



REQUEST FOR PROPOSAL - Version 9.1 – June 2019
Terms of Reference

TO PROVIDE *Preliminary Design Services*

Highway 400 - Highway 404 Link (The Bradford Bypass)

Town of Bradford/West Gwillimbury, Township of King and Town of East Gwillimbury

WO # 19-2001

Assignment Number: 2019-E-0048

Central Region

December 13, 2019

Ministry of Transportation

Ontario

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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 RFP Documents using a Total Project Management approach.

This Assignment includes the development of a Preliminary Design and a Transportation Environmental Study Report (TESR) for Bradford Bypass. A Route Planning and individual Environmental Assessment Study was completed for the corridor in 1997, and the Ministry of Environment approved the EA in 2002. The proposed Bradford By-Pass is a 16.2 km rural 4-lane controlled access freeway. The highway will extend from Highway 400 between Lines 8 and 9 in Bradford/West Gwillimbury, crossing a small portion of King Township, and will connect to Highway 404 south of Holborn Road in East Gwillimbury. There are proposed full and partial interchanges, as well as grade separated crossings at intersecting municipal roads and watercourses, including the east and west branch of the Holland River.

This assignment includes: Advanced Traffic Management Systems, Bridge Engineering, Drainage and Hydrology Engineering, Electrical Engineering, Environmental, Foundations Engineering, Highway Engineering, Pavement Engineering, Surveying, Traffic Engineering and Traffic Planning, Value Engineering and Constructability Review.

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

All Proponents approved in the Ministry's Registry, Appraisal and Qualification System (RAQS) in the Prime Specialty Preliminary Design – Functional Planning and Design Studies are invited to submit Proposals. Only Service Providers registered for the Prime Specialty will be considered. In addition, a Proponent must have prior registration in RAQS of their Core Plan and the corresponding Generic Category Plan.

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,

Legal Terms and Conditions

Addenda / Clarifications prior to the Proposal Submission closing dates

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

MINISTRY SUPPLIED INFORMATION

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

<u>Document #</u>	<u>Document File Name /Document Description</u>	<u>Posted in the RFP Public Notice site (yes/no)</u>
<u>1</u>	RFP - Terms of Reference	<u>Yes</u>
<u>2</u>	RFP- Legal Terms and Conditions	<u>Yes</u>
<u>3</u>	RFP - Appendices	<u>Yes</u>
<u>4</u>	Safety Requirements for Highway 400 – Highway 404 Link (Bradford Bypass)	<u>Yes</u>
<u>5</u>	Environmental Assessment Report – WP 377-90-00	<u>No</u>

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

<u>Document #</u>	<u>Document File Name /Document Description</u>
<u>1</u>	Draft or final report of the Ministry's current early assignment for Bradford Bypass (Traffic modelling, PTE work, Environmental Desktop studies and etc.)
<u>2</u>	AutoCAD files associated with the 2002 approved EA

The following information shall be provided to the Preferred Proponent:

<u>Document #</u>	<u>Document File Name / Document Description</u>
	Refer to Section 6 for available reference documents

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 TPM Agreement Administrator, including the Project Manager; or Area Contracts Engineer; 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 equally (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” 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 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.

“TPM” refers to Total Project Management.

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	December 13, 2019
Phase I: Deadline to Submit a Request for Clarification	January 8, 2020 / 12:00 pm
Deadline for Proponents to notify the Ministry of Intention to Submit a Proposal.	January 17, 2020 / 12:00 pm
Submission of Phase I Proposals	January 24, 2020 / 12:00 pm
Notification of shortlisted Proponents	February 17, 2020
Phase II: Deadline to Submit a Request for Clarification	March 9, 2020 / 12:00 pm
Phase II: Distribution of additional material	March 9, 2020
Submission of Phase II Proposal (by shortlisted Proponents)	April 6, 2020 / 12:00 pm
Preferred Proponent Notification	May 29, 2020
Phase III Submission (by Preferred Proponent)	June 5, 2020
Anticipated Start Date (After signed and executed agreement)	June 12, 2020

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 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.

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

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 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 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 **(5)** firms.

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.

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.

Phase I Proposals shall not exceed **thirty (30) pages**. *Standard letter (8.5"x11") size paper, using 1" margins and a minimum 10-point type shall be used. 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 and RAQS Declaration Form.*

Phase II Technical Proposals shall not exceed **forty (40) pages**. *Standard letter (8.5"x11") size paper, using 1" margins and a minimum 10-point type shall be used.*

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 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:

- **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.
- Be a Professional Engineer (P.Eng) licensed by the Professional Engineers of Ontario (PEO) to practice engineering in the Province of Ontario, with a minimum of eight (8) years of experience in the field of highway engineering design.
- Relative experience and past performance on projects of similar scope, complexity and size, including 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.
- Have Project Management experience in the area of Highway Engineering with five (5) years of experience managing Preliminary Design Assignments including, project delivery, time and cost control, co-ordination of multi-specialty Assignments.
- 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.

The Service Provider may wish to designate a Deputy Project Manager as well as a Project Manager, in order to assist the Project Manager from time to time in the execution of their duties required under this Assignment. If a Deputy Project Manager is designated in the staffing plan, the individual shall meet the following requirements:

- Be an employee of the Prime Firm (as specified in Part A, Section 1.4).
- Be a Professional Engineer (P.Eng) licensed by the Professional Engineers of Ontario (PEO) to practice engineering in the Province of Ontario, with a minimum of five (5) years of experience in the field of highway design and highway engineering.
- Specific technical and Project Management experience with three (3) years of managing Preliminary Design Assignments including, project delivery, time and cost control, co-ordination of multi-specialty Assignments.

- **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

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.

- **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.

- 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. Value Engineering
- **A discussion of the Proponent's Technical Team (by Functional Category):**

The following must be identified for each functional category identified in Section 6 *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.

The following shall be identified for each functional category identified in Section 6, in an Appendix *outside* the page limit specified in Section 1.4.2:

- 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). The available performance records should be provided or in their absence, the owner's contact name, address and telephone number are to be provided.
- resumes in the appendix are to be organized by functional category and then alphabetical by last name

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, 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:

- 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 Technical Team members:

Category, Specialty or Work Type	Qualification Requirements
Advanced Traffic Management Systems	The technical lead for the ATMS shall be a Professional Engineer Licensed in Ontario with seven (7) years of relevant ATMS experience. The lead must have successfully completed a minimum of three (3) ATMS design projects for the Ministry of Transportation (MTO).
Bridge Engineering	The project key staff shall be Professional Engineers licensed to practise in the Province of Ontario. The Structural Manager shall have a minimum of seven (7) years of structural design experience, and shall have demonstrated expertise in the design and evaluation of complex, multi-span bridge structures located on major freeways. The Structural Project Engineer(s) shall have a minimum of five (5) years of recent project experience and a demonstrated ability to successfully complete the designs of complex, multi-span bridge structures located on major freeways.
Drainage and Hydrology	The Service Provider shall have experience in analyzing and designing drainage systems for 400 series highways or similar infrastructures. The consultant must be able to undertake the work using modern methods, with attention to riparian rights, and upstream and downstream impacts. The Service Provider shall be a Professional Engineer of Ontario with a minimum of seven (7) years drainage and hydrology experience.
Electrical Engineering	The Service Provider shall have a minimum of one Professional Engineer licensed or eligible to be licensed in Ontario, with a degree in electrical engineering from a recognized university, on staff, with five (5) years of relevant engineering work experience. The Service Provider shall have staff with the electrical design expertise and project management ability/experience to complete large, complex, electrical design projects. The Service Provider shall have demonstrated experience and expertise in the design of highway lighting and traffic signals.

	<p>The Service Provider shall have successfully completed a minimum of three (3) electrical design projects done to Ministry of Transportation standards or equivalent experience in other jurisdictions similar to Ontario. These three projects must include a minimum of one highway lighting design project; and a minimum of one traffic signal design project.</p>
<p>Environmental</p>	<p><u>Environmental Planner – Class EA Process</u></p> <p>The Environmental Planner shall have a broad based knowledge of a wide variety of environmental disciplines; and the technical aspects of these and current environmental issues, a working knowledge of federal and provincial planning and environmental policy/legislation in general, and a specific knowledge of MTO policy and legislation including the requirements of the MTO <i>Class Environmental Assessment for Provincial Transportation Facilities</i> (1999, as amended 2000).</p> <p>The Environmental Planner shall demonstrate, as a minimum, that they have proven professional experience in the:</p> <ul style="list-style-type: none"> • Demonstrated experience in successfully managing projects involving an individual environmental assessment or an equivalent experience in other jurisdictions similar to Ontario. • Management of the environmental component of multi-disciplinary projects; • Preparation, submission and successful clearance of Environmental Study Reports, Transportation Environmental Study Reports and Addendum, Environmental Screening Documents and Individual Environmental Assessments • Preparation and co-ordination of public consultation programs • Good understanding of the interests and mandates of environmental ministries and agencies; • Development of mitigation measures and contract documentation to address mitigation needs; • Co-ordination of erosion and sediment control measures; and • Ability to deliver products within tight timelines. <p>The Consultant Environmental Planner shall have proven experience on highway projects and/or infrastructure projects of similar scale and scope. Contact names and phone numbers are to be provided for all projects listed as applicable experience.</p> <p>The proposal must clearly demonstrate the environmental planning experience of the proposed staff. Any additional</p>

	<p>staff working with the lead environmental planner should also be listed.</p> <p><u>Fish and Fish Habitat</u></p> <p>The Pilot - MTO/DFO/MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings – Version 3, 2016 (or most recent version) requires at a minimum:</p> <p>a)</p> <p>I. Protocol Steps 1 – 3:</p> <p>Steps 1 through 3 of the Fisheries Protocol shall be conducted by any person(s) with sufficient knowledge, understanding and training regarding the intent of the criteria outlined in these steps. This person does not need to be a Fisheries Assessment Specialist registered on MTO’s Consultant Registry, unless otherwise specified by MTO.</p> <p>II. Protocol Steps 4 – 7:</p> <p>Field investigations should be undertaken by a MTO Fisheries Assessment Specialist, or by field staff knowledgeable about fisheries and who have a thorough understanding of MTO requirements for field investigations. Refer to the “Field Staff” Section below for additional information regarding field investigations undertaken at Step 4.</p> <p>The fisheries impact assessment shall be conducted by a qualified Fisheries Assessment Specialist that is registered on MTO’s Consultant Registry.</p> <p>III. Protocol Step 5:</p> <p>For projects proceeding from Step 3 (Fisheries BMPs), Step 5 may be completed by MTO or MTO Service Providers as there are no specific qualification requirements.</p> <p>For projects proceeding from Step 4 (Fisheries Assessment Process), Step 5 must be completed by a MTO Fisheries Assessment Specialist that is registered on MTO’s Consultant Registry.</p> <p>IV. Protocol Steps 6 and 7:</p> <p>Steps 6 and 7 of the Fisheries Protocol shall be conducted by a qualified Fisheries Assessment Specialist that is registered on MTO’s Consultant Registry.</p> <p>V. Protocol Step 8:</p>
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	<p>Where construction monitoring is required under a Fisheries Act authorization, a qualified Fisheries Contracts Specialist registered on MTO's Consultant Registry shall carry out the construction oversight, monitoring and documentation requirements.</p> <p>Note: Where fish sampling and/or rescues are required as part of the project, a licence to collect fish issued by the MNR according to Ontario Regulation 664/98 shall be obtained under the Fish and Wildlife Conservation Act.</p> <p>AND</p> <p>b) Field Staff</p> <p>A minimum of a 2-person crew is required under health and safety regulations for all field work in and around waterbodies. When conducting a fish community inventory or fish salvage by electrofishing, at least one member of the field crew shall possess a valid Ontario Electrofishing Certification.</p> <p>All field staff that conduct fish community inventories or fish salvage operations should have experience in appropriate fish collection and fish handling methods and be able to identify Ontario fish and mussel species using any tool(s) available (e.g. personal experience, field guides, identification keys etc.).</p> <p>* Field staff that are not registered on RAQS and need to gain experience may do so by conducting the duties of a Fisheries Assessment Specialist under the supervision of a RAQS qualified individual.</p> <p><u>Terrestrial Ecosystems (Biologist)</u></p> <p>As a minimum, field investigations and analysis must be undertaken using qualified individuals with technical or university degrees specializing in ecology/biology, wildlife, and botany resources. Biologist(s) should have demonstrated knowledge of pertinent Ontario and federal policies and procedures as well as professional experience in conducting wetland evaluations, wildlife (including birds) inventories, vegetation assessments, impact assessments, and in developing mitigation measures for design, construction and operations and maintenance stages. It is preferable if the biologist(s) have also completed the Ontario Wetland Evaluation and Ecological Land Classification Courses. The biologist shall also demonstrate professional experience in the assessment and development of erosion protection and sediment control measures. At the sole discretion of the ministry,</p>
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	<p>a qualified specialist with demonstrated relevant experience may be substituted for the biologist(s).</p> <p>The biologist(s) must demonstrate experience with avian species and Species at Risk as per the Endangered Species Act and/or Species at Risk Act.</p> <p>The consultant is to conduct terrestrial investigations as per the ERD and will include Species at Risk and migratory bird investigations as applicable to the study area. All findings and analysis are to be provided in the 'Terrestrial Ecosystems' report.</p> <p><u>Groundwater</u></p> <p>The Groundwater Specialist will be qualified to practice geoscience in Ontario (P.Geo.) with specific training or experience as a hydrogeologist.</p> <p>As a minimum, they shall have demonstrated knowledge of pertinent Ontario policies and procedures as well as professional experience in conducting impact assessments of highway design, construction and maintenance on groundwater resources, and water takings.</p> <p><u>Acoustics and Vibration</u></p> <p>The acoustics consultants are required to have proven knowledge and a minimum of 5 years of demonstrated experience with the Province of Ontario's acoustics policies and procedures including Ontario MTO, Environmental Guide for Noise (October 2006) and Ontario MTO Environmental Reference for Highway Design (June 2013) as well as demonstrated experience in highway noise analysis and highway noise control and mitigation. At least one of the firm's key personnel must have knowledge of and experience with the United States Federal Highway Administration (FHWA) noise prediction model (STAMINA 2.0, TNM 2.5, and Stamson 5.0 or a model subsequently approved by the Ministry). Generally, Stamson 5.0 will be used in simple cases only (e.g for 4 lane roadway or less with simple topography).</p> <p>AND</p> <p>Demonstrated experience involving vibration analysis and vibration control and mitigation.</p> <p><u>Land Use</u></p> <p>As a minimum, the consultant shall have demonstrated knowledge of pertinent Ontario policies and procedures as well</p>
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as proven professional experience in the identification, impact assessment, evaluation, construction mitigation and enhancement of land use factors associated with highway projects and/or projects of similar scale, scope and complexity.

Contaminated Property and Waste Management

Each step in the contaminated property process has its own qualification requirements as detailed in the Guide. As a minimum, the consulting firm is to hold (or be eligible to hold) a valid Certificate of Authorization from either the Association of Professional Geoscientists of Ontario or Professional Engineers of Ontario and must be able to provide products signed / sealed by either a licensed Professional Geoscientist or Professional Engineer. Also, the consultant shall have proven knowledge and experience of the Province of Ontario's waste management and related legislation, regulations, guidelines and policies.

Experience and expertise shall include:

- Waste management planning and implementation for construction projects;
- Identifying and resolving associated health and safety issues and concerns;
- Conducting Phase I and Phase II Environmental Site Assessments and remediation;
- Soil assessments;
- Environmental impact assessments;
- Geotechnical investigations;
- Hydrogeological sampling, and/or construction mitigation; and
- Experience on MTO projects, and/or projects of similar scale and scope related to contaminated property assessment and management.

Built Heritage and Cultural Landscapes

As a minimum, the Cultural Heritage Specialist shall be a member in good standing with the Canadian Association of Heritage Professionals (CAHP) and have demonstrated knowledge of pertinent Ontario policies and procedures for cultural heritage, MTO guidance documents, and the Standards and Guidelines for the Conservation of Historic Places in Canada. As well, there shall be demonstrated experience in fulfilling the requirements of an environmental assessment for

	<p>linear corridor infrastructure projects pertaining to the identification, evaluation, assessment, documentation of built heritage and cultural heritage landscape resources.</p> <p><u>Archaeology</u></p> <p>The Archaeologist shall possess a valid Ontario professional archaeological consulting licence. As a minimum, the Archaeologist shall have demonstrated knowledge of pertinent Ontario policies and procedures as well as experience in conducting Stage 1-3 Assessments and Stage 4 – Mitigation, Protection and Monitoring for corridor projects.</p> <p><u>Landscape Composition</u></p> <p>Landscape Architect shall, as a minimum, have demonstrated knowledge of pertinent Ontario policies, procedures and MTO Design Guidelines as well as proven professional experience in highway landscape design through the successful completion of projects of similar scale and complexity. The Landscape Architect shall be in good standing with the Ontario Association of Landscape Architect.</p> <p><u>Air Quality</u></p> <p>The consultant shall have as a minimum, a master’s degree in chemistry or a closely related field and successful professional experience in conducting air quality impact assessments and modelling for highways or high order municipal roads. The laboratory conducting the analyses must be fully accredited and in good standing, with demonstrated experience in air analyses.</p> <p><u>Surface Water</u></p> <p>Work shall be completed by a qualified water resources engineer in consultation with qualified practitioners representing the other environmental factor areas, including environmental planners, ecologists, hydrogeologists, fluvial geomorphologists, etc. The water resources engineer should have demonstrated professional experience in completing surface water assessments in a highway setting, including the characterization of existing surface water conveyance networks, completion of impact assessments, and the selection and design of an integrated surface water conveyance and management system that incorporates design enhancements to address the needs of other environmental factor areas.</p> <p><u>Erosion and Sediment Control</u></p>
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	<p>Work shall be completed by a qualified erosion and sediment control professional. The erosion and sediment control professional shall either be a Professional Engineer or Professional Geoscientist licensed to practice in Ontario with professional experience in completing erosion and sediment control plans in a highway setting, including the characterization of existing site conditions, completion of impact assessments, and the selection and design of integrated erosion and sediment control best management practices.</p>
<p>Foundations Engineering</p>	<p><u>Lead</u></p> <ul style="list-style-type: none"> • Geotechnical (Structural and Embankment) Specialty – High Complexity <ul style="list-style-type: none"> ○ The MTO Foundation Designated Contact <p><u>Key Technical Staffs</u></p> <ul style="list-style-type: none"> • Geotechnical (Structural and Embankment) Specialty – High Complexity <ul style="list-style-type: none"> ○ MTO RAQS Approved Key Personnel • Hydrogeological – High Complexity <ul style="list-style-type: none"> ○ MTO RAQS Approved Key Personnel • Engineering Materials Testing and Evaluation Category: Soil and Rock Testing for Foundation Engineering Specialty – High Complexity <ul style="list-style-type: none"> ○ MTO RAQS Approved Key Personnel <p><i>Foundations Engineering Service Provider(s) and Engineering Materials Testing and Evaluation Service Provider(s) are eligible to provide Foundations Engineering services for this project if they are registered in the MTO RAQS at complexity ratings in the required speciality that meet or exceed the identified complexity requirement for this assignment.</i></p> <p>The Proponent shall demonstrate that the Foundations Engineering Service Provider(s) can provide sufficient staff resources expertise and equipment to provide Foundation Engineering services on short notice. A written agreement between Proponent and Foundation Engineering Service Provider(s) shall be included. The Proponent shall assemble a qualified team of Professional Engineers, Technicians, and Field and Laboratory personnel and associated equipment to deliver</p>

	<p>all the potential Foundations Engineering service requirements under this Agreement.</p> <p>For Engineering Material Testing and Evaluation, the Consultant must demonstrate the capability to deliver laboratory testing services equal to or higher than the complexity level of the Foundations Engineering services required for this assignment. The requirements for laboratory testing services are documented in MTO's RAQS web site under 'Engineering Materials Testing and Evaluation' category, Soil and Rock (including testing for Foundations Engineering) specialty.</p> <p>The Service Provider shall assemble a qualified team of Professional Engineers, Technicians, and Field and Laboratory personnel and associated equipment to deliver all the potential Foundations Engineering services requirements under the specialties specified.</p> <p>Quality Control Qualification Requirement for Foundations Engineering Works shall refer to Section 2.16 Quality Control Requirements and Section 3.3 Quality Control.</p>
Highway Engineering	<p>The Service Provider's key individual shall be a Professional Engineer (P.Eng) licensed by the Professional Engineers of Ontario (PEO) to practice engineering in the Province of Ontario, with a minimum of seven (7) years of experience in the field of highway design and highway engineering. The Service Provider shall submit the key individual's experience and past performance on relative projects including 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. The highway design support staff shall have Highway Engineering and Project Management experience with three (3) years of managing Preliminary Design Assignments including, project delivery, time and cost control, co-ordination of multi-specialty Assignments.</p>
Pavement Engineering	<p>The key individual shall be a Professional Engineer licensed in the Province of Ontario. Demonstrated experience in geotechnical field investigation including soil sampling; material testing; pavement coring and pavement evaluation. Preparation of Pavement Design Reports, including Life Cycle Cost Analysis, on MTO projects of similar scope and complexity (or higher).</p>

Surveying and Plan Preparation	Service Providers shall demonstrate recent successful experience on a minimum of two (2) highway projects with engineering surveys in the last 3 years.
Traffic Engineering	The project key staff shall be a Traffic Engineer licensed to practice in Ontario with a minimum of five (5) years of traffic planning and engineering experience, involving construction staging for the replacement/rehabilitation of highway structures as well as the planning and implementation of Managed Lane facilities. The key staff shall provide technical leadership in the identification, investigation, analysis, recommendation and mitigation of traffic management issues.

