Ontario

MINISTRY OF TRANSPORTATION

TENDER CLOSING DATE IS 03:00:00 P.M. LOCAL (TORONTO) TIME MAY 22, 2019

TENDER

FOR **GRADING, DRAINAGE, GRANULAR BASE, PAVING, ELECTRICAL, STRUCTURAL, AND ATMS**

(A) NECESSARY AVAILABLE FINANCIAL RATING IS $16,000,000 IN (GR) OR (S)

NECESSARY AVAILABLE MAXIMUM WORKLOAD RATING IS $35,000,000

AT HWY. QEW

FROM 1.4km NORTH OF BOWEN RD. INTERCHANGE SOUTHERLY TO GILMORE RD. INTERCHANGE / SITE No. 34-129/1 & 2, SITE No. 34-454C, AND SITE No. 34-455C

5.6 km Central Region

UNDER CONTRACT NO. 2019-2003

(B) THIS CONTRACT IS APPLICABLE TO QUALIFIED CONTRACTORS ONLY

BY

NAME OF FIRM OR INDIVIDUAL (HEREAFTER REFERRED TO AS "CONTRACT CONTRACTOR")

ADDRESS

NAME OF PERSON SIGNING FOR FIRM

OFFICE OF PERSON SIGNING FOR FIRM

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TENDER ITEM LIST

Grading

Item	Spec. Code	Item Description	Unit	Quantity	Unit Price	Total
1	0201-0015	Clearing	m2 (P)	6,686		
2	0201-0020	Clearing	each (P)	64		
3	0201-0075	Grubbing	m2 (P)	6,686		
4	0201-0080	Grubbing	each (P)	64		
5	0206-0010 SP	Earth Excavation, Grading	m3 (P)	21,467		
6	0206-0050	Excavation for Pavement Widening	m (P)	1,050		
7	0209-0030	Select Subgrade Material	t	173,207		
8	0299-0015 SP	Earth Ditch Cleanout	m (P)	785		
9	0305-0015 SP	Granular Sealing (m2)	m2 (P)	8,452		
10	0308-0010 SP	Tack Coat	m2 (P)	115,123		
11	0313-1370	Hot Mix Asphalt Miscellaneous	m2 (P)	331		
12	0313-1375	Superpave 12.5FC 2	t	6,521		
13	0313-1376	Superpave 19.0	t	20,263		
14	0314-0071	Granular A	t	80,782		
15	0314-0190	Granular B, Type II	t	585		
16	0342-0140	Shoulder Rumble Strips - Asphalt	m (P)	2,699		
17	0353-0011 SP	Concrete Curb and Gutter	m (P)	2,098		
18	0353-0020	Concrete Gutter Outlets	each (P)	8		
19	0904-0150	Concrete in Toe Wall	lump sum	100 %		
20	0405-0010	Pipe Subdrains	m (P)	2,060		
21	0407-0010	600 mm x 600 mm Manholes Catch Basins and Ditch Inlets	each (P)	20		
22	0407-0020	600 mm x 1200 mm Manholes Catch Basins and Ditch Inlets	each (P)	2		
23	0407-0040 SP	1200 mm Manholes Catch Basins and Ditch Inlets	each (P)	25		
24	0407-0080 SP	1800 mm Manholes Catch Basins and Ditch Inlets	each (P)	3		
25	0410-0300	300 mm Pipe Sewer	m (P)	669		
26	0410-0400	400 mm Pipe Sewer	m (P)	285		
27	0410-0500	500 mm Pipe Sewer	m (P)	46		
28	0421-0305	300 mm Pipe Culvert	m (P)	7		
29	0421-0405	400 mm Pipe Culvert	m (P)	14		
30	0421-0605	600 mm Pipe Culvert	m (P)	13		
31	0421-0805	800 mm Pipe Culvert	m (P)	114		
32	0421-6213	600 mm Pipe Culvert Extension	m (P)	3		
33	0421-6215	800 mm Pipe Culvert Extension	m (P)	61		
34	0510-3133	Removal of Asphalt Pavement	m2 (P)	24,612		
35	0510-3137	Removal of Asphalt Pavement, Partial-	m2 (P)	13,617		

		Depth				
36	0510-3134	Removal of Asphalt Pavement from Concrete Surfaces	m2 (P)	533		
37	0510-3139	Removal of Asphalt Pavement from Concrete Surfaces on Structures	m2 (P)	3,126		
38	0510-3532	Removal of Concrete Curb and Gutter	m (P)	1,974		
39	0510-4071	Removal of Maintenance Holes, Catch Basins, Ditch Inlets and Valve Chambers	each (P)	23		
40	0510-4076	Abandonment of Pipes and Culverts	m (P)	148		
41	0510-4210	Removal of Pipes and Culverts	m (P)	85		
42	0510-5402	Removal of Ramp Closure Gates	each (P)	1		
43	0510-5500	Removal of Energy Attenuators	each (P)	3		
44	0510-5528	Removal of Steel Beam Guide Rail	m (P)	3,463		
45	0511-0145	Rip-Rap	m2 (P)	232		
46	0511-0150	Geotextile	m2 (P)	1,172		
47	0517-0010 SP	Dewatering System	lump sum	100 %		
48	0517-0020 SP	Temporary Flow Passage System	lump sum	100 %		
49	0703-0020	Small Signs, Ground Mounted, New	each (P)	53		
50	0703-0021	Small Signs, Relocation	each (P)	8		
51	0703-0022 SP	Small Signs, Removal	each (P)	2		
52	0705-0025	Flexible Delineator Post - Temporary	each (P)	79		
53	0706-0013	Portable Variable Message Sign (Temporary)	each (P)	2		
54	0706-0015	Temporary Traffic Control Signs	lump sum	100 %		
55	9999-5019 SP	Advanced Notification/Warning/Detour Route TC-64 Signs	each (P)	25		
56	0710-0007 SP	Pavement Marking Obliterating - By Abrasive Blasting	m (P)	78,747		
57	0710-0030 SP	Pavement Marking, Durable	m (P)	14,483		
58	0710-0115	Pavement Marking, Temporary, Paint - Fluorescent Orange	m (P)	66,465		
59	0710-0010 SP	Pavement Marking	m (P)	7,393		
60	0710-0060 SP	Pavement Marking Symbols, Temporary	each (P)	1		
61	0721-0050	Single Rail Steel Beam Guide Rail	m (P)	2,268		
62	0723-4100 SP	Energy Attenuator - Permanent, Narrow	each (P)	2		
63	0723-4105 SP	Energy Attenuator - Temporary, Narrow	each (P)	7		
64	0723-4106 SP	Energy Attenuator - Temporary, Wide	each (P)	1		
65	0723-4110 SP	Energy Attenuator - Relocation, Narrow	each (P)	14		
66	0732-0100 SP	Steel Beam Energy Attenuating Terminal System	each (P)	3		
67	0740-0015 SP	Tall Wall Barrier	m (P)	648		
68	0741-0020	Temporary Concrete Barrier	m (P)	3,721		
69	0741-0025	Temporary Concrete Barrier, Relocation	m (P)	13,726		
70	0741-5600 SP	Temporary Concrete Barrier Restraint System, Pinned	m (P)	1,087		

71	0799-6015 SP	Ramp Closure Gates	each (P)	2		
72	0799-6016 SP	Concrete in Ramp Closure Gate Support Footings	each (P)	2		
73	0802-0020	Topsoil from Stockpiles	m3	1,875		
74	0804-0052	Seed and Erosion Control Blanket	m2 (P)	76,098		
75	0805-0030 SP	Light-Duty Silt Fence Barriers	m (P)	3,016		
76	0805-0100 SP	Straw Bale Flow Check Dams	each (P)	40		
77	0899-8016 SP	Wildlife Fence - Type B, 6.35 mm Fabric Opening, Steel Posts	m (P)	1,347		
78	9999-6079 SP	Relocation of Telephone Utilities	lump sum	100 %		

Non-Structural Culvert

Item	Spec. Code	Item Description	Unit	Quantity	Unit Price	Total
79	0422-0130 SP	2400 mm x 1500 mm Precast Concrete Box Culvert	m (P)	56.0		
80	0902-0010	Earth Excavation for Structure	m3 (P)	610		
81	0904-0015	Concrete in Culverts	m3 (P)	4.0		
82	0905-0010	Reinforcing Steel Bar	lump sum	100 %		
83	9999-0352 SP	Working Slab	lump sum	100 %		

ATMS

Item	Spec. Code	Item Description	Unit	Quantity	Unit Price	Total
84	0602-0025	Electrical Maintenance Holes	each (P)	5		
85	0602-0045	Electrical Handholes	each (P)	6		
86	0602-0050	Electrical Chamber Drains	m (P)	22		
87	0603-0045 SP	Rigid Ducts, Direct Buried	m (P)	1,033		
88	0604-0045	Low Voltage Cables, in Ducts	m (P)	2,823		
89	0604-0050 SP	Extra Low Voltage Cables, in Ducts	m (P)	5,216		
90	0604-0055	Traffic Signal Cables, in Ducts	m (P)	19		
91	0609-0020	Ground Wires	m (P)	963		
92	0609-0030	Ground Electrodes	each (P)	6		
93	0616-0020 SP	Concrete Footings in Earth	each (P)	1		
94	0616-0040 SP	Concrete Pads	each (P)	1		
95	0623-0022 SP	ATMS Loop Detectors	each (P)	12		
96	0682-0009 SP	ATMS Field Equipment Cabinet Maintenance Sites	each (P)	1		
97	0682-0050 SP	Base Mounted Communication Pedestals	each (P)	1		
98	0682-0060 SP	Controller Cabinets	each (P)	1		
99	0682-0061 SP	Controllers	each (P)	1		
100	0682-0065 SP	Loop Vehicle Detector Sensor Units	each (P)	8		
101	0682-0081 SP	Removal of Advanced Traffic Management System Equipment	lump sum	100 %		
102	0683-0009 SP	Splice Enclosures for Fibre Optic Cables	each (P)	1		
103	0683-0010 SP	Fibre Optic Communication Cables, in Ducts	m (P)	963		

104	0685-0010 SP	Variable Message Signs	each (P)	1		
105	0699-6142 SP	Power Supply Cabinets	each (P)	1		

Electrical

Item	Spec. Code	Item Description	Unit	Quantity	Unit Price	Total
106	0601-0010 SP	Maintenance and Operation for Temporary Traffic Signal System Work	lump sum	100 %		
107	0602-0045	Electrical Handholes	each (P)	2		
108	0603-0035	Rigid Ducts, Concrete Encased	m (P)	33		
109	0603-0045	Rigid Ducts, Direct Buried	m (P)	324		
110	0603-0071	Rock Excavation for Electrical Installations	m3 (P)	0.6		
111	0604-0045	Low Voltage Cables, in Ducts	m (P)	1,359		
112	0609-0020	Ground Wires	m (P)	384		
113	0609-0030	Ground Electrodes	each (P)	3		
114	0610-0010 SP	Removal of Electrical Equipment	lump sum	100 %		
115	0615-0110	Steel Poles, Base Mounted	each (P)	5		
116	0615-0130	Frangible Bases	each (P)	1		
117	0615-0160 SP	Breakaway Base Anti-Theft Device	each (P)	1		
118	0616-0030	Concrete Footings in Rock	each (P)	5		
119	0617-0022	LED Roadway Lighting Luminaires and Bracket Assemblies	each (P)	3		
120	9999-6040 SP	Remote Non-Intrusive Traffic Sensors (RNITS) System	each (P)	4		

QEW CNR/CPR Overheads, NBL & SBL, Site No. 34X-0129/B1&B2

Item	Spec. Code	Item Description	Unit	Quantity	Unit Price	Total
121	0510-9010	Removal of Bridge Structure	lump sum	100 %		
122	0510-9015	Removal of Bridge Footings	m3	192		
123	0539-0040 SP	Protection System	lump sum	100 %		
124	0599-5965 SP	Retained Soil System with Finishing Cap, Wall/Slope, High Performance	lump sum	100 %		
125	0599-5972 SP	Backfill for Retained Soil System, High Performance	t	16,990		
126	0899-0010 SP	Management and Disposal of Materials Containing Asbestos	lump sum	100 %		
127	0902-0010	Earth Excavation for Structure	m3 (P)	1,016		
128	0903-0010	Supply Equipment for Driving Piles	lump sum	100 %		
129	0903-0012	Supply Equipment for Installing Caisson Piles	lump sum	100 %		
130	0903-0090	Caisson Piles	m	90.00		
131	0903-0120	Driving Shoes	each (P)	52		
132	0904-0055	Concrete in Footings	m3 (P)	28.0		
133	0904-0065	Concrete in Barrier Wall Footings	m3 (P)	170		
134	0904-0095 SP	Concrete in Substructure and Retaining Walls	lump sum	100 %		

135	0904-0105	Concrete in Deck	lump sum	100 %		
136	0904-0115 SP	Concrete in Barrier Walls	lump sum	100 %		
137	0904-0135 SP	Concrete in Approach Slabs	lump sum	100 %		
138	0905-0010	Reinforcing Steel Bar	lump sum	100 %		
139	0905-0025	Stainless Steel Reinforcing Bar	lump sum	100 %		
140	0905-0030	Mechanical Connectors	each (P)	954		
141	0905-0045	Stainless Steel Mechanical Connectors	each (P)	18		
142	0906-0011	Fabrication of Structural Steel	lump sum	100 %		
143	0906-0020	Delivery of Structural Steel	lump sum	100 %		
144	0906-0030	Erection of Structural Steel	lump sum	100 %		
145	0911-0012 SP	Coating New Structural Steel	lump sum	100 %		
146	0913-0010	Embedded Work in Structure (Ministry)	lump sum	100 %		
147	0914-0011 SP	Bridge Deck Waterproofing	lump sum	100 %		
148	0914-0031 SP	Form and Fill Grooves	m (P)	66.00		
149	0920-0010 SP	Deck Joint Assemblies, Installation	lump sum	100 %		
150	0922-0010 SP	Bearings	lump sum	100 %		
151	0928-0055 SP	Access to Work Area, Work Platform and Scaffolding	lump sum	100 %		
152	9999-0468 SP	CSP for Integral Abutment	lump sum	100 %		
153	9999-0903 SP	H-Piles - HP 310X132	m	1,138		
154	9999-9137 SP	Vibration Monitoring	lump sum	100 %		

Frenchman's Creek Culvert at QEW Ramp W-W & Ramp E-E/W, Site No. 34-454/C

Item	Spec. Code	Item Description	Unit	Quantity	Unit Price	Total
155	0539-0040 SP	Protection System	lump sum	100 %		
156	0902-0010 SP	Earth Excavation for Structure	m3 (P)	66		
157	0902-0030	Dewatering Structure Excavations	lump sum	100 %		
158	0904-0015 SP	Concrete in Culverts	m3 (P)	25.0		
159	0904-0095 SP	Concrete in Substructure and Retaining Walls	lump sum	100 %		
160	0928-0055	Access to Work Area, Work Platform and Scaffolding	lump sum	100 %		
161	0928-0065 SP	Concrete Removal - Partial Depth - Type B	m3	2.0		
162	0928-0070 SP	Concrete Removal - Partial Depth - Type C	m3	1.0		
163	0928-0075 SP	Concrete Removal - Full Depth	m3	21.0		
164	0929-0030	Abrasive Blast Cleaning of Reinforcing Steel	m2	19		
165	0930-0146	Concrete Patches, Formed Surface	m3	1.0		
166	0930-0151	Concrete Patches, Form and Pump	m3	2.0		
167	0932-0010 SP	Crack Injection	m	145		
168	0999-0165 SP	Dowels into Concrete	each (P)	400		
169	9999-9140 SP	Culvert Waterproofing	m2 (P)	59		

Frenchman's Creek Culvert at QEW, Site No. 34-455/C

Item	Spec. Code	Item Description	Unit	Quantity	Unit Price	Total
170	0539-0040 SP	Protection System	lump sum	100 %		
171	0902-0010 SP	Earth Excavation for Structure	m3 (P)	38		
172	0902-0030	Dewatering Structure Excavations	lump sum	100 %		
173	0904-0015 SP	Concrete in Culverts	m3 (P)	19.0		
174	0904-0095 SP	Concrete in Substructure and Retaining Walls	lump sum	100 %		
175	0928-0055	Access to Work Area, Work Platform and Scaffolding	lump sum	100 %		
176	0928-0065 SP	Concrete Removal - Partial Depth - Type B	m3	2.0		
177	0928-0070 SP	Concrete Removal - Partial Depth - Type C	m3	1.0		
178	0928-0075 SP	Concrete Removal - Full Depth	m3	17.0		
179	0929-0030	Abrasive Blast Cleaning of Reinforcing Steel	m2	17		
180	0930-0146	Concrete Patches, Formed Surface	m3	1.0		
181	0930-0151	Concrete Patches, Form and Pump	m3	2.0		
182	0932-0010 SP	Crack Injection	m	139		
183	0999-0165 SP	Dowels into Concrete	each (P)	344		
184	9999-9140 SP	Culvert Waterproofing	m2 (P)	50		

Retained Soil System Wall #1, Site No. 34X-0600/W0

Item	Spec. Code	Item Description	Unit	Quantity	Unit Price	Total
185	0599-5965 SP	Retained Soil System with Finishing Cap, Wall/Slope, High Performance	lump sum	100 %		
186	0599-5972 SP	Backfill for Retained Soil System, High Performance	t	6,990		
187	0902-0010	Earth Excavation for Structure	m3 (P)	735		

Retained Soil System Wall #2, Site No. 34X-0601/W0

Item	Spec. Code	Item Description	Unit	Quantity	Unit Price	Total
188	0599-5965 SP	Retained Soil System with Finishing Cap, Wall/Slope, High Performance	lump sum	100 %		
189	0599-5972 SP	Backfill for Retained Soil System, High Performance	t	15,330		
190	0902-0010	Earth Excavation for Structure	m3 (P)	1,165		

Retained Soil System Wall #3, Site No. 34X-0602/W0

Item	Spec. Code	Item Description	Unit	Quantity	Unit Price	Total
191	0599-5965 SP	Retained Soil System with Finishing Cap, Wall/Slope, High Performance	lump sum	100 %		
192	0599-5972 SP	Backfill for Retained Soil System, High Performance	t	1,503		
193	0902-0010	Earth Excavation for Structure	m3 (P)	310		

Sign Support Structures

Item	Spec. Code	Item Description	Unit	Quantity	Unit Price	Total
194	0915-0040	Steel Column Breakaway Sign Support Structures	each (P)	3		
195	0915-0041	Steel Column Non-Breakaway Sign Support Structures	each (P)	2		
196	0915-0110	Attachment of Signboards	each (P)	5		

		Grand Total:				

INSTRUCTIONS TO BIDDERS

1.0 DEFINITIONS

Bidder means a person, sole proprietorship, firm, partnership, corporation, or any other business venture that submits a Bid to the Ministry.

Bonds means both the Contract Bonds and the Statutory Bonds prescribed in the Tender Documents.

Business Day means any Day which is not: a) A Saturday or a Sunday or b) A Day observed as a holiday under the laws of the Province of Ontario or the federal laws of Canada applicable to the Province of Ontario.

Contract Bonds means the surety bonds executed by the Contactor and its Surety prescribed in the Tender Documents, but does not include Statutory Bonds.

Contractor Registration Form or CRF means the Ministry approved form supplied by the Ministry and completed by the Bidder to submit information in support of a contractor's basic financial rating.

Contract Tender Form or CTF means the Ministry approved form detailing the contract tender information for an advertised contract.

Day means a calendar day.

Itemized Bid Form means the Ministry approved form that the Bidder is to use to price the items specified in the tender documents to perform the Work.

Late Bid means a Bid received by the Ministry's Service Provider after the Tender Closing.

Late Bid Notification is a statement sent by the Ministry's Service Provider to a Bidder notifying the Bidder that their Bid is a Late Bid and will not be considered and is rejected.

MERX means the company engaged by the Ministry to provide electronic tendering services in respect of this Bid, which is a subsidiary of Mediagrif Interactive Technologies Inc.

No Bid Statement means a 'No Bid' selection on a Summary Bid Submission Form submitted to the Ministry's Service Provider from a Bidder who has an approved Tender Registration Form, but who does not intend on submitting a Summary Bid Submission Form containing a summary Bid prior to the Tender Closing, or intends to withdraw a summary Bid submitted on a Summary Bid Submission Form submitted to the Ministry prior to Tender Opening.

Non-Rated Contractor means a Contractor who does not have a basic financial rating or maximum workload rating in accordance with the Ministry's Qualification Procedures for Contractors.

Non-Resident Contractor means any Contractor residing outside of the Province of Ontario and with respect to a corporate contractor, not being incorporated pursuant to the laws of Ontario and who has not maintained a permanent place of business in Ontario continuously for twelve months prior to Tender Closing.

Non-Qualified Tender Registration Form (NQ-TRF) means the Ministry approved form supplied by the Ministry completed by the Bidder to notify the Ministry of its intention to submit a Bid on a contract in accordance with the Instructions to Bidders.

Qualified Contract means a contract that is tendered in accordance with the Ministry's Qualification Procedures for Contractors.

Qualification Procedures for Contractors means the administrative routine established by the Ministry to determine that contractors have the financial, managerial, and technical capability to perform the work in accordance with the contract.

RAQS is an abbreviation for Registry Appraisal and Qualification System.

RAQS/MERX is an abbreviation for the Ministry's tendering system replacing RAQS.

Rated Contractor means a contractor who has been granted a basic financial rating or maximum workload rating in accordance with the Ministry's Qualification Procedures for Contractors.

Service Provider means the person appointed by the Ministry to provide electronic tendering services on behalf of the Ministry.

Statutory Bonds means the surety bonds executed by the Contactor and its Surety and required to be furnished by Part XI.1 of the Construction Act, R.S.O. 1990, c.30, as amended.

Summary Bid Submission Form means the electronic form obtained from the Ministry's Service Provider prior to Tender Closing that the Bidder is to use to summarize the lump sum offer to perform the Work.

Tender or Bid can be used interchangeably and means the offer submitted by a Bidder to perform the work required of the Tender Documents at the prices set out in the offer, which offer shall be set out in the forms approved by the Ministry and in accordance with the procedures more particularly described in these Instructions to Bidders. More particularly, the forms shall include, among other things, the Summary Bid Submission Form and the Itemized Bid Form.

