welding Inspectors. Certification shall be to either CWB level 2 or CWB level 3
    b. Survey areas of significant corrosion to determine the thickness (section loss) of the steel member. Measurements are required in all areas of significant corrosion as required to quantify the locations and extent of section loss (minimum of 5 ultrasonic measurements of the steel thickness required on each surface, at each test location).
    c. Damaged areas and all suspicious details shall be tested by NDT.
    d. 15% of inspected details to be tested by Magnetic Particle (MP Test) NDT. Ultrasonic NDT shall be used to detect subsurface cracking and other defects where appropriate (e.g. pins, riveted connections, questionable welds, and weld repairs). At least 20% of details susceptible to distortion induced fatigue (internal cross bracing member connection plates not connected to girder flanges) shall be tested by MP test. Bridges that have previously experienced distortion induced fatigue; box girder bridges; and bridges with staggered cross frames and a skew greater than 20 degrees shall have 50% of connection details tested by MP test. (i.e., NDT is required on alternate cross bracing members).
    e. Any welded plate girders with stiffeners that are not welded or bolted to the tension flange and have a diaphragm connected are critical and must be inspected for fatigue cracks.
    f. Hair line cracks detected by either visual inspection or MP Test shall be traced to their extent using a Liquid Dye Penetration Test.
    g. Liquid Dye Penetration Tests shall be performed where required to determine the location of the fatigue crack tips.
    h. Non-destructive tests shall be performed by an inspector certified under CAN/CGSB48.9712, Non-destructive Testing – Qualification and Certification of NDT Personnel, to either CGSB level 2 or CGSB level 3 for the method used, under the supervision of the engineer.
7. Area Structural Section is to be advised immediately of any significant fatigue related defects identified on the structures being inspected and be given access to the site within 48 hours.
8. Minimum of one photograph is required for every inspected Category E and more severe detail. Photographs showing the extent of damaged areas, areas of a significant

corrosion and other noted defects are required. The photographs shall be dated, and location clearly identified.

9. The Service Provider shall analyse the remaining fatigue life of each bridge inspected in accordance with the CHBDC. The engineer shall verify that the remaining fatigue life is realistically represented by the evaluation results. The Service provider shall obtain traffic volume data for the bridges from the area Traffic Section.

The technical services above apply to the following sites, along with additional site-specific requirements as listed below:

- ***Structure Name, Site No.***
    - *List additional site-specific requirements here*

Note: Delete the following section if not applicable to the assignment

7.2.2.5 Structural Evaluation

1. The Service Provider shall perform a structural evaluation in accordance with the CHBDC (CSA-S6-14).
2. The evaluation shall identify the current load carrying capacity of the bridge, as well as the capacity under rehabilitated conditions if necessary.
3. The evaluation shall support the proposed scope of rehabilitation to confirm feasibility if necessary, including the effects of any increased loads on the structure and foundations and take into account the current observed condition of the structure.
    a. The evaluation shall consider load effects due to any load changes as a result of bridge rehabilitation, as well as changes to traffic and construction staging as required.
4. The analysis shall identify any structurally deficient members and provide feasible options to bring them up to adequate capacity.
5. The method of analysis shall be in accordance with the requirements of the CHBDC. The Simplified Method of Analysis shall be used for bridges which meets the conditions for use. An Approved Refined Method of Analysis shall be performed for bridges not meeting the requirements of the Simplified Method of Analysis.

The technical services above apply to the following sites, along with additional site-specific requirements as listed below:

- ***Structure Name, Site No.***
    - *List additional site-specific requirements here*

Note: Delete the following section if not applicable to the assignment.

7.2.2.6 Additional Technical Services Required

1. *List the requirements of any additional technical services required here (i.e. cultural heritage, underwater inspections, etc.). Duplicate this section for each additional technical service required.*

The technical services above apply to the following sites, along with additional site-specific requirements as listed below:

- ***Structure Name, Site No.***
    - *List additional site-specific requirements here*

7.2.3 Deliverables

7.2.3.1 General

1. A digital copy of all drawings in AutoCAD DWG format at the time of the final submission.
2. A detailed breakdown of quantity calculations for all items, including a copy of any marked-up drawings showing any areas used in the calculations, in the final submissions.
    a. The computation of all quantities shall clearly show all assumptions, calculations, conversions used, etc.
    b. A detailed cost breakdown for all Lump Sum items shall also be provided.
3. Submission of two (2) hardcopies and one (1) digital copy of each draft and final deliverable.

The deliverables above apply to the following sites, along with additional site-specific requirements as listed below:

- **ALL SITES**
    - No additional requirements

7.2.3.2 Structural Design Calculations

1. The Service Provider shall submit a copy of all final structural design calculations performed that are relative to the design for information purposes only.
2. The calculations should be provided in a report format, including a title page and an executive summary of the design methodology preceding the calculations.
    a. The executive summary shall clearly indicate any commercial or proprietary software used, including version number.
3. A hard copy of the input data and a sketch or screenshot of the computer model shall be included.
4. Only one final submission of the structural design calculations is necessary. The calculations shall be stamped by the designer as well as the checker.

The deliverables above apply to the following sites, along with additional site-specific requirements as listed below:

- **ALL SITES**
  - No additional requirements

7.2.3.3 Structural Design Report

1. The Service Provider shall provide a Structural Design Report (SDR) for each bridge being newly constructed or rehabilitated.
2. The SDRs shall follow the Structural Planning Guidelines and have the Group WP, Sub-WP, Site Number, and date on the title page.
3. The SDRs shall include, but are not limited to, discussions on the following:
   a. Existing conditions
   b. Proposed work
   c. Alignments and cross-sections
   d. Evaluation and ranking of feasible alternatives (including results of Life Cycle Cost Analysis)
   e. Traffic data and management during construction (including detour staging or detour structure)
   f. Environmental concerns and proposed mitigation measures
   g. Temporary water management measures during construction
   h. Construction limitations, constructability and other issues (utilities, property, etc.)
   i. Estimated working days and construction costs to do the work
4. The Service Provider shall include a Preliminary General Arrangement drawing for the structures and detour structures (if applicable) in each SDR.
5. The Service Provider shall summarize and document the findings of the structural evaluation, condition survey(s), inspections, investigations, and all other pertinent findings in the SDR.
6. A *Level 2 (Residual value)* Life Cycle Cost Analysis shall be performed in accordance with the MTO Structural Financial Analysis Manual for all feasible options considered. The Service provider shall present the results of this analysis to the Ministry for review, discussion and a decision on the preferred option.
   a. A minimum of three feasible and realistic rehabilitation/replacement options shall be considered in the analysis. The proposed options shall be submitted to the Ministry for review and comment prior to performing the analysis.
   b. A sensitivity analysis shall be carried out by varying the discount rate in the analysis. The rates to be used for this purpose shall be 4%, 5%, and 6%.
   c. A 50-year time period shall be used for calculating residual values when required, or as directed by the area structural section.

Include the following if necessary:

The Service Provider shall consider the following alternatives as a minimum:

- ***Structure Name, Site No.***
  - *List minimum alternatives to be considered here*

The deliverables above apply to the following sites, along with additional site-specific requirements as listed below:

- ***Structure Name, Site No.***
  - *List additional site-specific requirements here*

Note: Delete the following section if not applicable to the assignment.

7.2.3.4 Detailed Bridge Condition Survey Report

1. The Service Provider shall document the findings of the detailed bridge condition survey and testing in a Condition Survey Report.
2. The content and format of the Condition Survey Report shall be in accordance with the latest version of the MTO Structure Rehabilitation Manual.

The deliverables above apply to the following sites, along with additional site-specific requirements as listed below:

- ***Structure Name, Site No.***
  - *List additional site-specific requirements here*

Note: Delete the following section if not applicable to the assignment.

7.2.3.5 Structural Steel Inspection and Fatigue Analysis Report

1. The Service Provider shall prepare a Structural Steel Inspection and Fatigue Analysis Report" for each inspected structure, which shall include, but is not limited to:
   a. Cover page (should include: an elevation view photo of the bridge, bridge description, site number, GWP, and Area)
   b. Table of contents
   c. Executive Summary
   d. Site Summary Sheet containing: site number, structure name, year constructed, highway number, date of inspection, report reference, summary of significant findings and remaining fatigue life of the bridge
   e. Key Plan
   f. Introduction
   g. Inspection Methodology
   h. Summary of the visual inspection and NDT plan
   i. Inspection photographs
   j. Bridge drawings showing the location of areas inspected and location of defects
   k. Interpretation of NDT results
   l. Summary of significant findings/summary of the visual inspection and NDT plan
   m. Fatigue analysis of structure - description of details identified for structural analysis under the categories of fracture critical members, fatigue prone details and fatigue prone connections
   n. General description of structural analysis procedure followed

o. Description of computer software used for the structural fatigue analysis
p. Maximum and minimum stress ranges of fatigue prone details
q. Remaining fatigue life of the bridges
r. Proposed corrective measures and recommendations for repairs as needed, including cost estimates.
s. Summary of recommended actions:
    i. Immediate to 1-year needs
    ii. 1-to-3-year needs
    iii. 3-to-5-year needs
    iv. Other needs
t. Fatigue inspection needs
u. Appendices (drawings, photographs, final inspection form, non-destructive testing attestation, remaining fatigue life calculations, fatigue retrofit cost estimates)

The deliverables above apply to the following sites, along with additional site-specific requirements as listed below:

- ***Structure Name, Site No.***
    - *List additional site-specific requirements here*

Note: Delete the following section if not applicable to the assignment.

7.2.3.6 Structural Evaluation Report

1. The Service Provider shall document the findings of the structural evaluation in a Structural Evaluation Report.
2. The reports shall include the following at minimum:
    a. Level of inspection performed
    b. A summary of the observed overall condition of the bridge, as well as the specific condition of critical elements
    c. A description of the evaluation procedure, including:
        i. Summary of material properties used
        ii. Description and rationale of the structural analysis methodology used
        iii. A note on which commercial or proprietary software was used to perform the analysis
    d. A summary and discussion of the significant findings of the evaluation
    e. Any assumptions made and deviations from standard practices
    f. Overall recommendations, including if load posting is required as a result of the evaluation and the associated load posting value(s) if necessary.
    g. Site photographs as an appendix
    h. All calculation notes supporting the evaluation findings as an appendix

The deliverables above apply to the following sites, along with additional site-specific requirements as listed below:

- ***Structure Name, Site No.***
    - *List additional site-specific requirements here*

Note: Delete the following section if not applicable to the assignment.

7.2.3.7 Additional Technical Services Required

1. *List the deliverable requirement for any additional technical services required here if needed.*

7.2.4 Reference Documents

- Latest OSIM inspection report, dated *[***insert date***]*
- Previous OSIM inspection reports (upon request after award of assignment, and if available)
- Original design drawings *(Contract* **xxxx-xxxx***)*, dated *[insert date] (if available)*
- Rehabilitation design drawings *(Contract* **xxxx-xxxx***)*, dated *[insert date] (if available and/or applicable)*
- *List any other relevant reference documents to be made available to bidders here.*

7.3 Drainage and Hydrology Engineering - N/A

7.3.1 Project Scope

This assignment includes the drainage design services for the *select scope for this project from bridge, culvert(s), and/or highway drainage system* within the limits of the project. **{Depending on the amount of information a separate report can be provided for each bridge and structural culvert(s). The drainage study for a number of non-structural culverts and the highway drainage system can be included in a single report.}**

7.3.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

7.3.2.1 General

1. The Service Provider shall complete all drainage design work in accordance with the latest version of the following documents:

    a. MTO Drainage Management Manual, 1997
    b. MTO Drainage Design Standards, 2008
    c. MTO Gravity Pipe Design Guidelines, 2014

d. MTO IDF Curve Lookup online application, 2016
e. Provincial Engineering Memoranda:
   - Implementing the New Unified Ontario Flood Method
   - Implementation of the Ministry's Climate Change Consideration in the Design of Highway Drainage Infrastructure Policy
   - Implementing new Gravity Pipe Trenchless Technologies Design Guides and Gravity Pipe Design Approvals
f. All other applicable reports, manuals, directives, guidelines, standards, and relevant publications.

2. Any exceptions to any applicable MTO manual, report, memo, or guideline shall be clearly justified, documented, and approved as appropriate.

3. Applicable design software used in design shall be as reviewed and documented in the MTO Evaluation of Drainage Management Software online manual. The use of any other software not reviewed by MTO shall be clearly justified and documented.

The technical services above apply to the following sites, along with additional site-specific requirements as listed below:

- **ALL SITES**
  - No additional requirements.

7.3.2.2. Detail Design

1. The Service Provider shall perform the detail drainage design as follows:

   For Water Crossings:

   a. Identification and evaluation of all selected options. In the case of pipe culvert options, pipe material and size options shall be identified with future considerations and the range of feasible sizes documented in accordance with the Gravity Pipe Design Guidelines
   b. Existing structures shall be evaluated for the need to reline or replace. Lining with close fit liner and grout liner options shall be investigated and the feasible options identified.

   For Highway Drainage System:

   a. Layout and design of the roadside ditches, storm sewers, other minor flow channels, pump stations and any other ancillary flow elements to convey the highway runoff to a sufficient outlet. For pipe sewers, pipe material and size options shall be identified, and the range of feasible sizes documented in accordance with the Gravity Pipe Design Guidelines.
   b. Accommodation of major overland flow requirements on the road surface and

other major flow paths

c. Layout and design of culvert opening, erosion protection and associated structures that are part of the surface drainage system
d. Identification of the location of the outlet and preliminary design of outfall, connections to outlets and outfall protection
e. layout and design of stormwater management control facilities

2. The Service Provider shall prepare drainage design related contract package material, including all drawings, specifications, special provisions and non-standard special provisions, necessary to supplement the specifications of the Ministry. This material shall be included in the overall contract package submitted to the MTO. The latest version of all Ministry specifications and standard drawings shall be used for all final drawings at the time of submission.
3. Any deviations from standard design practices shall be clearly noted in the drainage design report.
4. Corrections and revisions to the Drawings and Documents, as is typical for assignments of this nature, resulting from Ministry reviews shall be made by the Service Provider at no additional cost to the Ministry prior to the submission of final documents.
5. The Service Provider shall coordinate with all relevant MTO functional offices as required to support the design.
6. The Service Provider shall liaise with local Conservation Authorities, Municipalities, Counties, Townships, other provincial Ministries, and all other stakeholders as required to support the design.
7. The Drainage Engineer responsible for the design shall visit the site(s) to review and familiarize themselves with the site conditions, lead the field investigation and identify any potential conflicts with the proposed work.
8. The Service Provider shall provide field and desktop investigative services to confirm topographical and stream catchment features, stream flow and rainfall data, local conditions upstream and downstream including the stream channel and floodplain, local roadside ditches, embankments and road surface at each site and shall incorporate this information into the design for each structure.
9. The Service Provider shall provide investigative services to locate and confirm the location of any/all upstream and downstream in-stream structures, utilities and other structures that can interfere with the work, for each site. The impact of these structures shall be considered in the hydrologic and hydraulic analysis for the design options selected
10. The Service Provider shall consider and include any necessary design provisions under the Canadian Navigable Waters Act.
11. The Service Provider shall respond to all requests for clarifications, change proposals, and submissions related to drainage work during construction when necessary. The Service Provider shall correct any errors or omissions in the design by issuing sketches

and/or revisions to the drawings, specifications or other components of the package in a timely manner.

The technical services above apply to the following sites, along with additional site-specific requirements as listed below:

- ***Structure Name, Site No.***
  - *List additional site-specific requirements here*

7.3.3 Deliverables

7.3.3.1 General

1. A digital copy of all drawings in AutoCAD DWG and PDF formats at the time of the final submission.
2. Submission of two (2) hardcopies and one (1) digital copy of each draft and final deliverable.
3. Quantity sheets for the final design option being adopted.

The deliverables above apply to the following sites, along with additional site-specific requirements as listed below:

- **ALL SITES**
  - No additional requirements

7.3.3.2 Hydrology and Drainage Reports

For Water Crossings:

1. The Service Provider shall provide a Hydrology and Drainage Report for the detail design of each bridge, culvert or a set of culverts.
2. The Report shall include, but are not limited to, discussions on the following:
   a. Existing conditions
   b. Summary of field investigation, desktop data collected and geotechnical data relevant to the drainage and hydrology design
   c. A summary of all the applicable design standards and identification of the design service life for each structure
   d. Hydrology analysis with climate change considerations
   e. Stream and structure alignments; stream cross-sections upstream and downstream; MTO right-of-way boundaries
   f. Proposed work
   g. Hydraulic analysis and evaluation of the different alternatives including liner and replacement options with future considerations for culverts, bridge spans and openings, piers, abutments and footing configuration.

   h. Proposed watercourse modification, if required and provide the hydraulic analysis to support the proposed works.
   i. A summary of computer model results used in hydrologic and/or hydraulic design
   j. Bank erosion analysis and mitigation design.
   k. Scour analysis and design of protection measures at bridge footing and abutments; culvert inlet and outlet.
   l. Fisheries concerns, analysis and mitigation measures required.
   m. Construction limitations, constructability and other relevant issues (utilities, property, etc.)
   n. Estimated working days and construction costs to do the work
3. The Report shall include the following drawings (*Include as applicable*):
   a. - detail bridge opening layout and bridge deck drainage requirements
   b. - detail culvert opening layout
   c. - detail watercourse modification layout
   d. - detail erosion and scour protection requirements
4. The Report shall incorporate all recommendations from the geotechnical reports.
5. The Service Provider shall summarize and document the findings of all inspections, investigations, evaluations and all other pertinent findings.
6. A decision-making matrix shall be prepared for all options considered. The matrix shall be numerically based with varying weights for the factors involved.
7. Appendices shall be included containing a summary of the alternatives considered, hydrology and hydraulic analysis and supporting data.

For Highway Drainage System:

1. The Service Provider shall provide a Hydrology and Drainage Report for the design of each surface drainage system network and associated stormwater management components.
2. The Report shall include, but are not limited to the following:
   a. Existing conditions
   b. Summary of field investigation, desktop data collected and geotechnical data relevant to the drainage and hydrology design
   c. Summary of all the applicable design standards and identification of the design service life for each pipe run, associated structures and stormwater management facility
   d. Pipe network layout with locations of all outlets and associated structures and connections; MTO right-of-way boundaries
   e. Hydrologic and hydraulic analysis of the different possible alternatives, including liner and replacement options for all pipes, structures and stormwater management facilities used.
3. The Report shall include the following drawings (*Include as applicable*):
   a. Accommodation of major overland flow requirements

   b. Ditch and channel layout
   c. Culvert opening layout
   d. Storm sewer layout
   e. Outfall protection requirements
   f. Storm water management control facility layout
4. The Report shall include a summary of the results on the following:
   a. Erosion analysis and control measures at all outlets
   b. Computer modelling used in the hydrologic and/or hydraulic design
   c. Construction limitations, constructability and other relevant issues (utilities, property, etc.)
5. The Report shall incorporate all recommendations from the geotechnical reports.
6. A decision-making matrix shall be prepared for all options considered. The matrix shall be numerically based with varying weights for the factors involved.
7. Appendices shall be included containing a summary of the alternatives considered, hydrology and hydraulic analysis and supporting data.

7.3.4 Reference Documents

- *Drainage Mosaics/aerial photographs, land use, topographic, and soil maps*
- *Soil and water pH and Resistivity maps and data*
- *Any field inspection report, dated [insert date] (if available)*
- *Previous Drainage Report, dated [insert date] (if available)*
- *Environmental Assessment Study Reports [Insert date]*
- *Previous watershed or sub-watershed Reports, dated [insert date] (if available)*
- *Original design drawings (Contract xxxx-xxxx), dated [insert date] (if available)*
- *Hydrologic and hydraulic computer models developed by others and used as basis for the design*
- *List any other relevant reference documents to be made available to bidders here.*

7.4 Electrical Engineering - N/A

7.4.1 Project Scope

This project includes electrical detail design within the project limits. Electrical design work includes, full and partial lighting for highways, municipal roads, bridges, commuter parking lots, truck inspection services, service centres, remote airports, patrol yards, marine docks, roundabouts, etc.; traffic signals; counting stations; electrical vehicle charging stations; electrical embedded work in structures/underpass lighting; electrical removals; and all associated electrical work. **Select project-specific information.**

7.4.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

The electrical engineering detail design services shall include the following.

Select applicable information below

- Arrange and conduct site meetings to assess site conditions, inventory existing electrical plants, investigate utility hook-ups requirements and identify conflicts. Liaise and prepare agreements with all utility agencies (Hydro, Telephone, Cable TV, Gas, and Oil) regarding relocations and to resolve / avoid electrical conflicts, to obtain utility services, and to acquire utility crossing permits.

- Arrange and conduct meetings with municipalities and private owners to explain the ministry's intent, solicit comments and negotiate mutual agreement between the parties involved. Liaise and prepare draft agreements with local municipalities, private owners, and agencies regarding maintenance, operation, ownership and cost sharing of municipal and private lighting, traffic signals and other electrical systems.

- Co-ordinate with the ITS section to determine and provide contract drawings showing joint-use Electrical and ITS plants, including chambers, ducts, under-pavement crossings and power supplies. All joint-use Electrical and ITS plants shall be included under the Electrical quantity sheets and tender items.

- The ministry's electrical project manager, electrical coordinator and traffic specialist (Traffic Signals) shall be invited to attend all meetings.

- All lighting calculations shall be carried out using Ministry approved computer programs. Lighting calculation layout drawings generated by the lighting program shall show roadway lighting levels, uniformities and light trespass levels. The lighting design shall accommodate more than one suppliers' luminaires.

- The Consultant's electrical key staff shall attend, all required Public Information Centres to explain and present the Ministry's intent to install high mast lighting and to identify mitigation measures regarding light trespass concerns.

- Lighting standards shall be included as part of the design criteria. Design criteria relevant to electrical design shall be submitted as part of the 60% and 90% submission.

- Prior to the 60% meeting and preparation of the contract documentation arrange and conduct an electrical design presentation meeting to present the final concept of the electrical design to the ministry. Electrical design drawings complete with lighting calculation layout drawings, design criteria, electrical design draft synopsis together with

the consultant's Electrical QC Check List shall be submitted to the Ministry a minimum of one week prior to the meeting.

- Avoid mounting MTO equipment on utility poles. If mounting MTO equipment on utility poles is required, the Consultant shall comply with Electrical Safety Authority (ESA) Ontario Regulation 22/04 – Guideline for Third Party Attachments and obtain approval from the owner of the utility poles, prior to finalizing the electrical design.

- Prior to the 90% meeting, arrange and conduct a final electrical design presentation meeting to present the final electrical design to the Ministry. Electrical design packages together with design criteria, design synopsis, construction cost estimates and the consultant's Electrical QC Check List shall be submitted to the Ministry a minimum of one week prior to the meeting.

- Evaluation of lighting warrants and traffic signal operation design work such as PH-M-125 drawing and timing plan, if required, shall be carried out according to Section 7.11, Traffic Engineering.

- The Consultant's electrical key staff shall attend all design team progress meetings with electrical items on the agenda.

The detail design work shall include the following.

Fill in the project specifics

- **POWER DISTRIBUTION**
    - Power distribution system to provide power for illumination, ITS, traffic control systems and, all other systems and components that require electrical power
    - Initial arc flash study for all new and modified power supply equipment including but not limited to the short-circuit study and coordination study. Provide arc flash mitigation methods if the incident energy exceeds 4 cal/cm2
    - Design power supply equipment in accordance with the initial arc flash study
    - Final arc flash study for all new and modified three phase power supply equipment including arc flash hazard warning labels shall be completed and submitted as part of the shop drawing review during construction in coordination with the contractor.

- **LIGHTING:**
    - Full and partial lighting for highways, municipal roads, bridges, commuter parking lots, truck inspection services, service centres, remote airports, patrol yards, marine docks
    - Conduct existing high mast pole inspection, testing and evaluation *(Select applicable ones and specific locations)*

- **TRAFFIC SIGNALS**

- Traffic signals for MTO highway ramp terminals
- Traffic signals for Municipal intersections
- Non-intrusive detection shall be utilized for presence detections
- All traffic signals shall be AODA compliant

  Select applicable ones and specific locations

- **COUNTING STATIONS**
  - Counting stations or PDCS shall be provided at the locations indicated by the area Traffic Office. Section 7.11, Traffic Engineering
  - RNITS shall be provided at the locations indicated by the area Traffic Office. Section 7.11, Traffic Engineering

- **ELECTRICAL VEHICLE CHARGING STATIONS**
  - Electrical vehicle charging stations for commuter parking lot

- **ELECTRICAL EMBEDDED WORK IN STRUCTURES**
  - Electrical embedded work in structures shall be provided, where required, in all new and rehabilitated structures as per current requirements and standards.

- **ELECTRICAL REMOVALS**
  - All existing electrical systems that are not required to remain in service shall be removed.

- **TEMPORARY ELECTRICAL WORK**
  - The need for temporary electrical work shall be reviewed and provided, as required, for all stages of construction.
  - Lighting shall be maintained in full nighttime operation.

7.4.3 Deliverables

In addition to requirements outlined elsewhere in the Agreement, the following materials shall be submitted to the Ministry subsequent to the Final Executive Approval Meeting:

<u>Electrical Engineering Section</u>

1. Electrical Design Synopsis, final construction cost estimates and working day estimates.

2. Final calculation layout drawings generated by approved computer lighting program. The drawings shall illustrate illuminance and luminance levels, uniformities on roadway and light trespass levels at and beyond the MTO Right-of-Way.

- One set of lighting calculation layout drawings in PDF format .
- One set of lighting program files.

3. Final Electrical Contract Drawings and Documents:
   - One set of 11"x17" drawings with Quantity Sheets in PDF format
   - One set of electrical contract documents in PDF or WORD format
   - One set of drawings in AutoCAD format (drawings with references binded)

4. Initial and final arc flash study report

   - One set of arc flash study report
   - One set of arc flash study report in Word format
   - One set of arc flash study program files

Electrical Operations

Final Electrical Contract Drawings and Documents:

- One set of 11"x17" drawings with Quantity Sheets
- One set of electrical contract documents
- One set of arc flash study report in PDF format and one set of arc flash hazard warning labels

7.4.4 Reference Documents

Fill in as applicable, i.e. PDR, Old Contracts, etc.

7.5 Engineering Materials Investigations - N/A

7.5.1 Project Scope

This project consists of geotechnical aggregate investigation of the 6 permitted and non-permitted aggregate pits listed in Table 7.5-1.

Table 7.5-1 Permitted and Non-Permitted Aggregate Pits

Site	W.P.	MAIDB #	Permitted	Zone	Northing	Easting	Remarks
1	767-91-00	Longbow Lk #27	no	15	5 509 800	406 500	1.0 km W Via 17A Jct 17, N Side (Loc E.B.75), P-8229 & Crown
2		Longbow Lk #1	yes	15	5 498 900	422 200	Jct Hwy 71 and Highwind Lk Rd
3		Kenora	yes	15	5 515 100	402 400	5.7 km N Via

Site	W.P.	MAIDB #	Permitted	Zone	Northing	Easting	Remarks
		#41					Jones Rd Hwy 17, E Side, P-8213-38
4	51-97-00	Kenora #48	yes	15	5 539 500	399 800	3.7 km N Via Eng. R. Rd Jct 658, E Side
5		Kenora #49	yes	15	5 538 900	399 500	3.5 km N Via Eng. R. Rd Jct 658, W Side
6		Kenora #30	yes	15	5 529 000	393 300	Jct Hwy 658 & 659, N Side Hwy 659

7.5.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

Aggregate Resources Prospecting and Evaluation

The Service Provider will conduct geological investigations of the sites listed in Section 7.5.1 in order to determine the most likely prospects for finding further aggregate resources within those sources. Emphasis should be given to finding our prime Ministry aggregate products. These are crushable samples (>35% Ret. 4.75 mm) and virgin fine aggregate (VFA gradation band available from Geotechnical Section). The sites to be investigated are present and former Ministry gravel and sandpits. Techniques for investigation are outlined below and are the minimum requirements for the investigation. All sampling, classification, and testing shall be in accordance with approved Ministry procedures.