(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:

- 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,

- 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.

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

1.5.2.1 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 has the best 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.

- **Project Overview**

The Project Overview must include the following sections:

- **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 and the General Terms of Reference.

- **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 end 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 3-6).

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.

- **Functional Category Plans**

A separate Functional Category Plan must be submitted for **each** of the following 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.

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.

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 6)

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:

- i- Value Engineering

ii- Constructability Review

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:

- **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.

- **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 Preliminary Design work to be carried out for a project. Planning and Design 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.

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.

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:

- **Provide the Service Provider address and Service Provider contact for all notices, documents, deliveries and Approvals required or permitted by this Agreement.**
- **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:

- (a) 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).
- (b) Valid corporate Health and Safety Policy as prescribed in the OHSa.
- (c) 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.
- (d) 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.
- (e) Indication of whether a Preventative Maintenance Program for equipment is available (if required).
- (f) 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.

- (g) 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.
- (h) Procedures for (i) responding to OHS issues identified by MTO; (ii) managing orders from Ministry of Labour (MOL); (iii) fulfilling MOL notification for critical injuries and fatalities; and (iv) notifying MTO of critical injuries/fatalities and MOL orders.
- (i) List of MOL orders that have been issued to the Service Provider within the past five (5) years and any conviction for OHSA violations if applicable.

- **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 6.7 Foundations Engineering, excluding specified Additional Biddable Work Items.
- One table for the works listed in Section 6.7.3 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.

Environmental

The Preferred Proponent shall complete and submit an Environmental cost breakdown table containing design cost for each environmental speciality.

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	50	n/a
Project Management Approach	50	n/a
Schedule and Cost Control	50	n/a
Project Manager	200	n/a
Functional categories:		
Advanced Traffic Management Systems	75	xx
Bridge Engineering	200	80
Drainage and Hydrology Engineering	75	n/a
Electrical Engineering	75	n/a
Environmental	250	100
Foundations Engineering	200	80
Highway Engineering	200	80
Pavement Engineering	75	n/a
Surveying	50	n/a
Traffic Engineering	200	80
Value Engineering		
Constructability Review		
TOTAL SCORE	1750	420

**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 75% for the Project Staffing and Organization Proposal Score (table above) and 25% for the Service Provider’s Corporate Performance Rating (CPR). The Proposal Score and the CPR are each rationalized out of 100 points to the highest scored submission, multiplied by the relative weights 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 may result with the Ministry rescoring 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 may result in the termination of the Agreement with the Service Provider.

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.

Schedule/Plan	Maximum Score	Minimum* Score
Project Staffing and Organization Plan (Total Score from Phase I to be carried forward)	1750	420
Project Overview		
Understanding of Project	100	n/a
Approach (including Project Schedule)	100	n/a

Schedule/Plan	Maximum Score	Minimum* Score
Functional categories: Advanced Traffic Management Systems Bridge Engineering Drainage and Hydrology Engineering Electrical Engineering Environmental Foundations Engineering Highway Engineering Pavement Engineering Surveying Traffic Engineering Value Engineering Constructability Review	100 300 100 100 400 300 300 100 100 250 n/a n/a	n/a 120 n/a n/a 160 120 120 n/a n/a 100 n/a n/a
Innovation Plan	100	n/a
TOTAL SCORE	4100	1040

** 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 qualified Proposals will be evaluated based on a weighting of 65% for the Technical Proposal, 25% for the Service Provider's Corporate Performance Rating (CPR) and 10% for the Service Provider's Price. The Proposal score and CPR are 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 \$25,000 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.

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 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 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 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 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 consequential losses and damages, and legal fees on a solicitor and client basis) suffered or incurred by the Ministry as a direct or indirect 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, 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 equally and fully (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. For a Joint Venture, the following information must be provided:

- Declaration that the Service Providers in a Joint Venture will be working as equal partners for the purposes of this Assignment.
- Specialties / areas of work that each individual Service Provider will be responsible for.
- 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 Agreement with the Ministry and make decisions on behalf of the Joint Venture on contractual matters.
- As a minimum, one firm among the Joint venture firms must be approved in RAQS for the Prime Specialty identified and the Key Personnel approved for that Specialty are currently available within the firm.

- The 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.
- Each firm in a Joint Venture will receive Performance Appraisal for this 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:

- | | |
|--|---------------------|
| • Developed Alternatives Executive Meeting | Feb 23, 2021 |
| • Pre-PIC # 1 Executive Meeting | Mar 23, 2021 |
| • PIC # 1 | Apr 22, 2021 |
| • Preferred Alternative Executive Meeting | Mar 15, 2022 |
| • Value Engineering Workshop | May 30, 2022 |
| • Value Engineering Recommendations | Jun 13, 2022 |
| • Updated Preferred Alternatives Executive Meeting | Aug 16, 2022 |
| • Pre-PIC # 2 Executive Meeting | Sep 13, 2022 |
| • PIC # 2 | Oct 13, 2022 |
| • Constructability Review Meeting | Oct 18, 2022 |
| • TESR Posted for Public Review | Dec 12, 2022 |
| • TESR Public Review Complete | Jan 20, 2023 |
| • PDR Executive Meeting | Jan 31, 2023 |

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

(b) Dates for Submission of Deliverables

The Service Provider shall prepare a project schedule that includes the following deliverables, as applicable:

- Notice of Study Commencement
- Fieldwork dates (as required)
- Draft General Arrangement Drawings
- Final General Arrangement Drawings
- Engineering Survey Deliverables

- Draft Geotechnical Design Report
- Final Geotechnical Design Report
- Draft Foundation Investigation and Design Reports (FIDR)
- Final FIDR and Foundation Investigation Reports (FIR)
- Hydrogeological Screening Reports, if required
- Hydrogeological Investigation Reports, if required
- Hydrogeological Design Reports, if required
- 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
- External consultations required for PIC's
- Public Information Centre(s) (PIC deliverables/draft materials, Presentations (e.g., Sr Management), and PIC Dates).
- Operational Performance Review
- Safety Analyst Review
- Final Property Requirements
- Property Request
- Submit Specialist Environmental Reports (if required)
- Transportation Environmental Study Report
- Constructability Review(s) – with related dates
- Submission of Design for Ministry Comments
- Written Comments provided by the Ministry (allow minimum of 3 weeks)
- Constructability Review Report
- Submission for Developed Alternatives Presentation
- Developed Alternatives Presentation
- Submission for Preferred Alternatives Presentation
- Preferred Alternatives Presentation
- Utility Relocation Plans (if required)
- 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
- Notice of Study Completion/Filing TESR
- Environmental Clearance

- Submission for Preliminary Design Presentation
- Preliminary Design Presentation

(c) Meetings and Presentations Dates

Minimum meeting requirements to be included in the schedule are:

- Start-up Meeting with the Ministry
- Two On-site Meetings
- Progress/Monthly Meetings (Monthly, includes Mandatory Milestone meetings). Decision on a limited number of reasonable alternatives will be in one of those meetings.
- Design Team Review Meetings (one meeting before each executive meeting). Some of those meetings can be combined with the Progress/Monthly Meetings
- Executive Presentation meetings, plan for ten (10) meetings
- Utility Coordination Meetings, plan for five (5) meetings
- Stakeholder Meetings (Assume a number according the external consultation requirements)

(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 15 Calendar Days for this Assignment.

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 Time Table (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

Meetings during the design phase will be held at the Ministry Regional 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.

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 Operations staff shall be mailed in a **separate** package and sent directly to that office at the following address: *Ministry of Transportation, 437 McKeown Avenue - West Wing, North Bay, ON P1B 9E4.*

The following are the mandatory requirements for specific meetings:

Developed Alternatives Review Meeting

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

1. Meeting Agenda with time & location details.
2. Draft Design Criteria (for approval and signing).
3. Draft Reports (as applicable to project).
4. Final Reports (as applicable to project).
5. Draft Drawings of the Developed Alternatives.

6. Draft Preliminary material/documentation (as applicable to the project).
7. Updated Scope and Cost Report.
8. All Constructability Reviews identified in the RFP and Proposal completed and all Constructability Review Recommendations to be incorporated in design.
9. Signoff and tracking of Constructability Review completed.
10. Other documents applicable to the project.

Additional meeting Requirements:

1. Meeting Agenda / Time & Location Details.
2. Final Reports (applicable to project).
3. Final Approved Traffic Staging Design.
4. Preliminary Cost and Working Day Estimate.
5. A digital copy of the final InRoads cross-sections (AutoCAD, PDF or other Ministry approved format) for the entire project to the Ministry's Project Manager.
6. Draft Design Synopsis.
7. Updated Scope and Cost Report.
8. Internal Quality Review Meeting Notes.
9. 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.
10. The Service Provider receives (and acts to incorporate) the comments received by the Ministry's Project Team.

Mandatory meeting attendance: The lead individual from each functional discipline shall attend the Team Meetings and the Executive Presentation Meetings.

Developed Alternatives / Preferred Alternative Presentation

The Service Provider shall provide copies of the Developed Alternatives / Preferred Alternative 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 Preferred Alternative Presentation package is submitted, to the Ministry's Agreement Administrator that the Preferred Alternative 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 Preferred Alternative Presentation, the Project is required to be totally complete and all drawings and documentation completed in final form.

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

The individual who was directly responsible for and completed the InRoads work shall attend the Preferred Alternative Presentation Meeting.

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 Preferred Alternative Presentation.

Preliminary Design Report Presentation Meeting

The Design Synopsis shall be submitted for approval to the Ministry's Agreement Administrator **Twenty (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 Preferred Alternative 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; and
- m) Final Scope and Cost Report (to Project Manager only).

*The drawings must be signed/dated and sealed by Professional Engineer(s) licensed in the province of Ontario (in accordance to Part A – Section 3.3.2).

**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, as applicable.

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:

- Core Plan
- Generic Category Plan
- 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.

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 performance based selection approach for Engineering and Related Services Assignments. Past performance is applied in the selection of Service Provider for future work as a firm's Corporate Performance Rating (CPR) which is based on formal quantitative appraisals of individual 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)

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. (ie 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 combined Assignments (for example: Planning and Preliminary Design or Detail Design and Construction Administration) separate Performance Appraisal will be issued for each component of the Assignment.

For additional information refer to the latest version of Ministry's document "Consultant Performance and Selection System, Consultant Reviews and Consultant Infraction Reports, Procedures Guide" and "Consultant Performance Appraisals Procedure Guide" which are available at the [RAQS website](#) in the section of Consultant Performance and Selection System (CPSS).

Forms:

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

- Engineering and Related Services - 3 (both for Preliminary Design and Detail Design).

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”).

3.5 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) 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 ("MOL") 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 Contracts Engineer,
- (c) The Ministry Project Manager, and
- (d) The Ministry Regional Contracts Engineer

3.7 List of Designated Substances in Ministry Workplaces

3.7.1 Services Required

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 to 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	<p>Handling sand or gravel. Handling road sweeping materials.</p> <p>Silica will be present on all projects. Present throughout the working area including, but not limited to, asphalt, concrete, and granular materials.</p>
Lead	<p>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.</p>
<p>Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05)</p>	<p>Patrol yard building materials (i.e., pipe insulation, ceiling/beam insulation, ceiling tiles, acoustic wallboards, floor tiles, ducts in bridges, etc.).</p> <p>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.</p> <p>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.</p> <p>Asbestos may be found in some pavements, bridges, culverts, buildings, and electrical works:</p> <ul style="list-style-type: none"> - 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	<p>Manometers, thermometers or other pressure or temperature sensing devices may contain mercury.</p> <p>Steel Structure coatings may contain small concentrations of mercury.</p> <p>Mercury is not likely to be encountered as mercury vapour lamps have been replaced with high pressure sodium and LED for illumination.</p> <p>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.</p>
Arsenic	<p>Steel Structure coatings may contain small concentrations of arsenic.</p> <p>May be found in pressure treated lumber (e.g. sign supports and some guiderail posts) and some steel structure coatings.</p>
Benzene	<p>Benzene may be present in certain coating materials such as coal tar epoxy.</p> <p>Benzene may also be encountered in or adjacent to abandoned fuel storage facilities.</p>
Vinyl Chloride, Coke Oven Emissions, Ethylene Oxide, Acrylonitrile and Isocyanates	<p>Vinyl Chloride, Coke Oven Emissions, Ethylene Oxide, Acrylonitrile and Isocyanates are not normally present on MTO construction projects.</p>

SECTION 4: TERMS OF REFERENCE - GENERAL

4.1 Project Scope

This Assignment involves preparation of a *Preliminary* Design and completion of a Transportation Environmental Study Report (TESR) for the Bradford Bypass. The Bradford Bypass is a proposed new freeway connecting Highway 400 and Highway 404 through Town of Bradford/West Gwillimbury, Township of King and Town of East Gwillimbury.

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 Regional 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.

The Preliminary Design work includes engineering services in the following functional categories:

- Advanced Traffic Management Systems
- Bridge Engineering
- Drainage and Hydrology Engineering
- Electrical Engineering
- Environmental (Preliminary Design)
- Foundation Engineering
- Highway Engineering
- Pavement Engineering
- Surveying
- Traffic Engineering
- Value Engineering
- Property/Corridor Management
- Constructability Review

In addition, the following services are required:

- Additional biddable work item #1 as specified in section 6.7.3 (additional Foundation Investigation)
- Additional biddable work item #2 as specified in section 6.6.1 (Additional PIC Venues)
- Additional biddable work item #3 as specified in section 6.6.1 (undertaking the environmental scope outlined in this RFP for an additional 50m to the north and south of the 100m ROW noted in the 1997 Recommended Plan)
- Additional biddable work item #4 as specified in section 6.6.2 (completion of 3 CHERs and 3 HIAs)

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:

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

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

4.2 Technical Services Required

The technical services requirements specific to each functional category are described in Section 6. 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 Preliminary Design related questions during the Preliminary 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 and Section 6. 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 WO 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.
- 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.
- 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 be carried out per the Ministry provided Standard Special Provision 100F08.
- The Service Provider shall notify, in writing, the Regional Manager of Operations or an appointed regional staff member (e.g. Area Contracts Engineer 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 Regional Manager of Operations of the operation 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, 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:

Ministry of Transportation
Central Region
Planning & Design – York West/Simcoe Section
159 Sir William Hearst Avenue, 4th Floor
Toronto, Ontario M3M 0B7

Attention: Salia Kalali, P.Eng
TPM Agreement Administrator
Tel: (416) 235-6570
Fax: (416) 235-3576
Email: salia.kalali@ontario.ca

The deliverables for each functional category are described in Section 6. 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

The Ministry requires documentation summarizing the preliminary design details completed by the Service Provider during the Preliminary 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:

- 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.

The following documents shall be provided:

- a) Preliminary Design Report (PDR)
- b) Transportation Environmental Study Report (TESR)

- c) 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?
- b) Constructability Review Report;
- c) Minutes of the Progress Meetings, Milestone Meetings, and Design Complete Presentation;
- d) Minutes of the Executive Presentations;
- e) Permissions to Enter (if needed);
- f) Federal approvals and permits (if needed);
- g) Correspondence with government agencies and other stakeholders;
- h) Quality Assurance Report
- i) 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

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.

The Scope and Cost Reports may be found on the Provincial Highway 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 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.

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, as applicable:

- Foundation Reports (not required for tendering purposes)
- Foundation Investigation Reports (required for tendering purposes)
- Aggregate Sources List
- Pavement Design Reports
- Design Synopsis
- 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 items:

No.	Section	Item	# of Hard Copies	# of Digital Copies (Format)
6.1	ATMS	All drawings and documents	2	2(AutoCAD, PDF)
6.2	Bridge Engineering	All Drawings - Draft / Final	2	2 (AutoCAD, PDF)
		Structural Design Report (SDR) - Draft / Final	2	1(PDF)

		Preliminary General Arrangement Drawing - Draft / Final	2	1(PDF)
6.3	Drainage	All Drawings - Draft / Final		2(AutoCAD, PDF)
		Watercourse Crossings Inspection Report Draft / Final	2	1(PDF)
		Drainage and Stormwater Management Report Draft / Final	2	1(PDF)
		Hydrology Report Draft / Final	2	1(PDF)
		Highway Drainage Report Draft / Final	2	1(PDF)
6.4	Electrical	Electrical Preliminary Design Study Report Draft / Final	2	1(PDF)
6.6	Environmental	Project Website		1
		Consultation Plan	4	1 (PDF)
		Fish & Fish Habitat	3	1 (PDF)
		Terrestrial Ecosystems	3	1 (PDF)
		Groundwater	3	1 (PDF)
		Noise	3	1 (PDF)
		Land Use	NA	NA
		Contaminated Property & Waste Management	NA	NA
		Cultural Heritage - Built Heritage and Cultural Landscape	3	1 (PDF)
		Cultural Heritage - Archaeology	3	1 (PDF)
		Air Quality	3	1 (PDF)
		Erosion and Sediment Control	3	1 (PDF)
		Transportation Environmental Study Report (TESR) Final	4	2 (Word and PDF)
		Public Information Centres Materials and a Summary Report	4	2 (original format and PDF)
		All EA deliverables	4	Two (2) USB sticks

		Letter to indicate Class EA requirements for environmental clearance	4	1 (PDF)
6.7	Foundations	Draft Foundation Investigation and Design Report (FIDR) and/or Technical Memorandum	1	1
		Final Foundation Investigation and Design Report (FIDR) and/or Technical Memorandum (Digital shall include PDF, AutoCAD, gINT (.gpi))	1	1
		Final Foundation Investigation Report (FIR) (Digital shall include PDF, AutoCAD, gINT (.gpi))	1	1
6.8 Highway Engineering		All drawings		2 (AutoCAD, PDF)
		Field Review Report - Draft / Final	1	1 (PDF)
		Highway Asset Inventory Report - Draft / Final	1	1 (PDF)
		Preliminary Design of Carpool Lot Site(s) - Draft / Final	1	1 (PDF)
		Roundabout Alternatives - Draft / Final	1	1 (PDF)
		Preliminary Site Screening Report(s) - Draft / Final	1	1 (PDF)
		Property Request Plan(s) - Draft / Final	1	1 (PDF)
		Erosion and Sediment Control Overview Risk Assessment - Draft / Final	1	1 (PDF)
		Preliminary Design Criteria - Draft / Final	1	1 (PDF)

		Scope and Cost Report - Draft / Final	1	1 (PDF)
		Constructability Review Report - Draft / Final	1	1 (PDF)
		Preliminary Design Report - Draft	5	1 (PDF)
		Preliminary Design Report - Final	10	
		Composite Utility Plan Draft / Final	3	2 (AutoCAD, PDF)
		Mark-up Drawings From Each Utility Owner or Agency	1	1 (PDF)
6.9	Pavement	Preliminary Geotechnical Recommendations Report - Draft / Final	3	2 (Word and PDF)
6.10	Surveying & Plan Preparation	Plan and Profile drawings - Draft / Final	2	1 (Autodesk Civil3D)
		Preliminary Design Alignment Files - Draft / Final		2 (Autodesk Civil 3D and XML)
6.11	Traffic	Traffic Impact Study - Draft / Final	2	1 (PDF)
		Preliminary Traffic Management Plan - Draft / Final	2	1 (PDF)
		Operational Performance Review Report - Draft / Final	2	1 (PDF)
		Traffic Operations and Safety Report - Draft / Final	3	1 (PDF)
		Preliminary Permanent Sign Layout - Draft / Final	2	1 (PDF)
		Guide Rail Report - Draft / Final	2	2 (Word and PDF)
		PHM-125 - Draft / Final	2	2 (AutoCAD, PDF)
6.13	Constructability Review	Constructability Review Report	1	1 (PDF)

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.