Tender Closing or **Tender Opening** can be used interchangeably and mean the last date and time that the Ministry will receive Bids.

Tender Documents means the Tender, MTO General Conditions of Contract, Standard Specifications and Drawings, Special Provisions, Contract Drawings, Addenda incorporated into any aforementioned document, and documents referenced in the aforementioned documents, but excludes the Qualification Procedures for Contractors.

Tender Registration Form (TRF) means the Ministry approved form supplied by the Ministry completed by Bidders to pre-qualify for Qualified Contracts in accordance with the procedures set out in the Qualification Procedures for Contractors.

Unbalanced Bid means a Bid containing a lump sum or unit prices, which does not reflect reasonable actual costs to do the work as described in the Tender Documents, plus a reasonable proportionate share of the Bidder's anticipated profit, overhead costs, and other indirect costs which are anticipated for the performance of the work.

2.0 COMPLIANCE WITH INSTRUCTIONS

2.1 Bidders must comply with these Instructions to Bidders and those failing to do so may have their Bid rejected, unless otherwise stated.

3.0 ENQUIRIES DURING TENDERING PERIOD

3.1 Enquiries are to be submitted electronically through the RAQS/MERX website. All public enquiries and responses to enquiries will be posted through the RAQS/MERX website.

3.2 Unless addressed through an addendum to the Tender Documents issued by the Ministry, all responses to Bid enquiries shall not be incorporated as part of the Contract or in any way change the Contract.

4.0 JOINT VENTURES

4.1 Rated Contractors are permitted to Bid on tenders as a joint venture. Joint ventures are defined as persons or corporations not associated or related by common ownership. All joint ventures must, on a joint and several bases, absolutely, unconditionally and irrevocably be responsible for all obligations described in the Tender Documents. If the joint venture does not form a corporation, all the joint venture entities must sign the contract upon award of the Tender.

4.2 Rated Contractors shall in accordance with the Ministry's Qualification Procedures for Contractors notify the Ministry of their intent to form a joint venture. Upon approval by the ministry, the lead contractor must submit the TRF on behalf of the joint venture.

5.0 TENDER REGISTRATION

5.1 An approved Non-Qualified Tender Registration Form (NQ-TRF) or Tender Registration Form (TRF) is required for the submission of a Bid in respect of the work anticipated by the Tender Documents.

5.2 A Non-Rated Contractor must have a Ministry approved NQ-TRF for the submission of a Bid.

5.3 A Rated Contractor must have either a Ministry approved NQ-TRF or a TRF in the case of a Qualified Contract for the submission of a Bid.

5.4 Qualified Contracts are applicable to Rated Contractors only and require an approved TRF for the submission of a Bid.

6.0 STATUTORY BONDS

6.1 If the Total Bid Price is **$500,000.00 or more** the Contractor shall furnish the Ministry with the Statutory Bonds in the prescribed form that satisfies the requirements of the Construction Act, R.S.O. 1990, c.C.30, as amended. In this regard, the Contractor shall deliver and maintain a labour and material payment bond using Form 31 and a performance bond using Form 32 prescribed by the Construction Act from a surety company that is an insurer licensed under the Insurance Act to write

surety and fidelity insurance. Such bonds shall name Her Majesty the Queen in right of the Province of Ontario as represented by the Minister of Transportation as an obligee. Each such bond shall have a coverage limit of at least 50 per cent of the tender price.

7.0 ELECTRONIC BID SUBMISSION PROCEDURES

7.1 All Bidders must have a valid user ID and password to access the RAQS/MERX website and must have a Ministry approved CRF and a Ministry approved TRF for Qualified Contracts or Ministry approved NQ-TRF for all other contracts for the submission of a Bid in respect of this Tender. Failure to obtain either an approved TRF or NQ-TRF will disallow the Bidder from submitting a Bid on the basis of failing to comply with the Instructions to Bidders without any consideration by the Ministry.

7.2 The Bidder's TRF or NQ-TRF must be completed as of the date specified on the contract tender form. The Ministry will not approve any TRF's or NQ-TRF's received after 12:00 noon of the last Business day of the preceding week prior to the Tender Closing (generally, the Friday before Tender Closing).

7.3 Bidders must complete an on-line Summary Bid Submission Form. Only a Bidder with an approved TRF or NQ-TRF for the advertised Tender is able to complete and submit a Summary Bid Submission Form to the Ministry.

7.4 All Bids must be received by the Ministry before the Tender Closing date and time specified in the Tender Documents.

7.5 Bidders may submit a revised on-line Summary Bid Submission Form up until Tender Closing. The Ministry will only consider the last Summary Bid Submission Form received by the Ministry prior to Tender Closing. A No Bid Statement may be received from any Bidder on-line up until Tender Closing.

7.6 Upon successfully submitting an on-line Summary Bid Submission Form, Bidders will receive an on-line notification for information purposes that the Ministry has received their Summary Bid Submission Form.

7.7 The Itemized Bid Form will be available to pre-qualified Bidders for on-line data entry 24 hours prior to Tender Closing.

7.8 After Tender Closing, Bidders will receive an electronic notification from the Ministry's Service Provider, advising them that Tender Opening has occurred.

7.9 The Ministry's Service Provider will notify all Bidders electronically and will publish a Bidders list showing tender results on the RAQS/MERX website.

7.10 The three lowest Bidders will be advised to submit the Itemized Bid Form within 24 hours after the Bids are published. Failure to submit the Itemized Bid Form within the specified time may result in rejection of the Bid and/or may be referred to the Qualification Committee. The Itemized Bid Form shall not be changed once submitted.

8.0 COMPUTER SYSTEM FAILURE

8.1 The Ministry will only accept Bids submitted electronically through RAQS/MERX. Any Bid received through any other format will not be considered and is deemed rejected without consideration.

8.2 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.

8.3 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.

9.0 UNBALANCED TENDERS AND DISCREPANCIES

9.1 Bidders that submit Tenders that contain a lump sum or unit prices that appear to be an Unbalanced Bid may be referred to the Ministry's Qualification Committee and any Tenders that are so Unbalanced to the potential detriment of the Ministry, may be rejected.

9.2 The Ministry will not allow any Bidder to adjust the total Tender amount after Tender Closing.

9.3 In the event of a mathematical error or discrepancy in the Itemized Bid Form, the Ministry may request the Bidder to resubmit the Itemized Bid Form without changing the total Tender amount.

10.0 ACCEPTANCE OR REJECTIONS OF TENDERS

10.1 The Ministry reserves the right to reject any or all Tenders, and to waive formalities as the interests of the Ministry may require without stating reasons, therefore, the lowest or any Tender may not necessarily be accepted.

10.2 The Ministry shall not be liable for any costs, expenses, loss or damage incurred, sustained or suffered by any Bidder prior, or subsequent to, or by reason of the acceptance or the non-acceptance by the Ministry of any Tender, or by reason of any delay in the acceptance of a Tender, except as provided in the Tender Documents.

10.3 The Tender shall be irrevocable for a period of 30 days following the date of Tender Opening.

11.0 CONTRACT AWARD PROCEDURES

11.1 The Ministry will notify a Bidder that the Tender has been accepted within 30 days of the Tender Opening.

11.2 Immediately after the notification, the Ministry will send the standard form contract agreement and other such forms and documents as are necessary to the selected Bidder for execution by the Bidder.

11.3 The selected Bidder shall fully execute and return the contract agreement and other such forms and documents, including the required bonds, if applicable, required certificates and declarations as directed in the notification of acceptance of Tender within seven Business days of the date the documents are received.

11.4 Following receipt of all properly executed forms and documentation, the Bidder will receive written authority to proceed with the work.

12.0 FAILURE TO PROVIDE DOCUMENTS OR ENTER INTO CONTRACT

12.1 If the Bidder is a Rated Contractor and fails to return the applicable documents as directed in the notification of acceptance of Tender, within seven Business days of receipt of such notification, the Ministry may reject the Bid on written notice to the Bidder and refer the matter to the Ministry's Qualification Committee without prejudice to any right or remedy the Ministry may have in law.

12.2 If the Bidder is a Rated Contractor and fails for any reason to enter into the contract within the specified time, then it shall not be allowed to work on the contract as a subcontractor or be allowed to supply any material, equipment or labour to the contract and the matter shall be referred to the Ministry's Qualification Committee without prejudice to any right or remedy the Ministry may have in law.

12.3 If the Bidder is a Non-Rated Contractor and fails to return the applicable documents as directed in the notification of acceptance of Tender, within seven Business days of receipt, the Ministry may reject the Bid, on written notice to the Bidder without prejudice to any right or remedy the Ministry may have in law, and the Ministry may revoke the Bidder's bidding privileges with the Ministry on future Ministry contracts for a period of up to 2 years.

12.4 If the Bidder is a Non-Rated Contractor and fails for any reason to enter into the contract within the specified time, then it shall not be allowed to work on the contract as a subcontractor or be allowed to supply any material, equipment or labour to the contract and the Ministry may revoke the Bidder's bidding privileges on future Ministry contracts for a period of up to 2 years without prejudice to any right or remedy the Ministry may have in law.

13.0 NON-RESIDENT CONTRACTORS REQUIREMENTS

13.1 Non-resident Contractors must provide a retail sales tax "Letter of Compliance" from the Ministry of Finance, failing which the non-resident Contractor shall satisfy the Retail Sales Tax Act and its regulations (as amended from time to time) in lieu therefore.

13.2 Non-resident Contractors must provide a copy of their approved Workplace Safety and Insurance Board registration form titled "Registration of Constructors and Employers Engaged in Construction" with their executed documents.

CONFLICT OF INTEREST

1. Each bidder must include in its bid submissions confirmation of the following:

    1.1 That the bidder does not and will not have any conflict of interest (actual or potential) in submitting its bid or, if selected, with the contractual obligations of the bidder as supplier/consultant under the Contract. Where applicable, a Bidder must declare in its bid any situation that may be a conflict of interest in submitting its bid or, if selected, with the contractual obligations of the bidder as supplier/consultant under the Contract; and

    1.2 That the bidder neither has nor has had, access to any Confidential Information as defined below;

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

2. In addition, each Bid shall include the following information:

    2.1 A list of the names, addresses and telephone number of the persons who participated in the development of the bid; and

    2.2 A list of the names of any former employees of the Ontario Public Service, their job classifications and the particular ministries where these individuals were working immediately prior to their leaving the Crown that the bidder has either appointed to its Board of Directors or employed since April 23, 1997.

The submission of any bidder may be disqualified where the bidder fails to provide confirmation of the foregoing or makes misrepresentations regarding any of the above. Further, the Minister shall have the right to rescind any contract with the selected bidder in the event that the Minister at his/her sole discretion determines that the selected bidder has made a 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.

PART 1(a)

CERTIFICATION - CONFLICT OF INTEREST
(Complete Part 1(a) or 1(b) - Do Not Complete Both)

I/we hereby certify that there is not nor was there any actual or potential conflict of interest or unfair advantage in our submitting the Bid or performing the Work/Services required by the Contract.

In submitting the Bid, our company has no knowledge of or the ability to avail ourselves of confidential information of the Crown (other than confidential information which may be been disclosed by the Minister to the Bidders in the normal course of the Tender) where the confidential information would be relevant to the Work/Services, their pricing or the Tender evaluation process.

Name	**Signature**
Position	**Date**

The person who signs this declaration must be an authorised representative of the Tenderer and must have authority to bind the Tenderer.

PART 1(b)

CERTIFICATION - CONFLICT OF INTEREST
(Complete Part 1(a) or 1(b) - Do Not Complete Both)

In submitting our Bid, the Bidder declares that the attached is a list of situations, each of which may be a conflict of interest, or appears as potentially a conflict of interest in our company submitting the Bid or performing the contractual obligations of the Supplier/Consultant under the Contract. **(Strike out Paragraph if not Applicable)**

In submitting the Bid, our company has/has no **(Strike out the inapplicable portion)** knowledge of or the ability to avail ourselves of confidential information of the Crown (other than confidential information which may have been disclosed by the Minister to the Bidders in the normal course of the Tender) where the confidential information would be relevant to the Work/Services, their pricing, or the Tender evaluation process and where access to such additional information may prejudice the Crown or be an unfair advantage to the Bidder.

(If declaring that the Bidder <u>has</u> access to additional information that may be confidential, other than confidential information which may be disclosed by the Minister to the Bidders in the normal course of the Tender, please attach an explanation describing the additional information and how you access to it.)

With the exception of those situations and/or access to additional information disclosed on the list attached, I/we hereby certify that there is not nor was there any other actual or potential conflict of interest or unfair advantage in our submitting the Bid or performing the Work/Services required by the Contract.

I/We hereby acknowledge that the Minister at his/her sole discretion shall have the right to determine whether or not the declared situations do constitute an actual or potential conflict of interest or whether access to additional confidential information does constitute an unfair advantage over other bidders.

I/We acknowledge that in the event that the Minister finds the situations to be a conflict of interest or access to the additional confidential information to be an unfair advantage that our Bid may be rejected.

Name	**Signature**
Position	**Date**

The person who signs this declaration must be an authorised representative of the Tenderer and must have authority to bind the Tenderer.

PART 2

DISCLOSURE - CONFLICT OF INTEREST

PERSONS WHO PARTICIPATED IN THE PREPARATION OF THE TENDER			
NAME:	ADDRESS:	TELEPHONE NUMBER:	CONTRIBUTION OR % OF WORK:

The work specified in the Contract shall be performed in strict accordance with the following Provisions, Contract Plans, Specifications and Conditions for **CONTRACT NO. 2019-2003**

SCHEDULE OF PROVISIONS, CONTRACT PLANS, STANDARD DRAWINGS, SPECIFICATIONS AND GENERAL CONDITIONS

A. SPECIAL PROVISIONS

a) SPECIAL PROVISIONS FOR CONTRACT NO. 2019-2003 ATTACHED
b) SPECIAL PROVISIONS FOR LABOUR CONDITIONS ATTACHED
c) LIQUIDATED DAMAGES FOR CONTRACT NO. 2019-2003 ATTACHED

B. PLANS

Contract Drawing Book(s).

C. STANDARD DRAWINGS

OPSD

Dwg No.	Issue Date	Dwg No.	Issue Date	Dwg No.	Issue Date	Dwg No.	Issue Date
0100.0100	Nov 2009	0100.0110	Nov 2006	0100.0120	Nov 2009	0100.0130	Nov 2009
0100.0140	Nov 2002	0100.0500	Nov 2006	0100.0600	Nov 2006	0101.0100	Nov 2006
0101.0110	Nov 2006	0101.0120	Nov 2006	0101.0130	Nov 2006	0101.0140	Nov 2006
0101.0150	Nov 2006	0101.0160	Nov 2006	0101.0170	Nov 2007	0102.0100	Nov 2006
0103.0100	Nov 2006	0103.0110	Nov 2006	0104.0100	Nov 2007	0200.0100	Nov 2009
0200.0200	Nov 2009	0201.0100	Nov 2009	0201.0200	Nov 2009	0202.0100	Nov 2009
0202.0200	Nov 2013	0202.0310	Nov 2009	0202.0320	Nov 2011	0202.0330	Nov 2011
0202.0370	Nov 2017	0205.0100	Nov 2009	0205.0200	Nov 2009	0205.0300	Nov 2009
0205.0400	Nov 2009	0205.0500	Nov 2009	0205.0600	Nov 2009	0206.0100	Nov 2009
0206.0200	Nov 2009	0206.0500	Nov 2008	0207.0410	Nov 2008	0208.0100	Nov 2013
0209.0100	Nov 2009	0209.0110	Nov 2009	0209.0200	Apr 2010	0210.0100	Nov 2010
0210.0200	Nov 2010	0210.0700	Nov 2008	0211.0100	Nov 2010	0211.0200	Nov 2010
0212.0100	Nov 2009	0212.0200	Nov 2009	0212.0300	Nov 2009	0213.0100	Dec 1983
0213.0200	Dec 1983	0214.0100	Nov 2007	0214.0200	Nov 2007	0214.0300	Nov 2007
0216.0100	Nov 2006	0216.0200	Apr 1999	0216.0210	Nov 2008	0217.0600	Nov 2011
0219.1100	Nov 2015	0219.1300	Nov 2015	0219.1800	Nov 2015	0219.1910	Nov 2015
0219.2100	Nov 2015	0219.2110	Nov 2015	0219.2200	Nov 2015	0220.0100	Nov 2007
0300.0100	Nov 2011	0302.0100	Nov 2015	0400.0100	Nov 2007	0400.0200	Nov 2007
0400.0300	Nov 2007	0400.0400	Nov 2007	0400.0700	Nov 2007	0400.0800	Nov 2007
0400.0810	Nov 2007	0400.0900	Nov 2007	0400.1000	Nov 2007	0400.1100	Nov 2007
0400.1200	Nov 2007	0401.0100	Nov 2007	0401.0200	Nov 2007	0401.0300	Nov 2007
0401.0400	Nov 2007	0401.0500	Nov 2007	0401.0600	Nov 2007	0402.0300	Nov 2007
0403.0100	Nov 2007	0506.0100	Nov 2001	0509.0100	Aug 1994	0600.0100	Nov 2012
0600.0200	Nov 2012	0600.0300	Nov 2012	0600.0400	Nov 2012	0600.0600	Nov 2012
0601.0100	Nov 2007	0604.0100	Nov 2012	0604.0200	Nov 2007	0605.0100	Nov 2012

0605.0200	Nov 2007	0605.0300	Nov 2012	0605.0400	Nov 2013	0606.0100	Nov 2012
0606.0200	Nov 2012	0606.0300	Nov 2012	0607.0100	Nov 2012	0607.0200	Nov 2012
0608.0100	Nov 2012	0610.0100	Nov 2009	0610.0200	Nov 2006	0610.0300	Nov 2009
0701.0100	Nov 2009	0701.0120	Nov 2009	0701.0210	Nov 2009	0701.0300	Nov 2009
0701.0310	Nov 2009	0701.0320	Nov 2009	0701.0500	Nov 2009	0701.0510	Nov 2009
0701.1000	Nov 2005	0702.0400	Nov 2009	0702.0500	Nov 2009	0703.0120	Nov 2009
0703.0220	Nov 2009	0704.0100	Nov 2009	0704.0110	Nov 2008	0704.0120	Apr 2013
0705.0100	Nov 2009	0705.0200	Nov 2009	0705.0300	Nov 2009	0705.0400	Nov 2009
0706.0100	Nov 2009	0706.0200	Nov 2009	0706.0300	Nov 2009	0706.0310	Nov 2009
0706.0400	Nov 2009	0706.0410	Nov 2009	0707.0100	Nov 2009	0708.0100	Nov 2006
0708.0200	Nov 2006	0800.0100	Nov 2012	0800.0110	Nov 2012	0801.0100	Nov 2012
0801.0200	Nov 2012	0801.0300	Nov 2012	0801.0400	Nov 2017	0801.0410	Nov 2017
0801.0420	Nov 2017	0801.0430	Nov 2017	0802.0100	Nov 2010	0802.0130	Nov 2010
0802.0140	Nov 2010	0802.0200	Nov 2010	0802.0230	Nov 2010	0802.0240	Nov 2010
0802.0300	Nov 2010	0802.0310	Nov 2010	0802.0320	Nov 2010	0802.0330	Nov 2010
0802.0340	Nov 2010	0802.0500	Nov 2010	0802.0510	Nov 2010	0802.0530	Nov 2010
0802.0540	Nov 2010	0803.0100	Nov 2010	0803.0300	Nov 2010	0803.0310	Nov 2010
0804.0300	Nov 2006	0804.0400	Nov 2006	0805.0100	Nov 2009	0805.0200	Nov 2009
0806.0200	Nov 2011	0806.0220	Apr 2011	0806.0300	Nov 2013	0806.0400	Nov 2010
0807.0100	Nov 2010	0807.0300	Nov 2010	0807.0500	Nov 2010	0809.0100	Nov 2008
0810.0100	Nov 2013	0810.0200	Nov 2013	0812.0100	Nov 2006	0911.1340	Nov 2015
0911.1400	Nov 2013	0911.1430	Nov 2013	0911.1500	Nov 2013	0911.1510	Nov 2013
0911.1600	Nov 2013	0911.1610	Nov 2013	0911.3400	Nov 2013	0911.3800	Nov 2015
0911.3820	Nov 2015	0911.3830	Nov 2015	0911.4300	Nov 2015	0912.1010	Nov 2016
0912.1020	Nov 2016	0912.1030	Nov 2016	0912.1040	Nov 2016	0912.1230	Nov 2016
0912.1240	Apr 2016	0912.1250	Apr 2016	0912.1270	Apr 2016	0912.1280	Nov 2016
0912.1290	Nov 2016	0912.1300	Nov 2016	0912.1350	Nov 2016	0912.1450	Nov 2016
0912.1850	Nov 2016	0912.1860	Nov 2016	0912.2350	Nov 2010	0912.2450	Nov 2016
0912.2460	Nov 2016	0912.3150	Nov 2016	0912.3160	Nov 2016	0912.4010	Nov 2010
0912.4300	Nov 2010	0912.4800	Nov 2008	0921.1010	Nov 2016	0922.1500	Apr 2018
0923.0010	Nov 2011	0923.0020	Nov 2005	0923.1800	Nov 2011	0923.1810	Nov 2011
0923.1820	Nov 2011	0923.1830	Nov 2011	0923.1870	Nov 2011	0923.3800	Nov 2011
0923.3810	Nov 2011	0923.3820	Nov 2011	0923.3830	Nov 2011	0923.3870	Nov 2011
0923.4800	Nov 2017	0923.4810	Nov 2017	0923.4820	Nov 2017	0923.4830	Nov 2017
0972.1300	Nov 2012	0972.1320	Nov 2012	0984.1010	Nov 2014	0984.1050	Nov 2016
0984.2010	Nov 2017	0984.2020	Nov 2017	0984.2030	Nov 2010	0984.2040	Nov 2010
0985.1100	Nov 2013	0985.2100	Nov 2013	0985.2200	Nov 2013	0989.1100	Nov 2013
0989.2100	Nov 2013	2000.0010	Nov 2018	2011.1010	Nov 2018	2011.2010	Nov 2018
2011.4010	Nov 2018	2011.5010	Nov 2018	2011.7010	Nov 2018	2012.1010	Nov 2018
2014.1010	Nov 2018	2014.1020	Nov 2018	2100.0500	Nov 2013	2100.0600	Nov 2015
2101.0100	Nov 2013	2102.0100	Nov 2013	2103.0200	Nov 2015	2103.0400	Nov 2015
2112.0400	Nov 2004	2116.0100	Nov 2013	2116.0200	Nov 2013	2117.0200	Nov 2013