The Service Provider should contact appropriate Ministry of Natural Resources offices to determine the need for work permits and to check on any fire restrictions that may in place at the time of investigation.

The Service Provider will dig approximately 460 test pits. Of these 460 test pits, it is assumed for bidding purposes that 185 will be crushable (35% retained 4.75 mm and 25% retained 26.4 mm), 250 will be non-crushable holes (<35% retained 4.75 mm) and 25 holes will be unsuitable for Granular B. These 25 holes will be logged and staked but no samples will be taken.

The price quotation for the aggregate investigation portion of the Assignment will be based on 460 test holes. (185 X Your Price/Crushable Hole) + (250 X Your Price/Noncrushable Hole) +

(25 X Your Price/Non-Tested Hole) = Total Cost of Aggregate Investigation. The Ministry will however, pay you based on the actual samples taken and tested, based on your quoted price per type of hole (i.e., if you sample and test 130 crushable, 190 non-crushable, and 50 non-tested you will be paid according to your price per hole times those samples taken). Crushable and non-crushable holes will be determined by the results of the laboratory gradation test.

Include in your bid a provision for 16 hours of road building to gain pit access in case of washed out culverts, beaver dams, etc. This will include the use of a bulldozer, front-end loader, and all material and labour to complete the task. You will only be paid for actual work done if time is less than 16 hours and conversely this rate will be used to calculate any pit access road building costs in excess of the 16 hours bid.

7.5.3 Deliverables

Aggregate Resources Prospecting and Evaluation

Photos are required of all test locations where samples are taken. These photos should show typical examples of the type of material encountered in the test holes and panoramic shots showing the general layout of the test pit area. The photos will be taken with digital photographic equipment (minimum resolution of 640 x 480) and the digital files and prints will be included with the final report.

7.5.4 Reference Documents

- Key map showing locations of all 6 sites.
- Copies of sections of 1:100 000 maps showing a more detail location of each site.
- Recent sample site plans.
- Prototype digital files for plans and title blocks.
- Application Standards for Aggregate Resources for Category nine (9)

7.6 Environmental - N/A

7.6.1 Project Scope

A dedicated individual shall be identified as the lead for the environmental portion of this study and will be responsible for the entire environmental component of this study. They must have experience/education related to the undertaking.

This project may generate excess soil, as defined under O. Reg. 406/19. To maximize reuse of excess soil, excess materials and earth borrow, the Earth Management Plan if prepared as part of preliminary design should be reviewed.

MTO Projects/Undertakings are subject to the provincial Environmental Assessment (EA) Act RSO (1990) and Regulations made under that Act.

The Transit Project Assessment Process (TPAP) (Ontario Regulation 231/08-Transit Projects

and Metrolinx Undertakings) outlines a time-limited, streamlined approval process for transit projects. **Delete Paragraph if your Assignment has no TPAP requirements.**

The 'Class Environmental Assessment for Provincial Transportation Facilities' document establishes an EA process that has been pre-approved by the Ministry of Environment, Conservation and Parks (MECP) Minister for a defined set of undertakings. The MTO Class EA document outlines a pre-approved, self-assessment process that applies to routine projects with predictable and manageable environmental effects.

Project notices for Class EA undertakings must be sent to the appropriate MECP regional notification email account. The list of MECP regional notification email accounts and the current MECP Project Information Form are listed at 'https://www.ontario.ca/page/preparing-environmental-assessments#section-5'. If the project spans more than one MECP region, notify the MECP regional office where the majority of the project falls within.

Emails sent to the MECP regional notification email account must include a copy to the MTO Environmental Planner and require a subject line that identifies: '*project location'*, 'MTO Class EA', and '*project name'*. Note: if the project spans multiple municipalities, select 'several' from the Project Information Form drop-down menu for 'project location'. Include highway number and GWP or WP as part of 'project name'.

- Where a Notice of Study Commencement (PDF) is issued to MECP, a completed MECP 'Project Information Form' must also be attached to the email, in both Excel and PDF formats.
- Where required, a Notice of Completion (PDF) and a Notice of Addendum (PDF) must also be sent to the MECP regional notification email account. Do not include the Project Information Form as part of this notification.
- All correspondence (including copies of TESR/DCR/Addendum documents for public and/or MECP review) and other project notices (e.g. Step-down, PIC) must be sent directly to the MECP Regional EA Coordinator by the usual method, and is not to be sent to the MECP regional notification email account. Do not include the Project Information Form as part of this notification.

Under the 'Class Environmental Assessment for Provincial Transportation Facilities', this project is classified as a Group **Insert category of project** at the time of project initiation. **Delete Paragraphs 3-9 if your Assignment has no Class EA requirements.**

The federal EA process may also apply to projects that are subject to the Ontario EA Act. The Canadian Impact Assessment Act (IAA) is administered and enforced by the Impact Assessment Agency of Canada and applies to projects that are designated by the Physical Activities Regulations (SOR/2019-285), or projects that have been specifically designated by the Minister of Environment and Climate Change Canada. Where both the Ontario EA Act and IAA apply to a project, all efforts should be made to follow one coordinated process. Appropriate documentation shall be prepared and submitted for approval at a time suitable to the project schedule if the IAA requirements are anticipated.

The environmental schedule requirements for this project are the following:

Insert requirements

The anticipated level of importance to project delivery of factor-specific environmental services is as outlined below:

Insert outline

The environmental deliverables that will be provided by the Ministry are the following:

Insert deliverables

7.6.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

Project Specific Environmental Requirements

Where a project-specific Scope of Environmental Services has been prepared, its content shall be deemed to be a project requirement.

Additional project-specific environmental requirements are the following:

Insert requirements

Environmental Site Assessment (delete if not required)

General technical guidance for the 'Contaminated Property Identification and Management' is provided in Section 3.6 of the *Environmental Reference for Highway Design,* June 2013 and *Environmental Guide for Contaminated Property Identification and Management, October 2006* (Guide).

The project shall be designed in conformance with, but not limited to, the applicable standards, criteria and requirements of the applicable documents listed in the *Technical Standards and Specifications* (of this Request for Proposals document).

The Service Provider shall perform work which includes but is not limited to the following:

Contamination Overview Study (COS):

A Contamination Overview Study shall be completed.

Requirements for completing the COS are detailed in Section 1.2.2 Step 1 of the Guide.

[Designer Notes: Delete the above paragraph if a COS has already been completed].

Phase One Environmental Site Assessment (Phase I ESA)

The information gathered through the COS should be used to complete a Phase One ESA under the direction of a QP.

Requirements for completing the Phase I ESA are detailed in Section 1.2.4 Step 3 of the Guide.

[Note to User: Delete the above paragraph if COS indicates Phase I ESA is not required or if Phase I ESA has already been completed.]

Phase Two Environmental Site Assessment (Phase II ESA)

A Phase Two Environmental site Assessment shall be completed for the following Areas of Potential Environmental Concerns (APECs) identified through the completion of a Phase I ESA under the direction of a QP:

- [Designer Notes: list APECs identified in Phase I ESA or a COS]

Requirements for completing the Phase II ESA are detailed in Section 1.2.5 Step 4 of the Guide.

If the Phase II ESA indicates that contaminants of concern (COCs) are present on the property that exceed the applicable site condition standards further assessment may be required as extra work.

[Note to User: If a Phase I ESA has not been completed, delete the above and insert the Phase I ESA requirements.]

Excess Soil Management

Regulatory requirements are provided in *O. Reg 406/19 On-Site and Excess Soil Management* made under the Environmental Protection Act, R.S.O. 1990, c.E.19 and *Rules for Soil Management and Excess Soil Quality Standards* (the Soil Rules), document adopted by reference.

The project shall be designed in conformance with, but not limited to, the applicable standards, criteria and requirements of the applicable documents listed in the *Technical Standards and Specifications* (of this Request for Proposals document). Where excess soil is going to be generated within a project area, the Service Provider shall retain a Qualified Person (QP) within the meaning of section 5 of Ontario Regulation 153/04 Records of Site Condition – Part XV.1 of the Act (O. Reg. 153/04) to ensure the project complies with O. Reg. 406/19, the Soil Rules, and any other applicable legislation.

The Service Provider's QP shall review existing background information and environmental reports, such as Contamination Overview Study (COS), Preliminary Site Screening Reports (PSSRs), Phase One/Two Environmental Site Assessments (ESAs), geotechnical investigations and/or remediation reports, to determine if the project area is or has ever been, in whole or in part, an "enhanced investigation project area" as defined by O. Reg. 406/19.

The Service Provider's QP shall review the design and excavation details and potential reuse options of the excavated soil to determine if the project is exempt from the reuse planning and registry rules of O. Reg. 406/19 as per Section 8 and Schedule 2 of the regulation. If the project is determined to be exempt from the reuse planning and/or registry rules, the Service Provider

shall review the project exempt status and any proposed due diligence soil management scope with MTO prior to the commencement of any field sampling program.

INSERT THE FOLLOWING IF AN ASSESSMENT OF PAST USES HAS BEEN PREVIOUSLY COMPLETED FOR THE PROJECT AND MORE THAN 18 MONTHS HAS ELAPSED:

The Service Provider's QP shall complete a review of the Assessment of Past Uses (APU) previously completed and dated (INSERT DATE), and reassess the validity of the report.

Where existing environmental reports are available, update as necessary to ensure that the objectives of an APU are achieved, and the 18-month validity of an APU is met.

INSERT THE FOLLOWING IF AN ASSESSMENT OF PAST USES HAS NOT BEEN COMPLETED FOR THE PROJECT AND THE PROJECT IS NOT EXEMPT FROM THE EXCESS SOIL PLANNING REQUIREMENTS:

The Service Provider shall complete an Assessment of Past Uses (APU) as indicated below:

- The APU shall be completed in accordance with the requirements provided in Section B of Part I of the soil Rules;
- Where existing environmental reports are available, update as necessary to ensure that the objectives of an APU are achieved, and the 18-month validity of an APU is met; and
- Where excess soil is to be excavated from a project area, the APU shall include all information as required, including but not limited to, the identification of Potentially Contaminating Activities (PCAs), Areas of Potential Environmental Concern (APECs), and Contaminants of Potential Concern (COPCs) in relation to the proposed excavation areas to support the development of a Sampling and Analysis Plan (SAP).

FOR PROJECTS THAT ARE NOT EXEMPT

INSERT THE FOLLOWING IF AN ASSESSMENT OF PAST USES HAS BEEN COMPLETED, BUT A SAMPLING AND ANALYSIS PLAN HAS NOT BEEN COMPLETED FOR THE PROJECT:

Sampling and Analysis Plan

The Service Provider shall complete a Sampling and Analysis Plan (SAP) based on the findings of the Assessment of Past Uses, as indicated below:

- The SAP shall be completed in accordance with the requirements provided in Section B of Part I of the Soil Rules;
- The scope of the SAP shall comply with all requirements provided in the Soil Rules, including but are not limited to the sampling frequency and analyzing parameters. The sampling location and depth shall represent both the horizontal extent and vertical profile of the excavation areas and/or APECs;

- The SAP shall include tables and figures which clearly demonstrate the proposed borehole locations, soil sample locations and depths, and analyzing parameters, in relation to the APEC's and excavation areas (and proposed sample depth).
- The SAP shall include soil sampling and analysis for waste characterization purposes (i.e., impacted or contaminated) for potential disposal of contaminated soil (if present); and
- If an in-situ sampling approach is not considered practical or feasible, an alternative sampling approach shall be provided.

The APU and the SAP shall be submitted to and approved by MTO prior to the implementation of the SAP or commencement of in-situ environmental soil sampling.

The implementation of the SAP to support the completion of the soil characterization report shall be completed in accordance with the requirements provided in Section B of Part I of the Soil Rules, O. Reg. 153/04 and any other applicable legislation.

In-situ soil sampling shall be incorporated as much as possible into geotechnical investigations to be cost effective. Any required sampling locations and depths that cannot be completed in conjunction with geotechnical investigations may be completed by an independent environmental drilling and sampling program.

Soil Characterization Report

The Service Provider shall complete the Soil Characterization Report (SCR) based on the findings of the Sampling and Analysis Plan, as indicated below:

- The SCR shall be completed in accordance with the requirements provided in Section B of Part I of the soil Rules.
- Preparation of a Soil Characterization Report for the project area shall include APECs identified within the project area, investigation methods including drilling, excavating test pits, soil sampling, sediment sampling, field screening measurements, analytical testing, with necessary modifications; stratigraphy from ground surface to the deepest planned excavation, approximate depth to water table, borehole logs, figures with cross sections, tables and laboratory certificate of analysis.
- The SCR shall include the estimated volumes for soil that is feasible to be reused onsite within the project area and offsite on beneficial reuse sites that meet different tables of generic excess soil quality standards (and generic leachate screening levels for excess soil reuse), and the estimated volume of contaminated soil (if any) that cannot be reused for beneficial reuse and must be disposed of at a landfill or Class 1 Soil Management Site. The areas with soil quality meeting different excess soil quality standards shall be illustrated on figures.

FOR PROJECTS THAT ARE EXEMPT

INSERT THE FOLLOWING FOR PROJECTS THAT ARE EXEMPT FROM THE PLANNING REQUIREMENTS OF THE EXCESS SOIL REGULATION:

The Ministry has determined that Section 8 of O.Reg.406/19 does not apply to the project because the reason for excavating the soil that will become excess soil is [insert reason, e.g., "maintaining infrastructure in a fit state of repair."] As such, the decisions, recommendations, and requirements being implemented as part of the Ministry's due diligence to meet the intent of the regulation and follow applicable guidance (i.e., Rules for Soil Management and Excess Soil Quality Standards) shall be documented in the Earth Management Plan referenced in Section 7.8.

The Service Provider shall undertake Environmental Due-diligence Sampling to ascertain the quality of the earth material being excavated and managed both on-site and off-site, as per the following requirements:

Insert requirements through consultation with the design team at the Scoping Meeting

Earth Management Plan

- Preparation of an Earth Management Plan
  - Onsite beneficial reuse of excess soil should be considered as the first reuse strategy for excess soil generated within the project area and this should be included in the preparation of an Earth Management Plan. See Section 7.8 for more information on the Earth Management Plan. Drawings showing temporary onsite soil storage stockpile and reuse locations should be clearly identified in this plan.

- Provide excess soil management approaches during construction through the inclusion of special provisions, non-standard special provisions, environmental constraints, etc. as required. As a minimum, the contract documents shall ensure the Contractor to obtain a QP for excess soil management during construction and to comply with O. Reg. 406/09.

Contaminated Property Identification and Waste Management

Technical requirements for 'Contaminated Property Identification and Management' are provided in Section 3.6 of the *Environmental Reference for Highway Design*, 2013, and respective sections of the *Environmental Guide for Contaminated Property Identification and Management*, 2006. These reference documents provide general information, and should not be interpreted to represent a project-specific scope of work.

The Service Provider shall perform work which includes but is not limited to the following:

1. The Consultant shall identify any potential soil or groundwater contamination issues that may be encountered during construction and provide remediation and/or mitigation strategies. The consultant shall provide clear and comprehensive direction in the contract documents to address the management of any contaminated soil and/or groundwater generated during construction in accordance with all applicable regulations;

2. The Consultant shall identify waste and excess material that are expected to be generated during construction, but not limited to: excess earth; contaminated soil or groundwater; excess construction waste (pavement and bridge material; lighting material; utility material, etc.); designated substances including PCBs; effluent and cleaning material generated from cleaning operations; and provide a waste management approach and contract specifications, e.g. special provisions, environmental constraints, etc. for the project;

3. The Service Provider shall identify and provide details of any environmental protection requirements during structure rehabilitation and/or replacement activities;

4. The Service Provider shall provide direction on management of any wastewater generated from construction to prevent discharge to surface water, vegetation, soil, earth, groundwater, or any other element of natural environmental in accordance with all applicable regulation; and on disposal of any liquid waste in accordance with all applicable regulations;

5. Where groundwater monitoring wells are installed, unless required to remain for construction, they should be properly decommissioned by a licensed well contractor in accordance with *Ontario Regulation 903 R.R.O. 1990* (made under the Ontario Water Resources Act, R.S.O. 1990, c. O.40), when no longer in use; and

6. The Service Provider shall conduct a Designated Substance Survey (DSS) for the structures that are to be rehabilitated or replaced within the project area to ensure compliance with Section 30 of the Occupational Health and Safety Act (OHSA). The DSS shall be conducted as per the MTO Memorandum “Implement the Ministry’s Design Policy for Identification of Designated Substances through SSP101F21, November 2014” (HSB-DCSO 2014-05 October 20, 2014) and any applicable regulations. The findings of the DSS Report shall be included in the Contract Package.

Field methods must be conducted in accordance with *O. Reg. 153/04* and its technical supporting documents, and industry best practice. A QP shall be obtained for conducting and/or supervising contamination work. The Service Provider shall ensure that all intrusive investigation activities, screening, sampling, and other fieldwork required to obtain the desired results are supervised at all times by experienced competent staff.

Deliverables:

Designated Substance Survey (DSS) Report

Statutory Advertisements and Environmental Assessment Notices

An advertising agency has been selected to place all statutory advertisements in newspapers for the Ministry, such items as tender notices, public notices, road closures and certificates of substantial completion. The advertising agency also places any Environmental Assessment notices that are placed in newspapers, such as notices of Commencement, public information centres, and Completion in accordance with the applicable requirements in the MTO Class EA.

Meetings

The Service Provider Environmental Planner shall attend all Meetings in person as approved by the Ministry). Environmental Specialist / key technical environmental staff shall be involved in meetings as necessary to discuss the progress/design requirements associated with environmental investigations and to assist in assessing project alternatives.

Project Website **(include as required)**

The Service Provider shall develop and maintain a project specific website.

French Language Services Act

The Service Provider shall follow all requirements of the *French Language Services Act* and maintain a project specific website.

Indigenous Community Consultation and Engagement

All direct correspondence with Indigenous communities shall be drafted by the Service Provider and submitted to the MTO Environmental Planner for review, signature, and distribution.

A draft version of the letters must be sent to the MTO Environmental Planner for review prior to sending. MTO will be responsible for sending the letters to any Indigenous community. Final letters to the Conservation Authority and the Municipality shall be sent by the consultant, and the must be sent by regular mail, fax, or an email copy.

NOTICE to Service Providers: INDIGENOUS ENVIRONMENTAL COMMUNITY FIELD LIAISONS

MTO recognizes Indigenous communities' interest in environmental protection and, at times, in monitoring the potential environmental impacts of MTO projects.

MTO considers the participation of Indigenous Environmental Community Field Liaisons (E-CFLs) on MTO projects on a case-by-case basis when requested by Indigenous communities.

An E-CFL is any person(s) from or representing an Indigenous community who will participate in on-site observation of potential environmental impacts during environmental field activities in the planning and design stage of a MTO project.

The Service Provider is advised that if the Ministry receives any requests from an Indigenous community for the inclusion of an E-CFL for any environmental field activities associated with this project, and the request is determined to be appropriate by MTO, the Ministry will issue a Change Order to the Service Provider for the participation of E-CFLs. The Service Provider will take the necessary actions to coordinate and accommodate E-CFL activities and compensation for services using MTO approved E-CFL established rates.

7.6.3 Deliverables

The environmental assessment process documentation that must be prepared during this project is **Insert one of** *"Transportation Environmental Study Report", "Design and Construction Report", "Combination Transportation Environmental Study Report Addendum / Design and Construction Report", "Environmental Screening Document" etc.*

In addition to the environmental assessment process documentation, the following environmental technical reports are required: **Insert technical reports required, or delete this requirement**

The minimum number of rounds of public information centres required for this project is **insert #** with **insert #** venues for each round. Public Information Centres for this project will be in person.

The environmental schedule requirements for this project are the following: **Insert requirements**

Completion of a Class EA Monitoring questionnaire may be required for this Assignment upon clearance of the Transportation Environmental Study Report (TESR); TESR Addendum; Design and Construction Report (DCR) or Environmental Screening Document (ESD). If this Assignment is selected for completion of a Class EA Monitoring questionnaire, a blank questionnaire will be provided by MTO. Submission of the completed questionnaire to MTO will be required within 2 weeks of the above-noted clearance at no additional cost to the Ministry. **Delete Paragraph if your Assignment has no Class EA requirements.**

Assessment of Past Uses
Sampling and Analysis Plan
Soil Characterization Report
Earth Management Plan (refer to Section 7.8)

7.6.4 Reference Documents

All MTO environmental policy documents are collectively titled Environmental Standards and Practices (ESP). These ESP documents are referenced in Appendix 2: Technical Standards and Specifications.

The ESP documents provide the Ministry's staff and its agents with the requirements, guidance and tools to protect the environment during all stages of provincial highways management. All of the ESP documents are available electronically on the MTO public website at: Environmental Standards and Practices or from Service Ontario - Publications.

The ESP documents shall represent the minimum expectations for the work that the Service Provider must follow. It is the responsibility of the Service Provider to verify which of the documents specifically apply to the work, unless otherwise specified. The latest version of all referenced and posted ESP documents shall be used.

The project-specific environmental references are the following:

Insert references

7.7 Foundations Engineering - N/A

7.7.1 Project Scope

7.7.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

7.7.3 Deliverables

7.7.4 Reference Documents

Guideline for MTO Foundation Engineering Services and information from past foundation investigations may be viewed from the following sources:

- Foundation Library (Web-Based): http://www.mto.gov.on.ca/FoundationLibrary/index.shtml
- GEOCRES Library: Pavements and Foundations Section at the Ministry of Transportation (Ontario). For assistance, call (437) 249-1205

7.8 Highway Engineering - N/A

7.8.1 Project Scope

See the Preliminary Design Report for an overview of the project. The required Property Request was submitted and approved at the end of the Preliminary Design phase of the project.

7.8.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

Design

The Service Provider shall perform the following and/or complete the detail design, in accordance with the Legal Terms and Conditions and the following:

a) Prepare detailed quantity estimates for tender, materials and sundry construction;

b) In major grading areas and areas of excavation greater than 0.5 m, quantities are to be calculated using original ground cross sections;

c) All surplus stripping, grubbing, earth and rock material is to be used where possible within the highway ROW;

d) Provide hard copies of all plot plans and cross-sections required for the construction;

e) Contract documents shall be prepared using the latest version of the Ministry's Contract Preparation System (CPS). Cross-sections shall be completed using OpenRoads Designer (ORD) software. MTO ORD configuration contains design resources developed as per MTO Geometric Design standards, MTO IESCAD standards and CDED manual;

f) Determine the number of Working Days for the completion of the construction work;

g) Incorporate design drawings and specifications of work designed by others, when required;

h) Review all traffic control special provisions with the Agreement Administrator by the second last progress meeting;

i) Deliver the original and the **XX** number of copies of the documentation for the Detail Design phase at the Final Submission of Construction Contract Package to Contract Section date using current Ministry standards, policies and practices.

j) At the time of the Contract Section submission, provide updated Engineering Materials Testing and Evaluation quantities (Section 20), and the reasons for the deviation from the original quantities.

Earth Management

To support the Government of Ontario's objectives for the conservation of resources and the diversion of reusable earth material from landfill, the Service Provider shall strive to be proactive and innovative during design by considering all possible options and incorporating reasonable measures to confirm that the generation of excess earth is minimized on Ministry's projects.

Soil, crushed rock or soil mixed with rock or crushed rock, that has been excavated as part of a project and removed from the project area is deemed **Excess Soil** under O. Reg. 406/19 and must be managed in accordance with the requirements under the regulation. Refer to Section 7.6 for further details. The Service Provider shall make all reasonable effort to beneficially reuse excess soil. . The beneficial purpose for reuse is as defined under section 5.(1). 3 of O. Reg. 406/19, and should be taken into consideration.

On projects where excess material (e.g., soil, muskeg, rock) will be generated, opportunities for management options to be incorporated into the detail design package should be explored in accordance with the "**MTO Earth Best Practices and Recommendations for Design and Construction**".

The Service Provider shall produce and maintain an **Earth Management Plan** detailing the management of earth and showing the measures taken by the designer to minimize excess material generation and maximize reuse within the project area, including:

a) Incorporation of any previously prepared **Earth Management Plan** and associated information;

b) Quantities of earth within the project limits, i.e. total earth excavation; earth used within contract limits, earth that is suitable for re-use for engineered purposes vs. earth that is unsuitable for engineered purposes but that may be suitable for re-use for other purposes within the project area (e.g., slope flattening, culvert backfill and noise berms), earth to be stockpiled, earth to be managed as excess soil ;

c) Quantities of excess material, including excess soil, removed from the project area and potential final placement locations

d) Identification of earth quality through representative sampling and testing procedures and protocols, and identification and management of areas of potential environmental concern. Analytical testing to determine the environmental quality of the earth shall be conducted by an accredited laboratory (meeting Standards Council of Canada requirements).

e) Features that were built into the design to minimize excess (surplus and unsuitable), material generation with consideration of cost implications and justification;

f) Identification of viable management options and recommended methods and potential placement locations, including stockpiling areas located:
   i) Within Ministry R-O-W;
   ii) On lands otherwise under MTO jurisdiction and control;
   iii) On other lands (the Service Provider shall provide written evidence of appropriate consultation, landowner's consent, and any required municipal or other permits/approvals; and,
   iv) In pits and quarries licenced or permitted under the Aggregate Resources Act, in compliance with O. Reg. 244/97, the applicable Aggregate Resources of Ontario Standards, as well as the Site Plan which must state that soil may be imported for the purposes of rehabilitation. Where soil is to be imported for rehabilitation, details on the type, use, volumes and quality of the imported soil, as well as details on any related testing, tracking and recordkeeping that will be carried out must be stated on the Site Plan.

g) Tables summarizing the management data, including:
   i) the activity that generates excess material (e.g., stripping, culvert excavation, earth ditch cleanout, distortion treatments [e.g., frost heaves], other earth excavation activities);
   ii) the location of the activity (e.g., station numbers and offsets);
   iii) the quantity of excess material generated per activity at each location;

iv) the quality of the excess earth generated at each location according to the sampling results provided; and
v) the potential final placement location of the excess material.

h) Where excess material could be stockpiled, a Stockpile Monitoring Plan and schedule shall be appended, and include information on monitoring and other responsibilities necessary to confirm coverage until the material is transported to its ultimate destination for reuse;

i) Analysis and justification of recommended management options including any additional changes and expenditures, necessary elsewhere in the contract, to optimize earth management.

j) Contract provisions required for the management of earth, including excess soil.

The **Earth Management Plan** is to be developed by the completion of the project's Initial Design stage (refer to *Highway Planning and Design Process Guideline*) and updated as detail design progresses and new information becomes available. The **Earth Management Plan** is to be finalized by the completion of Final Design and provided for reference during tendering.

