

**Project Specific Supplementary Quality Control Plan**

Project: Preliminary Design for the Replacement and Rehabilitation of 12 Structures, New Liskeard Area  
 GWP No.: 5379-11-00 Assignment No.: 5013-E-0018  
 Location: Unnamed Creek Culvert, Site 39E-244C Highway No.: Highway 634  
 Service Provider/Sub-Contractors : Terraprobe Inc.  
 Specialty: Geotechnical (Structures & Embankments) Medium Complexity Date: June 28, 2016  
 Soil and Rock Including Testing for Foundation Engineering Medium Complexity

#	Phase/Task	Methodology	Deliverable	Reference Manuals	Independent Technical and Quality Control Review		QC Review and Auditor Staff	Completion Date
					Procedure	Documentation		
1.0 REFERENCE DOCUMENT REVIEW								
.1	Project familiarization and reference document review	Same as in Generic Category Plan		Review start-up meeting notes, background information and any summary notes, and complete checklist		Initials on start-up meeting notes and summary notes	R. Abdul	June 06, 2014
2.0 FIELD INVESTIGATIONS AND LABORATORY TESTING								
.1	Site inspection	Same as in Generic Category Plan		Review summary notes and complete checklist		Initials on summary notes and checklist	R. Abdul	July 04, 2014
.2	Health and Safety and Traffic Control	Same as in Generic Category Plan		Identify health and safety and traffic control concerns		Prepare appropriate Health and Safety and Traffic Control Plans	R. Abdul	July 11, 2014
.3	Define field investigation programs.	Same as in Generic Category Plan		Review field instructions		Initials on field instruction sheet and checklist	R. Abdul	July 11, 2014
.4	Field investigations	Same as in Generic Category Plan		Review field borehole logs		Initials on field borehole logs	R. Abdul	Sept. 10, 2014
.5	Laboratory testing	Same as in Generic Category Plan		Review laboratory test results		Initials on lab test results	J. Crowder	Oct. 22, 2014
3.0 EXTERNAL STAKEHOLDER CONSULTATION								
.1	Consultation with MTO, project team, etc. as applicable	Same as in Generic Category Plan		Review correspondence and complete checklist		Initials on checklist	R. Abdul	Throughout project life
4.0 DRAFT FOUNDATION INVESTIGATION AND DESIGN REPORTS								
.1	Foundation design alternatives	Same as in Generic Category Plan		Critical technical review		Checked and initialed calculation sheets, signatures on reports	R. Abdul	July 24, 2015
Milestone Quality Review No. 1		Audit Memo/ Report		Review Procedures/ Complete Checklists			M. Tanos	August 20, 2015
5.0 FINAL FOUNDATION INVESTIGATION AND DESIGN REPORTS								
.1	Design reports	Same as in Generic Category Plan		Critical technical review Complete checklist including items contained in Terms of Reference		Checked and initialed calculation sheets, signatures on reports	R. Abdul	June 28, 2016
Milestone Quality Review No. 2		Audit Memo/ Report		Review Procedures/ Complete Checklists			M. Tanos	June 28, 2016



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6.0 FINAL DESIGNS								
.1	Design check	Same as in Generic Category Plan		Review foundation considerations		Initials on review / meeting notes	R. Abdul	N/A
.2	Staging / Detours	Same as in Generic Category Plan		Review staging / detour requirements		Initials on review / meeting notes	R. Abdul	N/A
.3	Constructability review	Same as in Generic Category Plan		Review constructability issues		Initials on review / meeting notes	R. Abdul	N/A
Milestone Quality Review No. 3		Audit Memo/ Report		Review Procedures/ Complete Checklist			M. Tanos	N/A
7.0 CONTRACT PACKAGE PREPARATION / REVIEW								
.1	Review of 60% Contract Drawings and Specifications	Same as in Generic Category Plan For “Contract Preparation”		Complete checklist		Signatures on memos, reports and drawings	R. Abdul	Not Applicable (N/A)
Milestone Quality Review No. 3		Audit Memo/ Report		Review Procedures/ Complete Checklists			M. Tanos	N/A
.2	Review of 90% Contract Drawings and Specifications	Same as in Generic Category Plan For “Contract Preparation”		Complete checklist		Signatures on reports and drawings	R. Abdul	N/A
Milestone Quality Review No. 4		Audit Memo/ Report		Review Procedures/ Complete Checklists			M. Tanos	N/A
.3	Review of Contract Drawings and Specifications Prior to Submission to Contract Tendering Section	Same as in Generic Category Plan For “Contract Preparation”		Complete checklist		Signatures on reports and drawings	R. Abdul	N/A
Milestone Quality Review No. 5		Audit Memo/ Report		Review Procedures/ Complete Checklists			M. Tanos	N/A
.4	Contract Foundation Investigation Reports	Same as in Generic Category Plan		Complete checklist		Signatures on reports and drawings	R. Abdul	N/A
Milestone Quality Review No. 6		Audit Memo/ Report		Review Procedures/ Complete Checklists			M. Tanos	N/A