2123.0300	Nov 2013	2200.0300	Nov 2012	2210.0100	Nov 2013	2215.0200	Nov 2015
2215.0300	Nov 2014	2220.0100	Nov 2010	2228.0100	Nov 2016	2232.0100	Nov 2016
2255.0200	Nov 2013	2302.0100	Nov 2010	2302.0200	Nov 2013	2302.0400	Nov 2013
2415.0100	Dec 1993	2420.0100	Apr 2007	2421.0100	Nov 2016	2428.0100	Nov 2010
3000.1000	Nov 2010	3000.1500	Nov 2010	3101.1500	Nov 2010	3102.1000	Nov 2010
3310.1000	Nov 2010	3370.1000	Nov 2008	3370.1010	Nov 2008	3390.1000	Nov 2012
3419.1000	Nov 2010	3950.1000	Nov 2011				

MTOD

Dwg No.	Issue Date	Dwg No.	Issue Date	Dwg No.	Issue Date	Dwg No.	Issue Date
0101.0700	Apr 1994	0503.0200	Jan 2000	0503.0210	Sep 1999	0503.0220	Sep 1999
0504.0100	Feb 2016	0806.0210	Jul 2013	0911.1320	Jan 2018	0911.1360	Jan 2018
0911.1620	Feb 2018	0911.1630	Feb 2018	0911.1640	Feb 2018	0911.1670	Feb 2018
0911.1680	Feb 2018	0911.1700	Feb 2018	0911.1710	Feb 2018	0911.1720	Feb 2018
0911.1730	Feb 2018	0911.1740	Feb 2018	0911.3500	Jul 2018	0911.3510	Jul 2018
0911.3520	Jul 2018	0911.3530	Jul 2018	0911.3540	Jul 2018	0911.3550	Jul 2018
0911.3570	Jul 2018	0912.1090	Nov 2016	0912.1310	Jan 2007	0912.1880	Feb 2017
0912.2490	Apr 2016	0912.2550	Sep 2017	0912.2560	Sep 2017	0912.2570	Sep 2017
0912.3130	Feb 2017	0912.3140	Feb 2017	0912.4020	Jul 2018	0917.1000	Mar 1997
0917.1010	Mar 1997	0917.1020	Mar 1997	0917.1030	Mar 1997	0922.1650	Jan 2018
0922.1860	Jan 2018	0926.1000	Dec 2018	0960.0100	May 2013	0960.1010	May 2013
0960.1020	May 2013	0960.1030	May 2013	0960.1060	May 2013	0960.1080	May 2013
0973.1300	Sep 2017	0973.1310	Sep 2017	0973.1330	Sep 2017	0973.1400	Sep 2017
0973.1420	Sep 2017	0973.1430	Sep 2017	0973.1450	Feb 2018	2001.1000	Dec 2017
2001.1100	Dec 2017	2001.1200	Dec 2017	2001.1300	Dec 2017	2902.2050	May 2015
2910.0210	Dec 2017	2920.0200	Sep 2007	2940.0100	Sep 2007	2940.0200	Jun 2017
2940.0210	Dec 2017	2940.1100	Dec 2017	2940.1150	Sep 2007	2940.1200	Sep 2007
2940.2200	Dec 2017	2940.3100	Sep 2010	2940.3200	Sep 2007	2950.0100	Sep 2007
2950.0110	Sep 2007	2950.0120	Sep 2007	2950.0140	Sep 2008	2950.0200	Mar 2008
2950.0210	Mar 2008	2950.1100	Mar 2008	2980.1100	Sep 2007	3941.2100	May 2018

SSD

Dwg No.	Issue Date	Dwg No.	Issue Date	Dwg No.	Issue Date	Dwg No.	Issue Date
0012.0001	Sep 2016	0110.0061	Dec 2017	0110.0064	Dec 2017	0113.0013	Oct 2013
0113.0036	May 2017	0113.0038	May 2018	0116.0001	Mar 2016	0118.0030	Jul 2014
0118.0033	Jul 2014						

The following notes refer to Standard Drawing numbers in Section C above.

1. OPSDs are available for viewing and download from the Technical Publications website at www.raqs.mto.gov.on.ca/techpubs/ops.nsf/OPSHomepage.

   OPSDs that do not coincide with the most recent version published by OPS can be found in the archives section by selecting the “Go to Archives” tab.

2. MTODs are available for viewing and download from the Technical Publications website at www.raqs.mto.gov.on.ca/techpubs/ops.nsf/OPSHomepage under the applicable tabs located to the left of the screen.

   MTODs that do not coincide with the most recent version published by MTO can be found in the archives section of the above noted locations by selecting the "Go to Archives" tab.

3. Copies of all applicable Structural Standard Drawings (SSDs) are contained within the Contract Documents.

D. GENERAL SPECIAL PROVISIONS

Special No.	Issue Date	Special No.	Issue Date	Special No.	Issue Date
100S02	Mar 2018	100F08M	Jun 2017	100S15	May 2017
100S17	Mar 2018	100F21M	Aug 2018	100S22M	Nov 2016
100S59	Nov 2016	100S62	Nov 2016	101S04	Jan 2017
101S06	Mar 2018	101S18	Apr 1994	101F21	Nov 2014
101F23	Apr 2017	102S05	May 2017	102S07	Mar 2018
103F03	Oct 2018	103S04	Mar 2018	103S05	Oct 2018
103F31	Jun 2017	104S06	Dec 2017	105S09	Mar 2018
105S22	Jun 2016	106S05	Jun 2017	106S09	Mar 2018
106S16	Mar 2018	106S20	Mar 2018	107S02	Feb 2017
107S04	Feb 2013	107S05	Apr 2017	109S04	Aug 2018
109S12	Aug 2018	109S13	Jul 2017	109F16	Feb 2009
109S17	Feb 2019	109S18	Aug 2018	109S28	Mar 2018
109S29	Mar 2018	109F30	Oct 2018	109S32	Mar 2018
109F57	Apr 2018	110S05	Feb 2019	110F10	Sep 2001
110S16	May 2017	110S17	Aug 2018	111F06	Oct 2018
111F09	Aug 2018	112S07	Feb 2008	112S10	Dec 2017
113S03	Dec 2004	113S09	Feb 2013	113S11	Feb 2019
114S06	Jun 2017	118S03	Feb 2017	118S08	May 2018
124S01	Mar 2018	124S02	Mar 2018	168F10	Sep 2007
168F14	Dec 2017	168S20	Sep 2007	199F04M	Aug 2018
199F12	Nov 2014	199F14	Aug 2018	199S18	Jun 1992
199F31	Apr 2016	199F33	Jun 2013	199S38	Mar 2017
199F43	Mar 2018	199S44	Jan 2001	199S54	Feb 2018
199S55	May 2004	199S56	Sep 2005	199F57	Dec 2017
199F59	Dec 2017	199S60	Oct 2009	199S64	Jul 2016
199S65	Dec 2016	199S66	Mar 2018		

E. ITEM SPECIFIC SPECIAL PROVISIONS

Special No.	Date	Item No.
206F06	Sep 2017	5

299F11	Sep 2011	8
305S03	Mar 2017	9
308F02	Feb 2017	10
353S02	Jul 2007	17
407S06	Apr 2014	23, 24
422S01	Jul 2011	79
517F01M	Jul 2017	47, 48
599S22	Mar 2018	124, 125, 185, 186, 188, 189, 191, 192
601S01	Nov 2014	106, 114
610F01	Nov 2016	114
615S05	May 2017	117
682S01	Apr 2016	96
682S07	Dec 2017	87
682S09	Dec 2017	89
682S12	Mar 2018	105
682S14	Apr 2018	94
682S15	Sep 2007	97
682S16M	Jun 2017	98
682S17	Jul 2012	99
682S18	Sep 2007	100
682S19	May 2017	95
682F22	Nov 2016	101
682S25	Apr 2018	93
683S01M	Dec 2017	103
683S02	Dec 2017	102
685S01M	Feb 2016	104
703S01	Jul 2018	51
710S01	Sep 2011	57, 59
710S02	Sep 2011	59
710S03	Sep 2011	56
723S02	Feb 2017	63
732S03	Jan 2018	66
740S01	Sep 2011	67
799S05	Oct 2018	62, 63, 64, 65, 70
799S12	May 2013	71, 72
805F01	Dec 2018	75, 76
899S01	Mar 2015	126
899S02	Aug 2018	77
911F10	May 2016	145
914F02	Dec 2014	147
914S03	Mar 2016	148
920F03	May 2018	149

922F01	Nov 2016	150
999F29	Mar 2018	168, 183

The following notes refer to Standard Special Provision (SSP) numbers in Sections D and E above.

1. Special Provisions with an "S" identifier are available for viewing and download from the Technical Publications website at www.raqs.mto.gov.on.ca/techpubs/cdedsp.nsf under the applicable tabs located to the left of the screen.

   Special Provisions with an "S" identifier, that do not coincide with the most recent version published by MTO can be found in the archives section of the above noted locations by selecting the "Go to Archives" tab.

2. Special Provisions with an "F" identifier signifies that additional fill-in information has been added to the standard published version of the Special Provision. The entire text of fill-in Special Provisions shall be obtained directly from Section "A" of the Contract Documents.

3. Special Provisions with an "M" identifier signifies that the standard published version of the Special Provision has been modified. The entire text of modified Special Provisions shall be obtained directly from Section "A" of the Contract Documents.

F. STANDARD SPECIFICATIONS

OPSS

No.	Date	No.	Date	No.	Date	No.	Date
0102	Oct 1992	0201	Nov 2011	0353	Sep 1996	0422	Apr 2004
0609	Nov 2012	0617	Nov 2013	0703	Nov 2014	0705	Nov 2014
0710	Nov 2010	0740	Nov 2010	0741	Nov 2014	0801	Nov 2010
0802	Nov 2010	0902	Nov 2010	0906	Nov 2012	0932	Nov 2009

OPSS - MTC

No.	Date	No.	Date	No.	Date	No.	Date
0407	Mar 1984						

OPSS - Provincial

No.	Date	No.	Date	No.	Date	No.	Date
0100	Nov 2016	0106	Apr 2017	0120	Nov 2014	0127	Apr 2018
0180	Nov 2016	0182	Apr 2017	0206	Nov 2014	0209	Nov 2014
0220	Nov 2014	0305	Nov 2016	0308	Apr 2012	0313	Nov 2016
0314	Nov 2015	0342	Nov 2015	0401	Nov 2015	0402	Apr 2017
0405	Nov 2017	0410	Nov 2015	0421	Nov 2015	0510	Nov 2014
0511	Nov 2018	0517	Nov 2016	0539	Nov 2014	0602	Nov 2017
0603	Nov 2017	0604	Nov 2017	0610	Nov 2016	0615	Apr 2017
0616	Apr 2018	0623	Nov 2018	0706	Nov 2016	0721	Nov 2015
0723	Nov 2015	0732	Apr 2016	0803	Apr 2018	0804	Nov 2014

0805	Nov 2018	0903	Apr 2016	0904	Nov 2014	0905	Nov 2014
0911	Nov 2014	0913	Nov 2017	0914	Nov 2014	0915	Nov 2014
0920	Nov 2016	0922	Nov 2016	0928	Apr 2012	0929	Nov 2017
0930	Nov 2014						

G. REFERENCED STANDARD SPECIFICATIONS

The standard OPS specifications in the following list are applicable to the Contract when referenced by the Contract Documents.

No.	Type	Date	No.	Type	Date	No.	Type	Date
0100	Prov	Nov 2016	0102	Comm	Oct 1992	0106	Prov	Apr 2017
0120	Prov	Nov 2014	0127	Prov	Apr 2018	0180	Prov	Nov 2016
0182	Prov	Apr 2017	0201	Comm	Nov 2011	0202	Prov	Nov 2013
0203	Prov	Nov 2014	0206	Prov	Nov 2014	0209	Prov	Nov 2014
0212	Prov	Nov 2013	0220	Prov	Nov 2014	0301	Prov	Nov 2018
0304	Comm	Nov 2006	0305	Prov	Nov 2016	0307	Prov	Nov 2017
0308	Prov	Apr 2012	0311	Comm	Sep 1988	0312	Prov	Apr 2018
0313	Prov	Nov 2016	0314	Prov	Nov 2015	0316	Prov	Nov 2018
0320	Prov	Nov 2018	0330	Prov	Nov 2014	0331	Prov	Nov 2015
0332	Prov	Nov 2016	0333	Prov	Nov 2015	0335	Prov	Nov 2015
0336	Prov	Nov 2018	0337	Prov	Nov 2017	0341	Prov	Apr 2018
0342	Prov	Nov 2015	0350	Comm	Mar 1998	0351	Comm	Nov 2015
0353	Comm	Sep 1996	0355	Prov	Nov 2014	0363	Prov	Nov 2014
0365	Prov	Nov 2014	0366	Prov	Apr 2017	0369	Comm	Nov 2008
0401	Prov	Nov 2015	0402	Prov	Apr 2017	0403	Prov	Apr 2017
0404	Prov	Nov 2017	0405	Prov	Nov 2017	0407	MTC	Mar 1984
0409	Prov	Nov 2017	0410	Prov	Nov 2015	0415	Comm	Feb 1990
0416	Comm	Feb 1990	0421	Prov	Nov 2015	0422	Comm	Apr 2004
0441	Prov	Apr 2017	0490	Prov	Nov 2018	0491	Prov	Nov 2017
0492	Prov	Nov 2018	0493	Comm	Nov 2009	0501	Prov	Nov 2014
0510	Prov	Nov 2014	0511	Prov	Nov 2018	0512	Prov	Nov 2014
0517	Prov	Nov 2016	0539	Prov	Nov 2014	0578	Prov	Apr 2017
0602	Prov	Nov 2017	0603	Prov	Nov 2017	0604	Prov	Nov 2017
0609	Comm	Nov 2012	0610	Prov	Nov 2016	0611	Comm	Nov 2013
0614	Comm	Nov 2012	0615	Prov	Apr 2017	0616	Prov	Apr 2018
0617	Comm	Nov 2013	0620	Prov	Apr 2017	0621	Prov	Nov 2018
0622	Prov	Apr 2017	0623	Prov	Nov 2018	0630	Prov	Nov 2016
0631	Comm	Nov 2015	0703	Comm	Nov 2014	0704	Comm	Nov 2014
0705	Comm	Nov 2014	0706	Prov	Nov 2016	0707	Comm	Nov 2015
0708	Prov	Nov 2016	0709	Prov	Nov 2018	0710	Comm	Nov 2010
0721	Prov	Nov 2015	0723	Prov	Nov 2015	0732	Prov	Apr 2016
0733	Prov	Nov 2017	0740	Comm	Nov 2010	0741	Comm	Nov 2014

0753	Comm	Nov 2013	0760	Comm	Nov 2014	0771	Prov	Nov 2017
0772	Prov	Nov 2017	0791	Comm	Nov 2014	0801	Comm	Nov 2010
0802	Comm	Nov 2010	0803	Prov	Apr 2018	0804	Prov	Nov 2014
0805	Prov	Nov 2018	0810	Prov	Apr 2017	0811	Prov	Apr 2017
0812	Prov	Apr 2017	0820	Prov	Apr 2017	0821	Prov	Apr 2017
0822	Prov	Apr 2017	0823	Prov	Apr 2017	0824	Prov	Apr 2017
0830	Prov	Apr 2017	0902	Comm	Nov 2010	0903	Prov	Apr 2016
0904	Prov	Nov 2014	0905	Prov	Nov 2014	0906	Comm	Nov 2012
0907	Comm	Apr 2011	0908	Prov	Nov 2014	0909	Prov	Nov 2016
0910	Prov	Apr 2008	0911	Prov	Nov 2014	0913	Prov	Nov 2017
0914	Prov	Nov 2014	0915	Prov	Nov 2014	0918	Prov	Apr 2017
0919	Comm	Nov 2011	0920	Prov	Nov 2016	0922	Prov	Nov 2016
0928	Prov	Apr 2012	0929	Prov	Nov 2017	0930	Prov	Nov 2014
0931	Comm	May 1994	0932	Comm	Nov 2009	0935	Prov	Nov 2014
0942	Comm	Nov 2009	1001	Prov	Nov 2018	1002	Prov	Apr 2018
1003	Prov	Nov 2017	1004	Prov	Nov 2012	1005	Prov	Apr 2017
1006	Prov	Apr 2017	1010	Prov	Apr 2013	1101	Prov	Nov 2014
1102	Prov	Apr 2017	1103	Prov	Nov 2016	1151	Prov	Nov 2016
1152	Prov	Nov 2016	1153	Prov	Nov 2016	1202	Prov	Nov 2016
1203	Prov	Nov 2016	1204	Comm	Nov 2003	1205	Prov	Apr 2015
1210	Prov	Nov 2016	1212	Comm	Nov 2003	1213	Comm	Mar 1998
1215	Comm	Mar 1998	1301	Comm	Sep 1996	1302	Comm	Sep 1996
1303	Prov	Nov 2014	1305	Comm	Nov 2008	1306	Comm	Nov 2011
1308	Comm	Nov 2003	1315	Comm	Sep 1996	1350	Prov	Nov 2016
1351	Comm	Nov 2004	1352	Comm	Nov 1989	1430	Prov	Nov 2017
1440	Prov	Nov 2014	1441	Prov	Nov 2017	1442	Comm	May 1994
1443	Comm	May 1994	1503	Comm	Nov 2010	1504	Prov	Apr 2017
1505	Prov	Apr 2017	1540	Prov	Nov 2017	1541	Prov	Nov 2017
1601	Prov	Nov 2014	1605	Prov	Nov 2018	1704	Prov	Nov 2014
1712	Comm	Feb 1991	1713	Comm	Feb 1991	1714	Comm	Feb 1991
1715	Comm	Feb 1991	1716	Comm	Feb 1991	1750	Comm	Dec 1983
1801	Prov	Apr 2018	1802	Prov	Apr 2018	1820	Prov	Nov 2014
1821	Comm	May 1993	1840	Prov	Nov 2018	1841	Prov	Nov 2018
1842	Prov	Nov 2018	1843	Prov	Apr 2018	1850	Prov	Apr 2018
1854	Prov	Apr 2018	1860	Prov	Apr 2018	2001	Comm	Nov 2014
2301	Prov	Nov 2014	2401	Prov	Nov 2018	2409	Prov	Nov 2018
2410	Prov	Nov 2017	2414	Comm	Nov 2014	2420	Prov	Nov 2018
2421	Prov	Nov 2017	2422	Prov	Nov 2016	2423	Prov	Apr 2017
2426	Prov	Nov 2017	2428	Prov	Nov 2017	2432	Prov	Nov 2017
2434	Prov	Nov 2016	2452	Prov	Nov 2018	2453	Prov	Nov 2016
2460	Prov	Nov 2018	2461	Prov	Apr 2017	2471	Prov	Nov 2016
2474	Prov	Nov 2016	2475	Prov	Apr 2017	2476	Comm	Nov 2010

2479	Prov	Nov 2017	2485	Prov	Nov 2017	2502	Prov	Apr 2017
2510	Prov	Nov 2017						

The following notes refer to Ontario Provincial Standard Specification (OPSS) numbers in Sections F and G above.

1. OPSSs are available for viewing and download from the Technical Publications website at www.raqs.mto.gov.on.ca/techpubs/ops.nsf/OPSHomepage.

   OPSSs that do not coincide with the most recent version published by OPS can be found in the archives section by selecting the "Go to Archives" tab.

H. GENERAL CONDITIONS

OPSS.PROV 100, MTO General Conditions of Contract, November 2016

This document is available for viewing and download from the Technical Publications website at www.raqs.mto.gov.on.ca/techpubs/ops.nsf/OPSHomepage under the heading OPS Volume 5 – MTO General Conditions of Contract and General & Construction Specifications.

SIGNED STATEMENT BY BIDDER THAT THE BID IS PREPARED AND SUBMITTED WITHOUT COLLUSION OR DECEIT

The Bidder expressly warrants that the prices contained in his tender whether as unit prices or lump sums, and whether for transportation or supply of materials or for services, are quoted in utmost good faith on his part, without any collusive arrangement or agreement with any other person or partnership or corporation.

The Bidder expressly represents that he is not party or privy to any deceit tending to mislead the Ministry into accepting his tender as a truly competitive tender whether to the prejudice, injury or benefit of the Ministry.

THE CONTRACTOR BY THIS TENDER OFFERS TO COMPLETE THIS CONTRACT IN ACCORDANCE WITH THE PRICES QUOTED AND TERMS CONTAINED HERE IN.

Tax Compliance Declaration

The Ontario Government expects all suppliers to pay their provincial taxes on a timely basis. In this regard, bidders are advised that any contract with the Ontario Government will require a declaration from the successful bidder that his/her company's provincial taxes are in good standing.

In order for a company to be considered for a contract award, the bidder must submit the following statement of the company's tax compliance status:

I/we hereby certify that _____ at the time of
(legal name of company)
submitting this bid, is in full compliance with all tax status administered by the Ministry of Finance for Ontario and that, in particular, all returns required to be filed under all provincial tax statutes have been filed and all taxes due and payable under those statutes have been paid or satisfactory arrangements for their payment have been made and maintained.

Dated at _____ this _____ day of _____ 20__

_____
(An authorized signing officer)

_____
(Title)

_____
(Phone Number)

SECTION A
SPECIAL PROVISIONS
FOR

CONTRACT NO. 2019-2003

NOTICE TO CONTRACTOR - Fairness in Procurement

Special Provision

Contractors shall adhere to the Fairness in Procurement Act, 2018 and Suppliers from New York Regulation which set out specific mandatory requirements related to the Fairness in Procurement regulation.

Any structural iron used or supplied in the performance of this Contract and permanently incorporated in the surface road or bridge shall be fabricated in a jurisdiction other than New York.

Structural Iron means a product that is made of either wrought iron or cast iron or both and that is designed to carry a load, but does not include a product that contains any form of steel.

NOTICE TO CONTRACTOR - Flagging Operations

Special Provision

The contractor shall include MTO and the Contract Administrator on all correspondence with the Canadian National Railway pertaining to the request of flagging operations during construction operations.