The **Earth Management Plan** shall include details on how any Excess Soil, as defined by O. Reg. 406/19, will be managed to meet the requirements of the regulation. This includes identifying temporary stockpile and potential final placement locations for beneficial reuse, along with information on soil quantities and quality. It is the responsibility of the Service Provider to identify potential beneficial reuse sites for any excess soil after exhausting opportunities to manage the material within the project area.

The Service Provider shall confirm that the requirements of the **Earth Management Plan** are incorporated into the construction contract documents. An overview of the **Earth Management Plan** shall be included in the Design Synopsis for the project, providing information on how excess material, including excess soil, will be minimized and managed on the project.

Earth Borrow Material

As Part of the **Earth Management Plan** the Service Provider is required to carry out and document the results of an investigation to identify any potential sources of suitable earth/borrow material such as:

- Existing MTO stockpile location;
- Other MTO projects in design or under construction;
- Other road authority stockpile or project locations; and
- Other potential external sources.

The Service Provider's Qualified Person shall review the excess soil reuse planning reports such as APU, SAP and the SCR as per section 7.6.2, and confirm that MTO can accept excess soil for beneficial reuse from a project area where the owner is not MTO, and the excess soil source site is not from an "infrastructure project" as defined under O. Reg. 406/19.

The Service Provider is responsible for all field and office surveys and other activities necessary to complete the investigation. The field investigation shall include sampling and analytical testing by an accredited laboratory (meeting Standards Council of Canada requirements), to determine the environmental quality of the Earth Borrow material. The field investigation and subsequent report must confirm that identified Earth Borrow does not contain the following:

- Any solid non-hazardous or other waste material (as per EPA O. Reg. 347); or
- Any petroleum hydrocarbon or other contaminants as identified through the presence of visual, olfactory or other evidence; and/or
- Contaminants of concern exceeding applicable Ministry of the Environment, Conservation & Parks (MECP) excess soil quality standards, as found in the most recent version of the *Rules for Soil Management and Excess Soil Quality Standards* document.

Reused grading materials are required to meet OPSS 1010, OPSS 206 and any other applicable specification when obtained from within the right-of-way. Classification of acceptable materials, use and disposal are outlined in CDED B-206.

Confirmation of earth quality and documentation of potential sources of Earth Borrow shall be included in the Earth Management Plan.

Erosion and Sediment Control

Erosion and Sediment Control Overview Risk Assessment

The following approach for erosion and sediment control is applicable to this project:

Select appropriate approach below and delete others

Best Management Practices

Design of erosion and sediment control for the project shall be undertaken by the Service Provider in accordance with Approach 1: Best Management Practices as described in Section 3.13 of the MTO *Environmental Reference Highway Design* (ERD) and in accordance with the MTO *Envir*onmental *Guide for Erosion and Sediment Control during Construction of Highway Projects*.

OR

Erosion and Sediment Control Plan

Design of erosion and sediment control for the project shall be undertaken by the Service Provider in accordance with Approach 2: Erosion and Sediment Control Plan (ESCP) as described in Section 3.13 of the MTO *Environmental Reference Highway Design* (ERD) and in accordance with the MTO *Envir*onmental *Guide for Erosion and Sediment Control during Construction of Highway Projects.*

OR

Erosion and Sediment Control Overview Risk Assessment

The Service Provider shall undertake an Erosion and Sediment Control Overview Risk Assessment in accordance with Section 3.13 of the MTO *Environmental Reference for Highway Design* (ERD) and the MTO *Envir*onmental *Guide for Erosion and Sediment Control during Construction of Highway Projects*.
Following completion of the Erosion and Sediment Control Overview Risk Assessment prepare an Erosion and Sediment Control Plan (ESCP) as described in Section 3.13 of the MTO *Environmental Reference Highway Design* (ERD) and in accordance with the MTO *Envir*onmental *Guide for Erosion and Sediment Control during Construction of Highway Projects.*

Drainage

Ditching shall be designed by geodetic control using standard PQP cross section intervals at locations where a 'D' depth for ditching is indicated in the Pavement Design Report and at other locations where geodetic control is required to provide positive drainage.

Should excavations for ditching/ditch cleanout operations be in excess of 0.5 m in depth, geodetic control is required. The Service Provider shall prepare templates. Templates will be provided to the contractor. Equipment rental for ditching may be used for areas indicated for 'ditch cleanout' in the Pavement Design Report provided positive drainage can be attained.

The Ministry shall review any additional proposed rental ditching areas identified by the Service Provider. The Ministry must approve lineal metre ditching in lieu of equipment rental.

The Assignment includes reviewing existing drainage and hydrology of the highway drainage system (e.g. culverts, sewers, catchbasins, off take ditches) providing recommendations for improvements and completing the design for the improvements.

The Service Provider is to field review the project with Operations (Maintenance staff) and document/address any concerns regarding the existing drainage and hydrology system requirements. Prior to implementation of any Operations staff recommendations, the Ministry's Project Manager shall be advised.

Hydraulic analysis shall be undertaken for all proposed culvert replacements and culverts identified as having a history of capacity problems. The drainage and hydrology designs will be done in conformity to Ministry accepted standards.

All culverts will require a thorough inspection, evaluation and assessment of alternatives for replacement (if required). The design Service Provider will provide recommendations for replacement or rehabilitation.

Water Taking Permits

General

The Service Provider shall determine all water taking requirements. The Service Provider shall determine the regulatory requirements for the water taking activities. The Service Provider shall conduct all work associated with the Ministry of the Environment, Conservation and Parks' (MECP's) requirements for Water Taking including:

- Determination of the need for Environmental Activity and Sector Registry (EASR) registration and/or a Permit to Take Water (by 30% detail design completion);
- Preparation of the technical analysis to support the required approvals (by 60% detail design completion or 90 days prior to Design Complete Presentation, whichever is sooner);
- Submission of PTTW permit application to the MECP (by 60% detail design completion or 90 days prior to Design Complete Presentation, whichever is sooner);
- Submission of supporting documentation and draft PTTW from the MECP (by Design Complete Presentation); and
- Inclusion of relevant contract and supporting documentation into the contract package (by Design Complete Presentation).

The Service Provider shall refer to the following MTO document for information regarding the regulatory requirements for water taking activities:

- EPO Interpretive Bulletin (November 2016) – Water taking Exemptions and Environmental Activity Sector Registry (EASR) Regulation

Water Taking Report

The Service Provider shall prepare a Water Taking Report when it is determined that EASR registration is required. The Water Taking Report shall include the following information:

- All information the Contractor requires for online EASR registration;
- Technical analysis and documentation including reports and plans required by regulation completed by a Qualified Professional to support registration; and
- Written permission to access water taking locations outside the MTO right-of-way.

Permit to Take Water Report

The Service Provider shall prepare and submit a Permit to Take Water (PTTW) Report when it is determined that a PTTW is required. The PTTW Report shall include the following information:

- Completed PTTW application with fee and all applicable attachments;
    - Apply for the maximum or worst-case water-taking rate;
    - Apply for a minimum of 1 and maximum of 5 viable water sources;
    - Identify MTO as 'applicant' on application form;
    - MTO's Manager of Engineering Program Delivery is signatory to the application; and
    - Service Provider's 'Qualified Professional' is the 'Project Technical Information Contact'
- Technical analysis completed by a Qualified Professional to support the application;
- Aboriginal Consultation letters;
- Written permission to access water taking locations outside the MTO right-of-way; and
- Photographs.

The Service Provider shall refer to the following MECP documents for information regarding the application process and requirements: Guide to Permit to Take Water Application Form available online at MECP's website.

Where water can potentially be taken from more than one source (such as a lake, pond, river, wetland) it is preferable to avoid those sources that will result in a Category '3' classification.

Assume the proposed water taking activity/activities to be a Category 2 application. If MECP determines the activity/activities to be a Category 3, the additional work and administration fees will be negotiated with the firm as additional work or by separate competitive assignment.

Multiple water-taking activities required for a single project shall be addressed under a single permit application. This can include activities that are eligible for registration. A written request to MECP for a Section 20.18 Director's Order to exempt any eligible water taking activities from registration shall be included in the Permit to Take Water Report if they are to be included under a PTTW for a single project.

Field Reviews

The Lead Highway Engineer and individual(s) responsible for highway design are required to undertake detailed field reviews. The reviews must document the existing conditions and field recommendations for items such as drainage, culverts, sewers, guide rail, slope flattening, signing, pavement markings, erosion control, side roads and entrances.

Traffic

Roadside Safety

The Service Provider shall review all roadside hazard conditions and provide adequate mitigation in conformity with current Ministry and area standards. Elimination of guide rail through slope flattening shall be the preferred method of disposing of excess material.

Staging/Detours

The Service Provider shall be responsible for determining any staging/detouring requirements. The alignment and cross sections of the staging/detours shall be determined based on safety, costs and effectiveness. All temporary detours shall be designed to the same speed as the main lanes as per the Geometric Design Guide for Canadian Roads, the MTO Geometric Design Supplement and the Ontario Traffic Manual Book 7 - Temporary Conditions Office Edition.

Signing and Pavement Markings

The project includes all temporary and permanent signing and pavement markings throughout the project. The Service Provider is to review and recommend all signage and pavement marking requirements throughout the project including cautionary signing at critical locations. All recommended permanent signage is to be reviewed by the Ministry. Approved permanent signage is to be detailed in the contract package. Wording on both permanent and construction

identification signs must be Ministry approved. The Ministry must approve additional signs and pavement markings.

Property/Corridor Management

Entrance Closures/Relocations and Modifications

The Service Provider shall confirm and procure all necessary approvals for all sideroad and entrance closures/alterations and commercial entrance designs. The Service Provider shall provide the Ministry's Corridor Management Offices with plans of the project, for both existing and the proposed works to assist in their entrance reviews. For the construction of commercial entrances, the design should be reviewed with the Ministry, prior to contacting the owner.

Commercial Signage

The Service Provider shall confirm and obtain approvals from the Ministry's Corridor Management Offices for all sign removal/relocations. Tourism Oriented Destination Signing (TODS) and/or Commercial signing may exist throughout the project.

Utilities

Schedule utility relocations in advance of construction start in order to avoid conflicts which could result in the Ministry being considered a "Constructor" under the OHSA;

Include the relocation of utilities and address property requirements. The proposed method of minimizing impacts and delays to the traffic traveling through the work site (i.e. any suggested uses of A+B bidding, lane rentals, etc.) is to also be addressed.

The Service Provider shall schedule a Mandatory Utility Coordination Meeting early in the project's design. The purpose of this meeting(s) is, at minimum, to:

- Provide an overview of MTO's project scope;
- Develop a project communication protocol;
- Identify MTO project information (i.e. Geotechnical Reports, Transportation Environmental Study Report (TESR), etc.) to be shared with Utility Companies;
- Review the Utility Composite Plan;
- Identify locations where additional accuracy of an existing plant's location is required to complete the detail design
- Identify locations where additional accuracy of an existing plant's location is required to complete detail design. Additional intrusive investigations, if required, shall be completed under a change order.
- Develop a mutually agreed upon schedule for all works required to complete the utility relocation works, including the utility design, Utility Relocation Plan and time for utility to complete relocation.
- Determine if there is a need for coordination of the utilities' physical relocation works (i.e. subsequent or concurrent) and development of a field work plan/schedule;
- Identify any utility plant 'work around' restrictions (existing and proposed locations);

- Identify property acquisition and timing for placement of survey stakes, where applicable (Section 17.11); and
- Discuss need for future Utility project Meetings.

All existing and proposed utility plans conflicting with the project shall be identified, adjusted and/or relocated.

The Service Provider shall identify all utility relocation requirements and initiate utility relocation procedures in accordance with “Ministry's Relocation Procedures (Utilities) January 28, 2010” document. (This document has been prepared to provide a consistent approach in dealings between major utility companies (i.e. Bell Canada, Hydro One, Enbridge Gas and Union Gas), Ministry staff and its Service Providers. The procedures in this document shall be followed but may be modified for individual circumstances. For other utility owners, similar processes and procedures will apply.

The Service Provider shall identify all utility relocation requirements and initiate utility relocation procedures. The Service Provider shall assess all alternative designs to mitigate or minimize relocations and/or other protection measures and secure all necessary arrangements, with respect to utility relocations within the project limits.

The Service Provider shall verify/obtain all existing and proposed utility information from utility owners, arrange for test pits and attend any on-site meetings with utility companies. The Service Provider shall identify all utility relocation requirements, determine the most cost-effective relocation strategy, and secure all necessary arrangements, with respect to utility relocations required within the project limits.

Preparation and distribution of the Service Provider’s notification to Utility owners, in accordance with the Public Service Works on Highways Act, shall be the responsibility of the Service Provider.

The Service Provider shall prepare a composite plan illustrating all existing utilities within the project area based on information provided by the utility owners. The Service Provider shall, in conjunction with the utility owners, develop utility relocation plans, and cost-sharing arrangements. The Service Provider shall submit to the Ministry the following information for Approval of the relocation plan:

1. The composite plan (digital or hard copy);
2. The plan of proposed relocations (digital or hard copy);
3. A letter stating that the Service Provider has reviewed the proposed relocation in conjunction with the Detail Design, and that the Proposal will not conflict with the proposed construction; and
4. The Moving of Utility order, showing the cost sharing arrangement (along with the supporting cost estimates).

Submitted plans and profiles should be to the following scales unless otherwise requested:

1. Key Plan - 1:100 000 or 1:250 000 or as necessary for orientation

2. Detail Plan - 1:1000 in rural areas, 1:500 in urban areas

3. Profile - 1:1000 horizontally and 1:100 vertically in rural areas

- 1:500 horizontally and 1:50 vertically in urban areas

Utility Relocation Plans are to be approved by the Ministry prior to issuance to the utility companies in Letter 5.

Processing of Letter 6 (Final Cost Estimates), Letter 7 (Relocation Notification and PSWH Act) and the MOU shall be the responsibility of the Corridor Management section. Depending on cost, utility company and their schedule, it could take up to 6 months to get the MOU issued after final plans are established and sent to Corridor Management section and construction to begin.

Following completion of Utility Relocation, the Service Provider shall verify all relocated utilities to confirm that utilities have been relocated to the intended location. The Service Provider shall ensure that relocated utilities will not further impact any component of the intended work.

All work within the right-of-way and restricted area of the pipeline of a company under the jurisdiction of the National Energy Board (N.E.B) will be reviewed for conflict. Work in the vicinity of this type of pipeline must conform to the utility owner (in accordance with the National Energy Board Act (Section 112) and Pipeline Crossing Regulations (Parts 1 and 2)).

The Service Provider shall take reasonable steps so that all crossing agreements received from the utility owner are reviewed and all appropriate construction requirements are incorporated into the contract for all construction work within the prescribed distances specified. The crossing agreement shall be provided to the Ministry for sign-off.

All environmental and property clearances shall be secured prior to utility relocations.

Property

The Service Provider is responsible for issuing the Property Request(s) and identifying to the Ministry all permanent property requirements and temporary property interests integral to the completion of the project. Also, the Service Provider is responsible for distinguishing any Ministry-owned lands identified as surplus to the project. If a Property Request was submitted and approved at the end of the Preliminary Design phase of the project, the Service Provider is to confirm the approved Property Request and indicate any proposed changes thereto.

A Property Request is the formal document that authorizes the Ministry to proceed with the acquisition of property rights. The Property Request can be “new” or amending (additional property rights or the deletion of previously identified property rights). The Property Request is composed of three (3) documents, which are a plan/graphical illustration, a summary sheet, and a completed ADM-S-787 form. The Property Request must be clear and concise so that there are no misunderstandings about:

- What property and/or property rights are needed
- Why (purpose and justification for) the Ministry is acquiring the property rights
- When and/or how long the Ministry should acquire and hold the property rights

It is essential to know what property is owned by the Ministry before determining what additional property is required to complete the proposed construction or before delineating Ministry-owned lands surplus to the project. It is the Service Provider's responsibility to obtain the property mark-up from the Agreement Administrator; the property mark-up delineates the applicable, existing Ministry ownership and title information, along the entire section of highway under review. The Service Provider is responsible for marking and recording, on the property mark-up, the names and addresses of all owners and tenants adjacent to the entire limits of the project, including the corresponding Land Registry Office PINs.

The Property Request includes all property requirements and temporary interests that are considered integral to the completion of the project and **where the privilege of expropriation could/would be exercised (i.e., the land is used or altered not for the sole benefit of the property owner).** The limits of the lands required must be sufficiently detailed to defend the Property Request at a Hearing of Necessity (Section 6 of the Expropriations Act).

Property Requests shall be reviewed by an Ontario Land Surveyor (Head, Senior Surveyor) within the area Geomatics Section prior to approval.

If the property requirements are altered (additions and/or deletions), then an amending Property Request must be issued to the Ministry. Additions to and partial deletions from identified property requirements may have significant impact to the Property Clearance Date, as additional survey and/or appraisal work will be necessary prior to acquisition and/or expropriation**. A minimum of 18 months** is required for the acquisition of property rights to take place after "approval" of the Property Request or amendments to a Property Request. As it may be necessary to expropriate property, **it is essential that sufficient design information to defend the "taking" of the property as being fair, sound and reasonably necessary is available and that all Environmental Assessment requirements are met at least ten (10) months before the Property Clearance Date.**

Refer to the document entitled the "Property Request Manual" for a more detail description of the creation and the timing of Property Requests.

Upon the issuing of any Property Request and its subsequent approval, the Ministry will obtain the necessary title searches and legal surveys/plans necessary to complete negotiations and conveyance of the property requirements that have been identified.

The Service Provider will be responsible for making any required arrangements (i.e., agreements, Permissions to Enter) with municipal authorities, private landowners etc. for the temporary use of property during design and construction of the project (i.e., site investigations, field testing, pre-engineering activities and temporary field offices). The arrangements for the temporary use of private property that the Service Provider is responsible for securing are **restricted to properties where the privilege of expropriation will not be exercised since the property is not integral to the completion of the project.**

Examples of when Permissions to Enter are required are in order to enter onto an owner's property for the purpose of making **minor** grade changes to their vehicular entrances during construction or for entry onto an owner's property for the purpose of surveys or geotechnical

work. Where a substantial grade change to an entrance is proposed which may adversely impact the owner's property, the matter will be discussed with the Ministry Project Manager. Alternative solutions will need to be considered for presentation to the property owner. In situations where the owner refuses to sign "Permission to Enter", the situation should be documented and the owner's land left "as is". If the Service Provider has exercised all reasonable attempts, then the Service Provider should refer the matter to the Agreement Administrator.

Permissions to Enter that deviate from standard Ministry practice or are precedent setting or have equity implications, along with all agreements are to be pre-reviewed by Agreement Administrator. Original copies of agreements and Permissions to Enter must be sent to the Agreement Administrator to be retained for record purposes.

The Service Provider is to conduct Preliminary Site Screenings on all property identified as required and/or surplus on the Property Request, in accordance with the requirements of Directive QST B-42 and provide a **separate** Preliminary Site Screening form for each property. The Ministry's "Preliminary Site Screening Reports" must be submitted to the Agreement Administrator with the submission of any Property Request or amending Property Request.

The Service Provider is required to attend all property meetings.

Entrance Deficiencies

The TPM Consultant shall review all existing residential and commercial entrances within the limits of the work project to ensure entrance designs conform to current Ministry standards as per the "Highway Corridor Management Manual". Entrance deficiencies shall include but are not limited to residential horseshoe entrances, residential/commercial entrances with headwalls, residential/commercial entrances not built to the current standards (i.e. to wide; two openings instead of one; parking areas constructed within the highway limits etc.)

The TPM Consultants in consultation with the Corridor Management Officer (CMO) shall:

- prepare and maintain an entrance removal/relocation/redesign spreadsheet as the project advances and undertake a Last Registered Owner (LOR) search redesign in order to determine property owner name(s) and addresses for all identified entrance removal/relocation,

- review and assess the condition of all entrance culverts and recommend corrective measures for all deficient culverts,

- notify effected property owners by registered mail to the last known address of the owner of the deficiency and required modifications to the entrance (shown on a plan), and the proposed method of performing the work,

- If the notice failed to reach the owner, personal deliver must be arranged. In the event the title to the property is included in an estate, notice shall be mailed or delivered to the administrator of the estate,

- incorporate all entrance removals/relocations/redesign and culvert replacements in the Contract drawings,

- arrange site meetings as required with individual property owners to discuss proposed entrance modifications and ensure a CMO is present at the site meeting,

- Coordinate with the CMO for the issuance of an entrance permit and signed Entrance Works Agreement(EWA) for each entrance requiring removal/relocation/redesign,

- Confirm that entrance modifications will not impact existing utilities, and if the modifications require relocating a utility the TPM Consultant shall make arrangements for the relocation as per the Utility Terms of Reference.

7.8.3 Deliverables

Earth Management Plan

7.8.4 Reference Documents

Approved Documents:

Approved Preliminary Design Report	dated_____
Approved Preliminary Design Report Addendum	dated_____
Approved Design Criteria	dated_____
Culvert Inspection Summary Report	dated_____

Old Contracts:
Contract Book 67-128 GDGB&P
Contract Book 71-234 DST and STR REH

Utilities and Underground Services:
Preliminary description of major utility conflicts identified in the Preliminary Design Phase.

Property
Approved Property Request
Property Request Manual

7.9 Pavement Engineering - N/A

7.9.1 Project Scope

This project involves the design for the *rehabilitation or reconstruction or construction* of pavement structure on Highway **xx** from **xxxxx** to **xxxxx**, **xx** km, *including the interchange ramps at etc. and improvements at the intersection of etc.* Full details of the project are provided elsewhere in this RFP.

The Pavement Engineering requirements include: soils investigation, laboratory testing, pavement structure design, Pavement Design Report preparation, and contract data sheets. The Service Provider shall perform the work in accordance with the Provincial Pavement Engineering Investigation Guidelines, and this RFP. The requirements of this RFP shall take precedence in the event of conflict. **The PROVINCIAL PAVEMENT ENGINEERING INVESTIGATION GUIDELINES specify MINIMUM requirements. The Service Provider shall carry out adequate site investigation and testing to support recommendations made for the design and construction of the project and to calculate accurate construction tender quantities.**

Two (2) work projects are included in this assignment, WP xxx on Highway xx and WP xxx on Highway xx, and WP etc. Each work project shall be treated individually. Separate reports, data sheets, and all other documents shall be provided for each work project.

For this assignment, the Service Provider shall:

- Prepare and submit a Quality Control (QC) Plan to suit the design and production processes required to complete the requirements of these terms of reference;
- Have a representative of the Pavement Engineering team attends and participates in the meetings as specified;
- Complete site investigation and field testing as specified.
- Visually assess the pavement surface distresses, and determine the probable cause of the distresses giving consideration to the investigation results and pavement construction history;
- Formulate alternative pavement structure designs, perform a life cycle cost analysis, MTO GreenPave analysis of the alternatives, and provide recommendations as specified;
- Provide pavement structure and other geotechnical recommendations for the pavement distress locations and proposed highway improvements identified in this RFP;
- Prepare a Soils Profile for the new alignment sections of Highway **XXX** and the ramps at the **XXX** interchange;
- Prepare a Pavement Design Report, including Executive Summary;
- Prepare digital and hard copies of all field and laboratory data, including summary tables of pavement and granular depths, for inclusion in the Pavement Design Report and the Contract Package;
- Notify the Geotechnical Section of aggregate types and approximate quantity requirements for the project as specified;
- Have a representative of the Pavement Engineering team answers all reasonable questions related to their work at any time until completion of construction;
- Within areas of foundation investigation, additional pavement engineering explorations shall be advanced such that the combined data meets the requirements of the Provincial Pavement Engineering Investigation Guideline.
- Collaborate with the Environmental Service Provider to provide the technical services required for Excess Soil Management as described in Section 7.6.2 of the RFP.

7.9.2 Technical Services Required

7.9.2.1 Staffing

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

The Service Provider shall have the individual that prepared the Pavement Design Report attend appropriate internal technical review meetings. The individual that prepared the Pavement Design Report is responsible for confirming that the recommendations in the report have been properly interpreted and incorporated in the Contract Package. Prior to issuing Pavement Engineering deliverables to the Ministry (including draft reports), the Service Provider shall conduct a final review of the completed work to confirm that all requirements have been met. The Service Provider shall submit documentation of the reviews with each deliverable, otherwise the deliverable will not be accepted.

7.9.2.2 Meetings, Geotechnical

Key personnel providing Pavement Engineering services shall attend as a minimum the following meetings:

Project Start-up Meeting

The project Start-up meeting shall be attended to make certain there is a clear understanding of the project and Ministry expectations for the assignment. This meeting also provides the Service Provider with an opportunity to review the construction history of highway sections, using available historical information such as Contract Drawings. Only representatives of the prime Service Provider shall attend the Occupational Health and Safety portion of the meeting.

Progress Meeting

A project progress meeting shall be attended when site investigation and laboratory testing nears completion. The intent of the progress meeting is to present the results of the investigation and testing, identify potential problem areas or soils, in relation to embankment stability or settlement, soil erosion, or construction staging, and provide list of viable pavement design alternatives will be subject to a design analysis. To expedite the schedule, the Service Provider may as an option provide information on the results of the investigation, the potential problem areas or soils, and pavement design alternatives being considered by email or teleconference.

A draft copy of the pedological sketches and available borehole logs shall be submitted to the Ministry a minimum of five (5) full working days prior to the progress meeting or teleconference.

Pavement Engineering Design Presentation

The Service Provider shall present the results of the pavement structure design work for discussion. The presentation shall be two parts. The first part shall present the pavement structure design alternatives considered and the recommendations for new pavement structures, including detour structures, pavement structure rehabilitation, and new alignment connections to existing roadways. The recommended types and specification requirements for the various pavement layers shall be presented. The Service Provider shall provide for review representative photographs of pavement surface distresses and unique features or conditions. The Service Provider shall present an assessment of the predominant pavement surface distresses and identify the probable cause of these distresses with reference to the investigation results and pavement construction history.

The second part shall present the grading recommendations, including design recommendations to mitigate the impacts of frost action, the suitability of cut materials for fill construction, and erosion control.

Two hours shall be allotted for the presentation. The presentation shall be audio-visual, such as a PowerPoint presentation.

Any proposed major deviations from standards, specifications and procedures, and potentially controversial issues shall be identified and discussed with the Ministry.

Draft soils profiles for new alignment sections shall be submitted to the Ministry a minimum of five (5) full working days prior to the Pavement Engineering Design Presentation.

Design Team Review Meeting

Respond to any questions related to the pavement design and geotechnical recommendations. Prior to the meeting, the Service Provider shall provide a complete contract package to the Pavement Engineering team for their review.

7.9.2.3 General Information

Pavement Structure Information

A copy of the pertinent Pavement Performance Records (PPR) and available frost heave survey data will be provided to the successful proponent. The PPR provides a detailed pavement performance history of the section of highway. The **xxxx** Pavement Condition Index (PCI) for this section of highway is **xx**, with a Ride Condition Index of **x.x,**

This highway was originally constructed under Contract **xxx.** The last major work completed on this section of Highway was done in **insert year** under Contract **xxx**. Work included **insert description**. *Maintenance treatments since the last major work has included* **insert description**

Location Identification

In these Pavement Engineering terms of reference, pavement distress and investigation locations are referenced by *chainage taken from Engineering Title Records (ETR) books (e.g. E*

16+660 - 16+740 Bear Twp.), ***or*** *chainage painted on the road (e.g. R 17+920 – 18+050),* ***or*** *by kilometre distance from a reference point (e.g. K 0.29 - 0.38),* ***or*** *by GPS co-ordinates - latitude and longitude.* These are approximate location references. The Service Provider shall adjust the limits to suit conditions encountered in the field and shall reference the precise location of the investigation areas to the actual control lines used for detail design purposes.