4.3.3 Detail Design Documentation – NA

4.4 Reference Documents

This Project shall be carried out in accordance with the Project Requirements outlined in this RFP, the Ministry's current directives, accepted standards, specifications, practices, policies and procedures, and Regional 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.

Additional reference documents specific to a functional category are included in the Terms of Reference, Section 6.

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

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

6.1 ADVANCED TRAFFIC MANAGEMENT SYSTEMS

6.1.1 Project Scope

The study will involve reviewing previous studies and developing the future ATMS Plan along the Bradford Bypass based on the communications infrastructure of the COMPASS System and the most current practice for ATMS expansion. The study will also involve investigating and developing the ATMS for the portions of Hwy 400 and Hwy 404 leading up to the Bradford Bypass that currently do not have ATMS infrastructure.

The current COMPASS network on Hwy 400 ends at Rutherford Road. Full ATMS will be extended to King Road as part of an ongoing construction project expected to be completed in Fall 2020.

Compass network on Hwy 404 will extend up to Stouffville Road as part of ongoing construction contracts expected to be completed in 2021 and 2022.

The Ministry of Transportation currently operates the COMPASS Advanced Traffic Management System (ATMS) from the Central Region COMPASS Transportation Management Centre /Traffic Operations Centre. Within the limits of the Bradford Bypass identified in the PDR, and on Hwy 400 and 404 until their junction with the Bradford Bypass, the following ATMS sub-systems are to be evaluated to be included as part of the system:

- Communications sub-system including fibre-optic and wireless technologies;
- Power sub-system;
- Vehicle Detection Station (VDS) sub-system including loops and/or Non-intrusive Traffic Sensors (NITS) technologies;
- Closed-Circuit Television Camera (CCTV) sub-system;
- Variable Message Sign (VMS) sub-system;
- Ramp Metering Station (RMS) sub-system;
- Travel Time (TT) sub-system;
- Lane Management Sign (LMS) sub-system;
- Queue Warning Sign (QWS) sub-system;
- Roadside Unit (RSU) sub-system;
- Wildlife Detection Warning (WDW) Sub-System;
- Weather Warning Sub-System; and
- Connected and Automated (CAV) sub-system.

The principle objectives of the ATMS preliminary design effort required under this RFP are:

- Evaluate and justify the need to expand the COMPASS system on the Bradford Bypass and Hwy 400 and 404 upstream of the current ATMS limits for a seamless tie-in to the existing system.
- Conduct a feasibility assessment with cost/benefit analysis to develop options for ATMS infrastructure;

- Take advantage of all reasonable opportunities to expand the COMPASS System as a result of the Highway widening, expansion, 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

The technical lead for the ATMS shall be a Professional Engineer Licensed in Ontario with seven (7) years of relevant ATMS experience. The lead must have successfully completed a minimum of three (3) ATMS design projects for the Ministry of Transportation (MTO). These three projects must include a minimum of two (2) ATMS design projects of similar scope and complexity, two (2) ATMS Product, Process and Strategic Development & ATMS Electronic Subsystem Design projects.

The Service Provider shall be aware of existing advanced traffic management systems and planning within the project limits of Bradford Bypass and Hwy 400 and 404. 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 TPMA and the RFP. All proposed designs shall be consistent with the 'Technical Standards and Specifications' listed in Appendix 2: Technical Standards and Specifications, MTO ITS Service Books 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 on Hwy 400 and Hwy 404 resulting from the new Freeway construction and implementation of the various widening, expansion 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, expansion 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, expansion 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, expansion 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.

The outline that will be submitted by the consultant must include, but is not limited to the following items:

- A clear outline indicating the scope of work that the consultant will undertake to complete this component of the assignment;
- The investigative techniques that will be used to identify and evaluate new ATMS technologies;
- The project teams, both internal and external;
- The consultant's project team. This will include background information for each member, including past ATMS experience and each individual's relationship to the project.
- Project schedule, listing all key dates including those from Highway Engineering's preliminary design studies that are relevant to the ATMS work.

In order to define the study design the consultant will be required to co-ordinate with the Highway Engineering, Traffic and Traffic Modelling and Analysis Sections 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 utilizing the relevant Traffic Analysis and Traffic modelling reports and how they relate to the Advanced Traffic Management Systems;
- Traffic Management Strategies;
- The justification for ATMS sub-system(s);
- Feasibility analysis to determine the cost versus benefits and justification for ATMS sub-system(s) implementation on the Bradford Bypass as well as on Hwy 400 and Hwy 404 leading up to the Bradford Bypass;
- An investigation of the available ATMS equipment on Hwy 400 and Hwy 404 for the following systems;
 - i. Communications;
 - ii. Power;
 - iii. Vehicle Detection Station (VDS);
 - iv. Closed-Circuit Television Camera (CCTV);
 - v. Variable Message Sign (VMS);
 - vi. Ramp Metering Station (RMS) with and without HOV by-pass lanes;
 - vii. Travel Time (TT);
 - viii. Lane Management Sign (LMS);
 - ix. Queue Warning Sign (QWS);
 - x. Wildlife Detection Warning (WDW); and,
 - xi. Weather Warning.
 - xii. Roadside Unit (RSU); and
 - xiii. Connected and Autonomous Vehicle (CAV).
- An investigation of the feasibility of providing the ATMS infrastructure and ATMS sub-systems on the Bradford Bypass;
- An investigation of the feasibility of extending the limits of the ATMS infrastructure on Highway 400 and 404 up to the Bradford Bypass to tie in to the existing system;
- Identify all environmental factors, including but not limited to biological, social and cultural factors that relate to ATMS requirement on these corridors; and
- Identify relevant weather patterns and reports to consider providing and integrating 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, traffic analysis and traffic operations simulation models for ITS scenarios and other discipline reports within this PDR 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.

To ensure that the ATMS provides the most benefit to the public, the consultant will be required to investigate the potential partnerships with other government agencies, emergency services, media and the private sector. The consultant 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 about the ATMS.

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

ITS Service Books

ITS high-level planning for Bradford Bypass

Documents listed in Section 4.4

6.2 Bridge Engineering

6.2.1 Project Scope

A Route Planning and EA Study was completed in 2002 for Bradford Bypass corridor. The recommended Bradford Bypass mainline alignment, crossings and interchanges were developed to a concept level of design with the details such that design alternatives could be essentially contained within the identified ROW. The objective of this preliminary design assignment is to review, evaluate and recommend refined alternatives, considering changes to the design standards, current and projected traffic demand, environmental legislations, municipalities' current and future plans, etc.

The main objectives of the study can be summarized as follows:

- Review the recommended plans of the 2002 approved EA mainline alignment, interchanges and crossings;
- Develop alternatives for Bradford Bypass mainline alignment, grade separated crossings and interchanges;
- Evaluate alternatives and recommend preferred alternatives for the above elements;
- Develop a preferred staging and construction sequencing strategy for the corridor;
- Develop preliminary level design for all the highway engineering and structural engineering components.

The list of below is a summary of the structures included in the conceptual design from the 2002 approved EA. The purpose of this list is to give proponents an idea of the potential number and location of structures which will require Preliminary Designs. The number and location of the structures is subject to change as the design is refined. For example, as per the Safety Requirements for the Highway 400 – Highway Link the two freeway to freeway interchanges shall be fully directional, whereas the conceptual design in the 2002 approved EA included one loop ramp at each interchange. This will change the size and location of some structures at the interchange.

The scope of this assignment includes preliminary designs for any and all structures required to implement the Preferred Design resulting from this study.

#	GWP	WP	Structure Name	Site No.	Hwy	Location
1	TBD	TBD	N-E (loop) Ramp over Hwy 400	TBD	BBP	Hwy 400 & BBP
2	TBD	TBD	E-S Ramp over Hwy 400	TBD	BBP	Hwy 400 & BBP
3	TBD	TBD	N-E Ramp over E-S Ramp	TBD	BBP	Hwy 400 & BBP
4	TBD	TBD	10 th Sideroad Overpass - E.B.L. & W.B.L.	TBD	BBP	10 th Sideroad
5	TBD	TBD	Simcoe County Road 4 Underpass	TBD	BBP	Simcoe County Road 4 (former Hwy 11)
6	TBD	TBD	Artesian Industrial Parkway Overpass - E.B.L. & W.B.L.	TBD	BBP	Artesian Industrial Parkway
7	TBD	TBD	CN Rail Overhead - E.B.L. & W.B.L.	TBD	BBP	CN Rail
8	TBD	TBD	Holland River Bridge - E.B.L. & W.B.L.	TBD	BBP	Holland River
9	TBD	TBD	Bathurst Street Underpass	TBD	BBP	Bathurst Street
10	TBD	TBD	Holland River East Branch Bridge - E.B.L. & W.B.L.	TBD	BBP	Holland River East Branch

#	GWP	WP	Structure Name	Site No.	Hwy	Location
11	TBD	TBD	Yonge Street Overpass - E.B.L. & W.B.L.	TBD	BBP	Yonge Street
12	TBD	TBD	2 nd Concession Road Underpass	TBD	BBP	2 nd Concession Road
13	TBD	TBD	Leslie Street Overpass - E.B.L. & W.B.L.	TBD	BBP	Leslie Street
14	TBD	TBD	S-W Ramp over Hwy 404	TBD	BBP	Hwy 404 & BBP
15	TBD	TBD	W-N Ramp over Hwy 404	TBD	BBP	Hwy 404 & BBP
16	TBD	TBD	W-N Ramp over S-W Ramp	TBD	BBP	Hwy 404 & BBP
17	TBD	TBD	Professor Day Drive Underpass	TBD	BBP	Hwy 400 & BBP
	TBD	TBD	Structural Culverts	TBD	BBP	Various locations, required
	TBD	TBD	Retaining Walls	TBD	BBP	Various locations, as required
	TBD	TBD	Overhead and/or Cantilever Sign Support Structures	TBD	BBP	Various locations, as required

General

- The Service Provider's services shall include the following for new bridge structures, including new grade separations or interchange structures:
 - A preliminary E-Plan
 - A General Arrangement (GA) drawing indicating pier and abutment locations (coordinates & chainage, where available), horizontal and vertical clearances, foundation type (shallow or deep) construction depth, falsework allowance, if applicable, and traffic lane arrangement. If alternative types of structure have been considered, only the GA of the recommended type need to be presented.
 - Clearances and cross-section requirements for all new bridges shall conform to Revisions to Geometric Design Standard for Ontario Highways, 2002.
 - Summarize all the findings into a preliminary Structural Design Report (SDR) with emphasis on construction staging, cost and duration of construction, recommended structure type etc.
 - Where cost split with municipalities or other jurisdictions is involved, the Service Provider shall work in conjunction with their overall project manager and provide the structural cost split.
 - Opportunities for accelerated bridge construction techniques, such as using prefabrication, and/or Rapid Bridge Replacement (RBR) shall be part of the structural consideration.

- Show commitment to bridge aesthetics, identify the Bridge Aesthetic Classification, and recommend suitable aesthetic treatment according to Ministry Aesthetic Guidelines for Bridges
- The Service Provider's services shall include the following for retaining wall structures:
 - Plans indicating extent of new retaining walls at various locations with approximate chainage;
 - Elevations showing approximate top of wall elevations;
 - Type of retaining wall in relations to cost of construction and site constraints;
 - Precast construction and aesthetic shall also be explored; and
 - Duration and cost of construction.
- The Service Provider's services shall include the following for structural culvert structures:
 - An inventory of all structural culverts within limits of the study/planning. The Service Provider is responsible to identify and confirm all culvert requirements within the project limit.
 - Fully document the required culvert sizes, lengths, skew, extensions where applicable, depth of overburden in accordance with Ministry Form PH-D-353 91-04
 - Work in conjunction with the Service Provider's roadway engineer to assess/document the required hydraulic capacity of all culverts
 - Recommendations pertaining to concrete culvert extensions, repairs and/or replacement
 - Method for extensions, repairs and/or replacements, associated costs and duration of construction shall be documented.
 - Precast construction shall also be explored
- The Service Provider's services shall include the following for Overhead or Cantilever Sign Support Structures:
 - A list of new Overhead and/or Cantilever Sign Support Structures with location stationing within limits of the study/planning.
 - Cost of construction

Site-Specific Requirements

1) Structure Name: N-E (loop) Ramp over Hwy 400

Brief summary of the proposed bridge:

- Two lane structure carrying N-E (loop) ramp over Hwy 400

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

- TESR update to the 2002 TESR
- Preliminary design of a new structure, as part of the proposed freeway to freeway interchange at Hwy 400, and for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structure location/alignment and configuration to be verified in TESR update and PDR review.
- New structure shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes

The anticipated construction staging methodology is staging/ detour design on the Hwy 400 with the requirement to maintain three lanes of traffic in each direction at all times, except for temporary night-time time closures as permitted by MTO Traffic.

2) Structure Name: E-S Ramp over Hwy 400

Brief summary of the proposed bridge:

- Two lane structure carrying E-S ramp over Hwy 400

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

- TESR update to the 2002 TESR
- Preliminary design of a new structure, as part of the proposed freeway to freeway interchange at Hwy 400, and for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structure location/alignment and configuration to be verified in TESR update and PDR review.
- New structure shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes

The anticipated construction staging methodology is staging/ detour design on the Hwy 400 with the requirement to maintain three lanes of traffic in each direction at all times, except for temporary night-time time closures as permitted by MTO Traffic.

3) Structure Name: N-E Ramp over E-S Ramp

Brief summary of the proposed bridge:

- Single lane structure carrying N-E ramp over two-lane E-S ramp.

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

- TESR update to the 2002 TESR
- Preliminary design of a new structure, as part of the proposed freeway to freeway interchange at Hwy 400, and for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structure location/alignment and configuration to be verified in TESR update and PDR review.
- New structure shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes

The anticipated construction staging methodology is staging/ detour design on the Hwy 400 with the requirement to maintain three lanes of traffic in each direction at all times, except for temporary night-time time closures as permitted by MTO Traffic.

4) Structure Name: 10th Sideroad Overpass - E.B.L. & W.B.L.

Brief summary of the proposed bridge:

- Twin two-lane structures carrying Hwy 400 to Hwy 404 Link EB and WB lanes over two-lane 10th Sideroad.

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

- TESR update to the 2002 TESR
- Preliminary design of new structures for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structures location/alignment and configuration to be verified in TESR update and PDR review.
- New structures shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes
- Incorporate Active Transportation (AT) requirements and cycling infrastructure through the 10th Sideroad.

5) Structure Name: Simcoe County Road 4 Underpass

Brief summary of the proposed bridge:

- Four-lane structure carrying Simcoe County Road 4 over divided four-lane freeway.

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

- TESR update to the 2002 TESR
- Preliminary design of a new structure, as part of the proposed new interchange, and for the for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structure location/alignment and configuration to be verified in TESR update and PDR review, including the configuration of spans for the underpass structures, since the Bradford Bypass number of lanes will be determined during the preliminary design.
- New structure shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes
- Incorporate Active Transportation (AT) requirements and cycling infrastructure through the Simcoe County Road 4.

The anticipated construction staging methodology is offset alignment for the construction of new Simcoe County Road 4 Underpass structure.

6) Structure Name: Artesian Industrial Parkway Overpass - E.B.L. & W.B.L.

Brief summary of the proposed bridge:

- Twin two-lane structures carrying Hwy 400 to Hwy 404 Link EB and WB lanes over two-lane Artesian Industrial Parkway.

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

- TESR update to the 2002 TESR
- Preliminary design of new structures for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structures location/alignment and configuration to be verified in TESR update and PDR review.
- New structures shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes
- Incorporate Active Transportation (AT) requirements and cycling infrastructure through the 1 Artesian Industrial Parkway.

7) Structure Name: CN Rail Overhead - E.B.L. & W.B.L.

Brief summary of the proposed bridge:

- Twin two-lane structures carrying Hwy 400 to Hwy 404 Link EB and WB lanes over single track CN Rail line (plus potentially a two-lane service road adjacent to the east side of the rail right-of-way). Refer to discussion elsewhere in this document under “Railways”.

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

- TESR update to the 2002 TESR
- Preliminary design of new structures for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structures location/alignment and configuration to be verified in TESR update and PDR review.
- New structures shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes

8) Structure Name: Holland River Bridge - E.B.L. & W.B.L.

Brief summary of the proposed bridge:

- Twin two-lane decks on a set of common piers carrying Hwy 400 to Hwy 404 Link EB and WB lanes over Holland River. Main span provides 19.8m wide opening and 6.86m vertical clearance above water level 718.83' (219.1m) GSC based on Canadian Coast Guard direction. Potential exists for a two-lane road to use the easternmost span as an access from realigned Hochreiter Road to the agricultural field on the other side of the Link.

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

- TESR update to the 2002 TESR
- Preliminary design of new structures for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structures location/alignment and configuration to be verified in TESR update and PDR review.
- Review 2002 EA commitments regarding the use of elevated structure on piers rather than an earth fill embankment to cross the designated wetland.
- New structures shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes

9) Structure Name: Bathurst Street Underpass

Brief summary of the proposed bridge:

- Single lane structure carrying Bathurst Street over divided four-lane freeway.

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

- TESR update to the 2002 TESR
- Preliminary design of a new structure, as part of the proposed new interchange, and for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)

- New structure location/alignment and configuration to be verified in TESR update and PDR review, including the configuration of spans for the underpass structures, since the Bradford Bypass number of lanes will be determined during the preliminary design.
- New structure shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes
- Incorporate Active Transportation (AT) requirements and cycling infrastructure through Bathurst Street.

The anticipated construction staging methodology is offset alignment for the construction of new Bathurst Street structure.

10) Structure Name: Holland River East Branch Bridge - E.B.L. & W.B.L.

Brief summary of the proposed bridge:

- Twin two-lane decks on a set of common piers carrying Hwy 400 to Hwy 404 Link EB and WB lanes over Holland River. Main span provides 19.8m wide opening and 6.86m vertical clearance above water level 718.83' (219.1m) GSC per Canadian Coast Guard direction.

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

- TESR update to the 2002 TESR
- Preliminary design of new structures for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structures location/alignment and configuration to be verified in TESR update and PDR review.
- Review 2002 EA commitments regarding the use of elevated structure on piers rather than an earth fill embankment to cross the designated wetland
- New structures shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes

11) Structure Name: Yonge Street Overpass - E.B.L. & W.B.L.

Brief summary of the proposed bridge:

- Twin two-lane structures carrying Hwy 400 to Hwy 404 Link EB and WB lanes over two lane Yonge Street.

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

- TESR update to the 2002 TESR
- Preliminary design of new structures for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structures location/alignment and configuration to be verified in TESR update and PDR review.
- New structures shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes
- Incorporate Active Transportation (AT) requirements and cycling infrastructure through Yonge Street

12) Structure Name: 2nd Concession Road Underpass

Brief summary of the proposed bridge:

- Single two-lane structure carrying 2nd Concession Road over divided four-lane freeway.

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

- TESR update to the 2002 TESR
- Preliminary design of a new structure for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structure location/alignment and configuration to be verified in TESR update and PDR review, including the configuration of spans for the underpass structures, since the Bradford Bypass number of lanes will be determined during the preliminary design.
- New structure shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes
- Incorporate Active Transportation (AT) requirements and cycling infrastructure through 2nd Concession Road.

The anticipated construction staging methodology is offset alignment for the construction of new 2nd Concession structure.

13) Structure Name: Leslie Street Overpass - E.B.L. & W.B.L.