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**GWP No.: 5379-11-00**

**Assignment No.: 5013-E-0018**

**Location: Unnamed Creek Culvert, Site 39E-244C**

**Highway No.: Highway 634**

**Service Provider/Sub-Contractors : Terraprobe Inc.**

**Specialty: Geotechnical (Structures & Embankments) Medium Complexity**

**Date: June 28, 2016**

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**QUALITY CONTROL CHECKLIST  
FOUNDATION ENGINEERING SERVICES**

**MTO NORTHEASTERN REGION  
AGREEMENT NO. 5013-E-0018**

No.	Item	Checked	Project-Specific Comments
1	Review of project documentation and available Foundation Reports.	√	Reviewed available drawings and reports, as well as subsurface conditions in general vicinity of the site.
2	Site visit to inspect terrain and performance of existing structures and/or roads.	√	Site visit performed by Mr. Satyajit Manani, C.E.T.
3	Location, number and depth of boreholes and any other subsurface investigations, and sample frequency.	√	As per the RFP & Terms of Reference. Three boreholes were drilled – one near the inlet and outlet locations, one through the existing highway embankment and two dynamic cone penetration tests were performed. Boreholes were drilled to depths of between 4.3 m and 23.8 m. Soil samples were obtained at 0.75 m and 1.5 m intervals and the bedrock was cored (1.3 m and 2.9 m) in two boreholes.
4	Determination of groundwater elevation in boreholes.	√	Water level observed in open boreholes during drilling. Standpipe piezometers were installed to allow for on-going ground water monitoring.
5	Number of laboratory tests and type of laboratory tests.	√	35 moisture contents, 11 grain size distributions and 8 atterberg limits were completed on selected samples out of a total of 45 recovered samples.
6	Abandonment of boreholes and site restoration.	√	Boreholes backfilled in accordance with Ontario Regulation 903 (as amended).
7	Surveying of boreholes.	√	Control Point HCP 101 established on site by MMM surveyors. Borehole locations and ground surface elevations referenced to this control point by Terraprobe.
8	Submission of Foundation Investigation and Design Reports to MTO's Project Manager and to the MTO Foundations Section.	√	
9	Report signed and sealed by two P.Eng.'s from Terraprobe, one of whom is the Designated MTO Foundations Contact.	√	Draft report signed but not sealed. Final reports will be signed and sealed.
10	Report in two sections: (Part A) Foundation Investigation Report, and (Part B) Foundation Design Report.	√	
11	Foundation Investigation Report presents a subsurface model at the culvert site. Report consists of factual information only. Includes sections on Site Description, Investigation Procedures, Description of Subsurface Conditions and Miscellaneous.	√	
12	Presentation of borehole records to MTO format.	√	
13	Presentation of Borehole Locations and Soil Strata drawings to MTO format.	√	
14	Presentation of laboratory test result figures to MTO format.	√	
15	Foundation Design Report presents discussion and recommendations for design with recommendations in accordance with CHBDC, pertaining to both temporary and permanent conditions of the project.	√	
16	Appropriate range of alternatives considered.	√	



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No.	Item	Checked	Project-Specific Comments
17	Structure foundation design addressed including axial and lateral resistances for shallow/ deep foundations.	√	
18	Embankment design addressed, including settlement and stability.	√	
19	Earth/rock excavation requirements addressed.	√	
20	Construction concerns addressed including any required specifications and special provisions for materials and specialized construction activities, and recommendations for methods of overcoming anticipated construction problems.	√	
21	Recommended Additional Studies for Detail Design.	√	
22	MTO and TPM comments addressed in final Foundation Investigation and Design Report	√	

**Milestone Quality Review No. 2**

Designated MTO Foundations Contact:

*Michael Jones*

Foundations Project Manager:

*Rehman H. Oel*

Date:

*June 28, 2016.*