Traffic Data

Traffic data such as AADT, SADT, % Commercial, projections and any available information on the composition of the commercial traffic will be provided to the successful proponent.

Additional traffic information can be found in iCorridor (http://www.mto.gov.on.ca/iCorridor/) and MTO Technical Publication Website, under Traffic Volume Data section (https://www.library.mto.gov.on.ca/SydneyPLUS/TechPubs/Portal/tp/TechnicalPublications.aspx)

Frost Penetration Depth

Based on the MTC Report, "Aspects of Prolonged Exposure of Pavements to Sub-Zero Temperatures", the depth of frost penetration below exposed pavement in the project area is typically **x.x** m. The actual depth will vary depending on the nature and condition of subsurface materials.

Pavement Distress Areas

Three (3) areas of localized pavement distress that require investigation are tabulated below.

Approximate Location	Township	LHRS / offset	GPS (Latitude/Longitude)	Description *	Minimum No. of Boreholes
15+100	*Carling*	*35450 - 6.9*	*N 45º 28' 26.4" / W 80º 10' 26.4"*	*Moderate irregular frost heave. 20 m length.*	
16+200	*Carling*	*35450 - 8.0*	*N 45º 28' 51.9" / W 80º 11' 1.5"*	*Severe distortion. 30 m length.*	
16+806	*Shawanaga First Nation*	*35450 - 17.7*	*N 45º 32' 30.1" / W 80º 16' 11.7"*	*Settlement 10 m length.*	

* NOTE – Slight severity pavement distress areas (i.e. frost heaves) are provided for information purposes only. No investigations are required at slight severity pavement distress areas.

Structures

The condition of the wearing surface on the following structure(s) shall be visually evaluated. If the condition of the wearing surface warrants, pavement rehabilitation recommendations for wearing surface shall be provided in the Pavement Design Report. Prior to finalizing the

recommendations, the Structural Section shall be contacted to solicit comments. A copy of the Structural Section comments shall be appended to the Pavement Design Report.

Structure	Site No.	Location	Township
Moira R.	*40-1234*	*Hwy 12 at 2.1 km east of Jct. of Hwy 12 and Hwy 11.*	*Bear*

7.9.2.4 Site Investigation and Field Testing

Site Investigation and Field Testing shall be completed in conformance with the requirements specified in this section and as stipulated elsewhere in this RFP.

Prior to commencing the site investigation, the Service Provider shall thoroughly review available previous contract drawings, and use sound judgment in the programming and ongoing adjustment of site investigations.

Prior to drilling, the Service Provider shall contact utility companies to determine the locations of buried utilities within the limits of the project, and to obtain the proper clearances, including those on private lands. Before commencing work on Crown lands or private property, the Service Provider shall obtain the necessary Ministry of Natural Resources (MNR) permits, or permission to enter in writing from the landowner. When obtaining permits or permission, the landowner shall be made aware of the full impacts of the site investigation on the property, including any permanent damage to vegetation.

The Service Provider shall promptly notify the Ministry, in writing, of any subsurface condition encountered which is beyond the scope of the investigation work as outlined in the Provincial Pavement Engineering Investigation Guideline and this RFP. Notification shall include a factual description of the conditions, and field investigation data. Areas identified in the Foundation Engineering section of this RFP are exempt from this requirement.

The site investigation and recommendations for culverts, including replacements and extensions, swamp areas, and cut/fill embankments > 4.5 m in height (including temporary widening), that are not listed in the Foundation Engineering terms of reference, shall be completed by a Service Provider qualified in the RAQS Foundations Engineering category, Geotechnical (Structures and Embankments) – Low Complexity category. The recommendations for these project components shall be included in the Pavement Design Report. The investigation, testing, and reporting requirements shall be in accordance with the Provincial Pavement Engineering Investigation Guideline.

*Due to its good condition, cores/boreholes shall not be advanced through the Highway *** pavement from Sta. **** to Sta. ****, *** Township.*

<u>Location Referencing</u>

The Service Provider shall reference the precise longitudinal and transverse location of investigation areas and the recommendations of the Pavement Design Report to the actual control lines used for detail design purposes and in the Contract Package.

Soils Investigation

A detailed description of the proposed work is provided elsewhere in the RFP documents. The site investigation work shall include:

a) A soils investigation including borehole drilling, material sampling, and laboratory testing shall be carried out for the following project components:
   i. all proposed new highway construction;
   ii. all proposed new side roads and entrances;
   iii. all proposed horizontal and/or vertical alignment revision;
   iv. all areas where new construction will tie into an existing highway or side road;
   v. all proposed road/highway platform widening and slope flattening areas;
   vi. rock cut widening areas;
   vii. all proposed reconstruction work;
   viii. the identified areas of pavement distress;
   ix. detour alignments;
   x. ditching and drainage;
   xi. new culverts;
   xii. culvert extensions and replacements;
   xiii. illumination/signal poles (ten (10) poles assumed);
   xiv. foundation investigation and design for sign support structures (eight (8) structures assumed), overhead sign support structures (four (4) structures assumed), and one (1) Variable Message Sign (VMS).

b) Four (4) **mid-lane** boreholes per kilometre shall be advanced through the existing pavement surface as described in the following:

   i. Each kilometre of existing 2-lane roadway in the project area shall be divided into 250 m long sublots. One (1) borehole shall be drilled within the limits of each sublot. The longitudinal location, and the lane to be drilled within each sublot shall be established randomly. The transverse location of the borehole shall be mid-lane (i.e. between the wheel paths).

   ii. Additional holes shall be drilled in auxiliary lanes, including passing lanes and truck climbing. At the same longitudinal location of every second hole drilled in the driving lanes, a hole shall be drilled in the auxiliary lane. The holes shall be located mid-lane. *The total linear length of auxiliary lane is approximately **2.5** kilometres.*

   iii. Additional holes shall be drilled through existing hot mix patches evident at the time of

investigation and areas of selective resurfacing, which will not be addressed in Section 17.10.2.3, Pavement Distress Areas. The longitudinal location of the boreholes within the patch limits shall be established randomly. The holes shall be located mid-lane. The holes shall not be drilled within 10.0 m of the end of a patch. A minimum of one (1) hole per 100 m of patch length shall be drilled. Hot mix patched areas on this project are listed below:

'Patch' Location	Township	Lane
Sta. – Sta.	*Green*	*Both*
Sta. – Sta.	*Red*	*NB*

iv. Boreholes shall be relocated to fall on pavement cracks, provided that the crack is found within 10.0 m± of the randomly selected borehole site. Measurements of the crack width shall be taken at the top and the bottom of pavements 100 mm or less in thickness. For pavements greater than 100 mm thick, crack width measurements shall be taken at the top, mid-point and the bottom of the slab. The crack width measurements shall be recorded by notation on the borehole log.

v. The borehole station and offset distance from centreline shall be recorded.

vi. Samples of each type of granular base and granular sub-base materials encountered shall be taken. Samples of each earth subgrade material type encountered shall be taken. A minimum of one (1) sample of each material type per kilometre shall be taken and tested as described in the PROVINCIAL PAVEMENT ENGINEERING INVESTIGATION GUIDELINES. Where sufficient material cannot be extracted from a test hole drilled through the pavement, additional holes may be drilled in the adjacent shoulder to obtain the required sample weight.

vii. Samples of existing granular base material shall be taken from below the bottom of the bounded layer. Care shall be taken to avoid contaminating the granular base sample with shouldering material.

viii. The boreholes drilled through the existing pavement shall be advanced to 1.5 m or to rock grade, whichever is less. The size of the boreholes shall be 150 mm in diameter.

ix. The holes shall be backfilled with the soil cuttings produced while drilling. The hole shall be backfilled such that the subgrade soils are placed in the bottom of the hole. The granular materials shall be placed in the top part of the hole. The whole column of soil shall be compacted in layers. The thickness of each layer shall not exceed 300 mm when using mechanical equipment for compaction, or 150 mm thick when hand tamping. Mechanical equipment includes the use of the power auger to pack the material into the hole.

x. The holes drilled through the pavement shall be capped with cold mix asphaltic concrete. The thickness of this cap shall be equal to the depth of the existing pavement, to a maximum of 150 mm. The cold mix shall be properly compacted. The cold mix cap shall stand proud of the existing pavement surface by approximately 10 mm immediately after the cold mix has been placed and compacted.

xi. If a problem is encountered with the backfilled boreholes following the investigation (e.g. subsidence resulting in a surface cavity), the Service Provider shall return to the site and repair the boreholes to the Ministry's satisfaction.

c) Four (4) wheel **path** boreholes per kilometre shall be advanced through the existing pavement surface as described in the following:

i. In the same lane and at the same longitudinal location as the mid-lane boreholes, a borehole shall be advanced through one of the wheel paths. The wheel path to be investigated, either inner or outer, shall be established randomly.

ii. The station and offset distance from centreline for the holes shall be recorded.

iii. The size of these boreholes shall be a maximum of 50 mm in diameter.

iv. The hole shall be advanced completely through the asphaltic pavement surface to the underlying granular base material.

v. The thickness of the pavement encountered at the test hole locations shall be recorded.

vi. These holes shall be filled, full depth, with cold mix asphaltic concrete. The cold mix shall be properly compacted. The surface of the cold mix shall stand proud of the existing pavement surface by approximately 10 mm immediately after the cold mix has been placed and compacted.

d) Four (4) holes per kilometre for asphalt depth measurement shall be advanced through the existing pavement surface of the partially or fully paved shoulder, at the same longitudinal location as the mid-lane boreholes. The station and offset distance from centreline for the holes shall be recorded. The hole shall be advanced completely through the asphalt pavement surface to the underlying granular base material and the thickness of the asphalt encountered at the test hole locations shall be recorded. Holes shall be 50 mm diameter maximum and restored as described in c) above.

e) One (1) hole per 100m for asphalt depth measurement shall be advanced through the existing pavement surface of all turn lanes, slip-arounds, paved truck laybys, and turn tapers. Longitudinal and horizontal location shall be random. The station and offset distance from centreline for the holes shall be recorded. The hole shall be advanced completely through the asphalt pavement surface to the underlying granular base material and the thickness of the asphalt encountered at the test hole locations shall be recorded. Holes shall be 50 mm diameter maximum and restored as described in c) above.

f) One (1) hole for asphalt depth measurement shall be advanced through the existing pavement surface of all existing paved commercial entrances, and located within the highway right-of-way. Longitudinal and horizontal location shall be random. The station and offset distance from centreline for the holes shall be recorded. The hole shall be advanced completely through the asphalt pavement surface to the underlying granular base material and the thickness of the pavement encountered at the test hole locations

shall be recorded. Holes shall be 50 mm diameter maximum and restored as described in c) above.

g) Rut depth and pavement crossfall measurements shall be taken at the same location and in the same lane that the mid-lane boreholes are drilled. The rut depth measurements shall be taken in both inner and outer wheel paths using a 1.2 m straight edge. Crossfall measurements shall be taken using a 3 m straight edge. The measured rut depth in millimetres and the pavement crossfall in percent shall be recorded in the Pavement Design Report.

h) As part of the investigation work, sufficient field information shall be obtained in order to prepare widening designs which do not create 'granular sumps' or impediments to lateral subsurface drainage; as well as removal of existing impediments to subsurface lateral drainage in the existing shoulders and fore slopes. (i.e.: bedrock knobs, earth materials, etc.) Recommendations shall be provided in the Pavement Design Report to address these lateral drainage concerns.

   The subgrade elevation to be used in areas of roadway widening shall be defined. A relatively uniform subgrade line; to provide proper lateral drainage and at the same time minimize the potential for differential frost action, shall be developed, based on the soils borehole information. This subgrade line may be referenced to the top of the existing pavement, or to the proposed new profile grade, if known. Non-specific recommendations, such as 'match existing conditions', are not acceptable. The minimum depth of new granular materials required for each widening area shall also be provided. This information shall be contained in the recommendations section of the Pavement Design Report.

i) Recommendations shall be provided where the replacement or the extension of existing centreline culverts is proposed. Soils investigation work shall be performed as described in the PROVINCIAL PAVEMENT ENGINEERING INVESTIGATION GUIDELINES, and as outlined in the following:

   Where the top of the proposed new culvert embedment material will be placed above the frost penetration depth, and new culvert sections will be located inside the edge of new shoulder rounding, an investigation to determine the existing frost taper details shall be undertaken. Test holes shall be drilled in the shoulder ≈ 500 mm from the existing edge of pavement. The holes shall be placed at intervals that will show the rate of the existing frost tapers. Generally if standard tapers were constructed, the rate is 10:1. The rate can however vary, depending on site conditions and past remedial work. Minimum Drilling requirements are:

   - One (1) test hole placed within 300 mm of one side of the culvert.
   - Six (6) more test holes drilled at the culvert site, three (3) on each side of the culvert, to form a cross-section of the existing culvert backfill.
   - All seven test holes shall be advanced to a minimum depth of 500 mm below the culvert invert or to 500 mm below the depth of frost penetration; whichever is less.
   - One (1) complete set of holes shall be drilled at each culvert site. A drilled cross-

section is not required on both sides of the road. Where a culvert will be extended on one side only, the holes shall be place on that side of the highway.

j) If fully paved shoulders are proposed for the full length of the project, one (1) hole every 500m on alternating sides shall be drilled randomly between edge of pavement and inside of rounding to determine if 'core construction' is a concern. The hole shall be advanced to a depth of 1.5m. If core construction is encountered than sufficient holes should be drilled to determine the limits of 'core construction' (earth shoulders) on both sides of the roadway.

k) The Service Provider shall provide erosion control recommendations where excavation of earth ditches and earth slopes is anticipated. A recommended maximum slope or slope configuration shall be provided for all cut embankment slopes. Sufficient field investigation, laboratory testing, and design analysis shall be conducted to support the recommendations. Specific erosion control recommendations are required for all areas of highly erodible soil (K>0.6).

l) In addition to the investigation work discussed in the foregoing, areas where ditch clean out is needed shall be detailed. Areas where new OPSD 200 series ditches should be provided, based on current alignment and cross-section, shall also be detailed. For each area listed, the type of cut material, either rock or earth, shall be identified. Separate lists shall be provided for the two types of ditch work (i.e. ditch cleaning or new standard ditches). This information shall be included in the Recommendations Section of the Pavement Design Report. No boreholes are required for ditch clean out. Refer to PROVINCIAL PAVEMENT ENGINEERING INVESTIGATION GUIDELINES Section 1.2.8 for investigation requirements for new ditching.

m) The PROVINCIAL PAVEMENT ENGINEERING INVESTIGATION GUIDELINES Section 1.2.2d), for Cuts, is deleted and replaced by the following:

Boreholes shall be advanced to 1.5 m below profile grade, unless bedrock/rock fill/rock shatter is encountered. Termination of the investigation on dense or hard soil, boulders, tree roots, or other obstructions shall not occur.

Asphalt Coring and Testing

The Service Provider shall core the existing pavement in accordance with the PROVINCIAL PAVEMENT ENGINEERING INVESTIGATION GUIDELINES at a frequency of four (4) locations per 2-lane kilometre of roadway. Cores may be located at the same location as the mid-lane boreholes. The cores shall be 150 mm in diameter. The cores shall be retained for the duration of the Service Provider agreement unless approval to dispose of cores is given by the Ministry. Core testing is required for projects involving recycling of the existing asphalt pavement or stabilization of a mixture of pulverized asphalt and granular base. *The number of cores to be tested and the testing to be completed will be determined in consultation with the Ministry, and reimbursed as extra work* except when specifically noted in Section 7.9.2.5

All cores shall be visually examined for evidence of stripping or layer delaminations. If evidence of stripping or layer delaminations is observed, a photograph shall be taken with reference to the core location.

Decommissioning of Pavement Engineering Explorations

All aspects of implementation of geotechnical test holes (including, but not limited to, planning, licensing, construction, maintenance, abandonment, and reporting) shall be in accordance with O.Reg. 903 and its Amendments (the water/ well regulation under the OWRA).

Explorations shall be constructed, maintained and abandoned, or otherwise restored, to safeguard the public safety and environmental integrity of the site. Test pits shall be backfilled with suitable material and re-vegetated or otherwise protected from erosion. Temporary open holes shall be adequately covered. Holes in roads shall be backfilled as required to prevent future settlement and acceptably patched where pavement surfaces have been damaged.

Falling Weight Deflectormeter Testing

Falling Weight Deflectormeter Testing shall be in accordance with Falling Weight Deflectormeter Testing Manual (MERO-053) for testing frequencies and protocols.

Ground Penetrating Radar Testing

Ground Penetrating Radar Testing is typically used to identify the pavement thickness. The Ground Penetrating Radar Testing guideline can be found in the Provincial Pavement Engineering Investigation Guideline.

7.9.2.5 Engineering Materials Testing and Evaluation

Minimum Materials Testing and Evaluation requirements are described in the Provincial Pavement Engineering Investigation Guidelines. In addition to the tests identified in Section 1.3.1 of the Provincial Pavement Engineering Investigation Guidelines, the Service Provider shall also conduct sufficient Moisture-Density Relationship of Soils (LS-706) tests to reasonably determine the suitability of earth materials as fill and recommend percentage of unsuitable material for individual earth cuts. Particular attention shall be given to the determination of the erosion potential of earth ditches and cuts, and the frost susceptibility of soils within the frost penetration depth.

For GWP **insert #,** in support of recycling of the existing asphalt pavement; the following asphalt core testing shall be completed. Trimming/cutting of the cores will be required to test the section of asphalt to be recycled. Assume a maximum of **insert #** thickness of asphalt to be recycled.

- 1 Air Void Test per 2 – 2 lane km of highway
- 1 Asphalt Cement Content Test per 2 – 2 lane km of highway
- 1 Aggregate Gradation Test per 2 – 2 lane km of highway
- 1 Recovered Penetration Test per 2 – 2 lane km of highway
- CIREAM Mix Design on Asphalt Cores

Core samples shall be submitted to a laboratory equipped to carry out expanded asphalt mix designs with CCIL Type 'A' certification or equivalent. The mix design shall be carried out according to the 'Wirtgen Cold Recycling Manual', Appendix A2.3, using briquettes produced according to the 'Determination of Indirect Tensile Strength of Expanded Asphalt Mixes' document (LS-297 R26).

The mix design shall be completed in accordance with SP 335S03 (January 2015) and shall include the following:

- Information on the grade, manufacturer and supplier of the PGAC. The PGAC of 58-28 shall be used for the mix design
- The percent by mass of expanded asphalt in the CIREAM, referred to as the design rate, and all calculations performed to determine the design rate of expanded asphalt
- The recommended PGAC temperature for foaming, the half-life, the expansion ratio and the percent water added for foaming
- The optimum moisture content and mix design bulk relative density
- The dry tensile strength, wet tensile strength and tensile strength ratio
- The amount of water to be added to the mix
- Maximum field rate adjustment allowed to the design rate without adverse effects to mix properties

Allow for a second mix check using supplementary materials depending on results of the first mix design (i.e. low tensile strength results).

The Engineering Materials Testing requirements are found in Section 7.15.

7.9.2.6 Design Services

The following services shall be provided in addition to those normally provided during Pavement Design Report preparation:

Pavement Design Selection

The Service Provider shall use at least two appropriate methods when formulating the pavement design for this project. The results generated shall be evaluated by an experienced pavement designer, with consideration of the historical performance of pavement structures in the project area and the guidelines provided in the MTO Pavement Design and Rehabilitation Manual. **The Service Provider shall provide pavement design alternatives with service life estimates ranging from 8 to 18 years**."

Applying a single pavement design over the whole project length may not be appropriate. If significant sections of the project, two kilometres or more in length, are found where the pavement performance, pavement structure, or soil and moisture conditions differ substantially from those found on the bulk of the project, separate pavement design analysis is required. Recommendations shall be provided in order that the pavement life expectancy for these sections will match the pavement life expectancy of the remainder of the project.

When the pavement design analysis work is near completion, the Service Provider shall arrange a Pavement Engineering Design Presentation to Ministry representatives. The Service Provider is responsible for setting the date, time, and place of the meeting in a Ministry's complex.

The Service Provider shall present a recommended pavement design for discussion. The Service Provider shall include the reasoning for all of the rehabilitation/design alternatives, considered or rejected, as part of the presentation. Cost/benefit analysis, life cycle costing a summary of the design methodology, and comments regarding ease of construction, traffic delays, etc., are required for each alternative presented. The lifecycle cost analysis shall be based on a 30-year analysis period for local, collector and arterial highways and a 50-year period for freeways. The discount rate shall be

- From 0 to 30 years uses 4.5% nominal social discount rate
- From 31 to 75 years uses 4.0 % nominal social discount rate

The Service Provider shall forward paper copies of the alternative design information, **using the format provided by the Ministry to the successful proponent**, to each individual listed below a minimum of ten (10) full working days prior to the day the meeting is scheduled. The Service Provider shall present, and answer questions related to various alternatives at that meeting.

Pavement Design Alternatives and Invitation to Pavement Engineering Design Presentation Distribution List:

* Manager of Engineering
* Head, Construction
* Area Manager, Construction, Construction Management
* Head, Quality Assurance, Construction Management
* Head, Project Delivery
* Area Manager – Highway Engineering, Project Delivery
* Project Engineer or Manager, Project Delivery
* Head, Geotechnical Section
* Geotechnical Engineer
* Pavement Design and Evaluation Officer/Project Soils Engineer

* The meeting shall be arranged such that these individuals are available to attend.

The Service Provider shall take the minutes of the Pavement Engineering Design Presentation and circulate them to all on the distribution list no later than five (5) working days after the meeting. The minutes shall include a final copy of the alternative design information, adjusted as required based on the meeting discussions, in the Ministry's format. A digital copy of the minutes shall be submitted by email to the *Pavement Design and Evaluation Officer* ***or*** *Project Soils Engineer.* The minutes of the meeting shall be included in an Appendix to the Pavement Design Report.

GreenPave Assessment

For the pavement design report, the geotechnical consultant shall develop practical pavement design alternatives based on the geotechnical investigation specified herein. In addition to the

typical pavement design consideration of LCCA, the consultant shall evaluate and document the pavement design alternatives using MTO GreenPave. MTO GreenPave is a pavement sustainability rating system to promote sustainable pavement design and **not** intended for pavement alternative selection. Consultant shall determine the most technically appropriate and cost-effective alternatives based on factors such as LCCA and project specific constraints. In the event of equivalent LCCA (within 10%) between pavement designs, MTO GreenPave rating should be considered as one of the pavement alternative selection factors.

The GreenPave evaluation worksheet shall be appended to the Pavement Design Report. GreenPave evaluated projects will be included in MTO's annual Provincial GreenPave Summary Assessment Report.

Pavement Design Report

The Service Provider shall reference the precise longitudinal and transverse location of investigation areas and the recommendations of the Pavement Design Report to the actual control lines used for detail design purposes.

The Pavement Design Report shall include detailed station-to-station grading and pavement structure recommendations for new alignment and cross-section widening projects.

A draft Pavement Design Report shall be submitted for Ministry review following the Pavement Engineering Design Presentation. Within ten (10) business days of receipt of the draft, assuming that there are no major deficiencies in the report, the Service Provider will be provided with comments and instructed to proceed with the final report. The final report shall be submitted within fifteen (15) business days after resolution of the Ministry's comments.

The Service Provider shall submit a concise final Pavement Design Report. The report shall be prepared in accordance with the Pavement Design Report format described in the MTO Pavement Design and Rehabilitation Manual. Include only the relevant sections that specifically pertain to this project. The report shall provide clear and complete recommendations for all proposed work. Typical Drawings shall be included where appropriate. The report shall include recommendations for all pertinent 'Fill In' Special Provisions. The Service Provider shall prepare any Non-Standard Special Provisions that will be required in the final Contract Documents to support the pavement design recommendations.

The Pavement Design Report shall contain recommendations for Superpave mix design (mix types and thicknesses, applicable Special Provisions and fill-ins).

All copies of the final Pavement Design Report and any subsequent addenda shall be sealed by a Professional Engineer licensed in Ontario. Each report shall also bear the signature or stamp of the independent checker of the work.

Executive Summary

The Pavement Design Report shall include an Executive Summary, which shall be no more than two (2) pages in length. The format for the executive summary, covering the main components to be included shall be provided to the successful proponent.

Aggregate Information

Aggregate availability information is required for economic analysis of alternatives and inclusion in Pavement Design Reports. When required, the Service Provider shall request in writing information regarding the availability of aggregate for the project. The request shall be addressed to Aggregates Unit in Geotechnical Section. The request shall include the work project number, highway number, the project limits by kilometre distance from the nearest city/town/or intersection with another highway, and a preliminary estimate of the maximum potential quantities of aggregate required. The Aggregates Unit will provide, within two weeks of receipt of the request, the types of aggregate available, the estimated unit cost of aggregates, and a map showing the locations of the possible aggregate sources that may be available at the time of construction. The Service Provider shall include source locations, material available from the sources, and the approximate haul distance from each source in the Pavement Design Report. All information provided to the Service Provider shall be kept confidential and shall not be disclosed to any person other than those that have need of it for the purpose of this assignment.

The Service Provider shall forward all pertinent information related to the type and quantity of aggregate required for the project to the Geotechnical Section. The Geotechnical Section shall be kept informed of any changes regarding the aggregate requirements throughout the design stage. Information regarding the quantity of aggregate materials required shall be forwarded as an independent document. The aggregate quantity information shall **not** be placed in the Pavement Design Report. The preliminary aggregate information shall be submitted at the same time that the final Pavement Design Report is submitted to the Ministry.

Design Discussions and Reviews

The Service Provider shall have a member of the Pavement Engineering team answers all reasonable questions related to the report, and any associated addenda, at any time until completion of construction.

The Service Provider / Pavement Engineering team shall review the Contract Package to verify that all recommendations of the Pavement Design Report, and any associated addenda, have been correctly interpreted and properly incorporated into the final contract documents prior to submission of the Design Technical Presentation Package to the Ministry.

7.9.3 Deliverables

Except where otherwise directed, project deliverables shall be produced as described in the Provincial Pavement Engineering Investigation Guidelines and this RFP. The Service Provider shall submit the deliverables specified in this section to the Ministry's Project Manager.

Any deliverable or addendum that contains a recommendation or an interpretation of results requires the signature and stamp of a professional engineer, licensed to practice in the Province of Ontario. These include, but are not limited to Pavement Design Report, Soils Investigation Report, and Laboratory Testing Reports.

Pedological Sketches

Pedological sketches shall be submitted in an appendix of two copies of the Pavement Design Report. The remaining copies of the Pavement Design Report shall contain only an electronic or digital copy of the sketches.