Brief summary of the proposed bridge:

- Twin two-lane structures carrying Hwy 400 to Hwy 404 Link EB and WB lanes over four lane Leslie Street.

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

- TESR update to the 2002 TESR
- Preliminary design of new structures, as part of the proposed new (partial) interchange, and for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structures location/alignment and configuration to be verified in TESR update and PDR review.
- New structures shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes
- Incorporate Active Transportation (AT) requirements and cycling infrastructure through Leslie Street

14) Structure Name: S-W Ramp over Hwy 404

Brief summary of the proposed bridge:

- Two lane underpass structure carrying S-W ramp over Hwy 404

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

- TESR update to the 2002 TESR
- Preliminary design of a new structure, as part of the proposed freeway to freeway interchange at Hwy 404, and for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structure location/alignment and configuration to be verified in TESR update and PDR review.
- New structure shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes

15) Structure Name: W-N Ramp over Hwy 404

Brief summary of the proposed bridge:

- Two lane structure carrying W-N ramp over Hwy 404

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

- TESR update to the 2002 TESR
- Preliminary design of a new structure, as part of the proposed freeway to freeway interchange at Hwy 404, and for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structure location/alignment and configuration to be verified in TESR update and PDR review.
- New structure shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes

16) Structure Name: W-N Ramp over S-W Ramp

Brief summary of the proposed bridge:

- One lane structure carrying W-N ramp over two-lane S-W ramp.

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

- TESR update to the 2002 TESR
- Preliminary design of a new structure, as part of the proposed freeway to freeway interchange at Hwy 404, and for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structure location/alignment and configuration to be verified in TESR update and PDR review.
- New structure shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes

17) Structure Name: Professor Day Drive Underpass

Brief summary of the proposed bridge:

- Single two-lane structure carrying Professor Day Drive over divided four-lane freeway.

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

- TESR update to the 2002 TESR
- Preliminary design of a new structure for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structure location/alignment and configuration to be verified in TESR update and PDR review, including the configuration of spans for the underpass structures, since the Bradford Bypass number of lanes will be determined during the preliminary design.
- New structure shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes
- Incorporate Active Transportation (AT) requirements and cycling infrastructure through Professor Day Drive.

The anticipated construction staging methodology is offset alignment for the construction of new Professor Day Drive structure.

Structural Culverts

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

- TESR update to the 2002 TESR
- Preliminary design of a new culvert structures on the watercourse crossings, and for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New culvert structures location/alignment to be verified in TESR update and PDR review.
- New structures shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes
- The number of culverts, based on the watercourse crossings and the EA alignment, is assumed a minimum of 17 new culverts and 2 existing culvert extensions. With culverts openings (sizes) to be confirmed by hydraulic analysis as part of the PDR, about half of them can be assumed structural for purpose of preliminary anticipated scope of work.

Overhead and/or Cantilever Sign Support Structures

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

- TESR update to the 2002 TESR
- Preliminary design of a new structures for the proposed Hwy 400 to Hwy 404 Link (Bradford Bypass)
- New structures location to be verified in TESR update and PDR review.
- New structures shall accommodate ultimate 8-lane widening of the proposed Bradford Bypass from initial 4 lanes
- Need for overhead signs vs. ground mounted should be reviewed based on the BBP number of lanes, as overhead signs may not be required for up to 6-lane highway.

6.2.2 Technical Services Required

Staff to be provided

The key individuals must include (a) Structural Manager (b) Structural Project Engineer(s) that will actually carry out the structural design and seal the structural documents. The project key staff shall be Professional Engineers licensed to practise in the Province of Ontario. The Structural Manager shall have a minimum of seven (7) years of structural design experience, including a minimum of two (2) projects of similar scope and complexity over the past seven (7) years, and shall have demonstrated expertise in the design and evaluation of complex, multi-span bridge structures located on major freeways. The Structural Project Engineer(s) shall have a minimum of five (5) years of recent project experience and a demonstrated ability to successfully complete the designs of complex, multi-span bridge structures located on major freeways. The TPM Service Provider's staff shall have structural design expertise that is adequate for this project's scope and complexity; and shall have proven knowledge and experience in bridge design using the current edition of the Canadian Bridge Design Code (CHBDC) and current ministry design standards, specifications, policies and practices, including the preparation of contract documents and drawings for highway bridge projects in accordance with the Ministry standards.

REQUIREMENTS FOR PROFESSIONAL ADVICE ON BRIDGE AESTHETICS

Investigate and give consideration to the requirements for aesthetic appearance of the new underpass structures and their compatibility to the surroundings and context, taking into account the fundamental principles of bridge planning as well as site specific, local user requirements.

Retain the services of a Bridge Architect for professional advice on bridge aesthetics and implement the recommendations for aesthetic consideration during the bridge design process according to MTO guidelines “Aesthetic Guidelines for Bridges”, dated September 2004.

The level of architectural experience required for the Bridge Architect shall be as follows: Licensed Architect with a demonstrated experience in dealing with general architectural issues and aesthetic considerations generally in landscape, building, monument, bridges and infrastructure developments. The architect should demonstrate their experience through direct involvement on projects demonstrating aesthetic design qualities such as functional clarity, scale and proportions, order and balance, simplicity and continuity and site/environmental integrity.

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 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.

6.2.2.2. Preliminary Design & Planning

2. 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.
3. Structural design shall be in accordance with all region-specific requirements in addition to the general requirements. Region-specific requirements shall take precedence in the event of a conflict.
 4. The Service Provider shall coordinate with all relevant MTO functional offices as required to support the design.
 5. 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.
 6. 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.
 7. 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.
 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. Any deviations from standard design practices shall be clearly noted in the project's Design Synopsis.
 10. The Service Provider shall consider and include any necessary design provisions under the Navigation Protection Act.
 11. 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.
 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:

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

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 regional 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.

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

- **ALL BRIDGE SITES**
 - Minimum alternatives to be considered include developing and presenting a minimum of two (2) alternative structural design concepts for the new bridge structures, such as consisting of (i) concrete slab superstructure or girders; and (ii) steel girders.

6.2.4 Reference Documents

- Environmental Assessment Report (Dec. 1997) - Bradford Bypass

6.4 Electrical Engineering

6.4.1 Project Scope

This project includes the preliminary design study of electrical requirements within the project limits. Electrical design study includes lighting for highways, municipal roads, bridges; traffic signals; counting stations; carpool lots; roundabouts; RWIS; electrical embedded work in structures/underpass lighting; electrical removals; and all associated electrical work.

6.4.2 Technical Services Required

The electrical engineering preliminary design services shall include the following.

- 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.
- Preliminary power distribution system requirements/agreements for new hydro services shall be coordinated with local hydro authorities.
- Arrange and conduct meetings, liaise and prepare draft agreements with local municipalities, private owners, and agencies regarding the ownership, maintenance, operation, and cost sharing of Ministry lighting, municipal lighting, private lighting, traffic signals, navigational lighting, and other electrical systems. The ministry's project manager and electrical project manager shall be invited to attend the meetings.

- Prior to the 60% and 90% meetings, 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.
- If high mast lighting is selected as the recommended alternative, 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 ministry's electrical project manager and electrical coordinator shall be invited to attend all the meetings.
- The Consultant's electrical key staff shall attend all design team progress meetings with electrical items on the agenda.

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, counting stations, power supplies, and flashers.
- Identification of all existing electrical plants/systems affected by the recommended civil improvement alternative(s).
- Recommendation of improvement work to the existing electrical systems.
- Evaluation of lighting and traffic signal warrants shall be carried out according to Section 6.11, Traffic Engineering. Prepare preliminary PHM-125 drawings.
- Evaluation and recommendation of appropriate lighting alternatives based on lighting and traffic signal warrant requirements, lifecycle cost assessment, and current MTO policies and standards. All warrant calculations shall be included in the report. High mast lighting shall be considered where full illumination is warranted.
- Recommendation of temporary and permanent electrical work required for the recommended improvement alternative(s) and construction staging, including conceptual design with preliminary layouts.
- Recommendation of location and capacity of new power supplies for MTO Electrical and MTO ITS systems.
- Preparation of preliminary 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 utilize LED lighting, and accommodate more than one suppliers' luminaires from the most current edition of the MTO Accepted Photometrics List.

- Recommendation of design standards for all electrical systems.
- 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.
- Identification of required electrical removals.
- 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. In addition to requirements outlined elsewhere in the Agreement.
- Submit (2) hard copies and a digital copy of the electrical report to the Electrical Engineering Section.
- Preliminary 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 for typical cases.
 - One hard copy set of colour roll plans 1:1000 scale in PDF format.
 - Digital submission of layout drawings and lighting program files.
- Preliminary electrical layout drawings:
 - Digital submission of 11"x17" preliminary layouts in PDF and AutoCAD format (references binded).
- Preliminary PHM-125 drawings:
 - Digital submission of preliminary PHM-125 drawings (1:500 scale) in PDF and AutoCAD format (references binded).

6.4.4 Reference Documents

N/A

6.3 Drainage and Hydrology Engineering

6.3.1 Project Scope

This project includes preliminary drainage design for the Bradford Bypass. Additional details of the project scope and the limits of the study area can be found elsewhere within this document.

6.3.2 Technical Services Required

Staff to be provided

The Service Provider shall have experience in analyzing and designing drainage systems for 400 series highways or similar infrastructures. The consultant must be able to undertake the work using modern methods, with attention to riparian rights, and upstream and downstream impacts.

The Service Provider shall be a Professional Engineer of Ontario with a minimum of 7 years drainage and hydrology experience, which must include at least 2 MTO highway projects of comparable size and scope.

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
 - d. MTO IDF online application
 - e. All other applicable reports, manuals, directives, Provincial Engineering 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. 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 the detail drainage design including the following:

Ensure the design report(s) have completely documented all relevant background information. This shall include as a minimum, the review of relevant background studies and reports, liaison with external agencies, production of a drainage mosaic, and identification of drainage requirements to support the proposed work.

For Water Crossings

- a. Identification and evaluation of all selected 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 Navigation Protection 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 one (1) hardcopy 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 Drainage and Hydrology Reports

Hydrology Report:

Undertake required hydrologic analysis using methods acceptable to the Ministry. Hydrologic analysis shall be undertaken for 2, 5, 10, 25, 50 and 100 year return periods and typical rainfall distributions. IDF data shall be obtained from the MTO IDF tool for the year 2095. In situations where the watercourse is regulated by the local Conservation Authority, hydrologic analysis shall also be undertaken for the Regulatory Event. Obtain approval from MTO and external agencies as required.

1. The Service Provider shall provide a Hydrology Report (HR) for the preliminary design of each bridge or structural culvert. For non-structural culverts, a number of culverts can be included in one report.
2. The HRs 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 for the different applicable design requirements
 - e. Stream and structure alignments and stream cross-sections upstream and downstream
 - f. Proposed work
 - g. Hydraulic analysis and evaluation of the different alternatives including liner and replacement options for culverts and bridge spans and openings, piers, abutments and footing arrangement and configuration.
3. The HR 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. A summary of computer model results used in the hydrologic and/or hydraulic design
 - a. Erosion analysis and control measures for the stream channel and embankment
 - b. Scour analysis and protection measures at bridge foundations and culvert inlet and outlet.
 - c. Fisheries concerns, analysis and proposed mitigation measures
 - d. Construction limitations, constructability and other relevant issues (utilities, property, etc.)
5. The HR shall incorporate all recommendations from the Foundation Investigation and geotechnical reports.
6. The Service Provider shall summarize and document the findings of all inspections, investigations, evaluations, and all other pertinent findings in the HR.
7. A decision making matrix shall be prepared for all options considered, and included in the HR. The matrix shall be numerically based with varying weights for the factors involved.

8. Appendices shall be included containing a summary of the alternatives considered, hydrology and hydraulic analysis and supporting data.

Highway Drainage Report:

Undertake required hydraulic design of the proposed drainage infrastructure and ensure it conforms to current MTO standards, if possible. Ensure that headwater elevations do not increase outside of the MTO right-of-way for any of the flow rates determined as part of the hydrologic analysis.

Assess potential SWM impacts associated with the proposed work. If impacts are identified, conduct a preliminary design of facilities to mitigate any drainage quantity, quality and erosion impacts associated with proposed construction of the roadway system. Highway development conditions examined should include existing conditions, post-development conditions without stormwater management controls (to justify SWM if required) and post-development conditions with stormwater management controls if required. Ensure that consideration has been given to all upstream and downstream stakeholders.

Obtain approval from MTO and external agencies as required.

1. The Service Provider shall provide a Drainage Report (DR) for the preliminary design of each surface drainage system network and associated stormwater management components.
2. The DRs 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 for the different applicable design requirements
 - e. Pipe network layout with locations of all outlets and associated structures and connections
 - 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 DR 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. A summary of computer model results used in the hydrologic and/or hydraulic design
 - a. Erosion analysis and control measures at all outlets
 - b. Construction limitations, constructability and other relevant issues (utilities, property, etc.)
5. The DR shall incorporate all recommendations from the Foundation Investigation and geotechnical reports.

6. The Service Provider shall summarize and document the findings of all inspections, investigations, evaluations, and all other pertinent findings in the DR.
7. A decision making matrix shall be prepared for all options considered, and included in the DR. The matrix shall be numerically based with varying weights for the factors involved.
8. Appendices shall be included containing a summary of the alternatives considered, hydrology and hydraulic analysis and supporting data.

6.3.4 Reference Documents

- The MTO Drainage Manual can be obtained by the following link:
<http://www.library.mto.gov.on.ca/webopac/search.asp?mode=search>
Enter “Drainage Manual” in the title field and then search.
- MTO Drainage Directives can be obtained from the following link:
<http://www.mto.gov.on.ca/english/engineering/drainage/>
- The MTO Highway Drainage Design Standards can be obtained by the following link:
<http://www.library.mto.gov.on.ca/webopac/search.asp?mode=search>
Enter “Highway Drainage Design Standards” in the title field and then search.
- The MTO IDF Data can be obtained by the following link:
http://www.mto.gov.on.ca/IDF_Curves/terms.shtml

6.5 Engineering Materials Investigations - N/A

6.6 Environmental

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.

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

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 A project.

The environmental schedule requirements for this project are the following:

Terrestrial ecology investigations must be completed prior to any archaeological investigations or other invasive field investigations such as for foundations, to determine whether there are any SAR (plant or animal), critical habitats or ground nesting birds that may impact the timing of archaeological excavation/ plowing or other engineering or environmental field investigations. Archaeological and other field investigations must comply with any resulting timing restrictions and be incorporated into the project schedule. Archaeology must be completed prior to other invasive engineering investigations.

Fisheries investigations within regulated habitat (meander belt plus 30 meters) must be defined for Redside Dace prior to undertaking intrusive investigations. Approval from MECP must be obtained before the undertakings.

Permission to Enter (PTE) must be obtained prior to entering onto private property for any purpose including environmental field investigations.

In order to accelerate the preliminary design and EA work schedule, the ministry has advanced some preparatory work prior to the main PDR/EA TPM assignment under a separate assignment. The environmental component of this advance work consists of background data collection through secondary sources, desktop surveys, as well as obtaining Permission to Enter (PTE) for all properties in the study area. For the purpose of this advance work, the study area includes the 1997 approved Bradford By-Pass Recommended Plan as shown in Chapter 5 of the EA report entitled *Environmental Assessment Report One-Stage submission Highway 400 – Highway 400 Extension Link (Bradford Bypass) W.P. 377-90-00, McCormick Rankin Corporation, December 1997* plus an additional 500m to the north and south. Upon completion, these environmental factor background existing condition reports prepared under this separate assignment will be provided to the successful bidder.

For the purposes of this TPM assignment, the proposed Right-Of-Way includes the 1997 EA approved Bradford By-Pass Recommended Plan as shown in Chapter 5 of the EA report noted

above. Please note, unlike the advance assignment noted above, this TPM assignment does not include the additional 500m to the north and south. For bidding purposes, please include a separate biddable item for undertaking the environmental scope outlined in this RFP for an additional 50m to the north and south of the 100m ROW noted in the 1997 Recommended Plan.

The project delivery of factor-specific environmental services is as outlined below:

Factor-Specific Environmental Services	Technical Report Required	
	Yes	No (*but to be included in the TESR)
Environmental Planning	X	
Fish & Fish Habitat	X	
Terrestrial Ecosystems	X	
Groundwater	X	
Noise	X	
Land Use		X
Contaminated Property & Waste Management		X
Cultural Heritage - Built Heritage and Cultural Landscape	X	
Cultural Heritage - Archaeology	X	
Landscape		X
Air Quality	X	
Surface Water		X
Erosion and Sediment Control	X	

*If a Technical Report is not required, details for each factor are to be included in the TESR.

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

Summaries of all reports will also be included in the TESR.

All environmental work shall be conducted in accordance with the requirements of the MTO Environmental Reference for Highway Design (ERD), June 2013. Where discrepancies occur

between the ERD and legislative requirements, legislation shall take precedence over the ERD. Where the ERD requirements are in excess of requirements of factor specific protocols, the requirements of the ERD shall apply. Where inconsistencies are found to exist between the ERD and the project specific Terms of Reference, the Terms of Reference shall apply. The Prime Consultant shall be responsible for making all requirements known to any sub-consultants hired by them.

A design work plan shall be submitted as part of the proposal detailing each environmental factor-specific area and the project consultation plan, along with associated staffing.

The TPM Service Provider is to undertake the following (not necessarily limited to the following):

Review existing conditions, obtain additional information through agency consultation and field study where necessary, assemble the information on a complete Existing Conditions Map(s) for the entire project limits (as applicable), identify potential problem areas, identify impacts of recommended highway improvements, consult public agencies and/or private landowners, as appropriate and prepare an Transportation Environmental Study Report (TESR) and all technical reports as outlined in this Request For Proposals document.

The project environmental deliverables for design are the following:

1. Provide all components of environmental impact study;
2. Provide all components of environmental protection/mitigation;
3. Provide all elements of external consultation;
5. Prepare all elements of environmental assessment documentation, as applicable, and undertake related administrative support;
7. Ensure that the project is eligible for environmental clearance, including preparation of 'eligible for environmental clearance' letter;
8. Prepare and submit the 'MTO Class EA Process Monitoring Questionnaire for Design Consultant Staff'; and
9. Prepare 'Summary of Environmental Concerns and Commitments' table.

In undertaking the above environmental deliverables, the consultant is to meet the requirements of environmental statutory duty (including documentation) on behalf of the ministry, including but not restricted to, compliance with the requirements of the Ontario Environmental Assessment Act, the Impact Assessment Act (2019), and the Class Environmental Assessment for Provincial Transportation Facilities (Class EA) (1999, as amended 2000). Environmental statutory duty is outlined in Section 1.7.3 of the Class EA.

Requirements for additional project environmental deliverables are provided in the Environmental Reference for Highway Design, June 2013.

1. Environmental Impact Study

The components of environmental impact study include, but are not restricted to the following:

- Review of Existing Conditions background data provided by the previous Retainer Assignment, and further collection/update of any additional data as required;
- field investigation;
- determination of significance; and

- assessment of impacts.

The field investigations shall be conducted during the appropriate season and be of sufficient scope to gain all necessary and required approvals. The field work and background data shall be analyzed and compiled so as to produce relevant mapping of environmental constraints and deficiencies.

2. Environmental Protection/Mitigation

A wide range of environmental protection measures shall be considered and utilized to address potential environmental impacts.

3. External Consultation

The elements of external consultation include, but are not restricted to the following:

- Discussions and correspondence with stakeholders;
- Meetings, negotiations, external presentations, PICs, project website
- Associated Freedom of Information and Protection of Privacy Act requirements for the above.

A consultation plan shall be provided within one month of project start-up. The elements of external consultation are subject to pre-approval and participation by MTO.

The consultation process shall be documented in the EA Document and include a contact list of those involved with the consultation process.

Project Notifications to Ministry of the Environment, Conservation and Parks (MECP) Regional Offices

(refer to MECP website <https://www.ontario.ca/page/preparing-environmental-assessments#section-5>)

For all Group A and B projects:

- i) Send an email to the dedicated EA notification email account in the applicable MECP regional office with:
 - a. Notice of Study Commencement and completed Project Information Form (PIF)
 - b. Notice of Completion (no PIF required)
 - c. Notice of Addendum (no PIF required)
- ii) Send all other project notices (e.g. Step-down, PIC,) and correspondence (including copies of TESR/DCR/Addendum documents for public and/or MECP review) directly to the regional MECP EA Coordinator by the usual method (mail / courier / fax / email, etc.).