NOTICE TO CONTRACTOR - Coordination Of Works During Minor Shift And Adjustment And Work In The Vicinity Of Existing And Proposed Bell Fiber Optic Toll Lines

Special Provision

The Contractor is advised that a minor shift and adjustment of the Bell Fiber Optic Toll Line is to occur along the west ROW limits on the QEW during Stage 1 works and Winter Shutdown. It is also noted that there is an existing Bell Fiber Optic Toll Line along the west ROW limits of the QEW.

The Contractor shall, coordinate works with Bell during Stage 1 construction.

The Contractor shall contact:
Chris Gill, C. Tech
Implementation Manager - Access Network / Structures
20 Hunter Street West- Floor 6
Hamilton, Ontario- L8N 3H2

NOTICE TO CONTRACTOR – Municipal Permits

Special Provision

The Contractor is required to apply for and obtain all applicable permits from local municipalities for all work on municipal property or in a road allowance controlled by municipalities. The cost to comply with this requirement is deemed to have been included in the Contractor's bid price for the Contract.

NOTICE TO CONTRACTOR – Bedrock

Special Provision

The Contactor is alerted to the potential presence of dolomitic limestone bedrock, which is strong to very strong, exhibiting unconfined compressive strength (UCS) values ranging from 60 MPa to 215 MPa, within the depth of excavation for the non-structural culvert replacement at Station 14+273, and the two non-structural culverts under the N-EW and EW-S ramps at the Bowen Road interchange. Appropriate equipment and construction procedures will be required to penetrate into the bedrock to reach the founding/bedding level for these culverts.

NOTICE TO CONTRACTOR – Obstructions

Special Provision

The Contactor is alerted to the potential presence of cobbles, boulders and limestone bedrock fragments within the native soils. Consideration of the presence of these obstructions shall be made in the selection of appropriate equipment and procedures for excavations, driving steel H-piles, or advancing caissons, such that the design tip levels are achieved; or installation of temporary protection systems.

NOTICE TO CONTRACTOR – Caisson Piles

Special Provision

The Contractor is alerted the high groundwater pressures in the sand and gravel deposit overlying the bedrock at the CN/CP overhead structure site. Under these conditions, soils should be expected to slough, boil and cave. Appropriate equipment, materials and construction procedures shall be used to prevent such soil disturbance during installation of the permanent steel liners through the overburden soils.

Drilled shafts (caissons) at the QEW Bertie CN/CP overhead structure pier shall extend into the dolomitic limestone bedrock as shown on the Contract Drawings, to minimize the potential for soil loss at the soil/bedrock interface due to the high groundwater pressures in the sand and gravel deposit. The dolomitic limestone bedrock is strong to very strong, exhibiting unconfined compressive strength (UCS) values ranging

from 60 MPa to 215 MPa. Appropriate equipment and construction procedures shall be used to penetrate the overburden and advance sockets into the bedrock to reach the design founding level.

Permanent steel liners shall be used to form the caissons due to the artesian conditions encountered within the sand and gravel deposit overlying the bedrock. If it is discovered that the steel liner is not seated into the bedrock socket at the design rock socket depth, the steel liners shall be advanced further into the bedrock by re-seating and re-sealing them. Immediately following the completion of excavation for each caisson (including the construction of the rock socket) each caisson shall be thoroughly cleaned by airlift or other means such that the water issuing from the caisson on pumping is clean and free from silt and other material. The cleaning and integrity of the bedrock at the base of the caisson shall be verified by the use of a shaft inspection device prior to placement of the reinforcing steel and concrete. If the caisson hole contains water, the Contractor shall remove the water, or tremie procedures shall be used for concrete placement.

OPERATIONAL CONSTRAINT – Winter Shutdown

Special Provision

For the purpose of this special provision, "winter shutdown" refers to the period from first Friday in December to the first Monday in April of each calendar year during staged construction.

Prior to the Contractor's winter shutdown, all permanent highway lanes, shoulders, structures and interchange ramps which were in place prior to the start of construction, or their reconstructed counterparts, shall be paved, reinstated as defined elsewhere in the contract and opened to traffic. They shall remain unrestricted at all times to public traffic during the winter shutdown period.

All pavement markings, traffic signage, temporary concrete barrier and guide rail systems shall be in place as indicated on the contract drawings. Any pavement markings that will be in place during winter shutdown shall be painted markings only as specified elsewhere in the contract.

The Contractor shall schedule and carry out his operations in accordance with these requirements, using any required acceleration including the construction and/or removal of any temporary transitions between the existing pavement structure and the new pavement structure. Compensation for all such work shall be deemed to be included in the contract price for the appropriate tender items and no additional payment shall be made.

Winter shutdown requirements, as contained in this special provision, shall not relieve the Contractor of any other requirements contained in the contract, without the express written approval of the Contract Administrator. All hot mix paving work performed by the Contractor to meet winter shutdown requirements that do not meet the full requirements of OPSS 313 shall be considered temporary paving, and all costs associated with the placement and subsequent removal of the temporary pavement shall be at the Contractor's expense.

The Contractor's critical path schedule shall at all times reflect the winter shutdown contract requirements as defined in this special provision.

OPERATIONAL CONSTRAINT (GENERAL) – Coordination with Stakeholders, Emergency Service Providers, and Transit Agencies

Special Provision

Following the confirmation of their construction schedule, the Contractor shall provide in writing the details of all lane and ramp closures a minimum of seven (7) calendar days in advance any closures so that the Contract Administrator can provide notice to the following stakeholders/municipalities and emergency service providers:

Contact information is listed below for information. The Contract Administrator will verify the contact information is correct and current at the time of construction before sending out the advance notification letters.

Agencies/ Stakeholders	**Contact**	**Phone**	**E-mail**
Town of Fort Erie	Kelly Walsh Director, Infrastructure Services 1 Municipal Centre Drive Fort Erie, ON L2A 2S6	T. 905-871-1600 ext. 2400 F. 905-871-4022	kwalsh@forterie.ca
Niagara Region	Frank Tassone Associate Director Transportation Engineering Niagara Region Public Works Department Transportation Division 1815 Sir Isaac Brock Way, P.O. Box 1042 Thorold, ON L2V 4T7	T. 905-980-6000 ext. 3349 C.905-401-9124 F. 905-685-0013	Frank.Tassone@niagararegion.ca
Niagara Student Transportation Services	Lori Powell Executive Director 3900 Kalar Road Niagara Falls, ON L2H 0K2	T. 905-346-0297	Lori.Powell@nsts.ca
Canada Border Services Agency	Mary Boone Facilities Manager Southern Manager / Infrastructure / Operations Branch Canada Border Services Agency / Government of Canada 5755 River Road Niagara Falls, ON, L2G 3K9	905-354-3197	Mary.boone@cbsa-asfc.gc.ca
Niagara International Transportation Technology Coalition	Athena M. Hutchins Executive Director Niagara International Transportation Technology Coalition 93 Oak Street Buffalo, NY, 14203	716-847-2450	ahutchins@nittec.org

Emergency Services	**Contact**	**Phone**	**E-mail**
Ontario Provincial Police	Sheryl Bennett Senior Officer Accommodation Services Section 777 Memorial Ave, 1st Floor Orillia, ON L3V 7V3	705-329-6111	
Niagara Regional Police Services	Bryan MacCulloch Chief of Police Headquarters 5700 Valley Way Niagara Falls, ON L2E 1X8	T: 905-688-4111 x5002 or 905-688-3911	Bryan.MacCulloch@niagararegion.ca
Niagara Emergency Medical Services	Kevin Smith Chief Headquarters 509 Glendale Avenue East Niagara-on-the-Lake, ON L0S 1J0	T: 905-984-5050	kevin.smith@niagararegion.ca
Fort Erie Fire Department	Ed Melanson Fire Chief The Corporation of the Town of Fort Erie 444 Central Avenue, Fort Erie, ON L2A 3T6.	905 871-1600 ext. 2600	emelanson@forterie.ca

The Contractor shall also provide in writing the details of all lane and ramp closures including crossing road closures a minimum of fourteen (14) calendar days in advance any closures so that the Contract Administrator can provide notice to the following transit agencies:

<u>OPERATIONAL CONSTRAINT (GENERAL)</u> – General Insurance for Work Performed Within the CN Rail Right-Of-Way

Special Provision

As specified elsewhere in the Contract, the Contractor or its Sub-contractors shall provide the following insurance with respect to all works performed within the CN Rail Right-of-Way:

1. **Commercial General Liability Insurance** in an amount no less than $10,000,000 per occurrence, or such greater amount as Railroad may from time to time reasonably require, covering liability for bodily injury, personal injury including death, property damage or destruction of property, contingent employers liability, sudden and accidental pollution, product and completed operations, broad form property damage, non- owned automobile, blanket contractual liability, and unlicensed vehicles on and off premises owned or controlled by the owner.

   Company shall provide to Railroad a certificate of insurance evidencing the above and include:
   a. a waiver of subrogation in favour of CN and its subsidiaries;

b. name CN and its subsidiaries as additional insured;
c. contain a cross liability and severability of interest clause;
d. specifically include liability for operations within or around railroads and railway tracks;
e. contain a clause stating that CN's interests will not be prejudiced in the event the First named insured breaches any warranty of the policy;
f. provide a thirty (30) days written notice of cancellation, modification or material change in coverage.

2. **Automobile Liability Insurance** on all licensed vehicles owned, hired, leased to or operated by or on behalf of the Company's contractor in the amount of not less than $5,000,000 per occurrence. The certificate of insurance must include a waiver of subrogation in favour of CN and its subsidiaries; and name CN and its subsidiaries as additional insured.

3. **Workers' Compensation** - if available in the jurisdiction(s) covered by this Agreement, Company must be compliant with statutory Worker's Compensation and hold the relevant clearance letter(s). Otherwise, Company must provide Employer's Liability Insurance in an amount no less than $5,000,000.

The Contractor shall not enter the CN Rail Right-of-Way without having in its possession a certificate certifying that the Contractor has obtained all of the insurance coverage required under this Special Provision. CN may at any time require the Contractor to furnish the said certificate and failure to do so may result in removal from the CN property, cancellation of agreement and other consequences including without limiting damages or consequential losses resulting from the non-completion of the work, as CN may determine.

The said insurance shall state that no material changes will be made to the policies unless CN is given a prior written notice of thirty (30) days before such change or cancellation. Any insurance coverage required under the terms and conditions of this Contract shall in no manner restrict or limit the liabilities assumed

OPERATIONAL CONSTRAINT (CN RAIL) – Other Authorities

Special Provision

The "other authorities" to be satisfied when referred to in the specifications is as follows:

Structure	**Other Authority**	**Contact Person**
Bridge 1 Bridge 2	CN Rail	Mike Vallins: CNR Manager of Public Works Design and Construction 1 Administration Road, Concord, ON L4K 1B9 Email: Michael.Vallins@cn.ca Phone: 905-669-3264

OPERATIONAL CONSTRAINT (CN RAIL) – Working Within The CN Right-Of-Way, Mile 4.77 On The Stamford Subdivision

Special Provision

The contractor shall refer and adhere to the "*Working within the CN Right-of-Way, Mile 4.77 on the Stamford subdivision"* document provided for this contract.

OPERATIONAL CONSTRAINT (CN RAIL) – Work Permit Application

Special Provision

The contractor shall obtain the work permits required to work within the CN Rail right of way as per the CN *"Work Permit Application"* document provided for this contract.

OPERATIONAL CONSTRAINT (CP RAIL) – Protection Of Structures Adjacent To Railroad Tracks

Special Provision

The contractor shall refer and adhere to the "*Protection of Structures Adjacent to Railroad Tracks"* document provided for this contract.

OPERATIONAL CONSTRAINT – Traffic Restrictions on Milled Surfaces

Special Provision

The Contractor shall be permitted to run traffic on milled pavement surfaces for a maximum of (5) calendar days.

Traffic shall be permitted on milled shoulders for a maximum of (0) calendar days.

Further to the above, the following additional restrictions shall apply:

N/A

The Contractor shall ensure that milled pavement surfaces are kept clear of all refuse. The Contractor shall sweep the milled pavement surfaces, at no additional cost to the Owner. The Contract Administrator shall be the sole judge in determining when additional sweeping is required on milled pavement surfaces, at no additional cost to the Owner.

OPERATIONAL CONSTRAINT – Roadway Drainage

Special Provision

The Contractor shall ensure that positive roadway surface drainage is provided for when the pavement removal operation leaves the surface pavement below the adjacent existing lanes, shoulders or curb and gutter.

The Contractor shall ensure that all existing drainage facilities remain operational and free of construction debris during the progress of the work until the completion of construction.

All costs associated with roadway drainage shall be borne by the Contractor, at no additional cost to the Owner.

OPERATIONAL CONSTRAINT – Entrance Closures

Special Provision

The Contractor shall co-ordinate all entrance closures with the occupant requiring access to the property via the driveway. Access to all commercial entrances shall be maintained at all times unless arrangements have been made with the property owner.

The Contractor shall immediately advise the Contract Administrator of any agreements/arrangements made with private property owners.

The Contractor shall take care while working on or near private property and take all precautions necessary to minimize any damages. Any damage or disturbed areas caused by the Contractor's operations on private property shall be immediately repaired by the Contractor at no additional cost to the Ministry.
The cost to comply with these requirements is deemed to have been included in the Contractor's bid price for the Contract.

OPERATIONAL CONSTRAINT – Loading Restrictions on Detour Routes

Special Provision

The Contractor is advised that loading restrictions are present on Pettit Road, part of detour routes identified in the contract documents. The restriction is 5 tonnes per axle from March 1 to April 30.

OPERATIONAL CONSTRAINT – Surface Course Paving and Final Pavement Markings

Special Provision

The Contractor shall not place surface course asphalt and final pavement markings on QEW, Bowen Road

ramps and/or any municipal roads until the completion of all detours, lane closures and work requiring temporary pavement markings. Should the Contractor place any temporary or permanent pavement markings not in full conformance with the final pavement markings design on surface course asphalt, the Contractor shall, at no additional cost to MTO, replace the full lift of the surface course pavement a full lane width over the affected area and repaint the final pavement markings.

OPERATIONAL CONSTRAINT – Tourism-Oriented Directional Signing

Special Provision

The contractor shall provide TOD's, written notice, 30 days in advance of any temporary and/or permanent re-location of TOD signs.

The TOD Contact is:

120 Whitmore Road, Unit 8
Woodbridge, Ontario
L4L 6A3
Phone: (905) 851-1322
Fax: (905) 851-4724

OPERATIONAL CONSTRAINT – Working Around Utilities

Special Provision

Working around Existing Utilities

The approximate locations of the existing underground utilities are shown on the contract drawings, in accordance with the General Conditions of the contract. The Contractor shall notify the Contract Administrator and the affected utility company in writing, ten (10) working days in advance of any work to be carried out in the vicinity of the said utility and shall exercise all necessary care and precautions to safeguard from damage during construction.

The Contractor shall immediately report any discrepancy, omission or conflict identified with respect to existing utilities and descriptions between the Contract Documents and field conditions. The following utility companies have been identified within the contract limits:

Summary of Utilities within the Project Limits

Utility Company	Description/Location
Bell Canada	Fibre optic toll line/QEW ROW & Direct buried cable/Gilmour Culvert (relocation x 2)
Enbridge Gas Inc	Gas main/Bowen Rd & Gas Main/Gilmour Culvert (protect)
Canadian Niagara Power Inc	OH primary line/Bowen Rd (ensure clearances)

Niagara Region Broadband Network	Fibre optic cable/Gilmour Culvert (expose/shift may be required)

The Contractor shall contact/liaise with the following Utility Companies and representatives throughout the Contract:

Utility Company	Description/Location
Bell Canada	**Chris Gill, C. Tech** Implementation Manager - Access Network / Structures 20 Hunter Street West- Floor 6 Hamilton, Ontario- L8N 3H2 C: 289 260 3934
Enbridge Gas Inc	**Rob D'Onofrio, C. Tech** GDP Sr. Advisor Planning Tel: 905 641-4876 I Fax: 905 704-3683 3401 Schmon Parkway, Thorold ON L2V 4Y6
Canadian Niagara Power Inc	**Don Gilbert** *Manager, Operations, Corporate* 1130 Bertie Street Fort Erie, Ontario, L2A 5Y2 Phone: 905.871.0330
Niagara Region Broadband Network	**Jeremy Smith** Construction Coordinator Cell: 289-241-4031

OPERATIONAL CONSTRAINT - Preloading And Delay Of Sewer Installation, Paving, And Installation Of Two-Stage RSS Wall Facing Panels

Special Provision

The QEW high fill embankment widening and grade raise between Station 13+260 and 14+600, and the associated single-stage and two-stage RSS walls within these limits, shall be completed to the top of the granular sub-base. The following preload periods apply before paving, installation of sewers (where applicable), and installation of the facing panels on sections of two-stage RSS walls:

Location	Sewer Installation	Paving	Installation of Facing Panels on Two-Stage RSS Wall Segments
South of Station 13+725	Six (6) weeks	Six (6) weeks	Six (6) weeks
Station 13+725 to 13+670	Four (4) months	Four (4) months	Six (6) months
Station 13+670 to 13+475	Four (4) months	Four (4) months	N/A

The Contract Administrator shall confirm the end of the preload period based on the results of the settlement monitoring program as set out elsewhere in the Contract Documents. The Contractor shall not proceed with sewer installation, final granular placement and paving, or two-stage RSS panel installation until approval has been given by the Contract Administrator.

Prior to placement of the pavement structure granular base material and paving, the Contractor shall conduct a survey to determine the elevation of the top of the granular sub-base material, and shall place additional granular sub-base material as and where required to achieve the pavement design sub-base elevation.

OPERATIONAL CONSTRAINT – Identifying Structure Pier Caisson Locations

Special Provision

The Contractor shall locate, identify/mark, and maintain the location of the center pier caissons for both bridge structures within 14 calendar days of obtaining permission to start work in the presence of the Contract Administrator and CN Representative.

CN Contact Information:
Derek Basso
Public Works Officer
Eastern Canada Division of Engineering
Design and Construction
1 Administration Road, Concord, ON, L4K 1B9
O- 905-669-3373
F- 905-760-3406
E- Derek.Basso@cn.ca

The Contractor shall inform the Contract Administrator in writing, after locating and identifying the center pier caissons for both bridge structures.

All costs required to meet the requirements of this specification shall be deemed included in the Contractors bid price; no additional payment will be made.

OPERATIONAL CONSTRAINT – Tree Removals

Special Provision

With the exception of the tree removals shown in the Contract Drawings, the Contractor will not be permitted to remove any additional trees for any construction operations.

Trimming of existing trees shall be permitted for certain construction operations but shall not proceed without the approval of the Contract Administrator.

OPERATIONAL CONSTRAINT – Invasive Species Protection

Special Provision

The Contractor shall implement best management practices to prevent the introduction/spread of invasive plants including proper soil management and equipment cleaning protocols. The Contractor shall follow the

guidelines outlined in the Ontario Ministry of Natural Resources, Invasive Phragmites – Best Management Practices, Ontario Ministry of Natural Resources, Peterborough, Ontario. Version 2011. 15p.

This construction site contains areas with invasive plant species. The Contractor shall remove and dispose of excess soil from areas identified as containing invasive species including but not limited to Common Reed and Common Buckthorn. No invasive species shall be in the topsoil.

The Contractor shall be required to clean all vehicles and equipment exposed to invasive plants prior to every time leaving the construction site.

OPERATIONAL CONSTRAINT – Archaeology

Special Provision

During construction there is the possibility of encountering deeply buried archaeological material. In the event the following situations are encountered during construction, work must stop immediately and the actions undertaken as described below.

Should previously unknown or unassessed deeply buried archaeological resources be uncovered during development, they may be a new archaeological site and therefore subject to section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and a licensed archaeologist will be procured by the Ministry of Transportation to carry out archaeological fieldwork, in compliance with section 48 (1) of the Ontario Heritage Act. The Heritage Operations Unit of the Ministry of Culture must be immediately notified at (416) 314-7146.

In the event that human remains are encountered during construction, the proponent or person discovering human remains must immediately notify the police or coroner and the Registrar of Cemeteries, Ministry of Government Services at (416) 326-8392. The Register of Cemeteries, Cemeteries Regulation Unit can be reached at (416) 326-8404 or (416) 326-8393. The Heritage Operations Unit of the Ministry of Culture can be reached at (416) 314-7146.

If the above situations are encountered, the MTO-Central Region Planning and Environmental Office must also be immediately notified (416-235-5485).

Entry into the archaeologically-sensitive areas listed in in Table A is strictly prohibited without written approval from the MTO Contract Administrator.

Table A

Archaeologically Sensitive Area No.	Highway	Township	Station	Offset	Description	Exceptions
4	Queen Elizabeth Way Queen	Fort Erie Fort Erie	14+325.2	59mLT	Archaeology Site Will be fenced off delineated “no go”	No Exceptions
			14+325.2	24m LT		

	Elizabeth Way		14+479.2	22.3m LT	areas	
			14+479.2	55.5m LT		
5	Queen Elizabeth Way	Fort Erie	14+054	6.0mRT	Archaeology Site Will be fenced off delineated "no go" areas	Cannot be entered until authorized by the contract administrator

OPERATIONAL CONSTRAINT (ENVIRONMENTAL) – Work Requiring Water Taking

Special Provision

A Permit to Take Water (PTTW) for the project works will be provided to the Contractor by August 2019. The Contractor shall not commence excavation or any other work that requires water taking until the Permit to Take Water is provided by the Contract Administrator. The Contractor shall comply with the conditions of this permit.

OPERATIONAL CONSTRAINT – Archaeology Site Fencing

Special Provision

Fencing surrounding the archaeology site (STA 14+054, 6.0m RT) shall be maintained erect and in good repair throughout the duration of construction operations without breaks and unsupported sections by the Contractor and shall be removed upon completion of the work by the Contractor.

OPERATIONAL CONSTRAINTS - ATMS

Special Provision

Queue Warning System (QWS) – Site 1

Site 1 of the QWS system is impacted by the construction on the CN/CP structure and the adjacent roadway. The QWS equipment are to be removed prior to Stage 1 of the construction.
The Contractor shall notify MTO before and after completion of the removal.

