

GWP No.: 3204-16-00
 Highway No.: 401
 TPM Consultant: Stantec Consulting Ltd.
 Specialties: Bridge Engineering, Drainage and Hydrology Engineering, Electrical Engineering, Environmental,
 Foundations Engineering, Highway Engineering, Pavement Engineering, Surveying and Plan Preparation,
 Traffic Engineering

Purchase Order No.: 3017-E-0004-02
 Location: Roseville Road Underpass

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Date: February 3, 2020 (Revised)

Foundations Engineering Supplementary QC Plan									
No.	Phase/Task	Methodology	Deliverables	Reference Documents	Independent Tech. Reviews		Staff Performing Work	QC Review and Auditor Staff	Completion Date for Milestone Quality Review
					Procedure	Document			
1.0 PROJECT START UP									
1.1	Familiarization	Review project documentation including structure (bridge/culvert), embankment, survey, environmental aspects Review applicable Foundation Investigation and Design Reports and geoscience reports	Updated investigation plan	Terms of Reference Reference libraries including MTO Foundation Library (GEOCRES)	Review checklist Review updated plan Technical Review 1	Initials Memo	K. Nelson	Review: John Brisbois Auditor: Dave Emery	QB Apr/2019
1.2	Clearances and Notifications	Notify MTO District and Foundations Group of schedule Notify MOL, as required Arrange for clearances Arrange for permission to enter private property Establish Health and Safety Issues Establish traffic control requirements	MOL Notice PTE Records Health & Safety Plan Traffic Control Plan	MOL Regulations OHS Act Book 7, Temporary Conditions, Ontario Traffic Manual	Review checklist Review Health & Safety Plan Review Traffic Control Plan	Initials Initial plan	K. Nelson D. Lee K. Thrans	Review: John Brisbois Auditor: Dave Emery	QB Apr/2019

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2.0 DATA COLLECTION									
2.1	Site Inspection	Layout Conduct utility clearances for testholes Inspect site and critically assess existing surface conditions, structures and embankments, drainage Select appropriate method for testhole advancement	Locate records Update site Investigation Plan	Terms of Reference	Review checklist Review updated Plan	Initials	K. Nelson D. Lee	Review: John Brisbois Auditor: Dave Emery	QCB Apr/2019
2.2	Field Investigation	Prestart meeting to review Health & Safety, Site Investigation and Traffic Control Plans Traffic control set up Advance testholes per requirements Conduct sampling per frequency and method requirements Install and monitor standpipes/ piezometers Ensure integrity of samples through appropriate transportation and handling procedures Conduct in-situ testing	Meeting minutes Water levels Samples Test results Borehole records Survey data Artesian Condition Sealing Report Property Damage Report	Terms of Reference Book 7 ASTM protocols MTO LS protocols MTO protocols MTO Soil Classification Manual MTO Interim Guidelines for Borehole Abandonment	Review checklist Check calculations Review Artesian Condition Sealing Report Review Property Damage Report	Initials	D. Lee K. Thrans	Review: John Brisbois Auditor: Dave Emery	QCB Apr/2019

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
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		Monitor drilling operations and field investigation results Survey location of testholes Abandon testholes and restore site Ensure sufficiency of field investigation for project purpose							
2.3	Lab Testing	Inspect samples and confirm field description, select test program Conduct number, type of tests per requirements Confirm field descriptions based on lab testing Foundation Lab meets requirements specified in RAQS registration	Modified borehole logs Test results	Terms of Reference MTO Soil Classification Manual MTO LS and ASTM protocols, Stantec Testing and QC Standards	Review checklist Ensure sufficiency of lab testing, check lab results	Initials Initial lab results	D. Lee B. Prevost Z. Popper	Review: John Brisbois Auditor: Dave Emery	 Oct/2019
Milestone Quality Review No. 1					Audit Memo/Report	Review Procedures & Checklists	Memo/Report	Auditor: Dave Emery	March 12, 2020
3.0 DESIGN: ALTERNATIVES – EVALUATION – SELECTION - RECOMMENDATIONS									
3.1	Consultation (with MTO, & others)	Submit correspondence Attend meetings, as required	Minutes, records	Terms of Reference	Review checklist	initials	K. Nelson J. Brisbois	Review: John Brisbois Auditor: Dave Emery	