For Group C projects:

- i) If a Notice of Study Commencement is issued to MECP, send an email to the dedicated EA notification email account in the applicable MECP regional office with the Notice of Study Commencement and completed Project Information Form (PIF)

- ii) Send any other Group C project notices (e.g.PIC) and any correspondence with MECP directly to the regional MECP EA Coordinator by the usual method (mail / courier / fax / email, etc.).

Procedure to send emails to dedicated EA notification email account in the applicable MECP regional office:

- i) Download and complete the “Project Information Form” (PIF) and attach a PDF to the email (if the project spans more than one municipality, from the drop down menu select ‘Several’ for the location of the project).
- ii) The email ‘subject’ line is to include:
- Project location (copy from the location selected in the PIF. If the project spans more than one municipality, identify the upper tier/regional municipality where the majority of the project falls within)
 - Type of streamlined EA (MTO Class EA)
 - Project Name (include highway number and GWP or WP # for MTO internal reference)
- iii) Attach to the email a PDF of the applicable newspaper notice (Notice of Study Commencement / Notice of Completion / Notice of Addendum)
- iv) Copy the project MTO Environmental Planner when email MECP.
- v) Send the email to the MECP regional office where the project is located using the applicable MECP Regional EA notification address (if the project spans more than one MECP region, send it to the MECP regional office where the majority of the project falls within):
- **Central Region** – eanotification.cregion@ontario.ca
 - **Eastern Region** – eanotification.eregion@ontario.ca
 - **Northern Region** – eanotification.nregion@ontario.ca
 - **South West Region** – eanotification.swregion@ontario.ca
 - **West Central Region** – eanotification.wcregion@ontario.ca
 - The hyperlink to the [MECP District Officer Locator](#) website, can assist in determining what MECP region a project is located within.

Statutory Advertisements in Newspapers

An advertising agency has been selected to place all statutory advertisements in newspapers for the Ministry. Statutory advertising placed by the Service Provider on behalf of the Ministry includes such items as tender notices, public notices (public information centres, environmental assessments, expropriation of property, road closures) and certificates of substantial completion.

Indigenous Consultation

The Crown recognizes that it has a duty to consult with Indigenous Communities when it has knowledge of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that might adversely affect it. In accordance with the Ontario Environmental Bill of Rights “Statement of Environmental Values”, MTO will work with

Indigenous Communities and ensure interests are taken into account by the Ministry in its decision-making process.

Some of the issues that may be of particular interest to Indigenous Communities include but are not limited to the following:

- Implications to Land Claim areas
- Impacts to sacred grounds
- Impacts to known burial sites
- Effects on lands used for traditional hunting or fishing rights

MTO will be responsible for identifying and making initial contact with potentially affected Indigenous Communities. Communication will continue throughout the study. Where requested, presentations will be made to the Chief and elected council of each affected First Nation (or such other groups or committees as requested by the Chief). Follow-up actions will likely be needed to address any concerns highlighted by the individual Aboriginal community. The consultant will assist MTO staff in carrying out the Consultation Plan. This may include:

- Preparing correspondence to First Nations
- Attending and presenting the project to the Chief
- Assembling the relevant documentation for a submission to MECP in support of the undertaking.

French Designated Areas

The Service Provider is to determine if French language services are required as per Section 4 of the Environmental Reference for Highway Design.

In addition to the requirements outlined in the ERD, non-technical parts of project websites (e.g. project background, description, consultation, etc.) shall be available in both French and English in designated areas.

Ontarians with Disabilities Act (2001) Obligations

In the planning stage for any procurement, users of this precedent are reminded of the Ontario government's obligations under Section 5 of the Ontarians with Disabilities Act, 2001 (the "ODA") which section reads as follows:

Government goods and services

In deciding to purchase goods or services through the procurement process, its employees or the public, the Government of Ontario shall have regard to the accessibility for persons with disabilities to the goods or services.

Accessibility issues must be taken into account for each good or service when preparing the procurement documents and, where appropriate, necessary wording inserted into the procurement document so as to both specify the needs and allow evaluation of the good or services' capability to meet the desired accessibility requirements. For assistance, users can, where available, make reference to their Ministry's accessibility plan developed under the Act and the MBS Guidelines relating to the ODA.

NOTE: Public documents must be written/published in Arial 12 font.

4. Formal Environmental Approvals and Exemptions

The work of obtaining all necessary formal environmental approvals and exemptions identified during Preliminary Design includes, but is not restricted to the following:

- negotiation; and
- preparation of the applications, which contain all necessary supporting engineering and environmental information.

Environmental approvals negotiations and formal applications are subject to pre-approval and participation by MTO.

Where the Terms of Reference ‘Project Specific’ section of this RFP indicates that there is an existing formal environmental approval that applies to the project, its terms and conditions shall be deemed to be a project requirement, and any proposed changes may require an addendum, re-negotiation, etc.

The EA process requirements provide a mechanism to assist in achieving the appropriate balance when the objectives of different approvals are in conflict. In addition, each individual approval must be pursued in its own right.

5. Environmental Assessment Documentation

Environmental assessment documentation includes, but is not limited to the following:

- factor-specific environmental technical reports, as specified in Sections 6.6.1 and 6.6.3 of this Request for Proposals document;
- a summary of environmental conditions, which summarizes the environmental impact study;
- an environmental synopsis, which summarizes the environmental protection plan for the project;
- a summary of environmental concerns and commitments in tabular form; and
- environmental assessment process documentation in the form of a TESR.

Where factor specific environmental technical reports are specified in Sections 6.6.1 and 6.6.3 of this Request for Proposals document, they shall document each of the components specified above for environmental impact study.

Environmental assessment documentation is subject to MTO approval. One (1) digital copy in Microsoft Word of the draft EA document and each draft factor-specific report shall be provided to the Ministry for review.

Four (4) hard copies and one (1) digital copy of the final EA document shall be provided to the Ministry. Three (3) copies and one (1) digital copy of each finalized factor-specific environmental technical report shall be provided to the Ministry.

6. Environmental Clearance

As soon as the project is eligible for environmental clearance, this shall be indicated in a letter to

the Ministry, with direct reference to Class EA requirements for environmental clearance.

7. Class EA Process Monitoring

The information used to complete the 'MTO Class EA Process Monitoring Questionnaire for Design Consultant Staff' shall be collected from, but not limited to: project correspondence, media reports, bump-up requests and public information centre (PIC) comment sheets (as applicable to this project).

8. Concerns and Commitments Table

The table should provide a detailed breakdown of the identified environmental features within the project limits and the committed measures/approaches for protecting the environment or for addressing other project related concerns.

6.6.2 Technical Services Required

Staff to be provided

Mandatory staffing requirements are provided in Table 1 of Section 1.5.1

Project Specific Requirements

The following Terms are specific to this Assignment and require a detailed response in the Service Provider's Proposal.

Factor Specific Specialist Study Assumptions

Factor Specific existing conditions reports are currently being undertaken under a separate assignment and will be provided to the successful bidder. These existing conditions reports have been prepared based entirely on desktop review only, including information submitted by MNRF, LSRCA, MECP. Any gaps identified during desktop review will be identified and carried out under this TPM assignment. Any site reconnaissance/windshield surveys needed to confirm background data review or field investigations warranted, will be undertaken by this TPM assignment upon receiving the required Permission to Enter (PTE) for the required properties.

Fish and Fish Habitat

A desktop existing conditions report is currently being undertaken under a separate assignment and will be provided to the successful bidder. This assignment will include field investigations and preparation of an Impact Assessment Report.

The Service Provider is to confirm whether there are any waterbodies within 30 metres of the project limits that may be impacted by the proposed work, directly or indirectly. All work shall be undertaken in accordance with the Pilot - MTO/DFO/MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings – Version 3, 2016 (or most recent version) and with any applicable MTO Operational Procedures or Release Notes etc., as posted on the MTO Environmental Standards and Practices website.

Please note that the MTO Fish Guide and ERD are currently being updated to reflect changes to the Protocol and the Fisheries Act. It is anticipated that the MTO Fish Guide will be available by the end of 2019. Until such updates are available, technical requirements are provided in

select sections/sub-sections of the ERD and the 2009 Fish Guide as specified below. Where there is disagreement between the Fish Guide or ERD and the Protocol, the Protocol and associated Operational Procedures and Release Notes shall supersede the Fish Guide and ERD.

- ERD Section 3.1.1: Study Area (Fish Guide Section 3)
- ERD Section 3.1.2: Background and Data Collection (Fish Guide Section 3)
- ERD Section 3.1.3: Field Investigations (Fish Guide Section 4)
- ERD Section 3.1.4: sub-section 3.1.4.1 only: Assessing Potential Impacts (Fish Guide Section 5)
- ERD Section 3.1.8: Monitoring (Fish Guide Section 9)
- ERD Section 3.1.9: Documentation (Fish Guide Section 10)

There are no significant changes in effort anticipated with the updated Fish Guide and ERD, therefore the Service Provider is expected to follow the updated documents, upon their release. Any questions or requests for clarification on the Protocol process shall be made in writing to the MTO Project Manager.

The data from field studies shall be assessed and documented in project-specific reports. All MTO Project Notification Forms and DFO Requests for Review Forms shall be completed and submitted to MTO, as appropriate.

The Service Provider will also be required to consult with provincial and federal agencies in order to determine the need for permits/authorizations etc., as necessary and shall work collaboratively (i.e. fisheries plus terrestrial, structural, hydrology, fluvial geomorphology etc.) to develop any associated natural channel designs, fisheries enhancement, overall benefit and/or offsetting measures.

The Ministry has not acquired licences to collect fish for scientific purposes from the Ministry of Natural Resources and Forestry. The Service Provider will be responsible for obtaining these permits.

Terrestrial Ecosystems

Technical requirements for 'Terrestrial Ecosystems' are provided in Section 3.2 of the *Environmental Reference for Highway Design, June 2013*.

A desktop existing conditions report is currently being undertaken under a separate assignment and will be provided to the successful bidder. This assignment will include field investigations and preparation of an Impact Assessment Report.

The consultant biologist will have regard for the provincial *Endangered Species Act* that came into effect June 30, 2008. All environmental approvals, negotiations and formal applications prepared by the study team will be forwarded to MTO for endorsement prior to distribution.

The TPM Service Provider is to identify existing vegetation (SAR trees and shrubs, invasive species, noxious plants, quality/sensitivity, quantity, etc.) to be removed/ impacted by the project. This includes removal of trees which **may** trigger SAR specific surveys under the *Endangered Species Act*.

Groundwater

Technical requirements for 'Groundwater' are provided in Section 3.3 of the *Environmental Reference for Highway Design, June 2013*.

A desktop existing conditions report is currently being undertaken under a separate assignment and will be provided to the successful bidder. This assignment will include field investigations and preparation of an Impact Assessment Report.

A Groundwater Impact Assessment Report per the ERHD is required. In addition to the applicable sections of the Environmental Reference for Highway Design (ERD) and relevant Guides, the Service Provider shall have due regard for source water protection within the project study area. Refer to the attached Interpretive Bulletin dated August 30, 2013.

Water Taking requirements are provided under Highway Engineering in Section 7.8.2 of this document.

Noise

Technical requirements for 'Noise' are provided in the MTO *Environmental Guide for Noise, October 2006* and Section 3.4 of the *Environmental Reference for Highway Design, June 2013*.

An acoustical survey shall be conducted to determine the following:

- (j) Identification of noise sensitive areas (NSA's) including approved residential subdivisions; and
- (k) Preparation of a report documenting noise impacts.

Documentation shall include as a minimum requirement the following:

- A description of the NSA's, identifying discrete receiver locations including maps as appropriate,
- The name of the noise prediction model used
- Summary of the predicted future ambient and predicted future 'with the undertaking' sound levels equal to or greater than 65 dBA and/or sound levels equal to or greater than a 5 dBA change
- Mitigation options for impacted receivers with predicted future 'with the undertaking' sound levels equal to or greater than 65 dBA and/or sound levels equal to or greater than a 5 dBA change
- An analysis of construction noise impacts and recommended mitigation.

Land Use Factors

Technical requirements for 'Land Use' are provided in Section 3.5 of the *Environmental Reference for Highway Design*.

An existing conditions report is currently being prepared under a separate assignment and will be provided to the successful bidder. It will include land use identification obtained from secondary sources, feedback from provincial agencies and municipal staff, and site reconnaissance. It will include a review of the York Region Official Plan, York Region

Transportation Master Plan, Simcoe Country Official Plan and Transportation Plan and relevant secondary plans.

Contaminated Property Identification and Waste Management

Technical requirements for 'Contaminated Property Identification and Waste Management' are provided in Section 3.6 of the *Environmental Reference for Highway Design*, June 2013.

A desktop Contamination Overview Study (COS) is being undertaken as a separate assignment and will be provided to the successful bidder. This is a desktop study only, and will not include any field investigations, windshield surveys or interviews.

Built Heritage and Cultural Landscapes

Technical requirements for 'Cultural Heritage – Built Heritage and Cultural Heritage Landscapes' are provided in Section 3.7 of the *Environmental Reference for Highway Design* and the *Environmental Guide for Built Heritage and Cultural Heritage Landscapes*.

A Cultural Heritage Resources Assessment Report is being prepared under a separate assignment and will be provided to the successful bidder. This report will contain a desktop review of identified properties that have been Designated under Parts IV or V of the Ontario Heritage Act (OHA) or listed on the local municipality's Heritage Register Inventory, review of online searchable databases for the Ontario Heritage Properties Database, the Canadian Register of Historic Places as well as the Directory of Federal Heritage Designations.

For bidding purposes, provide a separate biddable item for the completion of 3 CHERs and 3 HIAs.

Archaeology

Technical requirements for 'Cultural Heritage – Archaeology' are provided in Section 3.8 of the *Environmental Reference for Highway Design*, June 2013.

Stage 1 Archaeological Assessments are being undertaken under a separate assignment and will be provided to the successful bidder.

Under this TPM assignment, Archaeology work will include the following:

- Stage 2 Archaeological Assessments for all sites identified in the Stage 1 Retainer assignment. For the purposes of bidding, assume Stage 2 work for approx. 15.5 km of the 100m ROW as defined in the 1997 EA.
- Stage 3 and 4 Archaeological Assessments. For the purposes of bidding, assume Stage 3 and 4 work for approx. 5 hectares of land.

The environmental effects of archaeological investigations must be considered. Construction impacts to archaeological resources shall be identified with appropriate mitigation/protection measures.

The Archaeologist will be responsible for submitting their assessments to MTCS for review and entry into the Ontario Public Register of Archaeological Reports.

The Archaeologist may be required to participate in First Nation consultation.

Landscape Composition

Technical requirements for 'Landscape Composition' are provided in Section 3.9 of the Environmental Reference for Highway Design. There may be opportunities for landscape planting as enhancement planting and/or for restoration planting due to impacts resulting from construction activities.

The Service Provider is to identify existing vegetation (quality/sensitivity, quantity etc.) to be removed/impacted by the project.

Landscaping is to be incorporated into design drawings where applicable.

The landscape consultant may be required to provide input to site restoration, monitoring and compensation plans for Species at Risk.

Air Quality

The TPM Consultant shall undertake a detailed local air quality impact assessment and a greenhouse gas emission impact assessment in accordance with the process and methodology outlined in *MTO's Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects (June 2012)*. A copy is available online at:

<http://www.raqsa.mto.gov.on.ca/techpubs/eps.nsf/8cec129ccb70929b852572950068f16b/24fe4bb174a2af7085257aa9006558f4?OpenDocument>

The pollutants of interest that should be assessed are the primary criteria air contaminants listed in the Environmental Guide along with greenhouse gases (carbon dioxide, methane, and nitrous oxide). Pollutant concentrations will be assessed for critical and sensitive receptors and maximum pollutant concentrations will be assessed within 500 metres of the edge of the travelled transportation infrastructure.

Surface Water

Technical requirements for 'Surface Water' are provided in Section 3.11 of the *Environmental Reference for Highway Design*, June 2013.

In addition to the applicable sections of the Environmental Reference for Highway Design (ERD) and relevant Guides, the Service Provider shall have due regard for source water protection within the project study area. Refer to the attached EPO Interpretive Bulletin (August 2013) – Source Water Protection Considerations in Class EA Projects.

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 *Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects*.

Consultation Program

External consultation requirements are described in Section 6.6.1 of this document. Further requirements for the 'Consultation Program' are provided in Section 4 of the *Environmental Reference for Highway Design, June 2013*.

A Consultation Plan shall be provided within one month of project start-up. Consultation shall include a project website and 2 PIC's. As a separate biddable item, include holding each PIC at an additional venue (e.g., 2 venues as opposed 1 one venue per PIC).

The following consultation deliverables are currently being undertaken through a separate assignment and will be provided to the successful bidder:

- Agency/stakeholder Contract Lists. This will include Federal and Provincial agencies, Municipalities, other agencies (Conservation Authorities, School Boards, CN Rail, Utilities, etc.), special interest groups, Indigenous Communities, etc.
- Public/property owner mailing list (including Canada Post mailout limits).
- Fact Sheets to public property owners for environmental field investigations.
- Final Permission To Enter (PTE) letters to select property owners within the study area. PTE letters will contain an information package, including fact sheets, and general information about the study.

Potentially affected stakeholders include, but are not limited to the following:

- Municipalities;
- Emergency Medical Services (EMS), Fire Services, Ontario Provincial Police (OPP), Local Police, etc.;
- Transit Agencies (local, regional, provincial);
- The public;
- Adjacent property owners including residential, business, commercial,
- Other stakeholders, Community Interest Groups (HEART/FROGS) and impacted property owners as required.

Methods of additional consultation for this assignment may include (but are not limited to):

- Newspaper advertisements
- Brochure delivery
- Project website
- Letters
- Meetings with Municipalities, Emergency Medical Services (EMS), Fire Services, OPP, Local Police, transit agencies (local, regional, provincial), school bus services, etc.
- Meetings with any other affected stakeholders, property owners and Community Interest Groups
- 2 Public Information Centres

Meetings

The Service Provider Environmental Planner shall attend all Meetings (in person).

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.

6.6.3 Deliverables

The environmental assessment process documentation that must be prepared during this project is a Transportation Environmental Study Report (TESR).

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

- Fish and Fish Habitat Existing Conditions and Impact Assessment Report
- Terrestrial Ecosystems Existing Conditions and Impact Assessment Report
- Groundwater Impact Assessment Report
- Noise Impact Assessment Report
- CHERs/HIAs as applicable.
- Archaeological Assessment Reports (Stage 2, 3 and 4 as required)
- Air Quality Impact Assessment Report
- Erosion and Sediment Control Risk Assessment
- Preliminary Landscape Plan
- Environmental synopsis and clearance letter, as well as a MTO Questionnaire.

The minimum number of rounds of public information centres required for this project is **2** with **1** venue for each round. As a separate biddable item, include holding each PIC at an additional venue (e.g., 2 venues as opposed 1 one venue per PIC). Consultation deliverables include, but are not limited to the following:

- Consultation Plan (1 month after project start-up);
- Consultation materials (e.g., letters, meeting minutes, PIC material including boards and summary reports, etc.)
- Project website
- Draft/final responses to Ministry staff to address any inquiries that are received from stakeholders (public/agency) as a result of consultation undertaken (PTEs/project website, etc).
- Maintain stakeholder comment/response tracking tables for the assignment

Ontario Government Notices (OGNs) in 2 newspapers will be required for the following:

- Notice of Commencement
- Notice of PIC 1 and PIC 2
- Notice of TERS Filing

Specific requirements for project environmental deliverables are provided in MTO's *Environmental Reference for Highway Design, June 2013*, as well as MTO's *Environmental Standards and Practices* which can be found on the MTO's website. Copies of these documents

are available from the MTO website:

<http://www.raqsa.mto.gov.on.ca/techpubs/eps.nsf/cdedwv?openview&start=1&count=10>

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.

Interpretive Bulletin Source Water Protection Considerations in Class EA Projects, Environmental Policy Office, August 2013.