OPERATIONAL CONSTRAINT – Electrical Works

Special Provision

Traffic Signal Maintenance and Operation at Gilmore Road and the QEW N-E/W Ramp

At the intersection of Gilmore Road and the QEW N-E/W Ramp, the Contractor is required to assume responsibility of the maintenance and operation of the temporary traffic signal system at this intersection during construction per OPSS 106 (106.07.04.05.01). The aerial signal system shall remain operational until the work at the QEW/Bowen interchange has been completed. Upon completion of the interchange works the Contractor shall remove the existing signal system.

OPERATIONAL CONSTRAINT (ENVIRONMENTAL) - Migratory Bird Protection

Special Provision

Migratory Bird Protection – General

The contractor shall adhere to the following;

Site Preparation:

- Prior to and during construction the Contractor shall inspect the construction area for nests and eggs/young and advise the Contract Administrator and Environmental Office (416-235-5485) of these locations immediately:

Site Preparation/Maintenance:

- To prevent the nesting of birds during construction the contractor shall establish preventative measures within the project limits;
- The Contractor shall adjust the preventative measures as needed during construction and maintain the integrity/function of the preventative measures until no longer needed or at the end of the contract;
- If adjustments to the preventative measures are required to facilitate construction staging operations, the adjustments shall be effective in preventing nesting of migratory birds;
- The Contractor shall document and report all preventative measures to the Contract Administrator;
- If nests with eggs and/or young are found the Contractor shall retain an avian biologist to confirm they belong to a migratory bird species;

If Active Nests (nests with eggs or young birds) are found:

- The contractor shall immediately notify the Contract Administrator who shall contact the Environmental Office and the environmental consultant/avian biologist for direction;
- The Contractor shall monitor the area daily for nesting activity and notify the Contract Administrator immediately if a nest (re)appears

The contractor shall remove nests only during specific situations as identified below;

Location	During the Migratory Bird Nesting Season	Outside the Migratory Bird Nesting Season
Durham Region York Region Peel Region Halton Region Niagara Region City of Hamilton City of Toronto	The contractor shall not destroy nests during the migratory bird nesting season (April 1 to August 15)	The contractor shall remove (inactive) nests only outside the migratory bird nesting season (August 16 to March 31)
Simcoe Region	The contractor shall not destroy nests during the migratory bird nesting season (April 1 to August 31)	The contractor shall remove (inactive) nests only outside the migratory bird nesting season (September 1 to March 31)

In certain circumstances a Canadian Wildlife Services (CWS) permit may be obtained for the removal of nest and eggs of migratory birds. The contractor shall notify the CA, the Consultant and the Environmental Office (416-235-5485) if a CWS permit is required.

OPERATIONAL CONSTRAINT (ENVIRONMENTAL) - Protection of Species at Risk

Special Provision No. ENVR 0007 September 7, 2017

Species at Risk (SAR) listed as endangered or threatened under the provincial *Endangered Species Act*, 2007 or the federal *Species at Risk Act*, 2002 and identified in Table A to be present within the contract limits shall be protected by implementing the corresponding mitigation measures specified in Table A.

Table A

SAR	Mitigation Measures	Related OPSS/SP/ Tender Item Code	Location of Mitigation Measures
Barn Swallow	While Barn Swallow nests were confirmed absent during the 2018 field season, should construction commence on or after April 1, 2019 (i.e., commencement of the breeding bird window) structure surveys must be repeated prior to any construction activities in, on or above structures in order to prevent a potential contravention of the ESA.		All locations

SAR	Mitigation Measures	Related OPSS/SP/ Tender Item Code	Location of Mitigation Measures
Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis, and Tri-colored Bat.	Vegetation removal must be restricted to the proposed expansion footprint and vegetation removal shall occur during the bat maternity roosting window (March 31 – October 1) and can only proceed upon confirmation from MNRF.		All locations where clearing is required
Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis, and Tri-colored Bat.	If clearing of vegetation must occur during the May 1 to September 1 timing window, then bat exit surveys must be performed 30 minutes before dusk until 60 minutes after dusk, a maximum of 24 hours prior to the removal of candidate maternity roost trees in accordance with the Technical Note Species at Risk (SAR) Bats (MNRF, 2015a);		All locations where clearing is required
Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis, and Tri-colored Bat.	Areas of vegetation removal shall be clearly marked in the field and disturbance beyond the marked limits will not be permitted;	OPSS801-Construction Specification for the protection of Trees	All locations where clearing is required
Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis, and Tri-colored Bat.	During the maternity roosting season for SAR bats, construction activities within 30m of suitable maternity roost trees are to be restricted to daylight hours when possible. If construction at night during the active season for bats cannot be avoided, the following mitigation measures will be implemented with respect to lighting work sites after dusk: • Work lights should be hooded (i.e. shielded) and directed downward toward the immediate work area to minimize horizontal and skyward illumination; and • Height of light units should be as low	Special Provision No. 199F12	Within limits of ESA 6

SAR	Mitigation Measures	Related OPSS/SP/ Tender Item Code	Location of Mitigation Measures
Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis, and Tri-colored Bat.	MNRF shall be notified immediately if mortalities of SAR bats are observed		All Locations
All SAR	If any Species at Risk are observed within the work area at any time, construction shall halt and MNRF will be contacted immediately		All Locations

Where Table A specifies that a Qualified Person is required, the name of the person shall be provided to the Contract Administrator a minimum of 10 Business Days prior to the commencement of work.

Unless specified elsewhere in the Contract Documents, a record shall be kept of all encounters with SAR that includes the date, location (GPS coordinates preferred), species, a photo of the species encountered, if possible, and any actions taken to protect SAR including but not limited to measures identified in Table A. A copy of the record shall be provided to the Contract Administrator upon contract completion.

OPERATIONAL CONSTRAINT (ENVIRONMENTAL) – Control Measures during Removal of Concrete/Structure, Structure Repair/Construction, and Concrete Sawcutting

Special Provision

This special provision describes the requirements for control measures during removal of concrete/structure, structure repair/construction, and concrete sawcutting.

The requirements of this special provision are in addition to those specified elsewhere in the contract.

For materials resulting from concrete/structure removal, and materials resulting from structures repair/construction, the Contractor shall take such measures and provide such protection system or systems to ensure that such materials do not:

a) fall into or enter the watercourse;

b) cause damage to any portion of the bridge not designated for removal.

For concrete sawcutting, the Contractor shall take such measures and provide such protection system or systems to:

a) contain any effluent until it is disposed of; and

b) minimize the escape of dust such that no visible dust reaches the watercourse, wetlands adjacent, or property outside the right-of-way limits.

The following work shall not commence until the Contract Administrator has given permission to proceed in writing.

a) removal of concrete/structure and imposition of construction loading on existing structure;

b) structure repair/construction; and

c) concrete sawcutting.

The Contractor shall give the Contract Administrator written notice a minimum of 14 calendar days prior to the date that permission is required to proceed with any of the above-specified work operations. The notice shall include six copies of written descriptions, stamped drawings and schedules that provide the following:

a) the sequence and method of control measures during:

   a) removal of concrete/structure;
   b) structure repair/construction; and
   c) concrete sawcutting.

b) the details of any construction loads imposed on the existing structure by the control measures.

Permission to proceed with the above will be provided if the Contract Administrator determines that the details of the notice meet the requirements of this special provision.

Where loads are imposed on the existing structure, the drawings will be stamped by the Authority with the words: "Checked only for loads imposed on the bridge, not checked for design of scaffolds and work platforms".

Dust from concrete sawcutting shall be managed as excess Portland cement concrete as specified elsewhere in the Contract.

Effluent from concrete sawcutting and all other excess materials resulting from concrete/structure removal and structure repair/construction shall be managed as specified elsewhere in the Contract.

At the conclusion of the work, the control measures shall be removed from the right-of-way.

OPERATIONAL CONSTRAINT (ENVIRONMENTAL) – Equipment Refueling, Maintenance and Washing

Special Provision

All activities, including equipment maintenance, refueling and concrete truck washing shall be controlled to prevent entry of petroleum products (e.g. gasoline, oils, lubricants), primers, grout, bonding adhesives or other hazardous or deleterious substances including any debris, waste, rubble or concrete materials in all water courses and water bodies within the project limits unless otherwise specified in the contract. Substances are to be stored and mixed on protected surfaces away from the water courses and water bodies within the project limits in order to prevent contamination of soils and waters. Any such material which advertently enters the water courses or water bodies within the project limits shall be removed by the Contractor, at his own expense, in a manner satisfactory to the Contract Administrator.

For mobile equipment and vehicles, maintenance, refueling and truck washing shall be conducted no closer than 30 metres from the water courses and water bodies within the project limits in order to prevent water contamination due to accidental spills.

All large equipment working in or near the water courses and water bodies within the project limits shall be well maintained to avoid contaminant leakage, shall be free of excess surface oil or grease and shall be equipped with spill kits deemed acceptable by the Contract Administrator.

OPERATIONAL CONSTRAINT - Spill Prevention and Response Contingency Plan

Special Provision

General

The Contract involves construction activities within and near watercourse areas as defined elsewhere in this Contract. This Special Provision covers the requirements for dealing with spills and unplanned situations.

Submission

The Contractor shall submit a Spill Prevention and Response Contingency Plan to the Contract Administrator 14 calendar days prior to commencing work. The Spill Prevention and Response Contingency Plan shall address procedures for preventing and responding to spills, and equipment and resources that will be available to prevent and/or respond to all potential discharges resulting from the Contractor's operations in this Contract. The Plan shall address the following key features:

- Identify roles and responsibilities in the event a spill were to occur.
- Provide contact list of names and phone numbers for various agencies.
- Protocols for on-site staff in reporting spills.
- Detailed emergency response procedures.
- Detailed emergency spill kit requirements.

Upon approval of the Plan, a copy of the plan shall be stored in proximity to each working area, clearly marked, and accessible should a spill occur. The Contractor shall ensure that all construction personnel are made aware of the Plan's contents and its location.

A Spills Containment Kit (comprising, at the very least, absorbent materials to initially contain a spill, protective gear for the handling of hazardous materials, and the number (1-800-268-6060) for the MOE Spills

Action Centre) shall be stored in proximity to each working area and clearly marked and accessible should a spill occur.

OPERATIONAL CONSTRAINT – General Environmental Protection Requirements

Special Provision

The Contractor is responsible for protection of people, property and the natural environment from environmental impacts and damage that may result from this contract.

Environmental protection during this contract shall:

a) comply with commitments and conditions of environmental approvals, permits, exemptions, agreements, reports, and clearances provided by the owner;

b) comply with any other formal environmental approvals, permits, exemptions, agreements, reports and clearances that must be procured by the contractor in order to perform the work; and

c) be integrated with environmental and other requirements specified in the contract.

Environmental protection shall include, but not be restricted to the control of materials, equipment and construction operations in order to avoid and minimize:

a) direct physical damage;
b) sediment, noise, vibration, dust, chemical, and other emissions; and
c) interference with local use, access and passage.

Such control shall include but not be restricted to selection and management of:

a) materials, including the management of excess and contaminated materials;
b) equipment, including maintenance and refuelling;
c) method of construction;
d) construction site disturbance limits; construction site access, detours and haul roads; earth aggregate and rock borrow areas; material storage and disposal areas; equipment storage areas; construction yards; and
e) timing, duration and staging of the work.

All materials used in the construction of temporary physical environmental protection measures shall remain the property of the Contractor.

OPERATIONAL CONSTRAINT (ENVIRONMENTAL) - Control Of Asian Long-Horned Beetle Infestation And Management Of Host Trees

Special Provision

SCOPE

This special provision describes the requirements for the acquisition, planting, management and disposal of trees that could host the Asian Long-horned Beetle (ALHB) which is known to infest trees within certain areas of the City of Toronto and the City of Mississauga in the Province of Ontario. This provision applies where the Contractor's operations will include the planting and/or moving, the pruning or removal, including clearing and grubbing, of deciduous trees.

These requirements are in addition to those which may be specified elsewhere in the Contract and do not relieve the Contractor of responsibilities imposed by statute and/or obligations imposed by the Contractor's Environmental Compliance Approvals.

DEFINITIONS

Host Tree: means a deciduous tree that is a suitable host for the Asian Long-horned Beetle (ALHB). Host tree species are the following deciduous trees: Maple, Horsechestnut, Birch, Willow, Elm, Mountain Ash, Poplar, Sycamore or London Plane Tree, Goldenrain tree, Katsura, Hackberry and Silk Tree.

Plant Material: means all material from deciduous trees including trees, branches, lumber, wood, firewood, nursery stock, logs, bark, wood and bark chips.

Regulated Area for ALHB: *means the area designated by the Canadian Food Inspection Agency (CFIA) as a Regulated Area due to infestation by the Asian Long-horned Beetle and is the area specified under the Asian Long-horned Beetle Infested Place Order as noted on the CFIA website (under plant protection/insects/Asian Long-horned Beetle).*

CFIA WEBSITE: ***http://www.inspection.gc.ca/plants/plant-protection/insects/asian-long-horned-beetle/order/eng/1386095262010/1388532690960***

SUBMISSION AND DESIGN REQUIREMENTS

1. A minimum of two weeks prior to commencement of the work, the Contractor shall provide the Contract Administrator with a written statement confirming that the Contractor has checked the CFIA website and identified the current ALHB Regulated Area and indicating whether or not any work will be conducted in or in proximity to a Regulated Area for the ALHB.

2. Within the **Regulated Area for ALHB,** a minimum of two weeks prior to commencement of the work, the Contractor shall provide the Contract Administrator with an ALHB Plan that details how work will be conducted in accordance with CFIA removal Orders, and other requirements; identifies disposal sites to be used, and demonstrates that the Contractor's Plan is acceptable to the CFIA. The Contractor shall notify the Contract Administrator of any required changes to the ALHB Plan prior to implementation.

3. At the completion of any disposal of host tree/plant material from the **Regulated Area for ALHB,** the Contractor shall provide the Contract Administrator with a completed "Contractor's Release to ALHB Disposal Site – Control of Asian Long-horned Beetle (AHLB) and Management of Host Trees" Form.

4. At the completion of all host tree work within the **Regulated Area for ALHB,** the Contractor shall provide the Contract Administrator with an ALHB Summary Report documenting the implementation of the ALHB Plan, detailing all work conducted, disposal sites used and confirming that work completed complied with CFIA ALHB removal Orders and other requirements.

5. Outside the **Regulated area for ALHB** the Contractor shall provide the following information to the Contract Administrator a minimum of two weeks prior to commencement of the work:

   a) The Name, Address and Location of the Nursery that will be supplying trees for the contract; and

   b) A copy of the completed "Nursery Stock Supplier's Release Form – Control of Asian Long-horned Beetle (AHLB) and Management of Host Trees" for any host trees to be planted on the Contract.

CONSTRUCTION

General

Prior to the work, the Contractor shall check the CFIA website to identify the current location and extent of the ALHB Regulated Area and to determine whether or not any work will be conducted in or in proximity to a Regulated Area for the ALHB.

Where the contractor has parked a vehicle or other machinery within or proximate to the **Regulated Area for ALHB**, for any period of time; prior to moving the vehicle outside the area, the contractor shall inspect its exterior surfaces and ensure that there are no beetles present. The transport of live beetles out of the Regulated Area must be prevented.

Any sightings of the beetle shall be immediately reported to the CFIA at 647-790-1012 (or 1-800-442-2342) and reported to the Contract Administrator.

Within the Regulated Area for ALHB

The Regulated Area is as specified under the Asian Long-horned Beetle Infested Place Order as noted on the CFIA website and is the area:

a) Bordered in the north by Finch Ave., in the east by Martin Grove Rd., in the south by Highway 401, and west by Dixie Rd.; and
b) Identified as a Regulated Area on the CFIA website - (under plant protection/insects/Asian Long-horned Beetle/Order):

http://www.inspection.gc.ca/plants/plant-protection/insects/asian-long-horned-beetle/order/eng/1386095262010/1388532690960

Federal regulations and CFIA Ministerial Orders restrict the movement of wood and plant material from Regulated Areas. When working within the Regulated Area, the Contractor shall comply with all CFIA requirements. No host tree related work shall be done by the Contractor without first receiving concurrence from the CFIA.

The Contractor shall follow the direction provided by the CFIA and facilitate safe access to the R-O-W when required for CFIA staff, inspectors or other CFIA - designated staff to conduct inspections or other work related to the ALHB/Regulated Area.

The Contractor shall ensure that host trees are not planted within the Regulated Area. The Contractor shall ensure that all firewood and host tree plant material is managed to ensure that it remains within the boundaries of the Regulated Area and is not moved to sites located outside of the Regulated Area.

For any removal work including pruning and clearing and grubbing of **host trees** the Contractor shall ensure that:

a) the Toronto Area Office (647-790-1012) of the Canadian Food Inspection Agency is notified at least two weeks prior to the proposed removal so that the CFIA has the opportunity to inspect the host trees for evidence of Asian Long-horned Beetle infestation; and
b) unless specified otherwise by the CFIA, host trees and plant material are not to be removed from the immediate work area but are to be chipped to a size not greater than 5/8th inch, at the work area the same working day and transported directly to a designated disposal site.

The designated sites are currently identified as:
For the City of Toronto: 120 Disco Rd.;
For the City of Mississauga: 2699 Drew Rd.;
or as otherwise specified by the CFIA and/or the municipality. and

a) At the completion of any host tree plant material disposal**,** the Contractor shall provide the Contract Administrator with a completed "Contractor's Release to ALHB Disposal Site – Control of Asian Long-horned Beetle (AHLB) and Management of Host Trees" Form.

ALHB Plan
Prior to commencement of the work the Contractor shall prepare an ALHB Plan that ensures that work will be conducted in accordance with CFIA removal Orders and other requirements and which includes the following information:

a) A description of the host tree work to be conducted including equipment and removal methodology to be used, parties conducting the work, traffic control, disposal sites, etc.
b) Confirmation that the Contractor has contacted the municipality within which the host trees to be removed are located and has identified any additional restrictions or conditions on management and disposal of host material imposed by the municipality;
c) Where additional restrictions or conditions are imposed by the municipality, the Contractor shall detail how these conditions are to be carried out; and
d) Confirmation that the Contractor's Plan is acceptable to the CFIA.

The Contractor shall modify the Plan as required and inform the Contract Administrator of any changes.

At the completion of any host tree work the Contractor shall prepare an ALHB Summary Report documenting the implementation of the ALHB Plan and detailing all work completed including how and where host plant materials were managed, approvals obtained, confirming disposal in accordance with CFIA requirements and noting any beetle sightings and CFIA notifications and other relevant information.

Where clearing and grubbing materials and/or other host tree residue is to be disposed outside the municipality within which the host tree was located, the Contractor shall conform to any additional restrictions on such material that the municipality has in place.

Where the contractor has parked a vehicle or other machinery within the **Regulated Area for ALHB,** for any period of time; prior to moving the vehicle outside the regulated area, the contractor shall inspect its exterior and interior surfaces and ensure that there are no beetles present prior to moving the vehicle out of the Area (to prevent the transport of live beetles out of the Regulated Area).

Outside the Regulated Area for ALHB

Outside the **Regulated Area for ALHB,** prior to acquiring any host trees, the Contractor shall ensure that all host trees to be planted on the Contract have never been located within the **Regulated Area for ALHB** and show no evidence of infestation with the ALHB. A release shall be obtained from the Nursery Stock Supplier.

NURSERY STOCK SUPPLIER'S RELEASE FORM (May 2014)

Control of Asian Long-horned Beetle (ALHB) and Management of Host Trees

MTO Contract#_____ Location:_____
Work Description: _____

_____

I/We _____ being the Owner(s) and/or Operator (s) of the Nursery Stock Supply Company named _____

Located at the following Address: _____
And legal description (if available): Lot ____ ,Concession _____ Township:_____
County/Region/District:_____ **verify that the deciduous trees (i.e. Host trees) to be provided to the ministry's Contractor for planting on the Contract noted above:**

1. Have never been grown, planted or otherwise placed for any length of time at a site located within the area identified as a **Regulated Area for ALHB:** which means the area designated by the Canadian Food Inspection Agency (CFIA) as a Regulated Area due to infestation by the ALHB and is the area:
   a) Bordered in the north by Finch Ave., in the east by Martin Grove Rd., in the south by Highway 401, and west by Dixie Rd.; and
   b) Identified as a Regulated area on the CFIA website - (under plant protection/insects/Asian Long-horned Beetle/Order):
   http://www.inspection.gc.ca/plants/plant-protection/insects/asian-long-horned-beetle/order/eng/1386095262010/1388532690960 and

2. **Do not exhibit any visible signs of infestation by the Asian Long-horned Beetle (ALHB).**

Dated this___ day of_____, 201__

_____
Print Name of NURSERY STOCK SUPPLIER'S Representative

_____
NURSERY STOCK SUPPLIER REPRESENTATIVE'S Signature

CONTRACTOR'S RELEASE TO ALHB DISPOSAL SITE (May, 2014)

Control of Asian Long-horned Beetle (ALHB) and Management of Host Trees

MTO Contract#_____ Location:_____

Work Description: _____

_____

The Contractor verifies that for the noted work the following quantity of chipped ALHB host tree/ material has been disposed and accepted at the following designated disposal site:

☐ 120 Disco Rd. in the City of Toronto; or

☐ 2699 Drew Rd. in the City of Mississauga.

Quantity (Volume) of Chipped Material: _____

Other: _____

Dated this___ day of_____, 201___

_____
Print Contractor's Name and Field Representative's Name

_____
Contractor's Signature

OPERATIONAL CONSTRAINT (ENVIRONMENTAL) - Management of Excess Earth with Salt Impacts

Special Provision

The Contractor shall note that excess earth from highway construction projects may contain elevated concentrations of chloride and sodium and may have elevated values for Electrical Conductivity and Sodium Adsorption Ratio. For the purpose of this Contract, excess earth with salt impacts is not considered to be "contaminated" within the meaning of Table 1 in OPSS 180.

Where the Contractor manages excess earth as disposable fill, the Contractor shall take into account the possibility of salt impacts and ensure that the material is managed responsibly and in an environmentally appropriate manner. Where the Contractor intends to manage the excess earth that may be salt impacted on private property, the Contractor shall make the Property Owner aware that it may be salt impacted by using the attached Property Owner's Release in place of MTO form PH-CC-183.