The sketches can remain in rough field note format. The sketches shall indicate locations of all investigations and the type of equipment used.

gINT Pavement Borehole and Corehole Data Requirement

All borehole and corehole data shall be completed in the - gINT software file format (.gpj). The MTO gINT library file (MTO Library.glb) and the project template file (mto project template.gpj) are provided in the link below and shall be used to ensure consistency. Also, the borehole log, grain size distribution and plasticity chart shall follow the format given in the link under MTO Technical Publications website, search for "gINT".
https://www.library.mto.gov.on.ca/SydneyPLUS/TechPubs/Portal/tp/tdSplash.aspx

Below is the sample gINT project file excerpt containing some pertinent borehole information that is required in the gINT file. The Lithology page for each borehole should also be filled out. Refer to the MTO template file for the complete table.

Bore hole ID	Total Depth (m)	Subsurface Description[Note1]	Surface Elevation [Note2] (m)	North [Note3]	East [Note3]	MTM Zone	Latitude	Longitude	Survey Grade [Note4]
001	1500	0 - 60 Asph 60 - 200 Cr Gr 200 - 1.1 Br F-Med Sa Tr Gr & Si (Moist) 1.1 NFP Prob Bld Poss BR		5127067.49	622170.06		46.286183	-79.414029	

Note 1: Subsurface description as per OPSD 100.06
Note 2: Ground surface elevation
Note 3: Northing and Easting datum – If pre-engineering used MTM NAD83 (Original), continue to use MTM NAD 83 (Original), otherwise use MTM NAD83 (CSRS)v6.
Note 4: Indicate if the survey is done using GPS, total stations or traditional leveling.

The locations and elevations of all boreholes, test pits and soundings shall be surveyed and referenced to MTO horizontal and vertical project control. Locations are to be identified on the borehole log by MTM co-ordinates (Northing and Easting) and Latitude & Longitude in the same datum, realization, map projection, and zone used for the pre-engineering surveys. If the datum, realization, etc. of the pre-engineering surveys are unknown, the area Geomatics Section should be consulted.

*Where applicable, NAD83 (CSRS)v6 datum shall be used, NAD83 (Original)

Otherwise both Northing and Easting Grid Coordinates and Latitude and Longitude Geographic Coordinates of the borehole location shall be indicated in the location of the borehole log record

sheet. LHRS Station, Offset and Township shall be provided to supplement the location description in the report.

**Minimal positional accuracy of boreholes, test pits, and soundings with respect to the nearest project control is 0.1 m vertical and 0.5 m horizontal.

Horizontal Datum: NAD83 (Original) or NAD83 CSRS (2010 epoch)

- Northing and Easting Grid Coordinates in metres, in the 3° Modified Transverse Mercator (MTM) projection (corresponding zone shall be indicated), to a precision of one (1) decimal place
- Latitude and Longitude Geographic Coordinates in decimal degrees to a precision of six (6) decimal places

Vertical Datum: Canadian Geodetic Vertical Datum (CGVD 1928)

- Elevation in metres to a precision of one (1) decimal place

Two digital copies of the gINT software file (.gpj).

Borehole and Asphalt Core Logs

Two (2) digital copies, on contract plates in AutoCAD format, shall be submitted. Two copies of the Pavement Design Report shall contain a hardcopy of borehole and asphalt core logs in an appendix. A plan and profile drawing of borehole and coreholes generated using gINT, saved in PDF format. Borehole and corehole logs generated using gINT, saved in PDF format shall also be provided. The remaining copies of the Pavement Design Report shall contain only an electronic or digital copy of the borehole and asphalt core logs.

Summary of Asphalt Core and Granular Information

Separate Summary tables of asphalt core and granular base and sub-base information shall be prepared for insertion into contract documents. The tables shall be in the following format:

LOCATION AND ASPHALT THICKNESS DATA							
Core No.	Station	CL Offset	Core Dimensions (mm)		Rut Depth (mm)		Location Remarks
			Diameter	Depth	Outside Track	Inside Track	
1	45+000	4.5Rt	50	48			Fully Paved Shoulder
2	45+200	1.2 Lt	150	126	5	8	Hot Mix Patch
3	45+400	1.1Rt	50	213	3	5	Wheel Track
4	45+600	1.9 Rt	150	160	6	10	Midlane

ASPHALT CORE TESTING DATA																
Core No.	Depth Tested (mm)	Rec Pen	%Air Voids	% AC	Percent Passing											
					26.5 mm	19 mm	16 mm	13.2 mm	9.5 mm	4.75 mm	2.36 mm	1.18 mm	600 µm	300 µm	150 µm	75 µm
2	Full Depth	45	3.2	4.4	100	100	99.1	91.7	68.5	48.6	36.9	26.5	15.9	8.6	5.2	3.6
5	0-50															

GRANULAR BASE GRADATION														
Base Sample No.	Location			Percent Passing										Acceptable *
	Station	CL Offset m	Sample Depth m	37.5 mm	26.5 mm	19 mm	13.2 mm	9.5 mm	4.75 mm	1.18 mm	300 µm	150 µm	75 µm	
3	48+200	4.4Lt	0.2	100	100	95.6	85.6	75.6	59.4	24.9	16.3		3.5	Not Accep for Gran A

GRANULAR SUB-BASE GRADATION															
Sub Base Sample No.	Location			Percent Passing											Acceptable *
	Station	CL Offset m	Sample Depth m	150 mm	106 mm	26.5 mm	19 mm	13.2 mm	9.5 mm	4.75 mm	1.18 mm	300 µm	150 µm	75 µm	
3	48+200	4.4Lt	0.6	100		95				60	71	25		7	Accep for Gran B

* Check Gradation, %Crushed and %Asphalt Coated Particles (refer to SP110S13).

Summary Tables shall be included in an appendix to the Pavement Design Report.

Aggregate Information

Two (2) digital copies produced in a format compatible with Microsoft Word, and one (1) hardcopy shall be submitted. The aggregate quantity information shall **not** be placed in the Pavement Design Report.

Pavement Design Report

Two (2) copies of a draft Pavement Design Report shall be submitted for Ministry review.

Two (2) digital copies (Microsoft Word format) and six (**6**) hard copies of the final Pavement Design Report and any subsequent addenda shall be submitted.

Note: Two hard copies of the Pavement Design Report shall contain a hardcopy of borehole and asphalt core logs and pedological sketches in an appendix. The remaining four (4)copies of the Pavement Design Report shall contain only a CD-ROM/USB copy of the borehole and asphalt core logs using gINT generated PDF format.

Executive Summary

Six (6) hard copies of the Executive Summary shall be submitted.

Digital Copies

Digital copies shall be submitted on separate CD-ROM. Individual disks shall contain one copy of each AutoCAD file, and/or one copy of each required Microsoft Word deliverable. Duplicate copies of digital files shall not be placed on the same disk. The disks shall be properly labeled to include MTO work project number, highway number, and AutoCAD layering information.

Soils Profiles

Two (2) 11”x17” hardcopies of the draft soils profiles shall be submitted for review. The draft soils profiles shall be submitted prior to the Pavement Engineering Design Presentation Meeting. The Ministry will provide comments within 10 business days of receipt.

Two (2) digital copies, on contract plates in AutoCad format, and three (3) 11”x17” hardcopies of the final soils profiles shall be submitted with the Pavement Design Report. All copies of soils profiles shall be signed and sealed by a member of the Service Provider’s Pavement Engineering team who is a Professional Engineer licensed in the Province of Ontario.

Recommendations and Pedological sketches shall **not** be placed on soils profiles. The following items shall be shown:

- The information block shown in the PROVINCIAL PAVEMENT ENGINEERING INVESTIGATION GUIDELINES appendix;
- Original Ground Line;
- Approved Design Profile Grade Line;
- Centreline culvert sites, if known;
- Location of test holes along centreline (or as near to C/L as practical);
- Location of offset test holes, including offset distance and elevation difference in relation to the centreline elevation (Datum), offset hole information shall be provided as a notation, placed on the profile as close as possible to the station where the holes were drilled;
- Bedrock line and swamp limits. All information, including Pedological sketches, shall be used to determine rock line and swamp limits;
- Soils Types encountered along centreline;
- Boundaries between soil strata encountered along centreline. The boundaries may be delineated either by line profile or Strata Plot;
- Estimated degree of consistency or denseness of the soils, in-situ;
- Ground water levels encountered in test holes at the time of the soils investigation;
- Laboratory test results, soil frost susceptibility, and erosion potential (K-factor). Laboratory testing, frost susceptibility, and K-factor data should be provided in table format and placed on the profile as close as possible to the station that the soils sample was taken.

The Soils Profile shall be prepared on Contract Plates using AutoCAD. The information shall be placed on the profiles in layers. Separate layers shall be used for:

- Original ground line;

- Design profile grade line;
- Culvert sites;
- Location of test holes;
- Bedrock line and swamp limits;
- Soils types, estimated soils consistency or denseness, groundwater levels, laboratory test results, relative frost susceptibility, and erosion potential.

7.9.4 Reference Documents

The following information is available for viewing at the area Geotechnical Section by appointment only:

Contract Number	Work Project Number	Type of Work	Pavement Design Report	Foundation Design Report
79-095	*123-75-00*	*GDGB &HMP*	*PD Report Tony 1976 Supplemental Bill 1977*	*Joe 1976*

- Information pertaining to aggregate sources in the Ministry's Mineral Aggregate Database.
- Preliminary Geotechnical Recommendations, **if available.**
- Pavement Performance Records (PPR) will be provided to the successful proponent.
- Provincial Pavement Engineering Investigation Guidelines, Version 2.1
- *Northeastern Area Pavement Design Practices and Guidelines (1997 05 20) – available upon request.*
- *Northwestern Area Pavement Design Thickness Chart.*
- *Northwestern Area Geotechnical Investigation Minimum Requirements.*
- Ministry of Transportation Report *"Procedures For Estimating Traffic Loads For Pavement Design, 1995".*
- Ministry of Transportation Materials Information Report MI-183 *"Adaptation and Verification of AASHTO Pavement Design Parameters for Ontario Conditions".*
- MTO Pavement Design and Rehabilitation Manual.
- Ontario's Default Parameters for AASHTOWare Pavement ME Design Interim Report.
- Falling Weight Deflectometer (FWD)Testing Manual, MERO-053.
- Ministry of Transportation *"Guidelines For The Use of Life Cycle Cost Analysis on MTO Freeway Projects."*
- EMO-030 Report, Recommended Practice for Establishing Rock Elevation for New Highway Construction (May 2008) – available upon request
- Pavement Design Alternatives Data format will be provided to the successful proponent.
- Executive Summary format.

7.10 Surveying & Plan Preparation - N/A

7.10.1 Project Scope

The Ministry requires that a Service Provider, specializing in Engineering Surveys, perform a topographic survey and supply the required digital plans and profiles, horizontal and vertical control information, and digital terrain models.

7.10.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

To support design and analysis tasks performed under this agreement, the Service provider shall perform engineering surveys in accordance with the following requirements.

All surveys and drafting shall be in accordance with the following documents:

- Engineering Survey Manual, January 2016
- AutoCAD Standards Guide Version 2004

The above two references are available for free download from the MTO Library online catalogue:
http://www.mto.gov.on.ca/english/publications/mto-research-library-online-catalogue.shtml

- The AutoCAD/Civil 3D standard template and related files and guideline

The Ministry's customized Civil3D and other CAD standard templates, files and guides can be downloaded from the MTO file application download website:
http://www.xfer.mto.gov.on.ca/PTASapps/index.htm

Project specific requirements:

The service provider shall prepare one B-plan, with accompanying C-plan (Profile) and H&V sheets.

*Plan 1: B-**XXX-XXX-X** and C-**XXX-XXX-X***

Survey coverage for Plan 1 shall begin at station 17+920 on plan B-735-589-5 and continue northerly to 13+700 on plan B-735-589-2.
The stationing shall be continuous from plan B-735-589-5.

HORIZONTAL PROJECT CONTROL

The project will be referenced to **NAD 83 CSRSv6:2010.0** control values provided in the appropriate MTM zone.

See Engineering Survey Manual, January 2016:

- Section 5 - Project Control
- Section 5.2.1 - Accuracy Standards
- Section 5.3.1 - Survey methodology
- Section 5.4.1 - Monumentation Standards

VERTICAL PROJECT CONTROL

The project will be referenced to **Canadian Geodetic Vertical Datum of 1928 (CGVD28)** using the primary vertical control values provided.

See Engineering Survey Manual, January 2016:

- Section 5 - Project Control
- Section 5.2.2 - Accuracy Standards
- Section 5.3.2 - Survey methodology
- Section 5.4.2 - Monumentation Standards

DIGITAL TERRAIN MODEL

See Engineering Survey Manual, January 2016:

- Section 6 - Topographic Detail
- Section 6.2 - Terrain Model
- Section 6.3.1 – Road Features
- Section 6.3.2 – Drainage Features
- Section 6.3.4 - Bridges
- Section 7.1.4 - Digital Terrain Model
- Appendix F - Field Feature Codes

DTM survey coverage shall extend to 5 metres past the existing MTO right-of-way limits.

Additional coverage is required to 10 metres beyond the top of cuts where they extend outside the above limit.

DETAIL

All manmade and topographical features will be detailed within the survey area.

See Engineering Survey Manual, January 2016:

- Section 6 - Topographic Detail
- Section 8 – Site Plans

Topographic detail at Bridges, Structural Culverts, Railway crossings, Pipeline crossings, Patrol Yard Facilities, and Truck Inspection Stations shall conform to the requirements outlined in Section 8, Site Plans (Engineering Survey Manual, January 2016).

ALIGNMENT

See Engineering Survey Manual, January 2016:

- Section 7.1.5 – Alignments

In the case where previous construction contracts have introduced alignment and curve revisions, the revised alignment and curve parameters shall be used (see previous Contract Books).

All spiral curves will be spiralled using an "A" Factor per the MTO standards for Design Speed of *100 kilometres per hour.*

H&V control sheets will be produced using the H&V software utility supplied by MTO, showing the coordinates of, and station/offset ties to all primary and project horizontal and vertical control points, boundary monuments, and alignment intersections. The Horizontal and Vertical Control sheets will be prepared using Microsoft Excel and the files will be named according to the plan number with “hv” added to the beginning of the plan number.

PLAN AND PROFILE

Drawings shall be in Autodesk Civil3D 2013 format.

Each Civil3D file will have a separate DTM and alignment which covers only the area depicted on that particular plan.

Scale will be 1:1000 horizontal and 1:100 vertical.

A Copyright text note (© King’s Printer for Ontario *2017*) will be added to all products below the Title Block.

See Engineering Survey Manual, January 2016:

- Section 7 - Digital Data
- Section 7.1.2 - Plan Specifics
- Section 7.1.6 – Profiles
- Appendix G – Sample CAD Plans

FIELD INSPECTION

See Engineering Survey Manual, January 2016:

- Section 9.2 – Field Inspection Prints

A set of plans demonstrating that a complete and thorough field check has been completed is to be submitted.

MTO OWNERSHIP LIMITS

See Engineering Survey Manual, January 2016:

- *Section 6.3.6 – Legal Survey Monuments*

The ministry will provide AutoCAD drawings containing georeferenced MTO ownership limits which the Service Provider will insert into the new B-Plan drawings.

The Service Provider shall tie-in all the existing right of way monuments to aid in generating the horizontal alignment. MTO P-Plan and non-MTO plan mark ups of found and missing monumentation shall accompany each relevant B-Plan submission.

Using the information provided by MTO, the Service Provider shall label the MTO ownership limits with the defining P-plan number.

LEGAL SURVEY MONUMENT PROTECTION

MTO has experienced significant damage to right of way monuments due to construction. In an effort to minimize this damage, the Service Provider must supply and erect marker posts at all survey monuments found on the existing highway right of way limits or monuments that witness the highway right of way limits unless conditions (such as parking lots, residential areas, farm fields) make it impractical or unsafe.

A marker post may be excluded if it will be within 3m of another marker and a marker stake may be used instead. A marker post that is found damaged or in poor condition shall be replaced by the Service Provider.

The ministry has previously located right of way monuments and placed plaques and delineator posts at monuments at a minimum collection rate of approximately 4 monuments per km.

Legal Survey Monument Marker Post

A marker post shall consist of a 1” sq galvanized tube delineator post x 7’ long together with a yellow 7” x 9.5” polyethylene plaque as shown below. Plaque must be securely attached to the post using two 1/8” diameter 0.313” – 0.375” grip range stainless steel rivets and two # 5 0.140” x 0.438 “ stainless steel flat washers.

The post shall be firmly planted 0.30m (1’) inside the highway right of way from the monument measured perpendicular to the boundary such that the plaque is installed facing the highway centreline. The tube shall be driven 0.91m (3’) into the ground so that the top of the tube is 1.22m (4’) above the surface of the ground. In bedrock, the tube shall be cut to no less than 1.37m (4.5’) and firmly driven or cemented no less than 0.15m (0.5’) into the bedrock so that the top of the tube is 1.22m (4’) above the surface of the bedrock.

The ministry will provide information about known material suppliers upon request.

STAKING

See Engineering Survey Manual, January 2016:

- Section 10 - Stakeout

The Service Provider must stake out the approved alignment in the field.

Yellow Traffic Marking Paint is to be used and will be applied by brush on the existing paved surfaces.

Alignments are to be painted on the edge of the westbound lane at a consistent offset on Highway 11.

PAVEMENT MARKINGS

Pavement Marking Detail Notes will be recorded after the approved alignment has been staked. The notes will include size, colour, location (station) and type of all pavement markings within the project area.

OPERATIONS NOTIFICATION

The Service Provider shall forward details of their planned field activities to the Manager, Operations **<NAME (EMAIL)>.**

If there is any change to the Service Provider's planned field activities, the Service Provider shall notify the Manager, Operations of the nature of the changes. The Geomatics Project Manager, **<NAME (EMAIL)>,** shall be copied on all correspondence regarding the above procedures.

PERMISSION TO ENTER

Every effort must be made by the Service Provider to obtain permission from the property owner, prior to entering onto privately owned property for the purposes of obtaining pre-engineering survey data. The Service Provider must clearly inform the property owner that the purpose of the survey is only to update our existing engineering plans information with no immediate effect on the existing highway right of way limits.

See Engineering Survey Manual, January 2016:

- Section 3.3 - Public Relations

ROW STAKING

The Ministry requires that the Service Provider have any new MTO boundaries or limits staked in locations where a utility is being relocated. This shall be performed by an Ontario Land Surveyor. The timing will be determined at the project's mandatory Utility Coordination Meeting. This work is to be completed one time only.

Unless specified otherwise, stakes are to be placed at existing monuments on the new MTO boundary.
It is the Service Provider's responsibility to research and supply all survey plans and other documents.
The Service Provider shall supply and use 2"x2"x4' wooden stakes for the ROW staking.

The service provider shall supply a written report, signed by the Ontario Land Surveyor and delivered to the MTO Project Manager, detailing the dates when the staking was performed,

and all issues encountered including missing survey bars and encroachments across the boundary that was staked.

In the event that the requirements of the Terms of Reference conflict with the Standards or Manuals listed above, the Terms of Reference for this specific project shall govern.

7.10.3 Deliverables

See Engineering Survey Manual, January 2016:

- Section 5.6 - Project Control Deliverables
- Section 6.1.1 - Field Notes
- Section 7.1.5 – Centreline Offset Reports
- Section 9 - Other Deliverables

The deliverables for this project will include:

- Proposed Schedule
- Progress reports (every two weeks during surveying and plan preparation)
- Project Specific Supplementary Quality Control Plan (submitted through RAQs)
- Occupational Health and Safety Plan
- Traffic Protection Plan
- …

Upon completion of field surveying and plans processing, *at the Engineering Survey Information key milestone date <OR> in advance of utilization of survey data for highway engineering Detail Design purposes*, the Service Provider shall submit the following:

- Digital file of least Squares adjustment Input and Output Files **or** Site Calibration/ Local Transformation raw data files including sketches and adjustment reports
- Civil3D 2013 files for all plan submissions
- H&V digital file for all plan submissions in Excel format
- All raw data files from the topographic survey
- All field survey notes, including traverse/network sketches, data capture notes
- Fly level notes
- Centreline station offset reports demonstrating goodness of fit of the alignment with each B-Plan submission.
- Pavement Marking Detail Notes
- MTO P-Plan and other non-MTO legal Plan mark-ups of found, missing and disturbed monumentation
- A set of plan mark-ups showing the Service Provider has completed a Field Inspection
- **…**

Three milestone reports are required:

- The Survey Report (Section 9.4.2, Engineering Survey Manual, January 2016) The Data Processing and Drafting Report (Section 9.4.3, Engineering Survey Manual, January 2016)
- The final Quality Control Report table indicating quality assurance activities with

appropriate sign offs

7.10.4 Reference Documents

For estimating purposes, the Ministry will provide the Service Provider with the following:

- Project location map
- MTO Legal Plans and Documents
- Non-MTO Legal Plans adjacent to MTO Right of Way, where available
- *AutoCAD drawings depicting ownership limits*
- Primary Horizontal and Vertical Control Points throughout the project limits
- Historic Contract Books
- Existing Engineering Survey Plans
- …

See Engineering Survey Manual, January 2016:

- Appendix D – Items that may be supplied by MTO for Assignments

The accuracy or completeness of any data supplied shall be verified by the Service Provider.

7.11 Traffic Engineering - N/A

7.11.1 Project Scope

The Service Provider shall conduct and document a detailed traffic design within the study area. The traffic design shall include, but not be limited to, the following:

- traffic management plan
- signing and pavement marking requirements
- construction access/egress
- construction staging/detours
- geometric, operational and safety improvements
- guide rail requirements
- review of applicable documents (including available correspondence and the Preliminary Design Report)
- *Traffic data collection*
- *Collision analysis*
- *Temporary traffic signals*
- *Permanent traffic signals*
- *Roundabouts*
- *Illumination requirements*
- *Traffic counting stations*

7.11.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Refer to the Note to User document for draft qualifications. Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

This Terms of Reference is to be read in conjunction with the Preliminary Design Report and Draft Design Criteria to be provided to the successful Service Provider.

See Section 1 of this RFP document for additional project details.

Additional requirements related to Traffic Engineering may be included in Section 7.4 (Electrical Engineering) and Section 7.8 (Highway Engineering) of this RFP document.

The Service Provider shall review all existing correspondence related to public complaints and concerns, and consult with the Ministry's Area Office staff regarding operational and safety concern areas. A copy of existing correspondence will be provided to the successful Service Provider.

The Service Provider shall confirm all appropriate Special Provisions (SP) and Non-standard Special Provisions (NSSP) are included as part of the Contract Package/Tender Documents.

Ministry Standards and Area Policies and Practices

The Service Provider shall undertake all works for this discipline in conformance with the following Ministry standards and area policies and practices (the latest publication or release) including but not limited to:

- Geometric Design Guide for Canadian Roads
- MTO Geometric Design Supplement
- Ontario Traffic Manuals (OTM) Book Suite
- Roadside Design Manual
- Roadside Evaluation Manual
- MTO Traffic Data Collection and Processing Procedures and Standards
- Sign Support Manual
- Guideline for Operational Performance Reviews
- Traffic Management Guidelines for Structure Rehabilitation projects
- Traffic Control Signal Timing and Capacity Analysis at Signalized Intersections
- Portable Temporary Traffic Signals Policy
- Commercial Site Access Policy and Standards Manual
- Full Road Closures Policy
- Operational Analysis of Roundabouts Guidelines
- Roundabouts: An Informational Guide (FHWA Publication) w/appropriate Highway Design Bulletins
- Applicable Ministry and area Standards, Policies, Directives and Guidelines

For any deviation of Ministry standards and area practices, the Service Provider shall provide recommendations and rationale for Ministry acceptance.

The Service Provider shall employ AutoCAD Standards complying with the requirements as indicated elsewhere in the Agreement.

Traffic Data

Available traffic data, as listed in Section 7.11.4, will be provided to the successful Service Provider.

All raw traffic data collected and processed for this project shall be provided to the Ministry as per the applicable Guidelines. The Service Provider shall format all data as per Ministry standards.

Collision Analysis

The Service Provider shall reference the Preliminary Design Report for collision data and collision analysis.

Roadside Safety

The Service Provider shall review all roadside safety findings and recommendations detailed in the PDR to confirm they remain appropriate. The Service Provider shall identify any changes required to the recommendations in the PDR. If necessary, the Roadside Evaluation Manual shall be utilized to determine benefit/costs for identified changes.

Elimination of guide rail through slope flattening shall be the preferred method of disposing of excess material.

The Service Provider shall undertake a Safety Improvement Benefit/Cost Review to assess the safety benefits and evaluate alternative countermeasures within the context of the project utilizing Traffic Engineering Software (TES) and applying the Highway Safety Manual methodology, and available data, provided by the ministry. A summary of the review shall be provided.

Permanent Signing & Pavement Markings

Signing includes both the sign and the sign support structures (ground mounted signs, overhead, cantilever and bridge-mounted type sign support structures).

The project includes all temporary and permanent signing. Temporary signing requirements are further detailed in the Traffic Management Plan Section.

The Service Provider shall review the Preliminary Sign Layout recommended in the Preliminary Design Report with the work proposed in the Detail Design. Any changes to the Concept Plan shall be documented, justified and submitted to the Ministry for review.

<u>Existing Conditions</u>

The Service Provider shall provide a detailed sign inventory of all existing signing within the project limits. The Service Provider shall contact the Area Office Sign (Services) Coordinator to arrange a site meeting to review and identify which signs shall be replaced or which signs shall be salvaged and reinstalled based on their condition. The Service Provider shall not rely solely on the existing inventory provided by the Area Office Sign (Services) Coordinator, but shall field confirm the information. The detailed sign information shall include, but is not limited to:

- Sign attributes (size, reference code)
- Location (chainage and offset)
- Message
- Condition of sign and support (appropriate for re-use)
- Support type with dimensions

The Service Provider shall contact the appropriate municipal road authorities to confirm, in writing, the official local road names and the civic address ('911') signing requirements. If the information received indicates a road name and/or civic address change, the Service Provider shall obtain the Municipal Bylaw, Council Resolution or written direction in this regard and forwarded a copy to the area Traffic Section for their records.

<u>Future Conditions</u>

Wording on both permanent and construction identification signing must be Ministry approved. All proposed signing recommendations are to be submitted to the area Traffic Section for review and approval.

The Service Provider shall be responsible for identifying all permanent signing recommendations (including new, relocation, replacement and removals) and provide a summary in a Permanent Signing Table.

The Service Provider shall contact the TOD Sign representative, in writing, to confirm the affected stakeholders are informed of the change in alignment and any changes to access for the businesses.

Final sign design details for aluminum extruded signs will be supplied by the Ministry.

The Service Provider is to review and recommend if any oversized wild animal crossing signs are required within the specified limits

The project includes the design and documentation of all permanent and temporary pavement markings throughout the project Limits. All permanent and temporary pavement markings, including mainline and any connecting roadways, are to be designed in accordance with OTM Book 11 and quantified in the Contract Documents.