6.7 Foundation Engineering

6.7.1 Project Scope

Foundation Engineering services are required for the preliminary design for the Highway 400 – Highway 404 Link (The Bradford Bypass). This Assignment includes the development of a Preliminary Design and completion of a Transportation Environmental Study Report (TESR) in compliance with MTO's Class EA for Group 'A' Projects for Bradford Bypass. The 2002 approved EA study proposed a 16.2 km rural 4-lane controlled access freeway extending from Highway 400 between Lines 8 and 9 in Bradford/West Gwillimbury, crossing a small portion of King Township, and connecting to Highway 404 south of Holborn Road in East Gwillimbury. The proposed corridor includes both full and partial interchanges, as well as grade separated crossings at intersecting municipal roads and watercourses, including the east and west branch of the Holland River.

The Foundations Engineering services required for this assignment have been categorised per MTO's consultant acquisition system, "Registry, Appraisal and Qualification System (RAQS)" as the following:

- Foundations Engineering Category:
 - **Geotechnical (Structures and Embankments)** specialty – **high** complexity
 - **Hydrogeological** specialty – **high** complexity
- Engineering Materials Testing and Evaluation Category:
 - **Soil and Rock Testing for Foundation Engineering** specialty – **high** complexity

The Foundations Engineering services shall include the following tasks:

- compile and review existing subsurface information and other relevant background information
- conduct site reconnaissance;
- conduct foundation field investigations and laboratory testing as specified;
- prepare Foundation Investigation and Design Reports and technical memoranda as specified;
- prepare Hydrogeological Screening, Investigation and Design Reports and technical memoranda, as specified.
- attend project meetings as specified (if required).
- design liaison and develop and review contract package;

The minimum requirements for Foundation Engineering are outlined in Section 6.7.2 Technical Services Required (Terms of Reference 'General'). Project-specific requirements are detailed in Section 6.7.3 Deliverables (Terms of Reference 'Project Specific') and shall govern where any conflict exists with Section 6.7.2 Technical Services Required.

Further details pertaining to structure and roadway design as related to Foundations Engineering are found elsewhere in this Request for Proposal Terms of Reference.

The WO/WP/GWP number shall be included on the subject line of all correspondence with MTO.

6.7.2 Technical Services Required

Staff to be provided

Foundation Engineering staffing requirements are included in Table 1 Section 1.5.1

Terms of Reference 'General'

Guideline for MTO Foundation Engineering Services

The minimum and general requirements for Foundation Engineering services are outlined in the Guideline for MTO Foundation Engineering Services, Version 01, dated May 2019, and may be viewed from following source:

- Foundation Library (Web-Based):
<http://www.mto.gov.on.ca/FoundationLibrary/index.shtml>

The guideline specifies the minimum requirements for foundation engineering services, including review and use of existing data, project initiation requirements, permits and approvals for site access and investigation, traffic protection and health and safety, site investigation and field testing, engineering materials testing and evaluation, and engineering and reporting. The Foundations Engineering Service Provider shall review the Guideline in conjunction with this Foundations Terms of Reference.

Project-specific requirements are detailed in Section 6.7.3 Deliverables (Terms of Reference ‘Project Specific’) and shall govern where any conflict exists with the Guideline.

Design Liaison

The Foundations Engineering Service Provider shall liaise with the Prime Service Provider to communicate and integrate Foundation Engineering requirements into the design, both during development of alternatives and selecting preferred alternatives. The Foundations Engineering Service Provider shall also support any liaison with other jurisdictions such as Railways in order to facilitate their approval of the work.

MTO Foundations shall be informed if any design changes that affect Foundations Engineering are made after executive review meetings.

Quality Control

All deliverables related to Foundations Engineering, such as reports, and technical memorandum shall be submitted in draft for review by MTO Foundations Group prior to implementation.

The draft submission shall be marked ‘DRAFT’ but must be comprehensive and technically complete except for issues that are clearly identified as under development and conceptual. The Service Providers shall allow a minimum of two (2) weeks in the project schedule for the MTO to review and provide comments on the submissions. The Foundations Engineering Service Provider shall consider MTO comments received on the draft submission in preparation of the final submissions.

Draft submissions submitted to the MTO Foundations Group will be considered in the evaluation of performance of the Service Providers.

Final submissions shall be submitted along with a letter from the Foundations Engineering Service Provider indicating how the MTO comments from the draft submission were addressed.

Draft submission shall be signed but not sealed and final report shall be signed and sealed by two (2) Professional Engineers licensed by the Professional Engineers of Ontario, representing the Foundations Engineering Service Provider, one (1) of whom shall be the RAQS Approved Key Personnel registered in the relevant RAQS Foundations Engineering specialty.

All submissions shall be accompanied by a Quality Control (QC) Plan Checklist completed to that submission milestone, signed by Foundations Engineering Quality Control Personnel.

6.7.3 Deliverables

TERMS OF REFERENCE ‘PROJECT SPECIFIC’

Foundation Engineering services are required for the preliminary design for the Highway 400 – Highway 404 Link (The Bradford Bypass). Foundation engineering services required are limited to preliminary design of the bridge substructure/foundations within the proposed corridor; both

full and partial interchanges proposed, as well as grade separated bridge crossings intersecting municipal roads and watercourses, including the east and west branch of the Holland River.

Project specific requirements are identified in this section. The project specific requirements shall be satisfied in conjunction with the general requirements specified in Section 6.7.2.

a) Exploration Requirements

The table below summarizing exploration requirements is based on the structures included in the conceptual design from the 2002 approved EA. The number and location of the structures is subject to change as the design is refined as part of the current Preliminary Design and Transportation Environmental Study Report assignment. For example, as per the Safety Requirements for the Highway 400 – Highway Link the two freeway to freeway interchanges shall be fully directional, whereas the conceptual design in the 2002 approved EA included one loop ramp at each interchange. This will change the size and location of some structures at the interchange.

The scope of this assignment includes preliminary designs for any and all structures required to implement the Preferred Design resulting from this study.

For bidding purposes, following Borehole (BH) exploration requirements be assumed:

INTERCHANGE / CROSSING	NUMBER OF BRIDGES	TOTAL NUMBER OF BHs (NOTE 1)	MIN EXPLORATION DEPTH (m)	MAX EXPLORATION DEPTH (NOTES 2 & 3) (m) / BH
Highway 400	3	4	Refer to Guideline for MTO Foundation Engineering Services. For this project, three consecutive readings of SPT exceeding 100 blows per 0.3 m is required to confirm refusal, or 3 m of bedrock coring.	40
10 Sideroad (Twin, OP)	2	4		40
Professor Day Drive (UP)	1	2		40
Simcoe RR4 (UP)	1	2		50
Artesian Industrial Parkway (Twin, OP)	2	4		50
CN Rail (Twin, OP)	2	4		50
Holland River West Branch (Twin, OP)	2	4		50
Bathurst Street (UP)	1	2		50
Holland River East Branch (Twin, OP)	2	4		50
Yonge Street (Twin, OP)	2	4		50

2nd Concession (UP)	1	2		30
Leslie Street (Twin, OP)	2	4		30
Highway 404	3	4		30

NOTES:

1. One Borehole per each proposed bridge abutment. For proposed Highway 400 and Highway 404 Interchanges, in view of multiple bridges, the total number of boreholes shall be distributed strategically to achieve representative subsurface conditions at the proposed abutment structure foundation location.
2. Maximum exploration depth specified is for bidding purposes. If competent stratum is not reached within specified maximum exploration depth, additional boring depth to be negotiated with MTO as extra work prior to being carried out.
3. Groundwater investigation requirements specified in the Guideline for MTO Foundation Engineering Services shall be satisfied, with each Interchange/crossing as considered a project site. Monitoring well screen depths to be determined once soil conditions are known at the borehole locations.

b) Engineering Materials Testing and Evaluation

Routine, complex and soil chemical laboratory testing are to be undertaken as per the Guideline for MTO Foundation Engineering Services. If encountered, Consolidation Test(s) for cohesive soils and Unconfined Compressive Strength Test(s) for Rock to be undertaken. For bidding purposes, it shall be assumed three (3) Consolidation tests and one (1) Unconfined Compressive Strength Test(s) per Borehole.

c) Engineering and Reporting

One (1) Preliminary Design level Foundations Investigation and Design Report per site shall be prepared, a total of thirteen (13) reports, and consist of:

Part A - Foundation Investigation Report.

Part B - Foundation Design Report.

The Guideline for MTO Foundation Engineering Services provides minimum engineering and reporting requirements, including minimum discussion and recommendation requirements, where applicable.

Information from past foundation investigations and design's reports to be reviewed and incorporated in the report, as part of investigation, assessment, discussion, recommendations and in appendices, including borehole locations and soil strata.

Based on the findings, reporting should include a section identifying Foundation Engineering requirements and recommendations for detailed design. The Foundation Service Provider shall develop a work plan based on the preferred alternative(s) with sufficient detail to scope detail design foundation engineering services. The work plan shall identify all foundations work required in order to complete the detailed design of the preferred alternative.

In addition to conventional MTO Foundations reporting format requirements, per interchange/crossings site, an accompanying 'snapshot' type of report, produced on a single

11x17 page size for investigation part and on a single 11x17 page size for design part, is required.

d) Meeting Requirements

The Foundations Engineering Service Provider shall attend as a minimum the following meetings (face-to-face and teleconference) and the service provider shall be responsible for documenting any technical meetings held specifically with MTO Foundation Office:

- 1 Project start-up meeting for Foundation Engineering services.
- 4 Progress and/or technical meetings for Foundation Engineering services.

It shall be noted that scope of foundation engineering services may be mutually reviewed/revised by MTO Foundation Office and Foundations Engineering Service Provider during the project, as required, from a foundation technical and cost effectiveness perspective to reflect unforeseen project specific conditions.

e) Additional Biddable Work Items

Foundation engineering services may be required for additional preliminary foundation investigation, laboratory analyses and engineering/reporting for possible additional scope of work within the proposed corridor, such as structural culverts, existing structure, high fills, Storm Water Management Ponds, hydrogeological studies, etc.

For proposal purposes a separate provisional cost item under contingency should be submitted, for a total of 25 boreholes, a total drilling length of 500 m, five (5) conventional investigation and design reports along with accompanying five (5) 'snapshot' investigation and design reports.

General Terms of Reference under Section 6.7.2 and the Guideline for MTO Foundation Engineering Services shall be referenced for preliminary investigation, foundation evaluation and recommendation for design. Notwithstanding, foundation engineering services under this contingency item may include assessment of preferred option from a foundation technical and cost effectiveness perspective and comment on scope of work required for detail design.

f) Financial Proposal Requirements

The Service Provider shall complete and submit the Foundations Engineering Itemized Price Breakdown Form. A separate Itemized price Breakdown Form shall also be completed for Contingency Item. A Foundations Engineering Itemized Price Breakdown Table is provided in Appendix 1, Forms and Tables. All submissions shall form part of the Technical and Financial Proposal. All cost estimate tables 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 all cost estimate tables shall be consistent with the total cost of the Foundations Engineering services provided in the Financial Proposal.

6.7.4 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>

6.8 Highway Engineering

6.8.1 Project Scope

The TPM Consultant shall provide all services for the Highway Engineering component of this Preliminary Design and TESR Assignment for Bradford Bypass corridor. The study limits are Highway 400 and Highway 404 in Town of Bradford/West Gwillimbury, Township of King and Town of East Gwillimbury.

A Route Planning and EA Study was completed in 2002 for Bradford Bypass corridor. The recommended Bradford Bypass mainline alignment, crossings and interchanges were developed to a concept level of design with the details such that design alternatives could be essentially contained within the identified ROW. The objective of this preliminary design assignment is to review, evaluate and recommend refined alternatives, considering changes to the design standards, current and projected traffic demand, environmental legislations, municipalities' current and future plans, etc.

The main objectives of the study can be summarized as follows:

- Review the recommended plans of the 2002 approved EA mainline alignment, interchanges and crossings;
- Develop alternatives for Bradford Bypass mainline alignment, grade separated crossings and interchanges;
- Evaluate alternatives and recommend preferred alternatives for the above elements;
- Develop a preferred staging and construction sequencing strategy for the corridor;
- Develop preliminary level design for all the highway engineering components.

6.8.2 Technical Services Required

Staff to be provided

The Lead Highway Design Engineer/Highway Design Manager shall be a Professional Engineer licensed to practice in Ontario with a minimum of seven (7) years of highway design experience. The key individual must have recent (within 6 years) experience in being the category lead and the management and production of MTO projects of similar scope and complexity (a minimum of 2 projects). Contact names and phone numbers are to be provided for all projects listed as applicable experience.

The key individual shall demonstrate their knowledge of current ministry design standards, traffic staging, specifications, policies, and processes.

The highway design support staff shall have at least 3 years (each) of MTO project experience.

The Service Provider shall identify a designated Utility Coordinator, unique from Lead Highway Design Engineer/Highway Design Manager and other key staff, for the all the utility work identified in this document.

Design Standards Order of Precedence:

The geometric design for all roads shall be designed in accordance with the standards and manuals included in Reference Documents, and if there is any conflict, ambiguity or inconsistency between the criteria contained in the standards and manuals included in Reference Documents, the following shall apply in descending order of precedence to the extent necessary to resolve the conflict:

- (i) Safety Requirements for The Highway 400- Highway 404 Link (The Bradford Bypass);
- (ii) Accessibility for Ontarians with Disabilities Act (AODA) and Ontario Regulation 413/12;
- (iii) Design Supplement for TAC Geometric Design Guide (MTO);
- (iv) Roadside Design Manual (MTO);
- (v) Geometric Design Guide for Canadian Roads (TAC);
- (vi) The applicable Ministry Directives, Drawings, and Design Bulletins;
- (vii) Engineering Survey Manual (MTO);
- (viii) The applicable standards of the relevant municipality; and
- (ix) American Railway Engineering and Maintenance-of-Way Association (AREMA) standard;

The design of the HOV Lanes shall be consistent with the TAC Geometric Design Guide for Canadian Roads manual - June 2017 (Appendix 11).

Field Reviews:

The individual(s) responsible for highway design are required to undertake detailed field reviews. The review must document all existing conditions for items such as drainage, all non-structural culverts, sewers, guide rail, median/shoulder barriers, slope flattening, signing, pavement markings and erosion control on Ministry highways and ramps, service roads, side roads and all entrances within the project limits.

A Field Review Report, including photographs/video survey and a field log shall be provided to the Ministry.

Roadside Safety:

Explicit Safety Analysis

- (a) The Service Provider shall perform an explicit safety analysis (the 'Explicit Safety Analysis') on hazards within the clear zone by calculating the potential future collision frequency, severity and societal costs, and also analysing human factors, to determine if the hazard should be relocated, shielded with roadside barrier, or otherwise safely mitigated in the Service Provider's design.
- (b) The Service Provider's Explicit Safety Analysis shall be conducted with safety as paramount; cost saving shall not take precedence over safety.
- (c) The Service Provider's analysis and calculation shall be carried out in accordance with the Safety Requirements for Highway 400 – Highway 404 Link (The Bradford Bypass) (Section 3.2), the methodology from Appendix A of the 1996 AASHTO Roadside Design Guide, and Reference Documents identified in this Request for Proposal.
- (d) The Explicit Safety Analysis shall be carried out by Qualified Personnel who are Highway or traffic engineering professionals (i.e. professional engineer) with safety engineering training, and who have demonstrated experience and familiarity in carrying out such safety analyses.
- (e) The Service Provider shall conduct Explicit Safety Analysis early in its design, and shall submit an Explicit Safety Analysis Report in accordance with the Review Procedure as part of the Preliminary Design Submittals. Updated analyses shall be submitted in subsequent submittals if the relevant design changes.
- (f) When the Explicit Safety Analysis is conducted to assess safety improvement options, options that increase collision costs shall not be carried forward, regardless of having better B/C ratios.
- (g) Notwithstanding the requirements in Section 1.8(a) to (f) in this Part 2, Project Co's design shall promote an open, barrier-free Roadway, to achieve safety goals, and shall submit an Explicit Safety Analysis Report whenever a hazard warrants barrier protections.

For existing highways and roads within the project limits, the Service Provider shall undertake a comprehensive Highway Safety Review and shall conduct studies, site investigations, and reviews to justify any recommended roadside safety requirements. The studies shall include a review of the need for guiderail and associated treatments, and shoulder rumble strips within the project limits. The TPM Consultant shall utilize the latest Ministry standards including the Roadside Design Manual – Dec 2017 and The Operational Performance Review (OPR) Guidelines – April 2015 to assist in determining whether or not safety improvements should be implemented.

The Service Provider shall utilize services of a human factors expert to carry out a broad, thorough safety review within the limits of the project. This will include the services of a qualified person to undertake an analysis of Human Factors Study in Traffic Safety for the design alternatives and the technically preferred alternative.

The results of both the comprehensive Highway Safety Review and the Human Factors Study, and the recommendations of any remedial measures and cost estimates to achieve current standards shall be prepared in a detailed Highway Safety Review Report.

In addition, the Service Provider shall undertake a Highway Asset Inventory study that identifies all operational and safety deficiencies of the existing infrastructure within the project limits and recommends a treatment strategy. This information is to be entered into a spreadsheet format which the Ministry will provide; one for safety and one for operational. The spreadsheets will be uploaded onto the Ministry's Corridor Investment Plans (CIP) Database. Using a "Deficiency to Needs Matrix" table, the Service Provider shall recommend a treatment strategy for addressing identified deficiencies. A "need" is defined as work required to correct or to address a deficiency. The findings and recommendations shall be recorded in a Highway Asset Inventory Report.

Geometrics:

The Service Provider through the development, evaluation and recommendation of the alternatives shall undertake the preliminary design of all horizontal and vertical alignments, speed change lanes and auxiliary lanes for the mainline, interchange ramps, side-roads and service roads in accordance with the Design Standards Order of Precedence. Where standards are presented as a range of acceptable values, the maximum value shall be utilized. If the maximum value cannot be achieved, the reason shall be presented to the Ministry for approval before proceeding with lower values.

The Service Provider shall formulate, analyse, and optimize alternative options and recommend technically preferred options through a cost-benefit analysis of all feasible alternatives. All instances of non-compliance with desirable design standards must be brought to the attention of the Ministry and documented in the final Preliminary Design Report.

The Ministry is currently undertaking a study to update the 2002 approved EA mainline alignment of Bradford Bypass so that it meets current geometric design standards. The purpose of this study is to provide a high-level understanding of how the mainline of the EA approved design would be impacted solely by changes in design standards. The outcomes of this study will be provided to the shortlisted proponents prior to the Phase II proposal stage. This study is to be provided for information purposes only and no reliance to the Service Provider is provided.

Cross Section:

The 2002 approved EA proposed a 4-lane rural facility with design speed of 120 km/h. The recommended cross section includes a 15-22m wide grass median. The ministry is undergoing a study to identify the locations where the grass median is narrower than 22m. As part of this study, an initial 4-lane cross section with wide grass median and an ultimate 8-lane (6 GPL's and 2 HOV's) cross section with concrete barrier are being considered. The outcomes of this study will be provided to the shortlisted proponents prior to the Phase II proposal stage. For clarity, the above early study is conducting a high-level review of interim and ultimate cross sections in the absence of traffic volumes. The Service Provider shall use the output of the macro modelling analysis included in this PDR assignment to make recommendations on the immediate number of lanes as well as when the expansion would be warranted. Regardless of

the number of lanes immediately required, the preliminary design shall accommodate the ultimate cross section with future widening towards the median.

The Bradford Bypass facility shall be designed as an un-tolled freeway. Any decisions regarding tolling of this facility will be made as part of a separate Provincial Tolling Strategy study.

In general, the Service Provider shall:

- Develop all interim and ultimate cross section elements in accordance with the Design Standards Order of Precedence. Where standards are presented as a range of acceptable values, the maximum value shall be utilized. If the maximum value cannot be achieved, the reason shall be presented to the Ministry for approval before proceeding with lower values.
- Ensure all interim and ultimate cross sections including horizontal and vertical clearances for final construction, construction staging and detours comply with the Design Standards Order of Precedence. All instances of non-compliance with the desirable standards must be brought to the attention of the Ministry and documented in the final Preliminary Design Report.
- Prepare interim and ultimate typical cross sections. Consultation with applicable municipalities and their endorsement are required prior to finalizing any cross sections on municipal roads. All typical cross sections shall be provided to the ministry for review prior to proceeding with grading review and running templates.
- Develop widening strategies from interim to ultimate along the corridor.
- Ensure that all crossfall and superelevation within the study limits, including the parameters used for any construction staging and detours, comply with the Design Standards Order of Precedence. All instances of non-compliance with the desirable standards must be brought to the attention of the ministry and documented in the final Preliminary Design Report.