The Contractor is responsible for conducting such sampling and testing as may be necessary to comply with any requirements imposed by the Property Owner as a condition of accepting the excess earth.

PROPERTY OWNER'S RELEASE

Contract No: _____

Work Description: _____

_____

I/We being the owner(s) of Lot _____, Concession _____, Township of _____, and County/Region/District of _____, verify that the Contractor for the above noted work has placed excess material from the above noted Contract on my/our property with my/our permission. I/We have signed together with the Contractor MTO forms PH-CC-181, Site Selection Notification for Stockpiling Materials Managed Through Re-Use, or PH-CC-182, Site Selection Notification for Material Managed as Disposable Fill, or both, that describe Conditions on Management, and have been assured by the Contractor that these conditions have been met.

Where materials are managed as disposable fill, I/we understand that excess earth from a highway project may contain elevated concentrations of chloride and sodium and may have elevated values for Electrical Conductivity and Sodium Adsorption Ratio and I/we agree to be responsible for any subsequent relocation and management of the material so placed.

Where materials are to be stockpiled, I/we agree that the stockpile(s) will be removed by the date(s) herein noted.

I/We hereby release the Owner and the Contractor in respect of the activities of the Contractor carried out in accordance with this release.

Dated this _____ day of _____ 20____

_____
Property Owner's Signature

_____
Print Contractor's Name & Field Representative's Name

_____
Contractor's Field Representative Signature

cc: Contract Administrator, Property Owner(s), Contractor

AMENDMENT TO MTO GENERAL CONDITIONS OF CONTRACT, NOVEMBER 2016 - Use of WBCMS for Administering the Contract

Special Provision

GC 1.07 Definitions

Subsection GC 1.07 of the MTO General Conditions of Contract is amended by the addition of the following definition:

Web-Based Contract Management Services (WBCMS) means a browser based solution that provides an electronic means to record, collect, transmit and store Contract data.

GC 1.09 Interpretation of Certain Words

Subsection GC 1.09 of the MTO General Conditions of Contract is amended by the addition of the following:

03. Any reference in the Contract Documents to "Owner Standard Form" or "PH-CC" shall be deemed to mean the electronic equivalent of that form within WBCMS.

.04 The words "write", "notify", "submit", "issue", "provide", "execute", "report", "give", "furnish", "return", "apply" and their variations, and other words referring to a communication from the Contractor to the Contract Administrator, or from the Contract Administrator to the Contractor, shall mean the word "electronically using WBCMS" (e.g., "writing electronically using WBCMS", "notify electronically using WBCMS").

.05 When administering Contract data, references to the term "Service Provider" in WBCMS shall mean the "Contractor".

GC 3.0 ADMINISTRATION OF THE CONTRACT

Section GC 3.0 of the MTO General Conditions of Contract, is amended by the addition of the following subsection:

GC 3.15 Use of WBCMS

.01 WBCMS shall be used to administer Contract data. After Contract award, submissions shall only be accepted by the Ministry through WBCMS.

.02 WBCMS is replacing paper copies therefore it is mandatory to fill the electronic records with all necessary data and attaching a scanned paper version is not acceptable.

.03 The Owner shall provide subscription information to the Contractor, including purchasing instructions, at the time of Contract award. The following requirements shall apply:

a) The Work shall not commence until WBCMS subscriptions have been purchased.

b) The Contractor shall ensure that a subscription is in place for each role within 5 Business Days of notification and maintained until issuance of the Contract Completion Certificate.

c) The Contractor shall agree to the WBCMS terms of service at the time of purchasing subscriptions, and abide by the terms and conditions for the duration of the Contract.

d) The Contractor shall purchase an annual subscription for each user in a role for each awarded Contract.

e) The Contractor shall maintain 1 Approval Role subscription until receipt of the Release from Warranty Certificate.

f) Subscriptions cost $1350 plus HST per user, per role, per year, and are valid for one year from the date of purchase. There shall be no additional costs to the Owner for using or accessing WBCMS.

g) It is the sole responsibility of the Contractor to ensure that internet access is continuously available to all their users at the work location during construction operations. There shall be no additional costs to the Owner for ensuring internet services are available at the work location.

h) The Contractor shall use Microsoft Internet Explorer 11 (IE11) as this is the Ministry supported browser.

i) The Contractor shall record all activities using WBCMS and the information must be entered on a daily basis. There shall be no additional costs to the Owner for using or accessing WBCMS.

.04 The roles and responsibilities within WBCMS are defined as;

a) Company User Administrator - Administers subscriptions, user profiles and assigns staff roles. This role does not require an annual subscription and cannot enter or review Contract data.

b) Field Role - Enters Contract data at the work location.

c) Office Role - Enters and reviews Contract data.

d) Approval Role - Reviews and approves field and office data. Any user in this role has the ability to bind the Contractor.

.05 When the Contract Documents require the submission of multiple copies of a document, and the document is to be submitted using WBCMS, then only the electronic submission is required.

.06 A document signed and sealed by one or more Engineer, Ontario Land Surveyor, Professional Geoscientist, or other professional licenced according to federal or provincial legislation shall be submitted electronically using WBCMS. In addition to the electronic submission, within 5 Business Days of the electronic submission using WBCMS, an original signed and sealed copy of the document shall be submitted by hand or by mail to the Contract Administrator.

.07 Submission of records using WBCMS shall be the legal equivalent of a delivery of original signed documents or information by hand by an authorized representative of the Contractor or the Contract Administrator.

AMENDMENT TO MTO GENERAL CONDITIONS OF CONTRACT, NOVEMBER 2016

Special Provision

GC 1.07 Definitions

Subsection GC 1.07 of the MTO General Conditions of Contract is amended by the addition of the following definitions:

Basic Holdback means the statutory holdback, equal to 10% of the services or materials as they are supplied under the Contract, required to be retained pursuant to the *Construction Act*.

Bonds means both the Contract Bonds and the Statutory Bonds prescribed in the Tender Documents.

Construction Act means the *Construction Act*, R.S.O. 1990, c.C.30, as amended.

Contract Bonds means the surety bonds executed by the Contractor and its Surety prescribed in the Tender Documents, but does not include Statutory Bonds.

Finishing Holdback means the statutory holdback, equal to 10% of the Finishing Work, required to be retained pursuant to the *Construction Act*.

Finishing Work means the Work to be completed after certification of Substantial Performance and prior to and necessary to be supplied or performed to complete the Contract.

Finishing Work Deficiency List means a list of deficiencies and Work yet to be completed identified, independently, by the Contractor and the Contract Administrator.

Statutory Bonds means the surety bonds executed by the Contactor and its Surety and required to be furnished by Part XI.1 of the *Construction Act*.

Total Bid Price means the price submitted by the Contractor at tender closing.

Written Notice of Lien means a written notice of lien in the prescribed form pursuant to the *Construction Act*, R.S.O. 1990, c.C.30, as amended, given by a person with a lien that identifies the payer and identifies the premises, and states the amount that the person has not been paid and is owed to the person by the payer.

GC 1.08 Substantial Performance

Paragraph GC 1.08.01 of the MTO General Conditions of Contract is amended by deleting point b) in its entirety and replacing it with the following:

b) When the Work to be performed under the Contract is capable of completion or, where there is a known defect, correction, at a cost of not more than:

   i. 3% of the first $1,000,000 of the Contract price,
   ii. 2% of the next $1,000,000 of the Contract price, and
   iii. 1% of the balance of the Contract price

Paragraph GC 1.08.02 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

.02 For the purposes of this Contract, when the Work or a substantial part thereof is ready for use or is being used for the purposes intended and the Owner and the Contractor agree not to complete the Work expeditiously, the price of the services or Materials remaining to be supplied and required to complete the Work shall be deducted from the Contract price in determining substantial performance.

GC 1.10 Liens

Subsection GC 1.10 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

.01 A lien is preserved when the claimant has given the Owner a copy of the claim for lien before the lien has expired pursuant to the *Construction Act*.

.02 A preserved lien is perfected when the claimant commences an action in the courts to enforce the lien prior to the end of the period specified in Section 36 of the *Construction Act*.

.03 A preserved lien becomes a perfected lien by sheltering under a perfected lien in accordance with the rules of sheltering specified in Subsection 36(4) of the *Construction Act*.

.04 The Owner shall retain an amount sufficient to satisfy the amount of a lien set out in a written notice of lien Form 1 of Ontario Regulation 303/18 of the *Construction Act* in accordance with Subsection 24(2) of the *Construction Act*.

GC 4.10 Termination of the Contract

Subsection GC 4.10 of the MTO General Conditions of Contract is amended by the addition of the following paragraph:

.03 If the Contract is terminated, the Owner shall publish the statutory notice of termination prescribed by Form 8 of Ontario Regulation 303/18 of the *Construction Act*, in a construction trade newspaper, and the date of the termination of the Contract shall be the date specified in the statutory notice of termination for the Contract.

GC 4.12 Use of Performance Bond

Subsection GC 4.12 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

GC 4.12 Use of Performance Bonds

.01 If the Contractor is in default of the Contract and the Contractor has provided a performance bond, the Owner may rely upon the performance bond and its conditions along with the Contract Documents.

GC 6.02 Indemnification

Paragraph GC 6.02.01 of the MTO General Conditions of Contract is amended by deleting point c) in its entirety and replacing it with the following:

c) Made in writing within a period of 6 years from the date of Substantial Performance of the Work as set out in Certificate of Substantial Performance or, where so specified in the Contract, from the date of the Contract Completion Certificate.

GC 6.04 Bonding

Subsection GC 6.04 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

GC 6.04.01 General

.01 If the Total Bid Price is $500,000 or more, the Contractor shall furnish the Owner with Statutory Bonds, being a performance bond and labour and material payment bond in accordance with the *Construction Act*.

.02 Such Statutory Bonds shall be obtained from a surety company or companies that is an insurer licenced under the *Insurance Act* to write surety and fidelity insurance.

.03 The Contractor shall furnish the Owner with Contract Bonds as prescribed in the Tender Documents and satisfactory to the Owner.

.04 Such Contract Bonds shall be obtained from a surety company or companies that is an insurer licenced under the *Insurance Act* to write surety and fidelity insurance.

GC 6.04.02 Performance Bond

.01 With respect to the Statutory Bond for a performance bond, the Contractor shall furnish a Performance Bond using Form 32 of Ontario Regulation 303/18 of the *Construction Act* that is conditioned on the due performance of the terms of the Contract for the amount of 50% of the Total Bid Price.

GC 6.04.03 Labour and Material Payment Bond

.01 With respect to the Statutory Bond, the Contractor shall furnish a Labour and Material Payment Bond using Form 31 of Ontario Regulation 303/18 of the *Construction Act* that extends or guarantees payment protections to the Subcontractor and persons supplying labour and Material to the Contract for the amount of 50% of the Total Bid Price.

GC 8.02.04.03 Certification of Subcontract Completion

Paragraph GC 8.02.04.03.02 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

.02 The Contract Administrator shall determine if the subcontract has been satisfactorily completed with all required inspections and testing required for the subcontract work and, if the Contract Administrator so determines, shall certify completion using Owner standard form PH-CC-797, Certificate of Completion of Subcontract.

GC 8.02.04.04 Subcontract Statutory Holdback Release Certificate and Payment

Clause GC 8.02.04.04 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

.01 At the time of issuance of the Certificate of Completion of Subcontract, the Contract Administrator shall:

a) Prepare a subcontract completion payment certificate showing:

i. The final prices for items;
ii. The amount of holdback monies;
iii. The amount due the Contractor.

b) Provide to the Contractor, the subcontract completion payment certificate within 10 Days of the date the subcontract was certified complete, for the Contractor to sign and return within 5 further Days. The Contract Administrator shall release to the Subcontractor through the Contractor the 10% holdback retained by the Owner in respect of the work covered by the said subcontract after being certified completed and providing that all lien claims that may be claimed against the holdback for the subcontract work have been expired or been satisfied or discharged, or otherwise provided for under the *Construction Act*, and providing that the Contractor has furnished to the Contract Administrator a statutory declaration in a form supplied by the Owner that the said Subcontractor has discharged all liabilities incurred by the Subcontractor in carrying out the said subcontract.

.02 The Contractor shall make payment of the said subcontract to the Subcontractor concerned pursuant to the *Construction Act*.

.03 Release of holdback monies by the Owner in respect of a subcontract according to the foregoing shall not relieve the Contractor or the Contractor's Surety of any of their responsibilities.

.04 Payment for subcontracts certified complete pursuant to the Contract and the *Construction Act*, including the payment of the statutory holdback, shall be made no later than 120 Days of the date on which the Work was certified complete, when all the liens have been satisfied in accordance with Section 25 of the *Construction Act*.

GC 8.02.04.05 Certificate of Substantial Performance

Paragraph GC 8.02.04.05.02 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

.02 Upon written application by the Contractor for Substantial Performance, the Contract Administrator shall conduct an inspection of the Work to determine if the Work is substantially performed and the date for Substantial Performance. The Contractor's application shall detail non-conformances, defects to be rectified, and Work yet to be completed. After inspection, the Contract Administrator shall provide a list of deficiencies and Work yet to be completed in addition to the Contractor's list. The Contractor's list of non-conformances, defects, and Work yet to be completed together with the Contract Administrator's list of same shall be combined and referred to as Finishing Work. All deficiencies and Work to be completed from the Finishing Work Deficiency List shall be completed prior to Contract Completion. Any additional defects and deficiencies for Work previously accepted as substantially performed shall be completed within 60 Days of Contract Completion, unless prevented by winter weather conditions; in such case, the defects and deficiencies shall be corrected by June 15th of the following year. Defects and deficiencies on Work completed after Substantial Performance shall be completed prior to Contract Completion.

Paragraph GC 8.02.04.05.04 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

.04 Upon receipt of a copy of the Certificate of Substantial Performance, the Contractor shall arrange to have the certificate published in a construction trade newspaper and the Contractor shall provide to the Contract Administrator proof that the certificate was published. Where the Contractor fails to publish a Certificate of Substantial Performance within 7 Days of receiving the certificate, the Owner shall publish the certificate in a construction trade newspaper and charge the Contractor $1,000 for the costs of advertising and administration. Subject to the *Construction Act*, the 60-Day lien period shall start on the date the Certificate of Substantial Performance is published in a construction trade newspaper.

Paragraph GC 8.02.04.05.05 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

.05 Except as otherwise provided for in Section 31 of the *Construction Act*, the 60-Day lien period prior to the payment of statutory holdback shall commence from the date of publication of the Certificate of Substantial Performance as provided for in paragraph GC 8.02.04.05.04.

GC 8.02.04.06 Substantial Performance Payment and Statutory Holdback Release Payment

Clause GC 8.02.04.06 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

.01 Upon receipt of the application for payment at Substantial Performance, the Contract Administrator shall check the invoice and advise the Contractor of any discrepancies. Any of these discrepancies that are unresolved prior to the expiry of the lien period shall be treated as set-offs.

.02 Subject to any outstanding liens and permissible set-offs, the Owner shall issue payment, including the release of the Basic Holdback on the Work done, within 30 Days after the expiration of the 60-Day lien period.

.03 In addition to any permissible set-offs, Finishing Holdback shall be retained at the rate of 10%, on all Work performed after the date of the Certificate of Substantial Performance.

.04 If the Contract provides for a completion schedule that is longer than one year, Total Bid Price is greater than $10,000,000 and there are no outstanding liens, the Contractor may request payment of the retained Basic Holdback on an annual basis. When a request is received, the Owner shall issue payment to reduce the holdback on work done from 10% to 2½%, plus the amount of the Owner's set-offs, provided that the Contract had not been substantially performed and the estimated value of the work performed is greater than 60% of the original tender value for a contract having an expected duration of two construction seasons or less, or 40% for a Contract having an expected duration of more than two construction seasons.

.05 The holdback may not be released to the Contractor within the timeline under GC 8.02.04.06 when Form 6 of Ontario Regulation 303/18 of the *Construction Act* is provided to the Contractor to indicate notice of non-payment of holdback and published by the Owner in a construction trade newspaper as provided in Section 27.1 of the *Construction Act*. The Contract Administrator shall notify the Contractor, in writing, of its publication no later than 3 days after the publication of the notice of non-payment.

.06 Within 3 days after receiving Form 6 of Ontario Regulation 303/18 of the *Construction Act* from the Contract Administrator, the Contractor shall notify the affected Subcontractor(s) providing a copy of the notice.

.07 Payments for Work certified as substantially performed, including release of holdback, shall be made no later than 135 Days of the date of publication of substantial performance. The Owner shall release the holdback at the end of the 60-Day lien period providing all liens are expired or been satisfied, discharged or otherwise provided under the *Construction Act*. This payment shall be made within 30 Days of the expiry of the 60-Day lien period and subject to Subsection 26.1 of the *Construction Act*.

GC 8.02.04.07 Certificate of Contract Completion

Paragraph GC 8.02.04.07.03 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

.03 If the Contractor has not applied for or received a Certificate of Substantial Performance, upon receipt of a copy of the Certificate of Contract Completion and the Certificate of Substantial Performance, the Contractor shall arrange to have the Certificate of Substantial Performance published in a construction trade newspaper and the Contractor shall provide to the Contract Administrator proof that the certificate was published. Where the Contractor fails to publish a Certificate of Substantial Performance within 7 Days of receiving the certificate, the Owner shall publish the certificate in a construction trade newspaper and charge the Contractor $1,000 for the costs of advertising and administration. Subject to the *Construction Act*, the 60-Day lien period shall start on the date the certificate is published in the construction trade newspaper.

Paragraph GC 8.02.04.07.05 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

.05 Upon receipt of the application for payment at Contract Completion, the Contract Administrator shall check the invoice and advise the Contractor of any discrepancies. Any of these discrepancies that are unresolved prior to the expiry of the 60-Day lien period shall be treated as a set-off.

Paragraph GC 8.02.04.07.06 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

.06 Upon conclusion of the 60-Day lien period, and provided no liens have been received, all remaining holdback, exclusive of set-offs, shall be paid by the Owner, within 30 Days.

GC 8.02.04.11 Owner's Set-Off

Clause GC 8.02.04.11 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

.01 Subject to Section 26 and Subsection 27.1 of the *Construction Act* and pursuant to Section 12 of the *Construction Act*, the Owner shall retain from monies owing to the Contractor under the Contract an amount sufficient to cover all debts, claims or damages related to the Contract, any outstanding or disputed liabilities the cost to remedy deficiencies, the reduction in value of substandard portions of the Work, claims for damages by third parties that have not been determined in writing by the Contractor's insurer, undetermined claims by the Owner under paragraph GC 8.01.02, a), and any assessment due the Workplace Safety and Insurance Board.

.02 Under these circumstances the Owner shall give the Contractor notice.

GC 8.02.04.12 Contract Completion, Statutory Holdback Release and Final Payment

Clause GC 8.02.04.12 of the MTO General Conditions of Contract is deleted in its entirety and replaced with the following:

.01 The Owner shall release the statutory holdback so as to discharge all claims in respect of the statutory holdback where all liens that may be claimed against the Finishing Holdback have expired or been satisfied, discharged or otherwise provided under the *Construction Act*.

.02 Final payment including payment of statutory holdback shall be made no later than 120 Days from the date of Contract Completion upon the expiry of all liens or upon the liens being satisfied, discharged or otherwise provided for pursuant to the *Construction Act*.

GC 8.02.04.13 Liens Filed Late

Clause GC 8.02.04.13 of the MTO General Conditions of Contract is deleted in its entirety.

AMENDMENT TO OPSS 1350, NOVEMBER 2016 - Greenhouse Gas Reduction Initiative

Special Provision No. 113S11 February 2019

1350.02 REFERENCES

Section 1350.02 of OPSS 1350 is amended by the addition of the following to **CSA Standards**:

A23.1 Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete

1350.03 DEFINITIONS

Section 1350.03 is amended by the addition of the following definitions:

Limestone Filler means divided limestone powder that may be used in concrete, as an aggregate, for the purpose of reducing the total amount of Portland cement used. Its use is limited to appropriate applications and exposure conditions after its suitability is determined through physical, chemical and mineralogical testing.

Portland Limestone Cement means cement obtained by intergrinding limestone with Portland cement clinker, as defined in CAN/CSA A3001.

1350.05 MATERIALS

1350.05.01 Cementing Materials

Subsection 1350.05.01 of OPSS 1350 is amended by the addition of the following to the first paragraph:

c) Portland limestone cement may be used in place of Portland cement only when the supplier of the Portland limestone cement is included in the Designated Sources for Material listing for Hydraulic Cements and Supplementary Materials. Concrete made with Portland cement and Portland limestone cement shall not be used in the same component. Portland limestone cement shall not be used in combination with limestone filler.

1350.05.02 Aggregates

Subsection 1350.05.02 of OPSS 1350 is amended by the addition of the following clause:

1350.05.02.01 Limestone Filler

Limestone filler shall comply with the following:

a) The requirements of OPSS 1002 for mineral filler with the exception that use of limestone filler is not confined to self-consolidating concrete.

b) The requirements of CSA A23.1, Annex L, L2 Organic Impurities.

c) The requirements of CSA A 3001, Clause 4.4.3 a) for calcium carbonate content.

Limestone filler shall be restricted to a maximum of 15% of the cement by mass.

1350.05.05 Concrete

Subsection 1350.05.05 of OPSS 1350 is amended by the addition of the following:

The selection of materials and design of the concrete mix shall be optimized to achieve GHG reduction of a minimum of 10% while maintaining the concrete performance requirements for the application and environment.

The 10% GHG reduction shall be obtained through the use of one or a combination of the following options:

1) Use of Portland-limestone cement.

2) Use of ground granulated blast furnace slag or fly ash to replace at least 10% of the cement content of the mix.

3) Use of limestone filler to reduce the cement content of the mix by at least 10% through enhanced particle packing, optimized aggregate gradation or other means.

1350.07 PRODUCTION

1350.07.05 Material Sampling and Testing

1350.07.05.02 Sampling of Water, Admixtures and Cementing Materials

Clause 1350.07.05.02 of OPSS 1350 is deleted in its entirety and replaced with the following:

1350.07.05.02 Sampling of Water, Admixtures, Limestone Filler and Cementing Materials

Samples of all cementing materials, admixtures, limestone filler and water (when other than municipal drinking water is used) shall be obtained according to the frequencies shown in Table 8, in the presence of the Contract Administrator, for testing by the Owner.