The Service Provider shall:

- identify locations where existing markings are not consistent with OTM Book 11 and where they may be contributing to operational problems/concerns.
- provide recommendations to the Ministry regarding modifications or adjustments to the existing pavement markings

- identify the need for any additional pavement markings which may be necessary as a result of proposed or recommended highway improvements
- review and incorporate innovative technologies such as rumble stripes (painted rumble strips), textured markings, glass bead systems, and orange temporary markings (for construction staging) as appropriate.
- recommend the method of pavement marking removal (grinding, soda, water-blasting). The condition of the existing pavement surface and the likelihood of resurfacing shall be considered in the selection process.
- review and recommend all temporary pavement markings throughout the project Limits
- confirm proper sight distance calculations have been completed and documented to establish appropriate passing / no-passing zones (for both permanent and temporary pavement markings)
- *be responsible for identifying all permanent HOT/Managed Lanes sign recommendations including identifying permanent signing recommendations that may be affected (including new, relocation, replacement and removals) and provide a summary in a Permanent Signing table.*
- *provide recommendations to the Ministry regarding HOT/managed lanes or adjustments to the existing pavement markings*
- *identify the need for any additional pavement markings which may be necessary as a result of HOT/managed lanes*

The Service Provider shall be responsible for preparing (permanent) pavement marking drawings at interchanges (from 250 m prior to the start of the deceleration taper to 50 m beyond the end of the acceleration taper) including ramps and terminals and at intersections with auxiliary lanes or traffic control signals and typical(s) for tapers.

The Service Provider shall be responsible for preparing (permanent) pavement marking drawings at intersections with auxiliary lanes or traffic control signals and typical(s) for tapers

The Service Provider shall provide all Signing and Pavement Marking (temporary and permanent) Layout drawings three (3) weeks prior to the 60% meeting for Ministry review. For multi-lane and freeway projects, layouts shall be provided in roll plan for each construction stage.

The Service Provider shall prepare and submit to the Ministry the following items for review and approval:

- Signing and Pavement Marking Layout Drawings (1:1000 scale)
- Temporary/Staging Signing Plan
- Permanent Signing Table
- Sign Details (The Ministry will provide Sign Details for aluminium extruded signs)

Approved Signing and Pavement Marking layout drawings shall be included in the Contract Package.

Two (2) copies of the approved Signing and Pavement Marking layout in roll plan format shall be provided at the Design Package Handover Meeting.

Construction Staging / Detour

The Service Provider shall be responsible for determining all staging, detour and staged improvement requirements. This includes confirming any requirement for temporary traffic control signals and temporary illumination.

The alignment and cross sections of the staging/detour shall be determined based on safety, effectiveness, and cost. The Service Provider shall detail the proposed alignment(s), cross-section(s) and any impacts including property, utilities, environment, delay and disruption to traffic.

All staging/detour options, including construction access/egress, shall comply with clear zone requirements at all times.

The Service Provider shall recommend an optimum staging configuration, including cost estimates, for each location. The Service Provider shall review options for staging/detours and full closures with alternate route selection.

The Service Provider shall analyze, recommend and submit staging/detour drawings for the final design. For detour routes (full closure) that direct traffic onto roads or affect existing traffic on roads not under Ministry jurisdiction, the Service Provider shall include the following in the recommended construction staging information:

- A detour design criteria
- Documentation confirming the detour route option is both viable and appropriate and was included in Public Notices.
- Recommended detour route plans on 1:1000 scale drawings
- Documented notification of the appropriate agencies
- Written approval from the appropriate road authorities for the use of their roads

Refer to the Full Road Closures policy for further details and criteria for full road closures.

Staging & Detour – Traffic Modelling

Using VISSIM or AIMSUN micro simulation software package, conduct Level of Service calculations and assess existing basic freeways and highway segments, weaving sections, ramp and ramp terminal operations under existing conditions and for the construction year.

Calibrate and validate existing conditions.

Micro simulate the construction year conditions in both directions based on information from macro modelling analysis. Conduct evaluation for construction sequencing and staging alternatives including detour routes. The limit of the micro-simulation model shall be discussed and agreed upon at the start of the project but shall extend as a minimum one interchange on both sides from the study limit.

Traffic shall be modelled for, the a.m. and p.m. peak weekday & weekend periods (3 hours/period) or, the time set for the construction staging and detours. The model should provide a reliable estimate of the entire study area operation. The service provider shall

investigate using the model and other tools all possible scenarios to identify and assess all proposed staging alternatives.

Prepare a 3D graphical traffic micro simulation model (VISSIM or AIMSUN) of the freeway within the identified study area to show traffic operations of the various staging alternatives on the selected preferred design alternatives for presentation to MTO Senior Management and display at Public Information Centres.

The simulation model input and output files, assumptions used in the models, calibration results, documentation of any model limitation, and snapshots (with road name labels) and traffic operation summaries of key simulation findings under various scenarios shall be submitted as part of the deliverables.

The traffic operation summaries shall include at a minimum documentation of the average vehicle speed along various sections of the network, travel time, average delay, levels of service, weaving, queuing or slow moving vehicles (due to difficult lane changes) that are observed on the network, etc. under the various scenarios.

All input and output files shall be submitted in both electronic and hardcopy formats for review.

The Service Provider shall include the following in the recommended construction staging design:

- Vertical and lateral clearances maintenance in conformance with the Traffic Management Guidelines for Structure Rehabilitation projects. If this cannot be met, the Service Provider shall propose options to address inadequacies.
- Illumination requirements, when required
- Temporary traffic signals requirements, when required
- Road user benefit/cost analysis
- A queue and delay analysis/study to identify impacts during summer and non-summer weekdays and weekends. From this, traffic impacts associated with SP 100F08 recommendations and staging/detours shall be detailed.

The staging/detour alternatives shall be submitted for Ministry review three (3) weeks prior to the 30% meeting.

Traffic Management Plan

The Service Provider shall prepare a detailed Traffic Management Plan for the recommended staging/detour designs. The purpose of this Traffic Management Plan is to:

- Provide safe and adequate traffic management requirements that are to be included in the construction tender documents.
- Determine the impact of any staging schemes for the safe and efficient movement of traffic
- Aid in the selection of staging schemes that will safely and adequately facilitate efficient operations without creating undue delay to the travelling public.

- Aid in proposing methods to inform the travelling public, emergency response agencies and other stakeholders of the potential impacts of the recommended staging/detour design.

The OTM Book 7 shall be used, as a minimum, to plan and implement all traffic management in this project. The Ministry has traffic management and incentive/disincentive SPs and NSSPs, which are specific for each area and shall be incorporated into the Traffic Management Plan.

The Service Provider shall use the Temporary Conditions Traffic Management Manual when designing Detour Route Markers for all 400-series highways, the QEW and highways with a posted speed of 90km/h or higher. For highways with a posted speed below 90km/h Detour Route Markers are to be designed in accordance with OTM Book 7

Highway XX shall be considered Freeway status as per OTM Book 7.

The Service Provider shall provide recommendations for the need of reduced regulatory speeds at work zone locations. For each recommended location, the Service Provider shall detail the following:

- Limits of the regulatory speed reduction (Stations).
- Justification / reasoning for the speed reduction.
- Construction operations when the speed reduction would apply.
- Any additional conditions where the speed reduction would or would not apply.
- Any anticipated impacts.

The Service Provider shall make provisions for vehicle access to be available to all ramps, acceleration / deceleration lanes, entrances (including commercial and private) at all times during construction and shall identify this requirement in the detour/staging drawings in the contract documents.

As appropriate, the Service Provider shall complete Temporary Sign Layout plan and Temporary Pavement Marking drawings for all staging/detour locations. The Temporary Sign Layout plan and Temporary Pavement Marking drawings shall be submitted to the Ministry for review and approval.

The Service Provider shall identify all existing signs (including ground mounted, overhead, electronic) that need to be modified or relocated to accommodate staging or the highway works.

It is anticipated Portable Variable Message Signs (PVMS) will be required for this project. The Service Provider shall determine the number and location of such signs as part of the Traffic Management Plan.

This Traffic Management Plan shall include the appropriate provisions to minimize impacts and delays to the travelling public within the work site. The Plan shall include, but not be limited to:

- Final staging/detour drawings
- Temporary Sign and Pavement Marking layout drawings
- Temporary Advance Information Signs, (TC-64) wordings and location plan

- Special provisions (SP)
- Non-standard special provisions (NSSP)
- Advance notification strategies (via additional signing, media / communications plans, other innovative methods)
- *Traffic Control Plan (e.g. final staging/detour drawings, signing plans, special provisions, etc.)*
- *Communication Plan (e.g. advance notification strategies via signing, media, etc.)*
- *Contingency Plan (in event work or traffic management strategy doesn't go as planned)*
- *Incident Management Plan (strategy for emergency situations)*
- *Monitoring / Performance Measurement Plan*
- *Implementation Plan*

At a progress meeting, the Service Provider shall make provisions for the Traffic Management Plan to be discussed and the appropriate documents to be reviewed. The Traffic Management Plan shall be presented to Head, Construction, Area Manager, Construction, Head of Project Delivery, and Head of Pre-Contract Traffic Engineering a minimum of one (1) month prior to the Final Design (60%) Team Review meeting for comment and acceptance. Hard copies of the draft documents are to be submitted, for all meeting attendees, to the ministry three (3) weeks prior to the progress meeting date to allow time for review and comment

Two (2) copies of the accepted Traffic Management Plan shall be provided, one (1) to the area Traffic Section and one(1) to the Ministry Project Manager.

Permanent Traffic Signals

The Service Provider shall review the Permanent Traffic Control Signal requirements as presented in the PDR with the proposed work generated from Detail Design. If changes in the Permanent Traffic Control Signal requirements in the PDR are required the Service Provider shall identify and recommend such changes.

Intersections where roundabouts were recommended in the PDR shall be reviewed with the proposed work generated from Detail Design. The Service Provider shall be responsible to complete all revisions in accordance with Ministry Standards and area Practices.

OTM Book 12, HCM Methodology, HCS 2010, SimTraffic and Synchro 10 shall be used to develop the signal timing. All recommendations shall be in accordance with Ministry Standards and area Practices.

The Service Provider shall conduct a queue/delay analysis to identify impacts the proposed traffic control signals will have during summer and non-summer weekdays and weekends.

For each signal location, the Service Provider shall be responsible to determine the appropriate phasing and timing requirements and to prepare all final Traffic Control Signal Legal Drawings (PHM-125).

The Service Provider shall prepare and submit a finalized plan which depicts the recommended geometric improvements and final traffic control signal design for Ministry review. The final

traffic control signal design shall include geometric requirements such as taper, parallel and storage lane dimensions.

For each permanent traffic control signal installation the Service Provider shall submit the following to the Ministry for review and approval six (6) weeks prior to the 60% meeting:

- Three (3) copies (hard copy) of Final Draft PHM-125 Drawings (1:500 scale)
- A digital copy to scale in AutoCAD (DWG) Format on CD
- Proposed Traffic Control Signal phasing, timing, and detector assignments

In addition to requirements as outlined elsewhere in the Agreement, the Service Provider shall submit the materials as described below to the Ministry subsequent to the Final Electrical Design Presentation Meeting

The Service Provider shall submit the following three (3) weeks prior to the 90% meeting for each permanent traffic control signal installation:

- ***XX(i.e. Five)XX (X(i.e. 5)X)*** copies of the Final PHM-125 Drawings (1:500 Scale)
- One (1) copy of the Final Electrical Drawing(s) to be forwarded to the area Traffic Section
- A digital copy to scale in AutoCAD (DWG) Format on CD
- Recommended Traffic Control Signal phasing, timing, and detector assignments
- Input and output files of the SimTraffic / SYNCHRO analysis of the recommended signal control

Temporary Traffic Signals

The project includes the detail design of temporary traffic control signals for areas utilizing long duration single lane (one-lane/two-way) construction staging, existing signalized intersection construction staging, bridge rehabilitation (one-lane/two-way) or anywhere else temporary traffic signals are required for construction

The Service Provider shall be responsible for determining temporary signal phasing/timing requirements and other operational considerations, i.e. time-of-day, actuation, etc. The proposed signal timings and associated calculations shall be provided to the area Traffic Section for review.

The temporary traffic control signals will be operated and maintained by the Contractor during the course of construction. The electrical contractor will be responsible for supply of traffic signal controller appropriate for timing and operations identified by Service Provider. The traffic signal controller must be able to accept any revisions to the signal timing that may be required during construction. All recommendations shall be in accordance with the Ministry Standards and area Practices.

The Service Provider shall determine if the signals should be operated as actuated or on fixed time. As part of the work, the Service Provider shall investigate if any auxiliary signal heads, advance flasher beacons and down lights are required at the site. Other operational

considerations such as actuation, time-of-day plans, active advance warning, progression, signing, etc. shall also be discussed and detailed.

The following locations will require temporary traffic control signals:

- *[Insert the List] (Include Station + Offset)*

The Service Provider shall conduct a queue/delay analysis to identify impacts the proposed temporary traffic control signals will have during summer and non-summer weekdays and weekends.

Review the need to integrate the existing permanent traffic signals with the recommended temporary and permanent traffic signals. Provide recommendations regarding the parameters of each traffic signal.

Conduct a review to determine if the temporary traffic signal at <Intersection Location> can operate independently from the existing traffic signal network.

The "Temporary Electrical Work" item for the temporary traffic signals shall be detailed in the Contract Package. All signal heads shall be mounted on span wire with a mounting height of 5.8 m. If portable temporary traffic signals (PTTS) are being considered, the Service Provider shall provide a benefit/cost analysis and justify the use of PTTS with reference to the appropriate Ministry standards and policies. The Service Provider is advised that PTTS are only permitted for use from April to November.

For each temporary traffic control signal installation the Service Provider shall submit the following to the Ministry for review and approval six (6) weeks prior to the 60% meeting:

- Three (3) copies (hard copy) of Final Draft PHM-125 Drawings (1:500 scale)
- A digital copy to scale in AutoCAD (DWG) Format on CD
- Proposed Traffic Control Signal phasing and timing

In addition to requirements as outlined elsewhere in the Agreement, the Service Provider shall submit the materials as described below to the Ministry subsequent to the Final Electrical Design Presentation Meeting.

The Service Provider shall submit the following three (3) weeks prior to the 90% meeting for each temporary traffic control signal installation:

- ***XX(i.e. Five)XX (X(i.e. 5)X)*** copies of the Final PHM-125 Drawings (1:500 Scale)
- One (1) copy of the Final Electrical Drawing(s) to be forwarded to the area Traffic Section
- A digital copy to scale in AutoCAD (DWG) Format on CD
- Recommended Traffic Control Signal phasing and timing
- Input and output files of the SYNCHRO analysis of the recommended signal control (if applicable)

Roundabouts

Additional information may be available elsewhere in this Agreement.

The Service Provider shall review the design of all roundabout locations as provided in the PDR to verify the recommendations remain appropriate. This review shall also include verifying if the designs of the roundabouts comply with current Ministry policies and standards and existing conditions. Any changes to the recommendations from the PDR shall be documented and a Peer Review (as described below) shall be completed.

The key individual identified to undertake the design of the roundabout (Roundabout Service Provider) shall be qualified in RAQS under the specialty Roundabouts.

The Operational Analysis of Roundabouts Guidelines shall be applied to determine if microsimulation is required for roundabout operational analysis. If micro simulation is not required, operational analysis shall be performed using ARCADY 7. Upon completion of the analysis, all input and output files shall be forwarded to the Traffic Section in digital format (electronic files that can be accessed and processed by AIMSUM/VISSIM and/or ARCADY 7).

A Peer Review shall be completed for each proposed roundabout design. The Peer Review Service Provider shall be independent from the Roundabout and Prime Service Providers and be qualified in RAQS under the specialty Roundabouts or the Peer Review Service Provider shall have the following qualifications:

- must be independent from the Roundabout and Prime Service Providers
- demonstrated successful experience as Peer Review Lead in similar projects
- at least ten (10) years of verifiable North American experience with designing roundabouts.
- at least five (5) years of verifiable Canadian experience on roundabout design
- *at least three (3) projects that include single-lane roundabouts and low speed approaches.*
- *at least three (3) projects that include multi-lane roundabouts and higher speed approaches.*

The Peer Review includes a detailed review of design assumptions, signage, markings, anticipated operations, etc. by a firm specializing in roundabout design with appropriate experience. All correspondence and comments with the Peer Review Service Provider shall be copied to the Ministry. Upon completion of the Peer Review, the Peer Review Service Provider shall provide confirmation that all roundabouts designed meet all Ministry standards and requirements, in writing, with a copy forwarded to the Ministry.

All drawings submitted shall include, but not be limited, to the following:

- geometric design elements (i.e. taper lengths, lane dimensions/arrangements, inscribed circle diameter (ICD), weaving lengths, angle of entry)
- north point
- road names
- illumination
- pavement marking layout
- signing layout (station & offset)
- sidewalks and pedestrian crossing locations.

- splitter island location
- landscaping items
- dropped curbs, etc.

The following items shall also be considered and discussed:

- Sight distance and visibility requirements.
- Operational requirements.
- Pedestrian Requirements – Number and location of crossings, curb depressions, and padding requirements.
- Lane configurations.
- Service Provider may be required to carry out speed studies.
- Lane markings must be implemented according to the Ontario Traffic Manual and applicable Ministry Policies.
- Splitter island location, landscaping, dropped curbs etc.

The Service Provider shall provide public education regarding the proper operation of the roundabout(s) as part of a Public Information Centre (PIC) in addition to the requirements described elsewhere in this Agreement. Examples include, but not limited to:

- Effective use of media to educate the general public
- Provide a Public Education Information Session (As part of PIC)
- Provide and maintain a public website during the design phase for information about roundabouts and its correct usage. The Service Provider shall design and maintain the website to allow its migration to a governmental website at a later date.
- Brochures and printed material for distribution to the area residents and businesses.

The Service Provider shall compile a Roundabout Evaluation Report in compliance with current Ministry policies and procedures. The Report shall be presented to the Ministry's Roundabout Implementation Team at 30% and 60% of the detail design phase. Copies of the report and any presentation materials shall be submitted to the area co-ordinator 2 weeks (10 working days) in advance of the Roundabout Implementation Team meeting date to allow time for review and comment.

The Service Provider shall submit the following to the Ministry for review and comment six (6) weeks prior to the 60% meeting for each roundabout location:

- Three (3) copies (hard copy) of Final Draft Roundabout drawing (1:500 Scale)

The Service Provider shall submit the following to the Ministry for review and comment three (3) weeks prior to the 90% meeting for each roundabout location:

- Final Roundabout Drawings
    - One (1) copy (hard copy) at 1:1000 Scale
    - One (1) digital copy in AutoCAD (dwg) format on CD (1:1 Scale)

- Other Deliverables
  - One (1) hard copy of Final Electrical Drawings
  - One (1) hard copy of the Input and outputs of all analyses
  - One (1) electronic copy of the Input and outputs of all analyses on CD

All required elements for the roundabouts, including detailed drawings, shall be included in the contract package.

Illumination Requirements

The Service Provider shall:

- review the illumination requirements in the Preliminary Design Report (PDR) with the proposed work generated from Detail Design
- identify and provide recommendations of any changes in the illumination requirements detailed in the PDR

The scope of work related to changes or additions to recommendations in the PDR include identifying, analyzing and recommending locations within the study limits which warrant illumination (partial, full, or temporary). This may include:

- upgrading existing illumination
- installation at additional locations to achieve partial or full illumination
- temporary illumination for staging, detour, traffic management, and construction access.

The Service Provider shall also refer to Section 6.5 (Electrical Engineering) for additional information and requirements.

The project includes the detail design of Temporary Illumination at all decision areas within and approaching the construction zone.

The Service Provider shall provide a detailed justification, benefit/cost analysis, and a detailed construction cost estimate for each recommended illumination treatment. All appropriate provisions shall be included in the contract package.

The municipality owns the existing mainline illumination through the ***town (or village).*** *The Service Provider shall confirm that no improvements are warranted based on current Ministry policy.*

Prior to the 30% design completion, the Service Provider shall submit the illumination recommendations with all supporting work sheets and documents to the Ministry for review and approval. A minimum of three (3) weeks shall be allowed for this review and approval process.

The Service Provider shall submit to the Ministry final recommended design drawings for:

- full and/or partial illumination upgrades;
- permanent illumination at lane transitions, signals, etc.;
- temporary illumination required for traffic staging.

Highway Geometrics

Refer to Highway Engineering Section.

Guide Rail

All existing guide rail shall be reviewed to identify any safety concerns and documented in a detailed report as outlined in the Highway Engineering component of this assignment. Any locations that have been identified in the operational and safety review must be included in the Guide Rail Report and provide a summary of findings. Also refer to the Roadside Safety Review Section.

All locations being recommended for upgrades or new installation must be justified due to operational or safety concerns.

One (1) copy of the Guide Rail Report shall also be submitted to the area Traffic Section for review and comment prior to finalizing. One (1) copy of the Final Guide Rail Report shall be submitted to the area Traffic Section.

Rumble Strips

The Service Provider shall review existing shoulder, transverse and/or longitudinal rumble strips within the project limits.

In accordance with Ministry Standards and area Practices, the Service Provider shall make recommendations regarding new installations, removal of existing, and replacing in-kind by utilizing a benefit/cost analysis.

Operational Impacts

The Service Provider shall review all the findings and recommendations regarding operational impacts in the PDR remain appropriate. The Service Provider shall identify any changes required to the recommendations in the PDR.

The Service Provider shall analyze all alternatives (including staging alternatives) ensuring proper sight lines and safety measures based on benefit/cost analysis (i.e. Operational Performance Review Guidelines).

Traffic Count Stations

The Service Provider shall review the location and type of existing count stations and report to the area Traffic Section if replacement or additional Traffic Count Stations are required to be installed as a result of the highway works. The area Traffic Section will review the findings and provide guidance on the location of new Traffic Count Stations. All Traffic Count Stations shall be installed according to Ministry Standards and area Practices.

The Service Provider shall review the locations of new traffic count stations and loops in the PDR and provide recommendations if changes are required.

The Service Provider shall review and document all drawings and items necessary to reinstate the Permanent Data Collection Station (PDCS). This includes confirming any requirements related to loops, ducts, MH, HH, wiring, controllers, modems, power supply and surge protection ***<PDCS Station name>***

Permanent Roadway Pavement Markers

The Service Provider shall:

- Review and document the location of existing permanent roadway pavement markers (PRPM) to be removed.
- Recommend locations for PRPM reinstatement. All recommended locations to install PRPM shall include:
    - Detailed justification of the use of PRPM
    - Location (station & offset)
    - Colour
    - Quantity

The Service Provider shall submit a list of recommended PRPM installations for inclusion in the Contract Package to the Ministry at the 60% Meeting.

Commuter Parking Lots

The Service Provider shall review existing commuter parking lot(s) and identify any deficiencies with respect to signing, parking lot operation/location and accessibility parking requirements and identify potential locations for new commuter parking lots at Highway Interchanges within the project Limits. Integration with local transit within the proposed locations shall be considered and analyzed.

7.11.3 Deliverables

- Traffic volume projections (mainline, side road and turning movement counts, etc.)
- Operational improvement recommendations: permanent/temporary traffic signals, signing, pavement marking, geometric improvements, etc.
- Roundabout Evaluation Report
- Temporary and Permanent PHM-125 drawings
- Recommendations for traffic staging and detouring strategies for roadway, structures
- Recommendations for illumination requirements
- Recommendations on traffic counter loop placement.
- Plans showing recommended strategies and typical sections.

7.11.4 Reference Documents

The following information will be provided to the successful Service Provider and if additional data is required, it is to be collected as described in Section 7.11.2 (Traffic Data):

- Projected sectional traffic volumes (5, 10, 20 year)
- Design hour volumes (DHV), AM & PM peak hour volumes, % commercial
- Collision data
- *Preliminary Design Report / Traffic Operations and Safety Report*
- *Turning movement / side road volume counts*
- *latest AWD and hourly volumes for ramps and side roads;*

- *directional split*
- *inventory counts*
- *Freeway Traffic Management System (FTMS) hourly mainline counts on* ***XX, year1-year2***
- *Existing Traffic related correspondence*
- *HOV Study*

Only the successful Service Provider will be allowed access to hard copy collision reports of Highway **XXX** at the Ministry located at the MTO's **XXX** at a time and date convenient to both parties. The Ministry will provide suitable access and workspace for the Service Provider to retrieve data from the collision reports. At no time will the Service Provider be allowed to photocopy or otherwise remove original copies of the hard copy collision reports from the Ministry.

7.12 Value Engineering - N/A

7.12.1 Project Scope

7.12.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

7.12.3 Deliverables

7.12.4 Reference Documents

7.13 Property/Corridor Management - N/A

7.13.1 Project Scope

7.13.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

7.13.3 Deliverables

7.13.4 Reference Documents

7.14 Constructability Review - N/A

7.14.1 Project Scope

Proponents shall provide a Constructability Review Plan for this project. The Plan shall include approach, methodology, staffing, schedule, site investigation and deliverables. Proponents shall demonstrate that they have the professional knowledge, capability, commitment and expertise to deliver a quality design that is buildable, cost-effective, biddable, and maintainable. Proponents shall provide a level of understanding and problem solving that will be used to identify potential areas for the Constructability Review. The Proponents shall demonstrate and confirm how all the necessary tasks to successfully perform the Constructability Review will be carried out.

7.14.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

Proponents shall carry out the following types of Constructability Reviews for this project:

- Internal (Service Provider) Review at 30% Completion Stage
- Internal (Service Provider) Review at 60% Completion Stage
- External (Contractor) Review at 60% Completion Stage

Proponents shall provide individuals/Team Members with construction related experience in all areas, including Critical Areas, as below:

- Highway and Worker Safety
- Traffic / Staging
- Construction Supervision / Administration (biddability, construction claims, construction delays)
- Scheduling
- Estimating
- Bridge / Culvert Construction
- Temporary / Permanent Drainage
- Foundations
- Pavement / Geotechnical
- ATMS / Electrical
- Utilities

- Environmental

NOTE: *Typically requires a minimum of five (5) years of relevant, proven experience in construction supervision/administration/management projects. The individual has worked on at least three (3) projects of similar size and scope in one or more of the above areas.*

A Service Provider Proposal shall meet the following staffing and schedule constraints for Constructability Review:

- The Team for Internal Review shall not be less than X individuals. For the purposes of an Internal Review, generally one individual expert is required per Critical Area of work. However if available, a Service Provider may provide an individual with expertise in more than one area. A Service Provider may also propose Team Members in other areas as necessary.
- The past experience of the proposed Team Members must be provided as part of this Proposal including project name, description, client, client contact, year, etc.
- The Service Provider shall identify the team Lead / Facilitator for the purposes of Internal Review. The Lead facilitates Internal Review(s) carried out in workshop(s).
    - The Service Provider Project Manager or any member of Design Team shall not be identified as a member of Constructability Review Team.
    - The Service Provider Project Manager will be available to provide any information related to the project and to answer any questions.
    - Ministry Staff shall not be part of a Constructability Review team. However, The Ministry Project Manager may attend to observe the proceedings.
- The Service Provider shall schedule the Constructability Review(s) such that a Constructability Review and all follow up work occur prior to the next scheduled Milestone Review Meeting and/or Design Complete Presentation with the Ministry Staff.
- An External Construability Review shall be carried out at the 60% Stage only, by the contractor staff (list provided by the Ministry).
- A joint Field Visit may be necessary for all those involved in a Constructability Review.
- For External Construability reviews, the Ministry Project Manager shall include a mandatory bid amount for the Service Providers to include in their Proposals.