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Foundations Engineering Supplementary QC Plan									
NO.	PHASE/TASK	METHODOLOGY	DELIVERABLES	REFERENCE DOCUMENTS	INDEPENDENT TECH. REVIEWS		STAFF PERFORMING WORK	QC REVIEW AND AUDITOR STAFF	COMPLETION DATE FOR MILESTONE QUALITY REVIEW
					PROCEDURE	DOCUMENT			
3.2	Conceptual Subsurface Conditions and Conceptual Design Alternatives	Prepare foundation drawing (plan and section) Summarize site conditions Review proposed development Engineering analysis Develop alternatives including risks and costing Assess alternatives, pros/cons Preliminary alternative recommendation Prepare DRAFT Foundation Investigation and Design Report complete with methodology, results, assessment, alternatives (pros, cons, risks and cost estimates) and recommendations	DRAFT Foundation Investigation and Design Report	Terms of Reference, Codes (Highway Bridge Design Code in use at MTO), Manuals, Texts	Review checklist Technical Review 2 Review calc's Letter signed by 2 P.Eng.'s Report split: Investigation & Design Report contains appropriate content & rec's Technical Review 3	Initials Memo Signatures	K. Nelson D. Lee B. Bocage	Review: John Brisbois Auditor: Dave Emery	Roseville Road U/P  Feb 17/2020 Culvert 33-375/C  May 8, 2020 Culvert 33-377/C  April 9, 2020 Culvert 33-420/C
3.3	Conceptual Foundation Design Selection	Correspondence / meetings to evaluate alternatives, as required		Terms of Reference, Codes (Highway Bridge Design Code in effect at MTO), Manuals, Texts	Review checklist Technical Review 4	Initials Memo	K. Nelson J. Brisbois B. Bocage	Review: John Brisbois Auditor: Dave Emery	

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3.4	Final Report	Update analysis and design to reflect input received during consultation Prepare FINAL Foundation Investigation and Design Report in accordance with MTO protocols	FINAL Foundation Investigation and Design Report	Terms of Reference, Codes (Highway Bridge Design Code in effect at MTO), Manuals, Texts	Review checklist Review calc's Report split: Investigation & Design Report contains appropriate content & rec's Report contains rec's for preferred alternative designs for temp, interim & permanent cases, red-flag issues & specs Report signed and stamped by 2 P.Eng.'s (designated Principal Contact) Technical Review 5	Initials Signatures Memo	K. Nelson B. Bocage	Review: John Brisbois Auditor: Dave Emery	Roseville Road U/P Culvert 33-375/C Culvert 33-377/C Culvert 33-420/C
Milestone Quality Review No. 2					Review Procedures & Checklists	Memo/Report		Auditor: Dave Emery	June 19, 2020

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4.0 Detail Design Support									
4.1	Detail Design Check	Consultation with project team including Structural Engineers		Terms of Reference, Codes (Highway Bridge Design Code in effect at MTO), Manuals, Texts	Review checklist Technical Review 6	Initials Memo	K. Nelson	Review: John Brisbois Auditor: Dave Emery	
4.2	Staging / Detours	Consultation with Project Team		Terms of Reference, Codes (Highway Bridge Design Code in effect at MTO), Manuals, Texts	Review checklist Technical Review 6	Initials Memo	K. Nelson	Review: John Brisbois Auditor: Dave Emery	
4.3	Constructability Review	Consultation with Project Team including Construction Engineers		Terms of Reference, Codes (Highway Bridge Design Code in effect at MTO), Manuals, Texts	Review checklist Technical Review 6	Initials Memo	K. Nelson J. Brisbois	Review: Raymond Haché Auditor: Dave Emery	
Milestone Quality Review No. 3				Final Audit Memo/Report	Final Review of Procedures & Checklists	Final Memo/Report	Auditor: Dave Emery	August 14, 2020	