Samples of admixtures and water shall be protected from freezing and high temperatures. Cementing materials samples shall be protected from moisture.

Table 8 of OPSS 1350 is amended by the addition of:

a) The words "Portland Limestone Cement" to the list of Cementing Materials in the column "Material", and

b) Note 3. Minimum sampling and testing frequencies for limestone filler shall be the same as those shown for Cementing Materials.

PROTECTION OF PUBLIC TRAFFIC

Special Provision No. 100F08M June 2017

Open Excavations

The Contractor shall schedule the Work so that there will be no open excavation adjacent to a lane carrying traffic overnight and on non-Working Days except where a traffic barrier designed to restrain errant vehicles is located between the traffic and the excavation. Excavations within 4 m of lanes carrying traffic shall be backfilled with the specified material up to profile grade and compacted prior to closing down operations each day.

Location and Storage of Materials and Equipment

Materials shall not be stored within 4 m of the traveled portion of any roadway except in the medians where the minimum clearance required is 2.5 m. Equipment shall not be stored within 4 m of the traveled portion of any roadway.

Notwithstanding the foregoing, the Contractor shall, at the Contractor's expense, remove any vehicle, equipment or material which, in the opinion of the Contract Administrator, constitutes a traffic hazard or obstruction to maintenance operations.

Delivery and Trucking

The Contractor shall plan and schedule the routes of vehicles transporting all materials to, from or within the job, so that vehicular movements are accomplished with minimum interference and interruptions to traffic according to the sections entitled "Restrictions on Construction Operations" and "Permitted Times for Lane and Ramp Closures". This will necessitate vehicles to "slip-off" or "slip-on" in the direction of traffic, in order to merge with and thereby avoid crossing traffic lanes.

Access to and from the highway right-of-way will be restricted to ramps at the interchanges unless otherwise provided for in the Contract.

Median cross-overs shall not be used except where single axle vehicles are entering a passing lane that is closed to traffic.

The Contractor shall obtain the Contract Administrator's prior approval for the location of any "slip-off" or "slip-ons". The Contract Administrator reserves the right to alter, reject or close same as considered necessary. The Contractor shall notify suppliers of materials and equipment of the above requirements.

Restrictions on Construction Operations

The use of construction accesses, shoulder closures and the loading and unloading of materials and construction equipment onto and from the traveled portion of the highway shall not be carried out on days identified under the section entitled “Holiday Restrictions”, or during the following periods:

Location	**Monday or a Day Following a Holiday**	**Tuesday to Thursday Except on Days Following and Preceding Holidays**	**Friday or a Day Preceding a Holiday**	**Saturday**	**Sunday**
QEW Toronto Bound – Gilmore Rd. to Netherby Rd.	06:00 – 09:00 15:00 – 19:00	06:00 – 09:00 15:00 – 19:00	06:00 – 09:00 12:00 – 23:59	No Restrictions	No Restrictions
QEW Fort Erie Bound – Netherby Rd. to Gilmore Rd.	06:00 – 09:00 15:00 – 19:00	06:00 – 09:00 15:00 – 19:00	06:00 – 09:00 12:00 – 23:59	No Restrictions	No Restrictions
Bowen Rd. from Laur Rd. to 500 m East of the East ramp terminal	00:00 – 09:00 15:00 – 23:59	00:00 – 09:00 15:00 – 23:59	00:00 – 09:00 12:00 – 23:59	No Restrictions	No Restrictions

Holiday Restrictions

The use of construction accesses, shoulder closures, lane closures, ramp closures, and the loading and unloading of materials and construction equipment onto and from the traveled portion of the highway shall not be carried out on the following Canadian or U.S. Statutory/Civic Holidays; or when applicable, after noon on days immediately preceding a Holiday, as shown in the following tables:

Name of Holiday	Date	After Noon on the Following Date Preceding the Holiday
New Year's Day	January 01, 2019	December 31, 2018
Martin Luther King, Jr. Day	January 21, 2019	January 18, 2019
Family / President's Day	February 18, 2019	February 15, 2019
Good Friday	April 19, 2019	April 18, 2019
Easter Monday	April 22, 2019	N/A
Victoria Day	May 20, 2019	May 17, 2019
Memorial Day	May 27, 2019	May 24, 2019
Canada Day	July 01, 2019	June 28, 2019
Independence Day	July 04, 2019	July 03, 2019
Civic Holiday	August 05, 2019	August 02, 2019
Labour Day	September 02, 2019	August 30, 2019
Thanksgiving / Columbus Day	October 14, 2019	October 11, 2019
Remembrance / Veteran's Day	November 11, 2019	November 08, 2019
American Thanksgiving Day	November 28, 2019	November 27, 2019
Christmas Day	December 25, 2019	December 24, 2019
Boxing Day	December 26, 2019	N/A

Name of Holiday	Date	After Noon on the Following Date Preceding the Holiday
New Year's Day	January 01, 2020	December 31, 2019
Martin Luther King, Jr. Day	January 20, 2020	January 17, 2020
Family / President's Day	February 17, 2020	February 14, 2020
Good Friday	April 10, 2020	April 09, 2020
Easter Monday	April 13, 2020	N/A
Victoria Day	May 18, 2020	May 15, 2020
Memorial Day	May 25, 2020	May 22, 2020
Canada Day	July 01, 2020	June 30, 2020
Independence Day	July 03, 2020	July 02, 2020
Civic Holiday	August 03, 2020	July 31, 2020
Labour Day	September 07, 2020	September 04, 2020
Thanksgiving / Columbus Day	October 12, 2020	October 09, 2020
Remembrance / Veteran's Day	November 11, 2020	November 10, 2020
American Thanksgiving Day	November 26, 2020	November 25, 2020
Christmas Day	December 25, 2020	December 24, 2020
Boxing Day	December 28, 2020	N/A

Name of Holiday	Date	After Noon on the Following Date Preceding the Holiday
New Year's Day	January 01, 2021	December 31, 2020
Martin Luther King, Jr. Day	January 18, 2021	January 15, 2021
Family / President's Day	February 15, 2021	February 12, 2021
Good Friday	April 02, 2021	April 01, 2021
Easter Monday	April 05, 2021	N/A
Victoria Day	May 24, 2021	May 21, 2021
Memorial Day	May 31, 2021	May 28, 2021
Canada Day	July 01, 2021	June 30, 2021
Independence Day	July 05, 2021	July 02, 2021
Civic Holiday	August 02, 2021	July 30, 2021
Labour Day	September 06, 2021	September 03, 2021
Thanksgiving / Columbus Day	October 11, 2021	October 08, 2021
Remembrance / Veteran's Day	November 11, 2021	November 10, 2021
American Thanksgiving Day	November 25, 2021	November 24, 2021
Christmas Day	December 27, 2021	December 24, 2021
Boxing Day	December 27, 2021	N/A

Permitted Times for Lane and Ramp Closures

Lane closures and ramp closures for construction will only be allowed during the following times, subject to the additional restrictions covered under the section entitled "Holiday Restrictions":

Lane Closures

Section Description: QEW Toronto Bound – Gilmore Rd. to Netherby Rd. (Two lanes)

Closure	Monday or a Day Following a Holiday	Tuesday to Thursday Except on Days Following and Preceding Holidays	Friday or a Day Preceding a Holiday	Saturday	Sunday
One Lane Closure*	00:00 - 24:00	00:00 - 24:00	00:00 - 24:00	00:00 - 24:00	00:00 - 24:00
Two Lane or Full Closure	Not Permitted	Not Permitted	Not Permitted	Not Permitted	Not Permitted

Section Description: QEW Fort Erie Bound – Netherby Rd. to Gilmore Rd. (Two lanes)

Closure	Monday or a Day Following a Holiday	Tuesday to Thursday Except on Days Following and Preceding Holidays	Friday or a Day Preceding a Holiday	Saturday	Sunday
One Lane Closure*	00:00 - 24:00	00:00 - 24:00	00:00 - 24:00	00:00 - 24:00	00:00 - 24:00
Two Lane or Full Closure	Not Permitted	Not Permitted	Not Permitted	Not Permitted	Not Permitted

*SB restrict one lane closure to Stage 1B

*NB restrict one lane closure to Stage 2B and Stage 3

Full mainline closures will be permitted for installation of overhead sign structures, bridge girders, hydro wire installations/modifications and removal of concrete panels during bridge demolition by saw cutting methods only. The installation over the traveled portion of the highway will require the stoppage of traffic across the full width of the affected set of traffic lanes as well as the closure of the adjacent lane on the other side of the median where applicable.

Closure of a full set of lanes shall only be carried out as follows:

- Ontario Provincial Police must be employed to perform the full closures;
- The closure shall take place between the hours of 00:00 and 05:00
- The duration of nightly closures is restricted to fifteen (15) minutes per any 1 hour period or until the end of the traffic queue passes.

Section Description: Bowen Rd. from Laur Rd. to 500 m East of the East ramp terminal (One lane each direction)

Closure	**Monday or a Day Following a Holiday**	**Tuesday to Thursday Except on Days Following and Preceding Holidays**	**Friday or a Day Preceding a Holiday**	**Saturday**	**Sunday**
One Lane Closure	09:00 – 15:00	09:00 – 15:00	09:00 – 15:00	0:00 – 24:00	0:00 – 24:00

Ramp Closures

Ramp Description: QEW Fort Erie Bound Off-ramp to Bowen Road (N-E/W Ramp)

Closure	**Monday or a Day Following a Holiday**	**Tuesday to Thursday Except on Days Following and Preceding Holidays**	**Friday or a Day Preceding a Holiday**	**Saturday**	**Sunday**
Full Closure	00:00 – 06:00 20:00 – 24:00	00:00 – 06:00 20:00 – 24:00	00:00 – 06:00 20:00 – 24:00	00:00 – 08:00 20:00 – 24:00	00:00 – 08:00 20:00 – 24:00
Full Closure (Stage 1B only)	00:00 – 24:00	00:00 – 24:00	00:00 – 24:00	00:00 – 24:00	00:00 – 24:00

Ramp Description: QEW Toronto Bound Off-ramp to Bowen Road (S-E/W Ramp)

Closure	Monday or a Day Following a Holiday	Tuesday to Thursday Except on Days Following and Preceding Holidays	Friday or a Day Preceding a Holiday	Saturday	Sunday
Full Closure	00:00 – 06:00 20:00 – 24:00	00:00 – 06:00 20:00 – 24:00	00:00 – 06:00 20:00 – 24:00	00:00 – 08:00 20:00 – 24:00	00:00 – 08:00 20:00 – 24:00
Full Closure (Stage 3 only)	00:00 – 24:00	00:00 – 24:00	00:00 – 24:00	00:00 – 24:00	00:00 – 24:00

Ramp description: Bowen Road On-ramp to QEW Toronto Bound (E/W-N Ramp)

Closure	Monday or a Day Following a Holiday	Tuesday to Thursday Except on Days Following and Preceding Holidays	Friday or a Day Preceding a Holiday	Saturday	Sunday
Full Closure	00:00 – 06:00 20:00 – 24:00	00:00 – 06:00 20:00 – 24:00	00:00 – 06:00 20:00 – 24:00	00:00 – 08:00 20:00 – 24:00	00:00 – 08:00 20:00 – 24:00
Full Closure (Stage 3 only)	00:00 – 24:00	00:00 – 24:00	00:00 – 24:00	00:00 – 24:00	00:00 – 24:00

Ramp description: Gilmore Road On-ramp to QEW Toronto Bound (W-N Ramp)

Closure	Monday or a Day Following a Holiday	Tuesday to Thursday Except on Days Following and Preceding Holidays	Friday or a Day Preceding a Holiday	Saturday	Sunday
Full Closure *	00:00 – 06:00 20:00 – 24:00	00:00 – 06:00 20:00 – 24:00	00:00 – 06:00 20:00 – 24:00	00:00 – 08:00 20:00 – 24:00	00:00 – 08:00 20:00 – 24:00

Ramp description: Gilmore Road On-ramp to QEW Fort Erie Bound (W-S Ramp)

Closure	Monday or a Day Following a Holiday	Tuesday to Thursday Except on Days Following and Preceding Holidays	Friday or a Day Preceding a Holiday	Saturday	Sunday
Full Closure *	00:00 – 06:00 20:00 – 24:00	00:00 – 06:00 20:00 – 24:00	00:00 – 06:00 20:00 – 24:00	00:00 – 08:00 20:00 – 24:00	00:00 – 08:00 20:00 – 24:00

*Contractor shall be allowed a maximum of five full closures to address construction and removal of construction access areas.

Penalty for Early Closing

On each occasion when the Contractor closes lanes to traffic earlier than the specified times, the Contract Administrator will assess the Contractor an initial penalty of $ 1,000.00.

Thereafter, a further penalty of $ 100.00 per minute will be assessed against the Contractor for every minute outside the permitted closure window that the traffic lanes are not open to traffic. The Contract Administrator will be the sole judge of the length of time of the delay.

Penalty for Late Opening

On each occasion when the Contractor fails to reopen the traffic lanes by the specified time, the Contract Administrator will assess the Contractor an initial penalty of $ 1000.00.

If traffic lanes are not open within 15 minutes of the specified time, a further penalty of $ 1000.00 will be assessed against the Contractor.

Thereafter, a further penalty of $ 100.00 per minute will be assessed against the Contractor for every minute that the traffic lanes are not open to traffic. The Contract Administrator will be the sole judge of the length of time of the delay.

Closure Notification

Prior to the Contractor closing lanes and/or shoulders, the Contractor shall:

1. Inform the Contract Administrator of any closure, 1 week prior to the start date of the closure.

2. Inform the Contract Administrator of any closure lasting more than one week, at least 2 weeks prior to the start date of the closure.

3. Inform the Contract Administrator of emergency closures as soon as any details are known.

4. Obtain a Closure Notification Number from the Contract Administrator for each closure.

5. Inform the Contract Administrator of any closure that is being canceled subsequent to 1. and 2. above.

6. Notify the MTO Central Region Road Work Scheduling and Coordination Unit (RWSCU) by web (www.mtorss.ca) with a completed Closure & Right-of-Way Usage Notification at least two full business days prior to the start date of the closure. The successful bidder should log on to www.mtorss.ca at the start of the contract to obtain a valid User ID set-up the contract information. A User ID and contract information are required before any web notifications can be submitted. Please refer to the Central Region Closure and Right-of-Way Protocol for more details.

7. Notify the Roadwork Scheduling and Coordination Unit (RWSCU) of any closure that is being cancelled.

8. Notify the MTO Compass Operations Centre by phone (416-327-8373) immediately prior to the set-up of any closure stating the Closure Notification Number and details of the closure.

9. Notify the MTO Compass Operations Centre immediately of any changes to the closure or anticipated problems that may delay the opening time, stating the Closure Notification Number and details of the changes to and/or problems with the closure.

10. Notify the MTO Compass Operations Centre immediately upon removing the closure stating the Closure Notification Number and details of the closure.

Lane Closures and Speed Control by OPP Officers (Paid Duty)

In addition to the requirements listed in the Ontario Traffic Manual (OTM) Book 7, Temporary Conditions; the Contractor has the option to use O.P.P assisted lane closures and speed control activities in order to execute the work.

However, for the following operations it is mandatory to use O.P.P assisted lane closures and speed control activities:

N/A

Basis of Payment

Section 706.10.02 of OPSS 706 is amended by the addition of the following

All costs associated with all O.P.P assisted lane closures and speed control activities as described above is deemed to be included in the Temporary Traffic Control Signs item and no additional payment will be made. If an authorized third party stipulates that additional OPP-assisted lane closures or speed control activities are required, the Owner will compensate the Contractor for the cost of the OPP services as a Change in the Work.

AMENDMENT TO MTO GENERAL CONDITIONS OF CONTRACT, NOVEMBER 2016 - Indemnification and Insurance Requirements Concerning the Canadian Pacific Railway Company

Special Provision No. 100F21 August 2018

Subsection GC 6.01, Protection of Work, Persons, and Property of the MTO General Conditions of Contract is amended by the addition of the following paragraph:

.06 For the purpose of subsection GC 6.02, Indemnification, and GC 6.03, Contractor's Insurance, the following definitions apply:

Affiliate means as defined in the Canada Business Corporations Act, as amended, and replaced from time to time or in any statute or statutes passed in substitution therefor.

Canadian Pacific Operational Special Provision means the Special Provision incorporated by the Contract Documents related to the means and methods by which the Contractor is to perform the Work on the Railway Lands.

CP means Canadian Pacific Railway Company.

CP Indemnified Group means the Canadian Pacific Railway Company, its Affiliates, officers, directors, employees and agents.

Losses means any and all claims, suits, demands, awards, actions, proceedings, losses, costs, damages, expenses, charges (including all penalties, loss of profit, loss of income or consequential losses) which a person suffers, sustains, pays or incurs and includes reasonable costs of legal counsel (on a solicitor client basis) and other professional advisors and consultants incurred in connection therewith.

Personnel means the servants, employees and agents of the Contractor and all individual persons engaged or retained by the Contractor, whether directly or indirectly, in connection with the Contract, including its subcontractors.

Railway Lands means the portion of the lands owned by the Canadian Pacific Railway Company shown in the Contract Documents, and includes all improvements, railway lines and structures situated thereon.

GC 6.02 Indemnification

Subsection GC 6.02 of the MTO General Conditions of Contract is amended by the addition of the following:

.06 Notwithstanding GC 6.02.01 and GC6.02.03, the Road Authority agrees to indemnify and hold harmless CP, its Affiliates, officers, directors, employees and agents (the CP Indemnified Group) from and against any and all Losses suffered or incurred by the CP Indemnified Group to the extent that such arise out of, result from, are based upon or are in any way connected with:

a) the Road Authority's breach of its obligations under this Agreement, including for certainty, anything required to be done or maintained by the Road Authority hereunder or anything not done or maintained by the Road Authority as required hereunder;

b) any negligent acts or omissions or wilful misconduct by any Personnel (including, for certainty, the Contractor); and

c) the Road Authority’s breach of the timing or conditions of any Track Block approved by CP with respect to the Construction Project.

.07 The Road Authority shall make no claim or demand against the CP Indemnified Group for any Losses, injury (including death), or damage to property suffered or sustained by the Road Authority, Personnel or any other Person which arises out of or is connected with:

a) this agreement;

b) the Construction Project;

c) anything required to be done or maintained thereunder; or

d) anything not done or maintained as required thereunder;

and hereby waives as against the CP Indemnified Group all such claims and demands.

.08 Without limiting the generality of the foregoing, the Road Authority shall indemnify and save harmless CP from and against any Losses which CP may suffer or incur resulting from inadequate or faulty construction of the Construction Project.

.09 If the Road Authority's Work pursuant to this Agreement is disrupted or delayed at any time for any cause, including the occurrence of an event of force majeure, expiration of a Track Block, or maintenance required by CP, the Road Authority shall not have a claim against the CP Indemnified Group for any Losses resulting from any such interruption or delay, and Road Authority hereby waives and releases the CP Indemnified Group from any such claim.

.10 The provisions of subsection 6.02 shall survive the contract completion or termination of the Contract.

GC 6.03 Contractor's Insurance

Subsection GC 6.03 of the MTO General Conditions of Contract is deleted in its entirety and replaced by the following:

.01 The Road Authority shall at its sole cost and expense, obtain and maintain (or cause to be obtained and maintained by the Contractor) during the term of this Agreement, and any extension hereof, with an insurer licensed under the Insurance Act (Ontario), the following policies of insurance:

a) *"Wrap-Up" Commercial General Liability* insurance covering the owner(s) and their agents, contractors and sub-contractors who perform work at the Project Site and including architects and engineers (but not for professional liability) with a limit of not less than [fifty million dollars ($50,000,000) – coverage amount will be on a case-by-case basis] for any one loss or occurrence for personal injury, bodily injury, or damage to property including loss of use thereof arising out of the Construction Project. This insurance policy shall by its wording or by endorsement include but not be limited to the following:

i. the CP Indemnified Group as additional insured;
ii. "cross liability" or "severability of interest" clause which shall have the effect of insuring each entity named in the policy as an insured in the same manner and to the same extent as if a separate policy had been issued to each;
iii. blanket contractual liability;
iv. broad form products and completed operations, not less than twenty-four (24) months completed operations coverage;
v. shall not exclude operations on or in the vicinity of the railway right-of-way, if applicable;
vi. non-owned auto liability;
vii. employer's liability;
viii. broad form property damage;
ix. owner's and contractor's protective liability;
x. employees as additional insured;
xi. property damage due to explosion, collapse and underground property damage; and
xii. sudden and accidental pollution liability.

b) *Automobile Liability* insurance covering bodily injury and property damage in an amount not less than five million dollars ($5,000,000) per accident, covering the ownership, use and operation of any motor vehicles and trailers which are owned, leased or controlled by the Road Authority and used in regards to this Agreement. The Contractor and its subcontractors shall independently maintain automobile liability insurance covering bodily injury and property damage in an amount not less than five million dollars ($5,000,000) per accident, covering the ownership, use and operation of any motor vehicles and trailers which are owned, leased or controlled by the Contractor and/or its subcontractors and used in connection with the Construction Project.

c) *Contractor's Pollution Liability* insurance, including naming the CP Indemnified Group as an additional insured, with a limit of not less than five million dollars ($5,000,000) for any one loss or pollution event. Coverage shall include, but not be limited to, claims for bodily injury, death, damage to property including the loss of use thereof, clean-up costs and associated legal defense expenses arising from pollution conditions caused by, and/or exacerbated by, work performed by the Road Authority and/or contractor. The policy shall be endorsed to contain a blanket contractual liability endorsement. If this policy is written on a "claims-made" basis it shall remain in effect for no less than twelve (12) months after the expiry or termination of this Agreement.

.02 For operations not covered by the "Wrap-Up" Commercial General Liability insurance set forth, the Contractor shall obtain and maintain until Contract Completion, a Commercial General Liability (CGL) policy with a limit of not less than ten million dollars ($10,000,000) for any one loss or occurrence for personal injury, bodily injury, or damage to property including loss of use thereof. This policy shall by its wording or by endorsement include but not be limited to the following:

i. the CP Indemnified Group as an additional insured with respect to obligations of the Contractor under this Agreement and incidental thereto;
ii. “cross liability” or “severability of interest” clause which shall have the effect of insuring each entity named in the policy as an insured in the same manner and to the same extent as if a separate policy had been issued to each;
iii. blanket contractual liability, including the insurable liabilities assumed by the Contractor under this Agreement;
iv. products and completed operations;
v. shall not exclude operations on or in the vicinity of the railway right of way;
vi. non-owned auto liability;
vii. sudden and accidental pollution liability; and
viii. employer’s liability, if applicable.