<u>Schedule</u>

The Schedule in the Proposal shall include, but not be limited to the following dates:

- Design Package forwarded to each Constructability Review Team Member for each Internal Constructability Review specified
- Constructability Review Workshop(s)
- Constructability Review by contractor staff (provided by the Ministry)
- Implementation of Recommendation(s) in the Design Package
- Constructability Review Report (prior to Detail Complete Presentation)
- Others

7.14.3 Deliverables

- Availability of Design Package for Constructability Review(s)

- Constructability Review(s) and Recommendations
- Response/Action by the Service Provider Project Manager
- Provide an overview of each Constructability Review at the subsequent Ministry Milestone Meeting
- Constructability Review Report
- Others

7.15 Engineering Materials Testing and Evaluation Services - N/A

7.15.1 Project Scope

For purposes of this Proposal, "Engineering Materials Testing and Evaluation Services" means all aspects of laboratory and field testing required for Detail Design and the field testing under Area Materials Testing/Quality Assurance Testing Assignments.

7.15.2 Technical Services Required

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

The Ministry reserves the right to monitor and/or inspect laboratory testing facilities and their operations by means of duplicate testing, testing of extra materials and/or observing the testing directly. The laboratories shall provide the Ministry with the necessary access to the facility, equipment and personnel to carry out the monitoring activities.

Where laboratory-testing facilities are required to test audit samples supplied by the Ministry, compensation will be made at the market rate. Laboratory testing facilities shall participate in required correlation programs/proficiency sample testing programs conducted by the Ministry or others, at no cost to the Ministry.

The minimum requirements for laboratories providing materials testing and evaluation services are defined in MTO LS-102 – Minimum Requirements for Laboratories Conducting Engineering Materials Testing and Evaluation Services for The Ministry of Transportation.

7.15.3 Deliverables

The Engineering Materials Field and Laboratory Testing Reference Table (Appendix 1: Forms and Tables, Table 27-4-A) shall be fully completed for each applicable Section and shall include reference to the relevant Specification, Special Provision, Directive or manual that outlines the testing frequency for each test.

7.15.4 Reference Documents

7.16 Additional Biddable Work

7.16.1 Design Support and Liaison during Construction

The Service Provider shall provide Design Support and Liaison during Construction as listed below. If the Service Provider fails to provide the completed Appendix 1: Forms and Tables with total hours and rates for each speciality, this may result in the firm being disqualified.

Design Support and Liaison Hours

{list required services/item headings – number of hours}

The Service Provider is required to provide in their proposal, as section 7.16, the scope of the proposed work for Design Support and Liaison during Construction identified by the Ministry. This time is intended to be used to respond to questions, proposals, concerns and issues brought forward by the Ministry's Agreement Administrator. It is not intended to be used to address and respond to issues arising from errors or omission related to design.

To ensure continuity of design intent and effective resolution of technical issues during construction, the Service Provider shall make available appropriate engineering staff involved in the design of the project to provide support to the Construction Administration Team throughout the construction phase.

Engineering staff shall participate, as required, in the review of requests for information, change proposals, shop drawings, value engineering proposals, claims related to design matters, and the resolution of unforeseen site conditions and technical issues arising during construction.

The Engineering Team shall work collaboratively with the Construction Administration Team to maintain consistency with the approved design intent, support timely decision-making, and facilitate successful project delivery under the MTPM framework. Records of significant engineering support activities and recommendations shall be maintained by the Service Provider and made available to the Ministry upon request.

Design Support and Liaison Site Visits/Meetings

{list required person/specialty – number of Site Visits/Meetings}

During construction, the Service Provider's Project Manager or a Specialty as specified above, as a minimum, shall attend select Site Meetings (as requested and at a location chosen by the Ministry's Agreement Administrator) as well as the Design Package Evaluation Meeting (at a location chosen by the Ministry's Agreement Administrator) upon completion of construction.

Attendance at these meetings shall be in addition to the Design Support and Liaison hours listed above

This will form part of the total lump sum price submitted with the Proposal. The Service Provider will provide total biddable costs as line items in form: Appendix 1: Forms and Tables - Summary of Project Lump Sum Prices for Detail Design.

Structural Engineering

As part of the "Design Support and Liaison during Construction" services, when OPSS 928 (Concrete Removal) will be included in the tender document(s) prepared as part of this Agreement, the {list required Structural Engineering positions} shall assist MTO to:

- Resolve issues related to concrete removal during construction such as:
  - When removal quantities exceed the specified quantities
  - When the sequence of removals is not as per design (example: for staged removals)
- Be available within 24 hours notification for assistance in case of critical issues for 100% of the operation.

As part of the "Design Support and Liaison during Construction" services, when OPSS 905 (Reinforcing Steel Placement) will be included in the tender document(s) prepared as part of this Agreement, the **{list required Structural Engineering positions}** shall be to:

- Review the Shop Drawings for information purposes only

As part of the "Design Support and Liaison during Construction" services, when SSP 999F29 (Dowels in Concrete) will be included in the tender document(s) prepared as part of this Agreement, the **{list required Structural Engineering positions}** shall be to:

- Review of Shop Drawings for information purposes only

As part of the "Design Support and Liaison during Construction" services, when either SSP 999S31 (Requirements for Precast Concrete Bridge Elements) and/or OPSS 909 (Prestressed / Precast Concrete Girders), and/or OPSS 906 (Fabrication and Installation of Structural Steel), and/or OPSS 915 (Overhead Sign Support Structures), and/or OPSS 910 (Post-tensioning System and Operation) will be included in the tender document(s) prepared as part of this Agreement, the **{list required Structural Engineering positions}** shall be to:

- Review Shop Drawings to confirm they are in accordance with the design for information purposes only.

Generally, when unforeseen site conditions arise which would have an impact on the design intent, provide assistance as requested by MTO.

Foundations Engineering

As part of the "Design Support and Liaison during Construction" services, when OPSS 903 (Deep Foundations) will be included in the tender document(s) prepared as part of this Agreement **{list required Foundations Engineering positions}** shall be to:

For driven piles:
- Check that the Contractor is not overdriving the piles
- Check that the Contractor is not damaging the piles during installation

For the monitoring of driven piles:
- Conduct the High-Strain Dynamic Testing or Dynamic to determine the ultimate resistance
- Receive and Check the pile driving records from the Contractor

For the driving to a specified ultimate resistance:
- Check that ultimate resistance was determined as specified in the Contract (using the Hiley Formula and/or PDA) at end of initial driving
- Calculate and establish ultimate resistance
- Measure and Record the set used to determine ultimate resistance for individual pile acceptance
- Obtain the set used to determine ultimate resistance and rebound measurements
- Establish the reference set used to determine ultimate resistance
- Calculate and Establish the achievement of measured ultimate resistance and the design ultimate resistance
- Prior to commencing the high-strain dynamic testing, verify and confirm that all equipment used has been calibrated and calibration certificates have been submitted as per ASTM D 4945
- Conduct the High-Strain Dynamic Testing or Dynamic Formula ***[*F]*** to determine the ultimate resistance
- Submit to the Contract Administrator the preliminary reports of the High Strain Dynamic Testing or Dynamic Formula ***[*F]*** on the same day of the testing to determine the ultimate resistance

For the wave equation analysis:
- Determine energy imparted on pile using the wave equation analysis as required
- Notify Contractor of the execution of the wave equation analysis

For the hammer performance:
- Witness the verification of the hammer performance as specified

For the caisson piles:
- Check that the Contractor maintains the sidewall stability throughout the excavation and concrete placement operation
- Check that soil cave-in into the excavation hole is prevented
- Check the excavation, steel reinforcement installation, and placing of concrete operations, load tests, operations for caisson piles work
- Check that the caissons are drilled to the correct design tip elevation
- Check that penetration and cut off are in accordance with design data
- Check that vertical and batter alignment of the caissons are as specified
- Check the sides and bottom of the excavation hole are as specified
- Check that the caisson bottom is as specified

For the slurry method:
- Check that slurry properties are being tested and verified as specified

- Check that the level of slurry in the excavation is as specified
- Check that any temporary slurry does not negatively impact shaft resistance design requirements
- Check that the temporary slurry is adequately flushed

For the inspection of the excavation
- Check the bottom of excavations
- Use MINI SID, SQUID as specified in combination with a manual probe
- Check the bearing area of the caisson pile prior to the placement of concrete

For the concrete:
- Check that the concrete is placed following inspection of the caisson hole

As part of the "Design Support and Liaison during Construction" services, when OPSS 902 (Excavation and Backfilling) will be included in the tender document(s) prepared as part of this Agreement, the **{list required Foundations Engineering positions}** shall be to:

For the protection systems:
- Check the Protection Systems installation when the Contractor determines its usage is necessary

For the dewatering of the structure excavation:
- Foundation Engineering Specialist to provide oversight for complex dewatering systems

For the excavation for foundations:
- Check founding soil to verify composition and confirm capacity
- Check that loosened material, soft material, boulders and other deleterious material at the foundation base are removed and replaced with suitable compacted material or mass concrete

As part of the "Design Support and Liaison during Construction" services, when OPSS 631 (Pole Foundations) will be included in the tender document(s) prepared as part of this Agreement, the **{list required Foundations Engineering positions}** shall be to:
- Check that the excavation was carried out without causing instability to the base and walls of the excavation

7.16.2 Additional Biddable Work Items

Additional Biddable Work Items will form part of the total lump sum price submitted with the Proposal. The Service Provider will provide total biddable costs as line items in form: Appendix 1: Forms and Tables - Summary of Project Lump Sum Prices for Detail Design.

{list required services/item headings}

During this Assignment these items may be partially or fully removed from the Assignment at the Ministry's discretion.

7.17 Rockfall Engineering - N/A

7.17.1 Project Scope

This project includes Rockfall Engineering design services for all rockfall hazards within the project limits.

The table below lists **high priority rockfall hazard sites** within the project limits:

Site No.	Base Point / Offset	Side	Latitude	Longitude	Comments
A31	*27980 / 6.5*	*E*	*45.09162*	*-78.73814*	- *2 documented rockfalls since 2003* - *machine scaling completed under C 2006-5014*
A32	*27980 / 6.5*	*W*	*45.09166*	*-78.73799*	- *3 documented rockfalls since 2009* - *no records of previous remedial work*

In addition to the high priority rockfall hazard sites noted above, there are numerous low priority and moderate priority rockfall hazard sites within the project limits. A summary table from the ministry's Ontario Rockfall Hazard Rating System (RHRON) database is attached, which summarizes the most recent RHRON data for the project limits. This table lists all rockfall hazards, their respective RHRON rating, their respective location, and other pertinent information.

The Service Provider shall perform all work in accordance with the most recent version of the 'RHRON: Ontario Rockfall Hazard Rating System – Field Procedures Manual (MERO-043)'. The requirements of the RFP shall take precedence in the event of conflict. The RHRON manual specifies minimum requirements. The Service Provider shall complete adequate site inspections and analysis to support recommendations made for the design and construction of this project.

For all rock cuts, moving the rock faces back to meet clear zone requirements or to improve sight distances may be proposed. These factors shall be considered when developing remedial measures.

In general, all newly constructed or widened rock cuts shall be designed in accordance with Northern Region Engineering Directive NRE 2000-204 High Rock Cut Design Guidelines.

7.17.2 Technical Services Required

7.17.2.1 Staffing

Staff to be provided

{include a description of staffing expectations (e.g. experience, technical expertise). Any staffing requirement(s) that would result in disqualification of the proposal if not part of the proponent's submission must also be included in Table 1 Section 1.5.1}

For this Assignment, key technical staff and Project Key Staff for this Specialty shall consist of a qualified rock mechanics engineer(s). A qualified rock mechanics engineer shall consist of Key Personnel registered in the Ministry's RAQS for the 'Rockfall Hazard Inspection, Evaluation and Design' Specialty or a Professional Engineer licensed in Ontario with a minimum 10 years professional engineering experience in rockfall hazard assessment and rock slope remediation. The Professional Engineer shall provide four (4) references for projects of similar scope and complexity completed successfully within the last ten (10) years

For this Assignment, site inspections and detailed hazard mitigation design services shall be completed by key technical staff and/or Project Key Staff.

The Rockfall Hazard Investigation and Design Report (the "*Design Report*") shall be prepared by key technical staff or Key Staff for this Specialty. The Design Report shall be reviewed by Key Personnel registered in this Specialty.

The Service Provider shall have the individual that prepared the Design Report attend appropriate internal technical review meetings. The individual that prepared the Design Report is responsible for confirming that the recommendations in the report have been properly interpreted and incorporated in the contract package.

7.17.2.2 Meetings

Project Key Staff for this Specialty shall attend as a minimum the following meetings:

Project Start-up Meeting

The project Start-up meeting shall be attended to make certain there is a clear understanding of the project and Ministry expectations for the assignment.

Background information related to rockfall hazards within the project limits will be provided to the successful Service Provider. If available, background information will include RHRON database excerpt, rockfall incident reports, historical construction documents, photographs, and past evaluation and design reports.

Progress Meeting

A project progress meeting shall be attended when site inspections are completed. The intent of the progress meeting is to present the results of the inspection, potential areas of concern,

viable rockfall mitigation design alternatives, and potential constructability issues. The Service Provider shall invite the ministry Geotechnical representative to this meeting. To expedite the schedule, the Service Provider may as an option provide the aforementioned information by email or teleconference.

Design Team Review Meeting

The Design Team Review Meeting shall be attended in order to respond to any questions related to rockfall engineering. Prior to delivery to the ministry, the Design Team Review Package shall be reviewed by the Rockfall Engineering technical team to confirm that the recommendations in the Design Report are properly interpreted and incorporated in the contract package.

7.17.2.2 Detailed Hazard Mitigation Design

For the high priority rockfall hazard sites listed in Section 7.17.1, Rockfall Engineering services shall specifically include:

a) establishing the limits of the existing rock slopes (i.e. offset distance from edge of pavement to face of cut, rock slope height, etc.) and determining the RHRON hazard rating in accordance with Part 4 of the RHRON manual;

b) conducting a quantitative assessment of discontinuities in the rock mass using conventional field measurement techniques complimented with advanced survey methods such as photogrammetry and LiDAR;

c) identifying potential rockfall locations and documenting those specific locations with photographs or other means. The natural slope above the rock cut shall be fully inspected for rockfall hazards. This inspection shall be completed by drone, rope access, or other suitable methods. Access onto private property may be required;

d) performing kinematic analyses to determine potential failure modes, conducting stability analyses (planar, wedge, circular, toppling) for potentially unstable rock masses, and carrying out rockfall simulations to evaluate ditch catchment effectiveness and rockfall overspill potential onto the travelled portion of the highway;

e) providing alternative solutions, along with associated quantity and cost estimates, for rockfall removal, reduction, protection, and stabilization options;

f) contacting the appropriate utility companies to solicit comments regarding the proposed work where the alternatives may impact existing utilities. Working clearances for utility poles and aerial lines shall be determined and considered while assessing the feasibility of alternatives;

g) recommending the preferred engineering alternative. When recommending rock

excavation, the new rock face geometry for each site shall be designed to suit the existing rock mass structure and to ensure overall face stability;

h) developing necessary special provisions to be included in the contract for all related aspects of the work;

i) documenting findings and recommendations in a Rockfall Hazard Investigation and Design Report

j) preparing contract documentation (i.e. Contract Drawings and/or Rock Hazard Report) detailing all aspects necessary for the construction of the recommended alternative. The contract documentation shall include sufficient detail to enable contractors to bid on and carry out the required work. The contract documentation shall address all conditions specified by utility companies.

Low Priority and Moderate Priority Rockfall Hazard Sites

In addition to the high priority rockfall hazard sites described above, the Service Provider shall review all low priority and moderate priority rockfall hazard sites (i.e. remaining RHRON Class B sites and RHRON Class C sites) within the project limits (*assume XX sites for bidding purposes*). For these low priority and moderate priority rockfall hazard sites, Service Provider services shall specifically include:

a) identifying ditch cleanout locations required to remove fallen rock debris by station to station limits;

b) identifying machine scaling areas to remove visibly loose and/or partially detached rock fragments that could fall in the ditch adversely impacting clear zone and/or longitudinal ditch drainage;

c) estimating machine scaling hours for each scaling area contained within a rock cut;

d) submitting high quality ‘marked-up’ photographs that delineate machine scaling areas, indicate method of machine scaling (i.e. hoe-ram or bucket) and specify estimated scaling hours for individual areas. Photographs shall be taken with a metric graduated leveling rod (6 m minimum) positioned in front of the face of the cut in order to provide a suitable reference scale. These ‘marked-up’ photographs shall be compiled in a Rock Hazard Report.

7.17.3 Deliverables

Except where otherwise directed, project deliverables shall be produced as described in the RHRON manual and this RFP. The Service Provider shall submit the deliverables specified in this section to the Ministry's Project Manager.

Rockfall Hazard Report Investigation and Design Report

Rockfall Hazard Investigation and Design Report(s) applies to the high priority rockfall hazard sites listed in Section 7.17.1.

The Service Provider shall reference the precise longitudinal and transverse location of inspection areas and the recommendations of the Design Report to the actual control lines used for detail design purposes.

The Design Report shall comprise two main parts; Part A - factual information and Part B - engineering discussion and recommendations.

Part A of the report shall include the following sections:

- Site Description: including, but not limited to, topography, geology, vegetation, drainage, existing land use and structures, etc.
- Site History: including, but not limited to, past evaluations/inspections, construction history, rockfall history, etc.
- Inspection Procedures
- Rock Mass Structure Description: including, but not limited to, lithology, discontinuities, groundwater, etc.
- Inspection Results

Part B shall present discussion and recommendations for design. The Service Provider shall discuss the results of the site inspection, the results of the quantitative assessment of the discontinuities, and the results of analyses and simulations. Based on these results, the Service Provider shall present comprehensive and practical recommendations pertaining to temporary, interim and permanent slope conditions. The Service Provider shall develop and evaluate alternatives based on advantages, disadvantages, costs and risks. The evaluation should consider the cost-effectiveness of alternatives including the likely success and durability of the treatment(s) and any ongoing maintenance requirements.

The report shall include high quality photographs in an appendix that identify rockfall locations, recommended treatments, and other detailed requirements or relevant special features.

Contract Documentation

Contract Drawings and/or Rock Hazard Report(s) shall be prepared and submitted separate from the Design Report.

If required to detail work at high priority rockfall hazard sites, Contract Drawings shall be prepared and incorporated into the Contract Drawings for the overall project. At a minimum, work at high priority sites shall be detailed in a Rock Hazard Report.

Rock removal areas for low priority and moderate priority rockfall hazard sites shall be detailed in a Rock Hazard Report.

Rock Hazard Report(s) shall include a title page with necessary contract information and a cover page with a legend, construction notes, etc. The Rock Hazard Report(s) shall be submitted in a layout and format suitable for contract advertisement.

The Service Provider shall provide all necessary special provisions and contract quantities by station to station limit.

Delivery Requirements

Draft deliverables shall be submitted for Ministry review. Unless the draft deliverables contain considerable deficiencies, the Service Provider will be provided with comments within ten (10) business days of receipt. The final deliverables shall be submitted within fifteen (15) business days after resolution of the Ministry's comments.

The Service Provider shall submit six (6) hard copies of the final Design and any subsequent addenda. The Service Provider shall also submit a USB containing an electronic copy of the report, high quality photographs, and any other attachment.

Final Rock Hazard Report(s) shall be submitted electronically only.

All copies of the final Design Report and any subsequent addenda shall be stamped by the key technical staff and/or Project Key Staff. The report shall also bear the signature or the stamp of the Key Personnel.

Rockfall Engineering Contract Drawings and the cover page of the Rock Hazard Report(s) shall also be stamped by the key technical staff and/or Project Key Staff.

7.17.4 Reference Documents

- RHRON: Ontario Rockfall Hazard Rating System – Field Procedures Manual (MERO-043)
- Summary table from the ministry's RHRON database outlining the most recent RHRON data for the project limits

7.18 Risk Based Cost And Schedule Assessment

7.18.1 Project Scope

The Service Provider is required to conduct a risk based cost and schedule estimate workshop to estimate the cost and schedule necessary to complete the design and construction of the project, develop a risk management plan and to proactively manage the risks in this assignment.

These terms of reference have been developed based on general principles for risk based cost and schedule assessments; the specific requirements will vary depending on the phase of the project under study.

7.18.2 Terms of Reference 'General'

The Service Provider will undertake an analysis of the scope, schedule, and cost estimate of the project to evaluate anticipated risks and uncertainty in the projected cost and schedule. Work shall include:

- document the assumptions regarding the base case project's scope, schedule, and cost
- development of a scope and schedule distribution model for the proposed base case
- development of a scope and schedule distribution model of relevant scenarios

A consistent methodology for probabilistic risk assessments must be used. The ministry does not have a prescribed methodology for undertaking cost risk assessments. However, the process shall be similar to the Cost Estimation Validation Process used by Washington State DOT. Further information on this technique is available at

Cost risk assessment | WSDOT (wa.gov)

The goal of the risk based cost and schedule estimates will be to apply recognised risk based estimating methodology to:

- Define, review or validate cost and schedule base estimates.
- Identify and document assumptions regarding escalation.
- Identify and quantify key events in a project that can cause a significant deviation from the base cost and/or schedule.
- Perform a Monte Carlo simulation analysis to model the collective impact of base and risk issues for the base project and where appropriate, alternative scenarios.
- The simulation will model construction costs, property costs, and other owner costs (design, Construction admin, etc.) both in aggregate and separately.
- Develop and document risk response strategies for the top SMART risks (i.e. identify and recommend an action against the risk).

7.18.3 Terms of Reference 'Project Specific'

The Service Provider shall complete a risk based cost and schedule assessment. The resulting risk assessment cost and schedule model shall be updated for the design completion meeting.

The update will include an evaluation of the probability and impact of all the top cost and schedule risks (generally SMART risks that have 5% or more impact on cost or risk the schedule in a significant way).

The risk register shall be updated at all progress meetings.

7.18.3.1 Cost Risk Assessment Activities

The list of tasks outlined in this Terms of Reference is intended to serve as a guide for the cost risk assessment workshop. It may not be all-inclusive.

Study Phase	Activity	Required Participants	Req'd Y/N	Schedule
Pre-Event	Organization Meeting **	MTO Project Manager Risk Elicitor Cost / Schedule Estimator	Y	6 weeks or more prior to workshop
Pre-Event	Workshop Study Design	Service Provider in liaison with PM and Risk Elicitator	Y	
Pre-Event	Site Visit	Key Team Members	Y	The Service Provider shall schedule prior to 3-day workshop.
Pre-Event	Circulate Workshop Agenda, Risk Questionnaire	Risk Elicitor	Y	Prior to Preparation of Draft Schedule and Risk Models

Study Phase	Activity	Required Participants	Req'd Y/N	Schedule
Pre-Event	Validate Base Case Cost and Schedule Estimate. All unit costs/parametric estimates validated by professional judgment and /or historical data. Data source is referenced.	Cost/Schedule Estimator and related SME	Y	Prior to Workshop (included in study team information book)
Pre-Event	Develop Draft Design and Construction Activity Flowchart	Key Team Members	Y	Prior to Workshop (included in study team information book)
Pre-Event	Prepare Study Team Workbook	Service Provider	Y	1 Week Prior to Workshop
Pre-Event	Prepare Draft Schedule and Risk Models	Cost/Schedule Estimator, SME	Y	Prior to Workshop
Workshop	Conduct a _ day Cost Risk Assessment Workshop	All team members	Y	
Workshop	Develop Risk Mitigation Proposals for top schedule and cost risks	All team members	Y	Done during risk workshop unless there is a follow-on VE workshop.
Workshop	Arrange venue, including adequate light refreshments and lunch for the duration of the workshop.		Y	

Study Phase	Activity	Required Participants	Req'd Y/N	Schedule
Post-Workshop	Finalize Schedule and Risk Models	Risk Elicitator	Y	Prior to Cost Risk Assessment Presentation
Post-Workshop	Cost Risk Assessment "one pager" similar to figure C.1.2, NCHRP 574/	Risk Elicitator	Y	Prepared for Cost Risk Assessment Presentation
Post-Workshop	Cost Risk Assessment Presentation	MTO PM, Risk Elicitator, MTO Regional Management, Service Provider PM.	Y	Within 2 weeks of workshop.
Post-Workshop	Draft Cost Risk Assessment Report	Service Provider	Y	
Post-Workshop	Final Report	Service Provider	Y	2 Weeks after receiving MTO comments
Post-Workshop	Update Scope and Cost Report Risk Register	Service Provider	Y	At Progress Meetings

** Teleconference is permissible

Above table is desirable but may be modified by the Service Provider to suit specific project requirements.

7.18.3.2 Workshop Team Configuration

The Service Provider shall supply the subject matter experts required for a successful workshop. Suggested subject matter experts are shown below. Members from the Ministry's Project Team will be included in this Cost Risk Assessment as indicated in the contract or assignment documentation, but the Service Provider shall provide expertise in all key areas. Typical Subject Matter members and attributes are shown below:

Team Member	Attributes
Risk Elicitator	Appropriate risk elicitation experience of projects of a similar scope and nature. Ability to facilitate workshops. Proven knowledge of stochastic estimating techniques and distributions.
Service Provider PM	Knowledge of risk based estimating principles is beneficial.
Cost, Schedule Estimator	Experience with transportation estimates. Proven ability with production rates and the ability to generate project construction schedules. Familiar with MTO estimating, construction escalation indices and contracting industry practices.
Highway Engineering Design Specialist	Independent Team Member with experience as the senior designer with projects of a similar nature or scope.
Pavement Design Specialist	Rigid & Flexible Pavement Design, Detail Design.
Foundation Engineer	Independent Team Member with experience as the senior designer with projects of a similar nature or scope.
Traffic/ Safety Specialist	Relevant Staging Experience, ATMS experience desirable if ATMS costs or risks anticipated, Explicit Highway Safety Experience.
Bridge Engineer	Independent Team member with senior experience with projects/structures of a similar nature and scope.
Construction Administration Specialist	Independent Team Member with experience with projects of a similar nature and scope. Experience or knowledge of alternative delivery and contracting experience an asset.
Construction Specialist	Independent Team Member with construction experience on projects of a similar nature. Experience or knowledge of alternative delivery and contracting experience an asset.

Team Member	Attributes

The above table of suggested subject matter experts is considered desirable but is not intended to be prescriptive. The Service Provider is expected to suggest other skill sets or combination of skills based on their experience with cost risk assessments. Some team members must be independent of the Service Provider's firm. The degree of independence of the risk team will be taken into account during the Service Provider's Proposal evaluation.

7.18.3.3 Ministry Supplied Team Members

Selected Ministry staff will participate as team members. The Service Provider shall include the ministry team members in their study design. The specific team members and skills sets will be in indicated in the contract or assignment documentation as follows:

Job Title	Office	Full Time in Work-shop Y/N	Technical Speciality or workshop contribution
MTO Project Manager	PD	Y	Highway Engineering

7.18.3.4 Pre-Event Activities

The TPM Service Provider's responsibilities for the pre-event (pre-workshop) shall include those outlined in the Activity Schedule (Section 5.13.3.1) as well as the following:

Study Team Information Workbook

Preparation of project information and distribution in the form of a **study team information workbook** required as indicated below. The study team workbook is intended to enable the independent subject matter experts to be familiar with the base case. The Service Provider shall be responsible for obtaining the information unless otherwise indicated.