Interchanges:

The Service Provider shall undertake the preliminary design for all interchange ramp systems and provide design alternatives as per the Design Standards Order of Precedence. This includes, but is not limited to, considering interim and ultimate traffic demands, existing and future constraints, past collision data of the existing facilities, safety and operations and compliance with the Design Standards Order of Precedence.

Intersections and Intersecting Roads:

The Service Provider shall:

- Review and evaluate the need to improve existing and proposed intersections within the study limits and provide recommendations as per the Design Standards Order of Precedence. This includes, but is not limited to, evaluating and recommending required auxiliary lanes within the project limits. The Service Provider shall consider past collision data as well as existing and future constraints and implications.
- Review, evaluate and recommend type of crossings at the intersecting roads in conjunction with the required structural design and considering property constraints. The Service Provider shall consult with various municipalities and confirm their need and plans during this exercise.

- Review, analyse and confirm that all sideroads and entrances (commercial and residential) operate safely and comply with the Design Standards Order of Precedence and current Ministry entrance guidelines and policies.

Staging/Detouring:

The Service Provider shall be responsible for determining any preliminary staging/detouring requirements/plans for all alternatives being considered. The Service Provider must demonstrate that staging and detour plans are viable, reduce both construction cost and time, and still maintain a safe and efficient movement of traffic through the construction zone. The alignment and cross sections of the staging/detours shall be determined based on safety, capacity, cost and effectiveness. All temporary detours shall be designed in accordance with the Design Standards Order of Precedence.

Staging drawings shall provide complete coverage of the construction area. All transitions from existing to staged conditions shall be fully illustrated.

The following are some considerations that the Service Provider shall take into account when developing alternatives for staging and/or detours:

- Staging shall include structural considerations such as the duration of construction on the structures, the required physical overlap between construction stages, placement of girders, overbuilding, etc.
- If required, each stage or sub-stage shall be developed to accommodate an independent deck pour.
- Staging shall be provided on arterial roads as required, such as the widening/rehabilitation of overpasses.

The existing number of lanes and capacity on Highway 400 and Highway 404 shall be maintained at all times, although off-peak lane closure hours will be permitted in most cases. The Service Provider shall seek and obtain express written permission from various municipalities before the Ministry will consider the utilization of any detour routes as part of the preliminary design staging.

The Service Provider shall evaluate the impact of construction on the operation of both MTO-owned and municipally-owned road networks and stage the work such that the impact is kept to an acceptable minimum.

The Service Provider shall liaise with, and address the concerns of emergency agencies, including but not limited to OPP, regional/municipal police, ambulance and fire departments. The Service Provider shall provide a list of the emergency services to be contacted. The Service Provider shall provide an alternate access scheme for emergency vehicles affected by lane or ramp closures. The Consultant shall provide a list of the emergency agency proposals and detail any police enforcement requests/agreements as part of the Preliminary Traffic Management Plan (as defined as Section 6.11.2).

Any traffic diversion assumptions shall be based on the availability of acceptable alternate routes. Any traffic diversion onto municipal roads will require municipal approval and shall

require the Service Provider to do a Traffic Impact Study as part of this assignment. Capacity estimates shall be based on local experience with similar closure(s) if at all possible. Any additional closure restrictions shall be clearly noted in the Traffic Management Plan. Isolated extended lane/ramp closures can be considered if the specific operation requires larger closure time windows that those provided on a daily basis.

The proposed closure windows shall consider the findings of the queue and delay analysis. The findings shall be incorporated as part of the Preliminary Traffic Management Plan. The recommended lane/ramp closure times shall be submitted for the Ministry for approval prior to the finalization of the Preliminary Traffic Management Plan.

Carpool Lots & Transitway:

The Service Provider shall undertake the following within the study area:

- Review Central Region Carpool Lots Opportunity Study and MTO Directive PLNG-B-008, identify and proposed options for a carpool lot site and undertake Preliminary Design of Carpool Lot Site(s)
- Study the potential for providing a Transitway along the Bradford Bypass freeway including recommendations for crossing location(s) where needed. The Consultant shall determine the associated additional property requirements associated with the potential Transitway. Conceptual plans and profiles for the Transitway shall be prepared in accordance with the existing 407 Transitway design standards. The Service Provider is advised that no station designs are required along this route.

Roundabouts:

The Service Provider shall review and make recommendations on the feasibility/suitability of providing roundabouts in lieu of signalized intersection at the interchange ramp terminals as part of the Preliminary Design Study and undertake Preliminary Design work for all recommended locations. The Service Provider shall make recommendations based on a review of the following parameters:

- Property requirements;
- Traffic operations;
- Road-user safety, using Collision Modification Factors (CMFs);
- Construction cost, taking into account possible savings from adjacent highway work;
- Impact on adjacent traffic control;
- Staging requirements; and,
- Signing requirements;

The Service Provider shall refer to The National Cooperative Highway Research Program (NCHRP) Report 672 (Roundabouts: An Informational Guide) and Highway Design Bulletin #2012-003 for guidance on the design of roundabouts at all recommended locations. Although this is considered to be a Preliminary Design exercise, the design of the roundabouts shall be advanced to a level of detail to accurately complete the geometric elements and speed-radius relationships tables (Tables 1 and 2) as outlined in HDB #2012-003.

The Service Provider shall include three (3) meetings with the Ministry's Roundabout Team for the presentation of the Roundabout Alternatives. These meetings shall be scheduled by the

Service Provider but should coincide with the Developed Alternatives and the Preferred Alternatives milestones.

The Service Provider shall consider the screening and evaluation of potential roundabout locations as a separate activity from the actual design of the roundabouts. All fees related to the evaluation of potential roundabout locations shall therefore be listed separately in the financial proposal and on all invoices from the design component of roundabouts, as it is anticipated that some potential roundabout locations will be screened out as being unfeasible as the study progresses.

Utilities:

All existing and proposed utility plans conflicting with the Project shall be identified. The Service Provider shall identify all utility relocation requirements.

The Service Provider shall designate a Utility Coordinator, who will be responsible for identifying and/or mitigating all utilities that require relocation. The Utility Coordinator shall be responsible for the delivery of all utility-related tasks on schedule, monitor progress and update the Utility Status Report. The Utility Coordinator is required to hold a Professional Engineering Licence issued in the Province of Ontario and be familiar with Ministry guidelines and directives associated with utility relocations. The Utility Coordinator would be a key staff member for large projects, ensuring the integration of work with the overall project schedule.

The Service Provider shall identify all utility relocation requirements based on the preferred preliminary design alternative. The Service Provider shall assess all alternative designs to mitigate or minimize relocation and/or protection measures and secure all necessary preliminary arrangements with respect to utility relocations within the project limits.

The Service Provider shall verify/obtain all existing 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, with respect to utility relocations required within the project limits.

All work within 30 metres of a pipeline plant right-of-way of a company under the jurisdiction of the National Energy Board (NEB) such as the Trans Canada Pipeline Limited, the plant shall be reviewed for conflict. Work in the vicinity of this type of plant must conform to the utility owner and NEB Crossing Regulations requirements.

As part of this assignment, the Service Provider shall retain the services of a firm specializing in the determination of the locations of existing plant. This firm must have demonstrated capability in following ASCE Standards 38-02.

The subsurface utility investigation work shall consist of the following:

- The Service Provider shall undertake sufficient investigation to identify all existing and proposed aerial and subsurface utility plant within the project limits.
- The consultant shall follow the guidelines outlined in ASCE Standards 38-02 (Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data).
- Utility information shall be collected and depicted on a composite utility drawing based on Quality Levels as outlined in the ASCE Standards:

Quality Level D – Information derived from existing utility records.

Quality Level C – Information obtained by surveying and plotting visible above-ground utility features and by using professional judgment in correlating this information to Quality Level D information.

Quality Level B – Information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities.

Quality Level A – Precise horizontal and vertical location of utilities obtained by the actual exposure (or verification of previously exposed and surveyed utilities) and subsequent measurement of subsurface utilities, usually at a specific point.

- The Service Provider shall utilize Quality Levels C-D for those utilities that will have minimal impact on the design of the overall project. Utilities that are determined to be in close proximity to the proposed design, and thus could impact the overall design, shall be increased to Quality Level B.
- The Service Provider shall also anticipate “sweeping” key areas in an attempt to identify any utilities that may be present however, are not indicated on the record drawings.
- Quality Level A test holes shall be used at key locations where the design could be impacted by the size or depth of burial of the existing utility, due to utility crossings, grade changes, new foundations or other works. All field data shall be surveyed within acceptable MTO tolerances.
- Prior to undertaking test pits, the Service Provider shall develop a Test Hole Plan. The proposed plan shall be submitted to the MTO Project Manager and Utility Coordinator for review and approval prior to any test pits being undertaken. The plan shall include the proposed test hole locations, hole depth, work reinstatement schedule (provide information such as the size of hole, impact to pavement, fill material, construction techniques, etc.). All reinstatement schemes must also meet the requirements of the utility agency/landowner.
- The Service Provider shall conduct test pits using a vacuum excavation crew or other appropriate equipment.
- Backfill shall comply with the requirements of the utility company and/or the agency/landowner.

Preparation and distribution of the TPM Legal 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 Utility Plan, illustrating all existing utilities within the project area based on information provided by the utility owners and information gathered from field investigation. The Composite Utility Plan must be completed by the Developed Preliminary Design Alternatives stage of the project. The work must be carried out in accordance with the ASCE “Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data” and the composite utility plan illustrating all existing utilities within the project area shall be sealed by a Professional Engineer, licensed in the Province of Ontario, who is responsible for the collection of the data.

The composite plan will be taken from Subsurface Utility Mapping (SUM). This SUM will show the complete underground utility network in and around the interchanges, freeways and project

limits. The Service Provider's proposal shall discuss their approach to ASCE Standard 38-02 and how they plan to carry out this deliverable.

The Service Provider shall, in conjunction with the utility owners, develop Preliminary Utility Relocation Plans. These plans shall be submitted as per the deliverables outlined below.

The Service Provider shall work closely with MTO's Utility Coordinators and follow all Corridor Management Guidelines. MTO Utility Coordinators shall be invited to attend all meetings with the utility companies and be copied on all correspondence and minutes of any utility meetings.

The Service Provider shall provide the following deliverables for the utility portion of the assignment:

- 3 full-size hard copies of the draft composite utility plan
- 5 11x17 hard copies of the draft composite utility plan
- Electronic copies of the draft composite utility plan (in AutoCAD and PDF format)
- 3 full-size hard copies of the final composite utility plan
- 5 11x17 hard copies of the final composite utility plan
- Electronic copies of the final composite utility plan (in AutoCAD and PDF format)
- 3 full-size hard copies of the proposed utility relocation plan
- 5 11x17 hard copies of the proposed utility relocation plan
- Electronic copies of the proposed utility relocation plan (in AutoCAD and PDF format)
- 1 copy of the complete correspondence history with all utility agencies
- 1 copy of the mark-up drawings from each utility owner or agency

Property:

The Service Provider shall be responsible for issuing the Property Request(s) and identifying to the Ministry all permanent property requirements and temporary property interests for the project. Also, the Service Provider shall be responsible for distinguishing and identifying any ministry-owned lands which may be considered surplus property once the project is completed.

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 documents, which are plan/graphical, a summary sheet, and a completed ADM-S-787 form. The Property Request must be clear and concise to ensure that there are no misunderstandings about:

- What property and/or property rights are needed for the project;
- Why (purpose and justification for) the Ministry is acquiring the property rights;
- When and/or for how long the Ministry should acquire and hold the property rights; and
- Area of requirement for each property.

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 shall be the responsibility of the Service Provider to obtain the property mark-up and/or Teranet data from the TPM Agreement Administrator; the property-mark-up delineated the applicable, existing Ministry ownership and title information, along the

entire section of highway under review. The Service Provider shall be responsible for marking and recording, on the property mark-up plan, the names and addresses of all owners and tenants adjacent to the entire limits of the project, including the corresponding property PIN and assessment roll numbers.

It is the Service Provider's responsibility to verify the property mark-up/Teranet data, as it may contain inaccuracies. The property mark-up and property limits shall be verified by the Service Provider via a survey as part of this TPM assignment in any case where accuracy within 0.5 metres is required.

The Property Request includes all property requirements and temporary interests that are considered to be integral to the completion of the project and where the privilege of expropriation could/would be exercised (i.e. the land required is to be altered not for the sole benefit of the property owners). 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).

Final Property Requests shall be reviewed by an Ontario Land Surveyor (Head, Senior Surveyor) within the Regional 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 or partial deletions from identified property requirements may have significant impact to the Property Clearance Date, as additional survey are/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 the "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 is available to defend the "taking" of the property as being fair, sound, and reasonably necessary and that all Environmental Assessment requirements are met at least 10 months before the Property Clearance Date.

Refer to the document entitled the "Property Request Manual" for a more detailed designation of the creation and 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 of the preliminary design plates.

The Service Provider shall be responsible for making any required arrangements (i.e. agreements, Permissions to Enter) with municipal authorities, utilities, private landowners, etc. for the temporary use of the property during design 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.

The ministry through a retainer assignment is drafting and aiming to obtain Permission to Enter for the identified properties in the 2002 approved EA. For bidding purposes and prior to the Phase II proposal stage, the ministry will notify the shortlisted proponents of the number of obtained PTE's. The PTE letters that were prepared during this retainer assignment will be

provided to the successful Service Provider as a sample for other required PTE's. The Service Provider shall attempt to obtain PTE for properties that PTE's were not successfully obtained through the current Ministry's retainer assignment, and for any required properties beyond the identified properties in the 2002 EA.

Examples of when Permission to Enter are required are in order to enter onto an owner's property for purpose of surveys or geotechnical work. In situations where the property owners refuse to sign the 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 TPM Agreement Advisor.

Permission to Enter that deviate from standard Ministry practice, are potentially precedent-setting or have equity implications, are to be pre-reviewed by the TPM Agreement Administrator. Original copies of agreements and Permissions to Enter must be sent to the TPM Agreement Administrator to be retained for record purposes.

The Service Provider is to conduct, as the earliest possible stage of the project, 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 Property Section and the TPM Agreement Administrator with the submission of any Property Request or Amending Property Request.

Commercial Signage:

Within the study limits, there may be Canadian Tourist Oriented Destination Signs (CTODS) and LOGO signing which are potentially in conflict with the Ministry's proposed work. The Service Provider shall document the locations of all existing CTODS and LOGO signs on a plan and indicate which signs are affected by the preferred alternative. The Service Provider, in conjunction with the CTODS Agency, identify all relocation requirements and determine the most cost-effective relocation strategy.

Land Management & Development:

The Ministry is undergoing an early study to review municipalities' Secondary Plans within the study area including existing and proposed developments and document updates/changes post 2002 EA. The outcomes of this study will be provided to the shortlisted proponents prior to the Phase II proposal stage. Some of the land being considered for these developments may include specific parcels of land which may ultimately be required by the Ministry for highway and/or transitway purposes. Accordingly, the Service Provider shall:

- Review, analyse and comment on selected land management issues in terms of impacts on this Preliminary Design Study
- Recommend design solutions that would either eliminate or minimize the impacts on the Ministry's interests
- Comment on cost sharing arrangements and determine any applicable cost recovery from developers/municipalities.
- Meet with stakeholders/consultants/municipalities on land management/development related issues

Erosion and Sediment Control:

This Assignment is sufficiently large and/or complex to require preliminary, technical information on erosion and sedimentation potential and risk to be gathered and analyzed to assist in development of an Erosion and Sediment Control Plan during Detail Design.

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 *Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects* (ESC Guide).

6.8.3 Deliverables

In addition to the above-noted Highway Engineering requirements, work to be included as part of the Highway Engineering component of the project consists of the following:

- Undertake a complete data collection phase that identifies, collects, verifies and updates all required data/information for the Project in order to identify, assess and document all of the existing and future deficiencies.
- Review and become familiar with all studies, reports, correspondence, plans, previous work and adjacent Ministry/municipal work which may be relevant to and/or affect the project.
- Liaise with local municipalities, Metrolinx, Conservation Authorities, Ministries, Utility Companies, Railway Authorities, and all applicable municipal/provincial/federal agencies and stakeholders.
- Document land use and proposed development plans adjacent to highway corridors.
- The Service Provider shall, in their development of alternatives, consider the short and long-term goals outlined in municipal Transportation Master Plans, as they pertain to Active Transportation, HOV & Transit initiatives, and any road improvements planned adjacent to the study area.
- Undertake all highway design field investigations necessary for preliminary design. The field review must document the existing conditions and field recommendations for items such as, but not limited to, drainage culverts, sewers, guide rails, slope flattening, signing, pavement markings and erosion control. A Field Review Report shall be submitted to the Ministry.
- Undertake preliminary design of horizontal and vertical alignments for the Bradford Bypass mainline including all interchange components and service roads in accordance with the TAC Geometric Design Guide for Canadian Roads manual and the associated supplements and appendices.
- Review, analyse and evaluate all sideroads, service roads and entrances within the project limits in accordance with the latest Ministry and/or municipalities' standards
- Provide alternatives and recommendations to enhance cycling facilities and pedestrian crossings on municipal roads within the project limits (where opportunities exist) and liaise with relevant stakeholder groups and municipalities. All cycling facilities within the MTO right-of-way shall be designed to current Ministry standards.

- Identify locations for commuter parking lots, transit priority lanes, bus bypass lanes, etc.
- Establish and justify evaluation criteria, evaluate each alternative, assess, document and determine the impacts of all alternatives.
- Review/develop and investigate alternative designs for the corridor. Utilize Operational Performance Review (OPR) Guidelines to assist in evaluating alternatives. Determine any preliminary staging/detouring requirements/plans for all alternatives being considered.
- Select and justify preferred alternatives based on technical analysis and feedback from PICs and stakeholder input, and obtain all endorsements and approvals as necessary.
- Identify properties required to accommodate the preferred alternative and prepare/submit a Property Request plan.
- Develop alternatives to replace any existing sub-standard elements within the study limits. Replacement alternatives shall also consider possible interim improvement options as part of an advance contract.
- For the preferred alternatives, determine all design elements in sufficient detail, including but not limited to plans, profiles, cross-sections, calculated alignments and property requirements that allow the preliminary design to proceed immediately into detailed design. Prepare plans/profiles of the preferred alternative at a scale of 1:1000.
- Develop and prepare a Preliminary Design Criteria for the recommended alternatives and revise as required to obtain approval.
- Prepare a Scope and Cost Report, construction cost estimates, schedules, working day estimates for the preferred alternatives. Recommend the contract sequencing, timing and staging of the preferred alternatives and prepare a construction staging/detour plans for the selected alternatives at a scale of 1:1000.
- The Ministry is anticipating that extensive liaison with a wide variety of stakeholders such as local municipalities, community and special interest groups, utility companies and railway authorities will be required as a result of this project. Accordingly, the Service Provider shall allocate sufficient time and resources in their proposal to accommodate these activities.

6.8.4 Reference Documents

- (x) Safety Requirements for The Highway 400 – Highway 404 Link (The Bradford Bypass);
- (xi) Accessibility for Ontarians with Disabilities Act (AODA) and Ontario Regulation 413/12;
- (xii) Design Supplement for TAC Geometric Design Guide (MTO);
- (xiii) Roadside Design Manual (MTO);
- (xiv) Geometric Design Guide for Canadian Roads (TAC);
- (xv) The applicable Ministry Directives, Drawings, and Design Bulletins;

- (xvi) Engineering Survey Manual (MTO);
- (xvii) The applicable standards of the relevant municipality; and
- (xviii) American Railway Engineering and Maintenance-of-Way Association (AREMA) standard;

6.9 Pavement Engineering

6.9.1 Project Scope

This assignment involves the preparation of Preliminary Geotechnical Recommendations to be included with the overall Preliminary Design Study. The information is intended to contribute toward the development of various preliminary design alternatives and provide general cost and quantity estimates for geotechnical related items. It is expected that a more detailed geotechnical field investigation, analysis and design assignment will be carried out as part of Detail Design. Therefore, this project will include a **limited** geotechnical field investigation program to provide a general overview of subsurface conditions. A detail design level field investigation is **not** required as part of this project.

