










CATEGORY: FOUNDATION ENGINEERING, 6017-E-0013, HWY 527 CULVERT REPLACEMENTS, DETAIL DESIGN

Phase/ Task #	Phase/Task	Methodology	Deliverables	Reference Manuals	Independent Internal Consultant Reviews		Specific Q.C. Staff Assigned	Completion Date
1.0 Reference Document Review								
1.1	Reference Document Review	Review Design Criteria, Collect and review background information, e.g. GEOGRES files, published data, maintenance reports, etc	Construction history	RFP	Confirm adequacy/ sufficiency of data	Initials	S. Dunlop, P. Eng	May 4, 2018 
2.0 Data Collection – Field Investigation								
2.1	Prepare Safety Plan	Confirm field staff understanding of OHS requirements. Confirm qualifications of sub-contractor personnel. Submit Notices to Ministry of Labour, as applicable.	Health & Safety Plan	MOL/OHS Act and Regulations, Book 7, and Thurber's Safety Manual	Review Plan	Initials	S. Dunlop, P. Eng.	Nov. 9, 2018 
2.2	Site Reconnaissance	Review site conditions including traffic, access, brush/tree cover, etc.	Notes / Records	OHSA, MTO Temporary Conditions Manual	Review Reconnaissance Notes	Initials	S. Dunlop, P. Eng.	Nov. 9, 2018 
2.3	Traffic Control Plan	Prepare a written plan for traffic control taking into account site conditions.	Traffic plan	Ontario Traffic Manual, Book7, OHSA	Review Traffic Plan	Initials	S. Dunlop, P. Eng.	Nov. 9, 2018 
2.4	Site Clearances	Obtain permissions to enter for investigation on private land. Obtain underground utility locates (gas/water, communications, etc).	PTE Records Locate Records	N/A	Review PTE and Utility Clearances	Initials	S. Dunlop, P. Eng.	Nov. 9, 2018 

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					Procedure	Reviews Doc.		
2.5	Project Notifications	File Notice of Project with MOL. Notify MTO Project Manager, MTO Local Operations, TPM Team of commencement of fieldwork.	Notifications	Regional Guidelines & RFP	Review Notifications	Initials	S. Dunlop, P. Eng.	Nov. 9, 2018 <i>SD</i>
2.6	Site Investigation Plan	Develop site investigation plan.	Fieldwork Plan	Design Criteria, MTO Foundation Investigation Guidelines	Review Plan	Initials	S. Dunlop, P. Eng.	Nov. 9, 2018 <i>SD</i>
2.7	Brief Technical Staff	Meet with all field staff plus key office and laboratory staff.	Field Instructions Briefing Notes	N/A	Review Briefing Notes	Initials	S. Dunlop, P. Eng.	Nov. 15, 2018 <i>SD</i>
2.8	Engage Specialist Contractors	Provide written instructions regarding project requirements, schedule and site specific issues to contractors (drilling, traffic control, etc)	Instructions to drillers	RFP, Thurber Field Manuals	Review Instructions	Initials	S. Dunlop, P. Eng.	Nov. 15, 2018 <i>SD</i>
2.9	Site Investigation and Field Testing	Drill boreholes at prescribed locations and to prescribed depths. Conduct SPT sampling and install piezometers. Protect integrity of samples through appropriate handling and transportation procedures. Restore site as far as is practicable.	Field logs.	MTC Soils Classification Manual, ASTM Methods, CFEM	Review field documentation.	Initials	S. Dunlop, P. Eng.	Nov. 29, 2018 <i>SD</i>

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2.10	Laboratory Testing	Record incoming samples and conduct visual identifications. Conduct routine/medium complexity testing in accordance with Proposal.	Lab work sheets.	MTO Laboratory Manual, ASTM Methods, Terms of Reference	Review results and conduct random re- calculations	Initials	F. Griffiths, P. Eng.	Dec. 7, 2018 
Milestone Quality Review No. 1								
			Audit		Review Process Table	Initials	P. Carnaffan, P.Eng.	PC Dec 10/18
3.0 Geotechnical Analysis								
3.1	Prepare graphical borehole logs, Plans, Profiles and Cross- sections	Obtain base plans from Prime Consultant, plot borehole locations and draft profiles and cross-sections. Prepare borehole logs on gINT software.	Borehole logs, plans and profiles.	MTO Drafting Standards for Foundations	Review logs, plans and profiles for accuracy, completeness and conformance to MTO Standards	Initials	S. Dunlop, P. Eng.	Dec. 14, 2018 
3.2	Engineering analysis	Perform calculations for: i) settlement ii) stability iii) other calculations as required by the project specifics	Calculation sheets.	CHBDC, CFEM, RFQ	Review for soundness of engineering judgement, review calculation sheets	Initials	S. Dunlop, P. Eng.	Dec. 14, 2018 
3.3	Selection of Alternatives	Review foundation alternatives against project requirements. Select geotechnically preferred alternative.	Draft Foundation Report	RFP, Design Criteria, project drawings	Review selection	Initials	S. Dunlop, P. Eng.	Dec. 14, 2018 

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					Procedure	Reviews Doc.		
4.0 Technical Reports								
4.1	Draft Report Preparation	Complete DRAFT Foundation Investigation and Design Reports. Reports signed by 2 P.Eng's one of whom is the Designated Principal Contact Prepare report in two sections i) Foundation Investigation Report ii) Foundation Design Report Check report contains appropriate content and recommendations Check reports document appropriate range of alternative recommendations with pros, cons, risks and cost estimates	Draft Foundation Investigation and Design Reports	Terms of Reference, Codes, CHBDC, CFEM	Critical technical review. Check reports contain appropriate content and recommendation Check reports document appropriate range of alternative recommendations with pros, cons and risks presented	Initials	F. Griffiths, P. Eng. 48C-124/C Waweig 48C-240/C Wabikon	Dec. 18, 2018 <i>FJW</i> Dec. 17, 2018 <i>FJW</i>
Milestone Quality Review No. 2			Audit		Review Process Table	Initials	P. Carnaffan, P.Eng.	<i>Dec 18/18</i> <i>PC</i>

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					Procedure	Reviews Doc.		
4.2	Final Report Preparation	Review and incorporate comments received from MTO and the TPM Team.	Final Foundation Investigation and Design Reports	Terms of Reference, Codes, CHBDC, CFEM	Review final reports for incorporation of comments.	Initials	F. Griffiths, P. Eng. 48C-124/C Waweig 48C-240/C Wabikon	
5.0 Design Consultation								
5.1	Tender Package Review	Review package	Written Comments	Technical report(s) and addenda	Activity Checklist	Initial Activity Checklist	S. Dunlop, P. Eng. GWP 6827-14-00 60% 90% GWP 6829-14-00 60% 90%	
5.2	Report Addenda	Prepare addenda as necessary	Addenda, Transmittal Records	N/A	Review addenda	Initials	F. Griffiths, P. Eng.	
Milestone Quality Review No. 3					Audit	Initials	P. Carnaffan, P.Eng.	