Workbook Element	Required Y/N	Description	Typical Information Source(s)	Other Details
Project Background	Y	Project Description and background	Existing Preliminary Design, Field Review, Design Criteria	Refer to Reference Documents
Parametric Cost Estimates	Y	Table showing parametric cost estimates to aid in estimating the cost of alternatives	HiCo, Analysis of Cost estimates from 2 recent contracts of similar nature.	Service Provider will be responsible for data mining recent contracts to establish parametric estimate values. For projects in detail design, major items will be used.
Cost Escalation Distribution	Y	Description of approach to modelling construction cost escalation.	Industry Sources	

Workbook Element	Required Y/N	Description	Typical Information Source(s)	Other Details
Capital Cost Model	Y	Spreadsheet based costing and schedule tool.		Service Provider responsible for developing cost & schedule data.

Any additional information required by the project team shall also be included in the workbook.

7.18.3.5 Workshop Activities

The Service Provider shall conduct a risk based cost and schedule assessment of the Project. The process should be similar to the Cost Estimation Validation Process used by Washington State DOT. Further information on this technique is available at

Cost risk assessment | WSDOT (wa.gov) In addition to the development of a cost and schedule risk models, risk mitigation proposals must be developed. Where a VE study follows or is combined with the risk workshop, the mitigation proposals can be developed as part of the VE workshop.

Workshop Venue & Logistics

The Service Provider shall be responsible for making arrangements for the venue including adequate light refreshments and lunch for the duration of the study. Adequate light refreshments are defined to include coffee and other hot drinks in the morning and soft drinks and juice in the afternoon. Common medical and religious dietary restrictions of workshop participants shall be accommodated where possible.

The Service Provider is expected to investigate appropriate locations/facilities for the study and or training, present alternatives and a recommendation, with the final study location subject to the approval of the ministry. It should be noted that rented facility must be continuously available to the team during the course of the workshop (i.e. not just rented during the day). Power supplies for data projectors, computers and printers will also be required. A description

of the options investigated, and a recommended venue shall be presented in the proposal or study design.

Workshop Equipment and Supplies

The Service Provider shall be responsible for providing all of the technical and logistical support required during a risk based cost and schedule study.

7.18.3.6 Post Workshop Activities

Study Deliverables

A risk based cost and schedule assessment report shall include the risk and cost models, a description of the approach to modelling construction cost escalation, a risk mitigation report and identification of the top schedule and cost risks. All issues documented in the report shall be considered confidential and care shall be taken to prevent inadvertent distribution. Note that digital files that are emailed must be sent to the ministry project manager in a secure format such that only the project manager can open and edit the document. Passwords should be provided separately from the file.

In addition to the final report the deliverables shall include all electronic records/work created during the workshop or in support of the workshop. This can include but is not limited to the schedule and cost models in a format that can be adjusted for actual escalation.

One copy of each of the draft & final reports shall be sent directly to the Design and Contract Standards Office at the following address:

	Ministry of Transportation 301 St. Paul Street St. Catharines, Ontario L2R 7R4

All other copies of the reports shall be sent to the ministry's Project Manger for Distribution.

Three (3) copies of draft reports, 1 digital copy of the report (with table of contents hyperlinked) and six (6) copies of final versions of these reports are required.

7.18.3.7 Post Workshop Activities

SMART Risk – A SMART risk refers to a detailed description of the risk. The risk must be described as specific, measurable, attributable, relevant and time bound.

7.18.4 Proposal Instructions

The Cost Risk Assessment/ Risk Management plan is to include the following sections:

7.18 Risk Assessment/Risk Management

7.18.1 Scope/Work Plans

- Include discussion of integration of Cost Risk Assessment into management plan

7.18.2 Deliverables

7.18.3 Staffing

Under Staffing, provide the following information in tabular format for each member of the Service Provider risk team:

Technical Specialty	Subject Matter Expert (team member name)	Years of Technical Experience in Specialty	# of CRA Workshops	Risk Training?	Worked with team before on risk study?	Team member independent of design team (Y/N)	Team member Independent of Firms associated with Design Team (Y/N)

SECTION 8: TERMS OF REFERENCE – CONSTRUCTION CONTRACT ADMINISTRATION

The Terms of Reference, the Services, Deliverables, and Records, Specialty Work Plan, and the Successful Service Provider's Construction Contract Administration Proposal shall form the Construction Contract Administration Plan and become part of MTPM proposal work plan.

8.1 Instructions to Respondents

The CA team performing CA services under this MTPM agreement shall be independent Service Providers which are not owned by, in whole or in part, or affiliated with, the Contractor, a sub-contractor or a supplier of construction material under the Construction Contract.

Technical and Management Proposal Components

Service Providers shall provide the details for each of the following Plans and Tables as part of the proposal. The proposal shall identify how the Service Provider will undertake these components with the proposed staff using the applicable edition of the Construction Administration Inspection Specifications (CAIS) and the applicable responsibilities in the Construction Contract between the Ministry and the contractor.

8.1.1 Construction Contract Administration Plan

Staffing Proposal

The Service Provider shall provide on-site staff in such numbers and duration that it deems necessary to fulfill its obligations under the Legal Agreement.

The Service Provider shall provide in narrative form, an explanation of the following information as evidence of the professional analysis conducted by the Service Provider at the Proposal stage to establish the appropriate and sufficient number of field staff assigned to the administration of construction activities for the duration of the agreement:

1) A time-based vertical bar chart which indicates, for definable interim phases of the Agreement, the stepped variation in the number of non-specialist field staff assigned (on the vertical axis) throughout the Term of Agreement. **The vertical axis shall identify the individual staff member by name in order to associate the individuals with the number of proposed staff**; Timeframe shall be shown on the horizontal axis;

2) A statement based on the chart, which indicates the resulting arithmetic mean number of assigned field staff;

3) In support of the vertical bar chart in 1) above, and based on information defined in the capital contract package, provide a simplified horizontal bar chart which illustrates a best estimate of a contractor's Schedule of Work. In this regard, the Service Provider is to include

the major items and key components, along the vertical axis: pavement markings, regulatory signs, Wayfinding signs and illustrate the corresponding anticipated timeframe for start of construction and expected duration of each of the above noted major items and components along the horizontal axis.

The Service Provider is advised that the above noted simplified horizontal bar chart produced by the Service Provider and included in their Technical Proposal will, in fairness, not necessarily be considered as the basis for extra payment to the CA team in the event that there are any differences between this horizontal bar chart produced by the CA team and the construction schedule(s) produced by the Contractor. The Service Provider is advised that one of the purposes of including the requirement of producing the simplified horizontal bar chart is to demonstrate to the Ministry

The Service Provider is advised that the details indicated in the narrative shall match the simplified horizontal bar chart. Failure to do so may result in disqualification of the proposal.

Design Phase Participation

The Service Provider shall describe how personnel with Construction Administration experience will participate during the design phases of the Assignment. The proposal shall identify the roles, responsibilities, and anticipated level of involvement of such personnel in constructability reviews, traffic staging reviews, risk identification, innovation evaluation, construction planning, and contract package development. The objective shall be to promote continuity of project knowledge and improve constructability under the MTPM framework.

8.1.2 Succession Management and Training Plan – N/A

8.2 Terms of Reference

The general scope of work for MTO Construction Contract Administration consists of:

• administer the construction contracts in accordance to the latest version of the Construction Administration Inspection Specifications (CAIS);

• inspect signs, sign overlays, pavement markings, pavement and traffic signal work in accordance with the contracts;

• ensure the signs are bagged and un-bagged in accordance with the contracts;

• inspect the conditions of the signs, sign overlays, pavement markings daily, and instruct the contractor to undertake corrective measures per contract requirements;

• inspect removal of temporary signs, sign overlays, and pavement markings, and salvage the sign board per contract requirements;

• submit final deliverables to the ministry per CAIS;

• maintain continuity of project knowledge from design through construction;

• coordinate with engineering staff responsible for the design of the project to obtain timely technical support and clarification;

• document and communicate construction findings, lessons learned, innovation outcomes, and design-related issues to the engineering team; and

• facilitate collaboration between the Engineering Team and Construction Administration Team throughout construction activities.

8.2.1 Construction Administration Staff

Construction administration staff and sub consultants performing services under this agreement shall be independent which are not owned, in whole or in part, or affiliated with, a contractor or supplier of construction material.

8.2.2 Staff Qualifications and Credentials

Staff credentials required as described throughout this document must remain in force throughout the Term of the Agreement, or until submission of final Deliverables, whichever occurs later.

The Service Provider staffing shall include the names, position titles and resumes of all staff (including Sub-Contractor) to fulfill the requirements of the project.

Organisational Chart - The proposal shall include an organizational chart for the MTPM agreement indicating all staff / organizations / MTO, and their reporting relationships.

The submission shall explain how all the Services, Deliverables, and Record Documents for the project will be achieved with the proposed staffing. It is important to relate each person's experience, qualifications and certifications to the requirements of the RFP, and their assigned duties.

Staff changes by the successful Service Provider during the construction phases will require written approval from the Ministry, prior to any such change. The qualifications and experience of the proposed staff must be equivalent to or better than the staff proposed at the EOI and RFP phases. Failure to comply may result in the termination of the agreement.

Staff proposed for key Construction Administration positions should demonstrate familiarity with the project design development process and experience working collaboratively with engineering design teams on transportation infrastructure projects.

Specialty Plans
The Service Provider shall provide specialty work plan(s) that meets the requirements as set out in Section 7.

Organizational Chart
The proposal shall include an organizational chart for the MTPM assignment indicating all staff / organizations / MTO, and their reporting relationships.

Project Manager

The key individual responsible for the Design component of the work is responsible for Project Management of the Construction Contract Administration Services under the Agreement (project coordination, quality, cost and schedule control, etc.) shall have:

• Proven ability to coordinate a multi-disciplinary team on projects of similar size and nature;

• Proven ability to work cooperatively and effectively with a wide variety of interests/authorities including property owners, different levels of government, utility companies and special interest groups as demonstrated on projects of similar size and nature;

• Authority to act on behalf of the Service Provider; and

• Proven negotiation, analysis, and decision-making skills to develop recommendations on complex matters and to resolve difficult issues.

The Project Manager's duties shall include:

• Taking full responsibility for the deliverables of this assignment;

• Managing resolution of issues;

• Timely analyses and recommendations are provided to the Ministry for all issues including, but not limited to: Extension of Time Requests, Change Orders, Claims, Negotiations, Change Proposals, and any design and construction problems encountered on the contract and to resolve any resulting Contractor, outside agency and/or public concerns; and

• The Project Manager shall ensure effective coordination between the Engineering Team and the Construction Administration Team throughout construction and shall establish procedures for timely review and resolution of design-related matters.

Contract Administrator / Office Person (rcca)

The Contract Administrator is responsible for administering on behalf of the Ministry the terms of the Construction Contract. The individual for the Contract Administrator / Office Person shall perform the duties of both positions. The individual cannot be the same as the Project Manager. The Contract Administrator shall be certified by OACETT and possess the Road Construction Contract Administrator (RCCA) designation. Proof of Certification and/or Designation (copy of Annual Membership Card or other OACETT documentation shall be included in Envelope #1.

The Ministry will only consider any one of the following as the acceptable forms of documentation:

• A photocopy of each individual's annual membership card; or

• A photocopy of a written confirmation that the individual is in good standing with OACETT. Omission of this requirement will result in disqualification of the Quotation.

• Demonstrated Construction Contract Administration experience as CA on two (2) or more MTO or municipal projects with at least one (1) similar MTO project of value *[Insert contract value*] as CA or an Assistant Contract Administrator (include Contact number for a Ministry contract or municipal projects)

• Sound knowledge of design standards, OPS specifications, standard drawings, EEM Vol. 4 CDED Manual, materials and methods associated with highway/freeway/ATMS construction;

• Demonstrated knowledge of relevant Laws and Regulations (Environmental, Health and Safety, etc.) and their application in construction contracts; and

• Proven analytical, communication, and negotiation skills.

Provide a resume demonstrating that the CA meets the minimum qualification and experience requirements (provide a signed consent form for resume verification in Envelope #1).

Technical Support Staff

Inspectors performing construction inspection for workmanship must have sound knowledge of design standards, specifications, and materials associated with construction, Laws and Regulations including Environmental, Occupational Health & Safety requirements and their application in construction contracts.

Senior Inspector(s)

Senior Level technical support staff shall be certified by OACETT for the Road Construction Senior Inspector (rcsi) designation. Proof of Certification / Designation (copy of Annual Membership Card or other OACETT documentation that confirms the staff's designation and validity of certification showing the category of OACETT Certification / Designation) shall be included in Envelope #1. The Ministry will only consider any one of the following as acceptable forms of documentation:

• A photocopy of each individual's annual membership card; or

• A photocopy of written confirmation from OACETT that the individual is in good standing with OACETT.

Additional experience requirements may be specified for Medium and High complexity agreements, such as:

• Technical support staff must have demonstrated experience in highway/freeway construction projects of similar type and complexity and particularly in their selected assigned

A resume demonstrating that the individual meets the minimum experience requirements (provide a signed consent form for resume verification) is to be included in Envelope #1.

Civil works directly associated with electrical installations may be inspected by technical support staff at the senior level who are certified by OACETT, and designated RCSI.

Junior Inspector(s)

Junior Level technical support staff shall be certified by OACETT for the Road Construction Junior Inspector (RCJI) designation. Proof of Certification /Designation (copy of Annual Membership Card or other OACETT documentation that confirms the staff's designation and validity of certification) shall be included in Envelope #1.

The Ministry will only consider any one of the following as acceptable forms of documentation:

• A photocopy of each individual's annual membership card; or

• A photocopy of written confirmation from OACETT that the individual is in good standing with OACETT.

Senior Quality Control Performance Measures Monitoring Technician / Office Person – N/A

Electrical Inspection Staff

Electrical Inspection support staff with the responsibility of conducting Electrical inspections and Electrical Tasks as described in the CAIS and as amended in this RFP shall be senior level technical support staff certified by OACETT, and designated as appropriate as RCSI. In addition to the OACETT requirements, the electrical inspector shall have a valid Master Electrician license, or an Electrician, Construction and Maintenance 309D license, or an Electrician, Construction and Maintenance 309A license at the time of the RFP submission and throughout the duration of the agreement. A resume, including a copy of the applicable license, is to be included in Envelope #1 to demonstrate that the electrician meets the licensing requirements.

Additional experience requirements may be specified for contracts requiring traffic signal inspection requirements on medium and high complexity agreements, such as:

Traffic Signal Inspection Staff

• Successful completion of the Ministry of Transportation's 170 Basic Training Course and 170 Advanced Training Course for work involving 170 Traffic Controller, or

• Successful completion of Level 1 and Level 2 of the International Municipal Signal Association (IMSA) Traffic Signal Technician Certification Program, and Five years qualifying experience

Professional Engineer, Engineer-in-Training and Engineering Student Member

Professional Engineers, (licensed by the Professional Engineers of Ontario (PEO)), with the appropriate related work experience in road construction contract administration, are not required to be certified by OACETT to perform the duties of road construction contract

administrator (rcca), road construction senior inspector (rcsi) and/or road construction junior inspector (rcji). Professional Engineers have the option of obtaining the appropriate certification and/or designation; otherwise they will be required to submit their resume detailing the related work experience.

Engineers-in-Training, (registered as such with the PEO) with the appropriate related work experience, are not required to be certified by OACETT to perform the duties of either rcsi or rcji. Engineers-in-Training have the option of obtaining the appropriate certification and/or designation, otherwise they will be required to submit their resume detailing the related work experience for rcsi duties. No related work experience is required for rcji duties.
The PEO membership designation "Engineering Student Member" (registered as such with PEO) will be considered equivalent to the OACETT Certification for Road Construction Junior Inspector designation requirements listed in the RFP. A copy of the individual's PEO membership card or any other PEO documentation that demonstrates that the individual is currently registered as such with PEO is a mandatory requirement of the submission.

Specialist Staff

Specialized technical work shall be performed by specialists with relevant education and experience in their field of expertise as identified in Section 7.

8.2.3 Materials Field Testing Staff and Equipment

The required field testing shall be scheduled by the Service Provider so that it is carried out during Contractor-scheduled lane closures; and coincides with the Contractor's operations, permitting proper testing and continuation of the work to the next level of the Contractor's operations without delay.

Field Compaction Testing
Where field compaction testing of earth and/or granular is to be carried out using a nuclear moisture-density gauge, the operator of the gauge shall have been trained in the safe operation, transportation, and handling of the gauge. The registered owner of the gauge shall hold and maintain a valid radioisotope license for the gauge. The gauge shall have been calibrated within the last 12 months, either by the manufacturer or other qualified agent, against certified density and moisture reference blocks. The certificate of calibration for the gauge shall be available for inspection. Technicians carrying out the field compaction test shall demonstrate their ability to measure density and calculate Quality Index (QI) of compacted lots.

Hot Mix Pavement Smoothness

The Service Provider shall complete inertial profiler measurements in accordance with Special Provision 103F31 and MTO Laboratory Standard LS-296. For this purpose, the Service Provider shall retain services of a qualified operator firm.

Updated lists of MTO qualified High Speed Laser Inertial Profiler Operators and firms are posted under "Qualified Laboratories" section on the RAQS-MERX website (www.raqs.merx.com)

The requirements and deliverables for completing smoothness measurements using an inertial profiler and reporting the results are:

- The Profiler Operator shall measure the sublots that are designated by the Contract Administrator

- All measurements and associated calculations shall be carried out in accordance with the procedures stated in LS-296

- Traffic protection, if necessary, shall be provided by the Contractor and arranged by the Contract Administrator

- All calibration, correlation, surface smoothness measurements, calculations and reporting procedures shall conform to the requirements and procedures stated in the latest LS-296 and the SP for any PMD acceptable to the Owner for surface smoothness measurements

- within five **(5) Business Days** after the inertial profiler measurements have been completed for all of the sublots designated by the Contract Administrator, the Profiler Operator shall provide copies of the following to the Contract Administrator:

(a) All of the unfiltered data files that are generated by the Inertial Profiler in ppf or erd format that can be read by ®ProVAL on CD's or sent electronically by E-mail for use by IBM-compatible PC's;

(b) All of the filtered data files generated by ProVAL in ppf or erd format on CD's or sent electronically by E-mail for use by IBM-compatible PC's;

(c) A hard copy or electronic summary of the longitudinal reference lines and offsets that were used for each profile run;

(d) A hard copy or electronic summary of the "lead-in" distances that the inertial profiler required, prior to the start of the first sublot being measured in each run;

(e) An electronic copy of the ProVAL reports showing all applicable IRI and the locations and magnitudes of all localized roughness determinations for each profile run that was carried out;
(f) Microsoft Excel spreadsheet files of the summaries of all IRI measurements for both wheel paths as well as the locations and magnitudes of all localized roughness for every run of each sublot, measured on the Contract, using the methods given in LS-296. The information shall be reported on the Excel form provided by MTO.

(g) All test results shall be accompanied by a transmittal letter to the Contract Administrator, under the signature of the Vendors Project Manager for this assignment, verifying the limits measured and indicating that the data analysis have been verified and the submitted results are in compliance with the requirements of this RFP, LS-296 and SP103F31.

All supplies and materials required to carry out the smoothness testing shall be supplied by the Profiler Operator.

Multiple mobilizations of the Inertial Profiler to the construction site may be required.

The Ministry shall not be responsible for any costs incurred due to delays caused by inclement weather.

Concrete Pavement Smoothness Testing - N/A

Well Testing/ Well Investigations – N/A

8.2.4 Engineering Team Participation During Construction

The Service Provider shall ensure that appropriate members of the Engineering Team remain available throughout construction to support the Construction Administration Team.

Engineering staff shall, as requested, provide technical advice, review requests for information, evaluate contractor change proposals, review shop drawings, address unforeseen field conditions, participate in dispute resolution related to design matters, and provide recommendations regarding design intent.

The Engineering Team shall respond to requests from the Construction Administration Team within timelines appropriate to the urgency and complexity of the matter.

The Engineering Team and Construction Administration Team shall maintain regular communication throughout construction to support continuity of project delivery under the MTPM framework.

The Service Provider shall arrange attendance by appropriate engineering specialists at construction meetings where significant design-related issues, change proposals, constructability concerns, or unforeseen site conditions are being discussed.

The Construction Administration Team shall document, monitor, and evaluate the implementation and performance of approved innovation initiatives during construction. Findings shall be communicated to the Engineering Team and Ministry for consideration in future project delivery improvements.

8.3 Services, Deliverables, and Record Documents

The Service Provider is responsible for providing the Services and Deliverables detailed in the applicable edition of the CAIS and in the Technical Standards and Specifications, and as amended below:

8.3.1 Engineering Materials Field Testing Services

The Service Provider is responsible for arranging and providing the field testing services noted in the Engineering Materials Field Testing Reference Table of the applicable edition of the CAIS.

Field tests are considered part of the duties of site staff. The Service Provider is to make an allowance and incorporate these costs in their Maximum Ceiling Price.

Included as a task under Engineering Materials Field Testing is the requirement that all samples of materials which the Ministry will test as per the Construction Contract Documents and the CAIS are delivered to the designated laboratory as specified in the Construction Contract Documents in a timely fashion, in a suitable testing condition with proper identification and WHMIS labels and in accordance with applicable Dangerous Goods Legislation. The Ministry will provide the test results to the Service Provider upon their availability. The test results will be communicated to the Contractor within the timeframes specified in the Construction Contract.

8.3.2 Engineer In Training (EIT) and Transportation Technician (TT) Training Program – N/A

8.3.3 Equipment and Supply

The Service Provider shall, at its cost, provide equipment and supplies for the duration of the agreement as described in the applicable edition of the Construction Administration and Inspection Task Manual and as amended within this agreement:

• The agreement will require a field office to be located **within a [*insert distance in km*]** radius from [***insert location or address***] for the duration of construction activity.

• Field offices will not be permitted in MTO Patrol Yards;

• The Field Office is to include a furnished work area and a meeting area suitable to accommodate a minimum of [***insert number***] attendees, all utilities and washroom facilities, as per current Occupational Health and Safety Act requirements. The Service Provider must provide a sign at the field office location; clearly visible to the public that identifies the firm and phone number for contact. In addition, a disposal bin for garbage removal shall be provided. All of the Service Provider's staff vehicles must have Service Provider identification clearly visible to public identifying the Construction Contract Administrator Firm. Magnetic stickers are acceptable.

• Equipment commonly used on a field construction project including, but not limited to, drafting equipment, office equipment for the field office, photocopier, a computer with operating system and related software programs MS Word, MS Excel, MS Access, MS Project and MS Outlook compatible with current Ministry applications. Also required are other similar products normally required of a contemporary construction field office such as scales, tapes, calculators, survey equipment, thermometers, safety equipment, office supplies of every nature and kind required for the efficient performance of the services including diary and other record books, non-specialized forms, stationery, janitorial supplies, packaging materials, sampling equipment, and computer disks and other incidental equipment considered to be normal "tools of trade";

• Bentley InRoads and AutoCAD if required;

• At least one (1) telephone with speaker phone function, voice messaging, ***[one (1) fax machine in the field office]***, one (1) scanner and one (1) cellular phone with voice messaging service for the use of the Contract Administrator; internet addresses, including all related

hardware and software, and server connection for both main and field offices to enable e-mail communications for the duration of the Agreement;

• A digital camera (with date imprint feature), and a digital video camera for use by Construction Administration staff;

• Equipment commonly used by laboratory technicians including, but not limited to, safety equipment and clothing, calculators and incidental equipment;

• Nuclear testing equipment for compaction testing (if required);
• Equipment for half-cell surveys of bridges and covermeter (if required);

• Equipment for dowel pull testing (if required);

• Copies of applicable A.S.T.M. and C.S.A. standards;

• Copies of applicable publications and documents unless otherwise provided by the Ministry;

• Copy of the Proposal, MTPM agreement, and the RFQ document available at the field office at all times;

• The Service Provider may provide additional equipment at his own discretion and expense, if deemed necessary for the satisfactory completion of the agreement all within the Maximum Ceiling Price quoted;

• Other project specific equipment if required

8.3.4 Status Report

The Service Provider shall, within *two (2)* business days of the applicable time period covered by the weekly status report, submit a weekly status report directly to the CCO/CSA in addition to the monthly justification breakdown. The weekly status report (in a form acceptable to the Ministry) shall include a summary of the previous week's activities and a summary of the anticipated activities for the upcoming week. These summaries shall include breakdowns of staffing names, positions, hours and/or days worked / to be worked, as applicable, and activities performed / to be performed by the individual within the weekly period. The weekly status report shall also include a breakdown of any Engineering Materials Field Testing performed including the number of tests performed.

The Service Provider shall submit to the Ministry on a monthly basis a Monthly Status Report within *five (5)* business days after the end of each calendar month from and after the MTPM Agreement CA task Start Date. The monthly invoice and associated weekly and monthly breakdowns shall be reviewed and approved by the Ministry prior to payment.

Project Specific Deliverables
The Service Provider shall carry out weekend and night time monitoring of temporary signs including TC-64 signs, traffic control measures in place and safety devices according to CAIS. Other deliverables are:

• Weekly digital photographic record with date imprint provided on compact disc to accompany monthly progress payment application. The photographic record of pre-construction conditions such as all existing signs, entrances, if any, safety devices, structures, electrical plant etc. shall be provided within one week of the pre-work meeting date with the contractor

• Weekly digital video record provided on digital video disc to accompany monthly progress payment application. Pre-construction video record as described above for pre-construction photographic record shall also be provided within one week of the Pre-work meeting date with the contractor.

• Weekly diary sheets in PDF to accompany monthly progress payment application

• In addition to Notifications-2.7 of CAIS, regular liaison/updates and meetings as necessary with municipalities, Region, etc. for successful resolution of concern/issue

• Provide comprehensive review and comments on the contractor's initial schedule submission to ACE/CSA prior to acceptance/"Permission to Start Work" and on all subsequent updates received during construction. The monthly status report shall include a brief discussion/outcome on the actual progress of work monitored/tracked by the PM-CA when compared to baseline critical path and recommendation, if any.

• Pre and post construction structure clearance measurements as applicable (OSCLIS in CAIS and Regional Memo) to be submitted timely. This includes traffic stages for horizontal clearances on the individual structures.

• Check and verify on a daily basis when pavement markings or sign installation operations are in progress that all conforming to the contract requirements.

• Liaison and coordination as frequent as necessary for the adjacent ongoing work. Lane closure applications by the contractor may require coordination a week in advance with other adjacent ongoing work to resolve potential scheduling conflict and constructor issue.

• Liaison and meetings with AMC/Maintenance shall be required in the pre-construction, seasonal shutdown and post-construction phases prior to the issuance of "Turnover Agreement" form and documenting any deficiencies identified at each turn-over phase.

• Prepare, submit and review well in advance with the Traffic Office completed new sign order form for the MTO supplied signs. Blank sign order form will be supplied by the CSA and new sign orders will be placed by the CSA upon Traffic Office approval. Lead time required by the Sign Shop for ordering new signs is a minimum of 6 weeks.

• Allow for and conduct special meetings with: MTO functional offices during construction (Traffic/Structural/Electrical/Environmental/Claims Negotiation/Sign Shop etc.), post construction meetings for design package evaluation/Contractor Performance Rating/senior MTO executives as required, highway commissioning, if required.

8.3.5 Construction Lessons Learned Report

Upon completion of construction, the Service Provider shall prepare a Lessons Learned Report jointly developed by the Engineering Team and Construction Administration Team. The report shall identify constructability observations, design improvements for future projects, innovation outcomes, schedule and cost observations, claims-related issues, and recommendations for continuous improvement of MTPM delivery.

Public Information Plan - N/A

8.4 Specialty Work Plan - NA