Limited geotechnical field investigations and associated Pavement Engineering Services are required for the new Bradford Bypass, a four-lane divided freeway approximately 16 kilometers long between Highway 404 and Highway 400. This also includes freeway to freeway interchanges at Highway 404 and Highway 400, two other interchanges at Simcoe Road, Bathurst Street and a partial interchange at Leslie Street. Therefore, associated limited geotechnical investigations and pavement engineering at these locations will also be required. Side roads, tie-in locations at ramps and/or scope per highway engineering is part of the assignment.

6.9.2 Technical Services Required

Staff to be provided

The key individual shall be a Professional Engineer licensed in the Province of Ontario and shall have completed a minimum of 2 projects of similar scope within the past 5 years. Demonstrated experience in geotechnical field investigation including soil sampling; material testing; pavement coring and pavement evaluation. Preparation of Pavement Design Reports, including Life Cycle Cost Analysis, on MTO projects of similar scope and complexity (or higher).

Field Investigation

The field investigation shall consist of, but not be limited to, the following:

- acquiring permission to enter private properties, contacting utility companies and obtaining clearances prior to commencing fieldwork, providing notice to various MTO offices of the proposed activities and procuring traffic protection in accordance with all applicable

regulations and current ministry practice. The Ontario Traffic Manual (OTM) Book 7, Temporary Conditions shall be referred to for traffic control requirements in work zones during the geotechnical field investigation.

- the provision of limited soils boreholes, pavement cores, material sampling and laboratory testing, as required to establish a general overview of subsurface conditions.

Advancement of soils boreholes shall be carried out in accordance with the requirements of the Ontario Water Resources Act – R.R.O. 1990, Reg. 903.

Borehole logs shall be completed in tabular form using the abbreviations for boring and test data listed in OPSD 100.06. This information shall be included with the Preliminary Geotechnical Recommendations.

In addition, the following gINT borehole and corehole reporting format is also required. This information is not to be included with the Preliminary Geotechnical Recommendations but shall be provided as a separate electronic submission.

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 RAQs Consultant – What’s New In RAQs.

<https://www.raqsa.mto.gov.on.ca/login/raqs.nsf/English/Graphic/RAQSPages/B.+Consultant%20Heading+-+G.+What's+New+For+Consultants?OpenDocument>

Below is the sample gINT project file excerpt containing some pertinent borehole information that is required in the gINT file under the Borehole page. The Lithology page for each borehole should also be filled out. Refer to the MTO template file for the complete table.

Borehole ID	Total Depth (m)	Subsurface Description ^{Note1}	Surface Elevation ^{Note2} (m)	North ^{Note3}	East ^{Note3}	MTM Zone	Latitude	Longitude	Survey Grade ^{Note4}
001	1.50	0 - 60 Asph 60 - 200 Cr Gr 200 - 1.1 Br F-Med Sa Tr Gr & Si (Moist)		512706 7.49	62217 0.06		46.286 183	- 79.4140 29	

		1.1	NFP							
		Prob	Bld							
		Poss	BR							

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 regional 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 0.5 m vertical and 2-3 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

gINT Reporting Format Deliverables

A disc with the following digital files shall be submitted to the Ministry:

- gINT software file (.gpj) and, if applicable, AutoCad file (.dwg) with all the boreholes and coreholes information
- A plan and profile drawing of boreholes and coreholes generated using gINT, saved in PDF format (.pdf)

- Borehole and corehole logs generated using gINT, saved in PDF format (.pdf)

Engineering Materials Testing and Evaluation

All materials testing shall be completed by a laboratory that meets the requirements of MTO LS-102 – *“Minimum Requirements For Laboratories Conducting Engineering Materials Testing And Evaluation Services For The Ministry of Transportation.”*

Preliminary Geotechnical Recommendations

The Preliminary Geotechnical Recommendations should be completed in a report format and **shall be signed and sealed by a Professional Engineer**. The report shall include a summary of the limited geotechnical field investigation program, a description of the subsurface conditions, and identification of any circumstances that may impact the Preliminary Design Study and/or require further geotechnical investigation/analysis during detail design. The preliminary geotechnical recommendations shall include the following items:

- Identification of potential problem soils that are weak, high in moisture, frost susceptible or contain organics. A preliminary remedial treatment should be identified to address these issues.
- General suitability of cut material to be used as fill within the project.
- Preliminary proposed slope geometry in cut and fill areas including the requirement for berms and erosion control.
- Topsoil depths.
- Results of a visual pavement condition survey in accordance with the Ministry Manual for Condition Rating of Flexible Pavements, SP-024, August 1989
- Preliminary rehabilitation requirements for existing pavement within the project area such as at the new Interchanges ramps or side roads tie-in locations.
- Removal of any steel slag pavement.
- Preliminary design of new pavement structures within the project area in accordance with the 1993 AASHTO Guide for the Design of Pavement Structures. Traffic load calculations shall be carried out as described in the Ministry of Transportation Report *“Procedures For Estimating Traffic Loads For Pavement Design, 1995”*. AASHTO pavement design parameters shall be selected as described in the Ministry of Transportation Materials Information Report MI-183 *“Adaptation and Verification of AASHTO Pavement Design Parameters for Ontario Conditions”*.
- Superpave mix types for all hot mix asphalt paving recommended for the project.
- Provision of a new smooth, durable and highly skid resistant riding surface. Ministry Directive PHM-C-001 (12 12 2014 revision) *“The Use of Surface Course Types on Provincial Highways”* shall be referred to unless otherwise specified.
- Assessment of detour requirements for construction staging including the suitability of existing shoulders for carrying traffic.
- Identification of the type and depth of any encountered rock. Shale material requiring excavation shall be defined as rock regardless of degree of weathering.

A draft of preliminary geotechnical recommendations (two copies) shall be forwarded to the ministry for review and acceptance. Subsequent to completing revisions, three hard copies and one electronic copy saved on a USB flash drive in Microsoft Word 2010 and Adobe PDF format shall be submitted to the ministry.

6.9.3 Deliverables

The details of the deliverables are included with section 6.9.2 (Technical Services Required).

6.9.4 Reference Documents

The following reference documents are applicable to the project and will be provided upon request from the Central Region Geotechnical Engineering Section.

- 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"*.

Proposal Instructions:

The proponent shall provide a table summarizing the limited field investigation program indicating the number and location of soils boreholes, pavement cores and anticipated laboratory tests of sampled material.

The proponent should be aware that the new alignment will be passing through farm land and areas that may consist of organic soils, thick topsoil and wet subgrade material. The field investigations should be carried in a manner that identifies these locations in order to provide mitigation measures during construction with a cost estimate. This information should be taken into consideration during preparation of the technical and financial plans of the proponent's submission.

6.10 Surveying & Plan Preparation

6.10.1 Project Scope

The Service Provider shall obtain and process survey data needed to complete all preliminary design requirements.

6.10.2 Technical Services Required

Staff to be provided

Service Providers shall demonstrate recent successful experience on a minimum of two (2) highway projects with engineering surveys in the recent 3 years and must be approved in the Ministry's Registry, Appraisal and Qualification System (RAQS) in the Prime Specialty Surveying - Engineering Surveys.

Field and office staff shall have experience in obtaining and processing field survey data to complete the engineering survey assignments for detail design with ability to collect, merge, and process three-dimensional survey data and extract cross-sections from a digital terrain model for detail design purposes; ability to produce digital H & V and construction drawings; ability to densify horizontal and vertical control network (project control network); and show consistent compliance

with traffic safety control requirements.

Project general requirements

The Service Provider shall verify content of existing data and obtain updated information as required.

To support design and analysis tasks performed under this agreement, the Service provider shall perform engineering surveys in accordance with the following requirements.

The Service Provider is responsible for acquiring and adhering to the standards as set out in the following:

- MTO Current AutoCAD/Civil 3D Engineering Survey Plan Processing Guide
- MTO Current AutoCAD Standards Guide
- MTO Current Engineering Surveys Manual
- Current Field Code Feature Sketches for MTO Engineering Surveys

MTO standards files and customizations for AutoCAD and Civil 3D are available for download from the MTO FTP web site under IESCAD:

<http://www.xfer.mto.gov.on.ca/PTASapps/index.htm>.

MTO Engineering Surveys Manual is available for download from the MTO web site at the link below, search “Engineering Survey Manual”.

<http://www.mto.gov.on.ca/english/publications/mto-research-library-online-catalogue.shtml>

Project specific requirements:

The TPM Consultant shall check available data and obtain and process any additional field survey data needed to complete all preliminary design requirements. Typical functions would include but not be restricted to the ability to work with Mr Sid format orthomosaic files, the extraction of In-Roads cross sections from a photogrammetric digital terrain model, production of a variety of digital Engineering plans as required. The consultant shall calculate/translate and deliver all preliminary design alignments in Auto-Cad/Civil 3D format. It may include some Engineering Survey field work for areas that are not covered with provided photogrammetric mapping. In addition, the Consultant may need to prepare a property request (if required) and shall prepare an Engineering Survey request for the detail design stage.

6.10.3 Deliverables

The TPM Consultant shall deliver to the Ministry the following:

- Autodesk Civil3D Plan and Profile drawings (where applicable).
- All approved preliminary design alignment files in Autodesk Civil 3D and XML formats.
- A survey Terms of Reference (description and a key map) for the detail design stage

6.10.4 Reference Documents

The Ministry will provide the Service Provider with the following:

- *Photogrammetric Base-Plans based on 2003 photography.*
- *Title Record key-maps*
- *Existing H&V control and alignment info for highways 400 and 404*

Note:

- The accuracy and completeness of all/any data supplied must be verified
- All horizontal values in 2003 Base-Plans are in NAD 83 Original grid. Base -Plan Photogrammetric accuracy compiled to meet horizontal and vertical accuracy of 10 cm on well-defined hard surfaces and 25 cm on other non-obscured surfaces
- New Base-Plans from 2019 photography are ordered and may be available in 2020. New plans will be in NAD83 MTM CSRS

6.11 Traffic Engineering

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 a Traffic Operations and Safety Report. The purpose of this Report is to identify and review any operational and safety issues and provide recommendations of improvement options.

The Service Provider shall conduct and document a detailed traffic study and prepare and submit an Operational Performance Review Report for the highway(s) and roadway(s) within the project limits. 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 Traffic Operations and Safety 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 Traffic Operations and Safety 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 **3** copies of the draft Traffic Operations and Safety 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 **3** copies of the final Traffic Operations and Safety Report and present it to Ministry for approval. The approved Traffic Operations and Safety Report shall also be included in an appendix contained within the Preliminary Design Report.

Ministry Standards and Regional Policies and Practices

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

- TAC Geometric Design Guide for Canadian Roads, 2017 (with MTO Supplement)
- Ontario Traffic Manuals (OTM) Book Suite
- Roadside Design 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 Regional Standards, Directives and Guidelines

For any deviation of the above Ministry standards and Regional 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

The project key staff shall be a Traffic Engineer licensed to practice in Ontario with a minimum of five (5) years of traffic planning and engineering experience, which must include at least two (2) recent projects of similar size and scope (and if applicable, larger more complex projects) involving construction staging for the replacement/rehabilitation of highway structures as well as the planning and implementation of Managed Lane facilities. The key staff shall provide

technical leadership in the identification, investigation, analysis, recommendation and mitigation of traffic management issues.

For this assignment, the traffic staging requirements for the construction of the new highway alignment along with highway operations on Highways 400 and 404 during construction, will be the primary focus of traffic engineering-related work. Traffic operations and detours onto to the adjacent road networks within the study limits also needs to be analysed; including considerations for any further improvement if required. Assessing future capacity constraints and improvements along the highway corridor is also part of this assignment.

The project key staff shall have demonstrated experience in developing construction staging options and analysing staging scenarios including cost estimates, queuing, micro simulation, delay analysis, future capacity constraints and improvements.

In addition, the traffic engineer, key staff and/or other key individuals identified for Traffic Engineering shall have a minimum of five years' experience on freeway projects in the following areas:

- Analysis of the freeway and interchanges with respect to existing and future conditions to ensure safety of the travelling public and to protect the operating efficiency of the freeway network;
- Collection of traffic and land use data, analysis of traffic data and forecasting future traffic volume and/or full build-out based on existing and future land uses;
- Capacity analysis of existing and proposed roadway configurations;
- Micro simulation modelling to support specific geometric alternatives;
- Development of operational improvements to address level of service and safety deficiencies;
- Review of base design plates and conduct field investigations for inventory of roadway features (i.e. identification of geometric concerns, etc.);
- Road safety and collision analysis. Analysis of all the identified concerns within the specified project length and listing of desirable treatment options;
- Development and justification of Managed Lanes;
- Determination of illumination, traffic signal requirements and roundabouts; and
- Signing and pavement marking requirements.

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 all public and private roads
- 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:

- 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 9 shall be utilized for LOS and capacity analysis.

Macro Modelling Analysis

- MTO is currently undertaking a study to develop a calibrated base year subarea model for the Bradford Bypass. The subarea model is based on MTO Greater Horseshoe Model (GGHM) and includes facilities that could have influences on the traffic usage on Bradford Bypass. The area coverage also includes the GTA West and Hwy 404 extension for testing of future scenarios. The subarea model validations include passenger and truck vehicles for AM and PM. The calibrated subarea models, with the network and associated trip matrices will be provided to the successful Service Provider.
- Develop future years, 2031 and 2041, mainline and ramp/turning movements along and for the Bradford Bypass. The successful Service Provider will be provided with the 2031 and 2041 population and employment forecasts and network plans.
- MTO will provide 2031/2041 AM and PM subarea models (AM/PM) that are consistent with the population, employment and network assumptions consistent with the information provided to the successful Service Provider.

- Based on the information provided the Service Provider shall develop forecasts for 2031 and 2041 horizon years and determine the number of lanes and the interchange locations and types for the Bradford Bypass.
- Convert predicted Peak Hour Traffic Movement into Design Hourly Volumes (DHV)
- Develop evaluation methodologies for the performance measurement of network scenario (such as LOS, V/C Ratios, and Speeds etc.).
- Perform Level of Service (LOS) analyses for the base year as well as for the specified horizon years of 2031, and 2041.
- Identify LOS deficiencies, indicating the time period for such deficiencies for all highway sections and intersections within the project limits. These should be provided for each and all network scenarios. A comparative review and commentary of such analysis will also be performed in order to identify areas of improvements/deficiency, underlying reasons, and suggested course of actions.
- Run base year and future scenarios as required, perform comparative analysis and evaluate each scenario according to the approved evaluation methodology as such that in the end optimal network scenario(s) is/are identified.
- Budget for at least 10 scenario runs in total for the horizon year (2031 & 2041).
- Prepare draft and final technical memoranda that will be finalized and assembled in the final project report.
- 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 2041. 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 calibration and validation analysis on existing conditions on the freeway segments within the study limit.
- Simulate future 2031 and 2041 horizons peak period conditions to assess the operations of the new freeway system within the study area based on growth factors and information generated from macro modelling analysis. 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 service provider shall investigate using the model and other tools all possible scenarios to identify and assess all proposed geometric configurations. The model will also be used to analyze the impacts of the various ITS alternatives.
- 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 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 Simcoe, Regional Municipality of York, Town of Bradford-West Gwillimbury, Town of East Gwillimbury, Township of King 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 Regional practices. The Operational Performance Review Report will be incorporated into the overall Traffic Operations and Safety Report.

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 MTO Economic Analysis Tool 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 Regional Traffic Section.
- All temporary detours or lane shifts shall be designed to the same speed as the main lanes

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 Regional 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 9 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.

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 9 to develop the signal timing at signalized intersections.

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 Regional 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 Regional 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 Regional 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. All recommendations shall be in accordance with Ministry standards, Regional 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 The Bradford Bypass, Highway 400 and Highway 404 will have on local roads as well as all affected properties in the study area. 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 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, Regional 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.

Commuter Parking Lots

The Service Provider shall identify potential locations for and improvements to existing commuter parking lot(s) in the vicinity of the new highway alignment. 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:

- Latest Design hour volumes (DHV), % commercial (2016)
- Available Turning movement counts (Ramp Terminals; 2015)
- Ball Banking (2011)
- Collision data
- Latest AWD and hourly volumes for ramps (2016)
- directional split (2016)
- inventory counts
- Latest FTMS hourly mainline counts on Hwy 400 & Hwy 404 (2015)

- Existing Traffic related correspondence

Only the successful Service Provider will be allowed access to hard copy collision reports of Highways 400 and 404 at the Ministry located at the MTO's Central Region Traffic Office 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

A Value Engineering (VE) workshop will be undertaken under a separate standalone MTO retainer assignment. Therefore, the Service Provider must work cooperatively with the standalone VE Service Provider to ensure the VE workshop is successfully carried out and implemented within the overall preliminary design assignment. It is anticipated that the VE workshop will take place before presentation of the preferred alternative to the public to allow for incorporation of approved VE recommendations into the design.

6.12.1 Project Scope

6.12.2 Technical Services Required

The Service Provider shall participate in the VE study by carrying out the following:

- Prior to the VE study, provide all project background information and all necessary materials including, but not limited to, plans, documents, cost estimates, schedules and reports pertaining to the project's findings to date.
- The Service Provider Project Manager is expected to attend:
 - the first day of the VE workshop to present background information, and explain the scope of the project, and;
 - the last of the VE Workshop when the VE team presents the study findings
- Carry out a review for the evaluation and analysis of the VE study recommendations to determine their technical merits and feasibility in relation to the overall preliminary design assignment and make recommendations to MTO Senior Management.
- Amend the Preliminary Design as required based on the endorsed recommendations of the MTO Senior Management (this activity is included as part of the scope of this EA Study/Preliminary Design Assignment)
- Incorporate the final approved recommendations into the PDR.

The terms of this category should be referenced in the Proponent's Phase II Proposal. This functional category will not receive a technical score in Phase I or in Phase II. The Proponent's Phase II Proposal will only require a written confirmation that the terms for this functional category be adhered to for this Assignment. The Proponent shall include this category in the Financial Proposal.

6.12.3 Deliverables

As stated in Section 6.12.2.

6.12.4 Reference Documents

N/A

6.13 Constructability Review

The Service Provider shall provide a Constructability Review Plan for this project. The Plan shall include approach, methodology, staffing, schedule, site investigation and deliverables. The Service Provider 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. The Service Provider shall provide a level of understanding and problem solving that will be used to identify potential areas for the Constructability Review. The Service Provider shall demonstrate and confirm how all the necessary tasks to successfully perform the Constructability Review will be carried out.

6.13.1 Project Scope

A Constructability Review shall be carried out in accordance with, but not limited to, Section 6.13 and the “Constructability Review Process Guide Ver. 2.0 April 2010,” listed under Reference Documents.

6.13.2 Technical Services Required

The Service Provider shall carry out the following types of Constructability Reviews as outlined below for this project:

- Internal (Service Provider) Review to be conducted after the Service Provider has selected a Preferred Alternative, but prior to the presentation of the Preferred Alternative to MTO Senior Management. The Service Provider shall schedule the Constructability Review at a milestone that will provide sufficient time for the Service Provider to prepare the report and make any necessary revisions to the recommended staging and/or preferred alternative.

This functional category will not receive a technical score in Phase I or in Phase II. The Proponent’s Phase II Proposal will only require a written confirmation that the terms for this functional category be adhered to for this Assignment. The functional category should be included in the Financial Proposal.

The Service Provider shall provide individuals/Team Members with construction related experience in all areas, including the following Critical Areas:

- 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 protection and mitigation

NOTE: Team members typically require 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's Proposal shall meet the following staffing and schedule constraints for Constructability Review:
 - The Team for Internal Review shall not be less than 10 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.
- The Constructability Review shall be carried out at the Preferred Alternative Stage only.
- A joint Field Visit may be necessary for all those involved in a Constructability Review.

Schedule

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)

6.13.3 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

6.13.4 Reference Documents

Constructability Review Process Guide Ver. 2.0 April 2010.

**SECTION 7: TERMS OF REFERENCE – FUNCTIONAL CATEGORIES
DETAIL DESIGN PLAN (NA)**

**SECTION 8: TERMS OF REFERENCE – CONSTRUCTION ADMINISTRATION
PLAN (NA)**