.03 The Road Authority shall ensure that it and the Contractor comply with the Workplace Safety and Insurance Act, 1997 (Ontario), as amended and replaced from time to time or any statute or statutes passed in substitution therefor, together with all regulations made from time to time under such act. Upon request, the Road Authority will provide CP with written confirmation from the Ontario Workplace Safety and Insurance Board that the Contractor is registered under and in compliance with the requirements of the Workplace Safety and Insurance Act, 1997 (Ontario), as amended and replaced from time to time or any statute or statutes passed in substitution therefor, together with all regulations made from time to time under such act.

.04 Concurrently with execution and delivery of this Agreement by the Road Authority, the Road Authority provides CP with a copy of certificates of insurance evidencing the above insurance to the satisfaction of CP acting reasonably. CP may at its option require the Road Authority to annually provide CP with a copy of updated certificates of insurance evidencing the renewal of the above insurance. CP shall have no obligation to examine such certificates or to advise the Road Authority in the event its insurance is not in compliance herewith. Acceptance of such certificates which are not compliant with the stipulated coverage shall in no way whatsoever imply that CP has waived the insurance requirements of the Road Authority.

.05 The Road Authority agrees that the insurance coverage required to be obtained and maintained by it under the provisions of this Agreement shall not limit or restrict its liabilities under this Agreement.

.06 Unless otherwise provided above, all insurance coverage shall take place in the form of an occurrence basis policy and not a claims made policy.

.07 The Road Authority agrees that the insurance coverage is primary and not excess of any other insurance that may be available.

.08 The Road Authority shall provide CP with written notice and all reasonable particulars and documents related to any damages, losses, incidents, claims and potential claims concerning this Agreement as soon as practicable after the damage, loss, incident or claim has been discovered.

.09 The insurance policies shall be endorsed to provide CP with not less than thirty (30) days' written notice in advance of cancellation, material change or amendments restricting coverage (with the exception of the automobile policies). Such notice shall be sent to:

Canadian Pacific Railway Company
7550 Ogden Dale Road SE
Calgary, AB, T2C 4X9
Attention: Director of Risk Management

.10 If at any time the Road Authority fails to obtain and maintain (or cause to be obtained and maintained by the Contractor) any of the insurance required under this Agreement, on notice from CP the Road Authority and the Contractor shall immediately stop all activities on the Railway Lands (including the Road Authority Work) and neither the Road Authority nor the Contractor shall access (whether directly or indirectly) the Railway Lands until each has received written approval from CP.

AMENDMENT TO MTO GENERAL CONDITIONS OF CONTRACT, NOVEMBER 2016 - Indemnification and Insurance Requirements Concerning the Canadian National Railway Company

Special Provision No. 100S22 November 2016

GC 6.02 Indemnification

Subsection GC 6.02 of the MTO General Conditions of Contract is amended by adding the following additional specific indemnification from the Contractor with respect to the Work on the Canadian National Railway Company railway right-of-way:

GC 6.02.01 Indemnification Requirements Concerning the Canadian National Railway Company

Company shall indemnify and hold harmless Railroad from any losses, liens, damages, liability, and expenses ("Damages") incurred by Railroad arising from Company's, or its employees, agents, contractors or sub-contractors', breach of its obligations or warranties under this Right of Entry; any third party claims associated with or arising under this Right of Entry; or Company's access to Railroad's or Railroad's affiliates' premises. In the event that Railroad has incurred Damages, Railroad shall notify Company and Company shall indemnify Railroad for the Damages and defend and hold harmless Railroad against any third party legal claims associated with the Damages. No third party claim may be settled without the consent of Railroad, which consent shall not be unreasonably withheld.

GC 6.03 Contractor's Insurance

Company, its contractors or any sub-contractors shall each provide and keep in force and effect throughout the term of this Right of Entry such insurance, in amounts and for risks as Railroad may prescribe from time to time including, if applicable, the kinds and minimum amounts of insurance set out under Schedule "C" – "General requirements".

If Company, its contractors or any sub-contractors shall perform sub-surface work, Company, its contractors or any sub-contractors shall also provide and keep in force and effect throughout the term of this Right of Entry the additional insurance specified under Schedule "C" – "Sub-Contractor Insurance Coverage".

The Company, its contractors or any sub-contractors will not enter Railroad property without having obtained a certificate certifying that they have obtained all of the insurance coverage required hereunder. The Railroad may at any time require the Company to furnish said certificate and failure to so may result in removal from Railroad property, cancellation of agreement and other consequences including without limiting damages or consequential losses resulting from the non-completion of the work, as Railroad may determine. Said insurance shall state that no material changes will be made to the policies unless Railroad is given a prior written notice of thirty (30) days before such change or cancellation. Any insurance coverage required under the terms and conditions of this contract shall in no manner restrict or limit the liabilities assumed by Company nor shall they release Company from any of its obligations under this contract.

Subsection GC 6.03 of the MTO General Conditions of Contract is amended by the addition of the following:

GC 6.03.08 Insurance Requirements Concerning Canadian National Railway Company

General Requirements

To the extent Company carries out work on its behalf or on behalf of Railroad, the Contractors or the Sub-contractors shall, throughout the term of this Right of Entry agreement, maintain in force the following coverage. The insurance limits may be met by a combination of primary and umbrella insurance policies.

.01 **Commercial General Liability Insurance -** occurrence based - in an amount no less than **$10,000,000** per occurrence, or such greater amount as Railroad may from time to time reasonably require, covering liability for bodily injury, including death, property damage or destruction of property (including loss of use), contingent employers liability, sudden and accidental pollution, product and completed operations, broad form property damage, non-owned automobile, blanket contractual liability, and unlicensed vehicles on and off premises owned or controlled by the owner.

Company shall provide to Railroad a certificate of insurance evidencing the above and include:
a) a waiver of subrogation in favour of CN and its subsidiaries;
b) name CN and its subsidiaries as additional insured;
c) contain a cross liability and severability of interest clause;
d) specifically include liability for operations within or around railroads and railway tracks;
e) contain a clause stating that CN's interests will not be prejudiced in the event the First named insured breaches any warranty of the policy;
f) provide 30 days written notice of cancellation, modification or material change in coverage.

.02 **Automobile Liability Insurance** on all licensed vehicles owned, hired, leased to or operated by or on behalf of the Company's contractor in the amount of not less than **$5,000,000** per occurrence. The certificate of insurance must include a waiver of subrogation in favour of CN and its subsidiaries.

.03 **Workers' Compensation -** if available in the jurisdiction(s) covered by this Agreement, Company must be compliant with statutory Worker's Compensation and hold the relevant clearance letter(s). Otherwise, Company must provide Employer's Liability Insurance in an amount no less than **$5,000,000.**

.04 **Professional Liability Insurance/Errors and Omissions** (incl. Pollution Liability) with a limit of no less than **$5,000,000.**

.05 **All Risks Contractor's Equipment Insurance** covering construction machinery and equipment used by the Contractor and Sub-Contractors for the performance of the Work, as any structures being built or assembled, shall be in a form acceptable to the Contractor and Railroad and shall not allow subrogation claims by the Insurers against the Contractor and Railroad. The policy shall be endorsed to provide the Contractor with no less than 30 days written notice in advance of cancellation, change or amendment restricting coverage.

.06 **Project Wrap-Up Liability Insurance** subject to limits of not less than **$25,000,000** per occurrence. Such insurance shall be in the joint names of the owner and contractor and name as additional insures all subcontractors and consultants. The Wrap-Up Liability insurance shall include, but is not limited to: bodily injury including death and property damage including loss of use; personal injury; contractual liability; premises and operations; products and completed operations liability coverage extension of twenty-four (24) months; contingent employers liability; shoring, blasting, excavation, underpinning, demolition, pile driving, caisson work and work below ground surface including tunnelling and grading; non-owned automobile; limited pollution coverage (Insurance Bureau of Canada Form 2313); non-cancellable or at least 120 days notice of cancellation, contingent medical malpractice; and fire fighting expense. This insurance policy shall be the primary insurance coverage in all cases for all risks of liability associated with the operations of this project. The policy shall be in force from commencement of work until substantial completion and include coverage for unfinished construction, maintenance and repair for a period of 12 months following substantial completion.

OCCUPATIONAL HEALTH AND SAFETY ACT COMPLIANCE

Special Provision No. 101F21 November 2014

List of Designated Substances

In accordance with the *Occupational Health and Safety Act, R.S.O. 1990, c. 0.1*, the Contractor is advised of the presence of the following Designated Substance(s):

Substance	Location
Arsenic	None Identified.
Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05)	Asbestos was identified in the Bridge Barrier Insulation of Bridge No. 34-129/1. For any future work, asbestos must be assumed to be present in the Waterproofing Membrane and the work shall be performed as though asbestos is present. Reference report "Designated Substances Survey- Replacement of Twin Structures over CN and CP Rails and Rehabilitation of Two Structural Culverts and One Non-Structural Culvert" dated November 2018.

Substance	Location
Lead	Lead was identified in the grey paint along the eastbound underside of QEW Bertie CNR/CPR Overhead bridge along QEW. Reference report "Designated Substances Survey- Replacement of Twin Structures over CN and CP Rails and Rehabilitation of Two Structural Culverts and One Non-Structural Culvert" dated November 2018.
Silica	Assume present in concrete components. Reference report "Designated Substances Survey- Replacement of Twin Structures over CN and CP Rails and Rehabilitation of Two Structural Culverts and One Non-Structural Culvert" dated November 2018.
Benzene	None Identified.
Vinyl Chloride, Coke Oven Emissions, Ethylene Oxide, Acrylonitrile and Isocyanates	None Identified.
Mercury	None Identified.

AMENDMENT TO OPSS 182, APRIL 2017

Special Provision No. 101F23 April 2017

Timing of In-Water Works, Oversight Requirements, and Measures to Avoid Harm to Fish

182.07.08.01 Timing of In-Water Works

Clause 182.07.08.01 of OPSS 182 is amended by deleting the first paragraph in its entirety and replacing it with the following:

In-water work where fish and/or fish habitat are present is permitted during times specified in Table A for each waterbody and station listed.

Table A
Timing of In-Water Work

Waterbody	Station	Timing Window For When In-Water Work Can Occur
Frenchman's Creek Culvert Site 34-455/C	n/a	July 2 - February 28
Frenchman's Creek Culvert Site 34-454/C	n/a	July 2 - February 28

182.07.08 Fish Protection

Subsection 182.07.08 of OPSS 182 is amended by the addition of the following clause:

182.07.08.06 Additional Measures to Avoid Harm to Fish

Measures listed in Table C shall be implemented at the specified locations.

Table C
Additional Measures to Avoid Harm to Fish

Waterbody	Type of Work	Additional Measures to Avoid Harm
Frenchman's Creek Culvert Site 34-455/C Frenchman's Creek Culvert Site 34-454/C	Culvert Rehabilitation	▪ Operational constraints and protection measures in Best Management Practices for Culvert Maintenance (Although Site 30-522/C is not eligible to use this BMP, the measures within the BMP still apply): o The operational constraints and protection measures for these MTO BMPs can be found on the MTO web site at: BMP Manual for Fisheries: http://www.raqsb.mto.gov.on.ca/techpubs/eps.nsf/0/b525316c99611b5e85257e7a006ace4e/$FILE/MTO%20BMP_Manual_2016_ACC%20Ver%202.2%20Final.pdf Design and implement an in-water work area isolation plan to maintain clean flow around the work area. The design should: o Use only clean materials free of particulate matter for temporary coffer dams; o Manage flow withdrawal and discharge to prevent erosion and the release of sediment to a waterbody; and, o Ensure work zones are stabilized against high flows at the end of each work day Isolated in-water work areas must be cleared of fish prior to commencement of work. Fish must be released unharmed downstream. Intakes of pumps and hoses for de-watering of in-water work areas must be screened to avoid entrainment of fish. Herbicide should not be used within 30 m of watercourse. The application of fertilizer should be avoided within 30 m of a watercourse. When the use of fertilizer is necessary, it shall be in a form and analysis ratio as specified in OPSS 803 and shall be applied as per OPSS 803.

AMENDMENT TO OPSS 313, NOVEMBER 2016

Special Provision No. 103F03 October 2018

OPSS 313, November 2016, Construction Specification for Hot Mix Asphalt - End Result, is deleted in its entirety and replaced with the following:

313.01 SCOPE

This specification covers the requirements for the placement, compaction, and acceptance of hot mix asphalt (HMA).

This specification also covers the requirements for the placement, compaction, and acceptance of HMA produced using warm mix asphalt (WMA) technology when the item title includes "Warm Mix".

313.02 REFERENCES

This specification refers to the following standards, specifications, or publications:

Ontario Provincial Standard Specifications, Construction

OPSS 308 Tack Coat

Ontario Provincial Standard Specifications, Material

OPSS 1101 Performance Graded Asphalt Cement
OPSS 1151 Superpave and Stone Mastic Asphalt Mixtures

Ontario Ministry of Transportation Publications

MTO Laboratory Testing Manual
LS-100 Rounding-Off of Test Data and Other Numbers
LS-101 Calculation of Per Cent within Limits
LS-262 Bulk Relative Density of Compacted Bituminous Mixtures
LS-264 Theoretical Maximum Relative Density of Bituminous Paving Mixtures
LS-265 Determination of Percent Air Voids in Compacted Dense Bituminous Pavement Mixtures
LS-266 Determination of VMA in Compacted Bituminous Mixtures
LS-282 Quantitative Extraction of Asphalt Cement and Analysis of Extracted Aggregate from Bituminous Paving Mixtures
LS-291 Quantitative Extraction of Asphalt Cement and Mechanical Analysis of Extracted Aggregate from Bituminous Paving Mixtures - Ontario Procedure
LS-292 Quantitative Determination of Asphalt Cement Content by Ignition and Analysis of Remaining Aggregate from Bituminous Paving Mixtures
LS-294 Measuring Pavement Lift Thickness
LS-306 Bulk Relative Density of Compacted Bituminous Mixtures Using Paraffin Coated Specimens
LS-317 Determination of the Severity of a Segregated Asphalt Pavement Surface
LS-604 Relative Density and Absorption of Coarse Aggregate
LS-605 Relative Density and Absorption of Fine Aggregate

ASTM International

D 6752-11 Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method
E 178-16 Standard Practice for Dealing with Outlying Observations

American Association of State Highway and Transportation Officials (AASHTO)

M 320-17 Standard Specification for Performance Graded Asphalt Binder
R 35-17 Superpave Volumetric Design for Hot - Mix Asphalt
T 166-16 Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens
T 283-14 Standard Method of Test for Resistance of Compacted Asphalt Mixtures to Moisture-Induced Damage
T 305-14 Determination of Draindown Characteristics in Uncompacted Asphalt Mixtures
T 312-15 Standard Method of Test for Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor

313.03 DEFINITIONS

For the purpose of this specification, the following definitions apply:

Ambient Air Temperature means the air temperature measured in the shade and away from the paving operations.

Anti-Stripping Treatment (AST) means a treatment used to minimize stripping of asphalt cement from HMA aggregates as defined in OPSS 1151.

Asphalt Cement (AC) means asphalt binder as defined in OPSS 1101.

Attribute means one of the following properties: designated large sieve (DLS), 4.75 mm sieve, 75 µm sieve, AC content, air voids, lift thickness, VMA, draindown, or compaction.

Binder Course means a HMA course between a surface course and either a granular base course or stabilized base course, an existing pavement, or another HMA binder course.

Crack means a break in the pavement surface, a separation of the pavement or aggregates at the surface of the pavement, and separation of pavement joints, and includes breaks and separations previously repaired by sealing.

Design Lift Thickness (T_D) means the thickness in millimetres as specified in the Contract Documents of:
a) A specified lift of asphalt mix measured by square metres, or
b) For multiple binder course lifts of the same mix type, it means the combined specified thicknesses in millimetres of the successive binder course lifts of the same mix type, at the same location measured by square metres.

Designated Large Sieve (DLS) means a sieve size specifically designated for each mix type for gradation testing. The designated sieve for the following mix types is:
a) 25.0 mm for Superpave 37.5;
b) 19.0 mm for Superpave 25.0;
c) 12.5 mm for SMA 19.0 and Superpave 19.0;

d) 9.5 mm for SMA 12.5 and Superpave 12.5, 12.5FC 1 and 12.5FC 2; and
e) 4.75 mm for SMA 9.5 and Superpave 9.5.

Draindown means that portion of SMA mixture, fines and AC, that separates and flows downwards through the mixture.

Fat Spot means an area of pavement where asphalt mastic has migrated to the surface creating a substantially blacker area than the surrounding pavement.

Field Adjustment to the JMF means a change in the target gradation, AC content, or both of a mix, within limits as specified in the Contract Documents without a redesign of the HMA, resulting in an adjusted JMF.

Hot Mix Asphalt (HMA) means hot mixed, hot laid asphaltic concrete and includes mix produced using WMA technologies. HMA may include recycled or specialty mixes.

Hot Mix Asphalt Miscellaneous means HMA that is placed in areas other than the roadway as specified in the Contract Documents.

Job Mix Formula (JMF) means the percentage passing on each designated sieve of the total mass of aggregate and the amount of AC as a percentage by mass of the mixture that are based on mix design procedures as specified in the Contract Documents.

Joint means a vertical contact between a HMA pavement course and any HMA pavement or any rigid object that exists at the time the HMA is laid.

Levelling Course means a HMA course of variable thickness used for correcting crossfall and profile deficiencies in the existing pavement prior to placing an HMA binder or surface course. Levelling course may also be referred to as a padding course.

Lift Thickness means the thickness in millimetres of: a) A single lift of asphalt mix measured by square metres, or b) For multiple binder course lifts of the same mix type, it means the combined thickness of all placed and compacted successive binder course lifts of the same mix type, at the same location measured by square metres.

Loose Mix means a representative sample of uncompacted HMA for testing mix properties.

Lot means a specific quantity of Material or a specific amount of construction.

Mean means the arithmetic average of the test results within a lot.

Mid-Lane Segregation means a continuous or discontinuous longitudinal “streak” of segregation, typically no greater than 300 mm in width located anywhere across the width of the lane.

Mix Properties means the AC content, gradation, air voids, and VMA.

Other Segregation means discrete areas or patches of regular, irregular, or chevron shape segregation.

Outlier means a test result that for a specific significance level is determined by statistical analysis not to be part of the test result population.

Padding means a HMA layer used to eliminate transverse and longitudinal irregularities on an existing surface before placing the binder or surface course.

Paving in Echelon means two or more pavers are used to pave multiple adjacent lanes simultaneously.

Payment Adjustment Sieves means the DLS, 4.75 mm, and 75 µm gradation sieves.

Per Cent within Limits (PWL) means an estimate of the percentage of the lot that is within specification limits, determined by using the mean and standard deviation of the lot.

Performance Graded Asphalt Cement (PGAC) means an asphalt binder that is produced from petroleum residue, either with or without the addition of non-particulate modifiers, according to AASHTO M 320.

Quality Assurance (QA) means a system or series of activities carried out by the Owner to ensure that Materials received from the Contractor meet the requirements as specified in the Contract Documents.

Quality Control (QC) means a system or series of activities carried out by the Contractor to ensure that Materials supplied to the Owner meet the requirements as specified in the Contract Documents.

Random Sample means a sample from a location chosen by the Contract Administrator based on random numbers such that any portion of a lot or sublot has an equal probability of being selected.

Reclaimed Asphalt Pavement (RAP) means the processed HMA material that is recovered by partial or full depth removal.

Roof Shingle Tabs (RST) means ground roof shingle scrap generated when new shingles are trimmed during production.

Segregation means a condition of the pavement characterized by areas with comparatively coarser or finer texture than that of the surrounding pavement, with severity levels:

a) Slight Segregation - a pavement matrix is in place between the coarse aggregate particles; however, there are slightly more, coarse aggregate particles in comparison with the surrounding acceptable mix.
b) Medium Segregation - the pavement has significantly more, coarse aggregate particles than the surrounding acceptable mat and usually exhibits some lack of surface matrix.
c) Severe Segregation - the pavement appears very coarse, with coarse aggregate particle against coarse aggregate particle and the pavement has little or no matrix.

Standard Deviation means the square root of the value determined by summing the squares of the difference between each test result and the mean of the test results divided by the number of test results minus one.

Stone Mastic Asphalt (SMA) means HMA consisting of a gap graded, stone-on-stone coarse aggregate skeleton with an asphalt cement-rich mortar.

SMA Mixes means SMA 9.5, SMA 12.5, and SMA 19.0.

Straight Edge means a straight edge made of metal with a level recessed in its upper surface parallel to the lower edge.

Superpave means a system for specifying material components and asphalt mix design using the Superpave gyratory compactor. It is an acronym for Superior Performing Asphalt Pavements.

Surface Course means the HMA wearing course of any flexible or composite pavement.

Through Lane means a traffic lane not intended for entering or exiting the roadway and does not include shoulders. Where there is more than one roadway, through lane refers to the traffic lane for the higher-class roadway.

Vertical Surface means all edges of concrete curbs, catch basins, appurtenances, longitudinal joints, and transverse joints for application of joint painting material.

Voids means air voids and voids in mineral aggregate (VMA).

Warm Mix Asphalt (WMA) means warm mixed, warm laid asphaltic concrete produced using technologies that allow for the mixing, handling and compaction of the asphaltic concrete mixture at a temperature typically 20 to 50 °C lower than conventional HMA.

313.04 DESIGN AND SUBMISSION REQUIREMENTS

313.04.01 Submission Requirements

Prior to the start of paving, the purchase price of the AC, in the form of a purchase order or other document signed by the Contractor's senior financial officer, shall be submitted to the Contract Administrator.

If the Contractor intends to store hot mix production in a silo, the planned times of hot mix production shall be provided to the Contract Administrator with 1 Business Day advance notice.

Prior to the start of paving on bridge decks, the mass of the rollers, except for Class V rollers, to be used on bridge decks, shall be submitted to the Contract Administrator in writing. The minimum compaction temperature for HMA or WMA recommended by the AC supplier shall also be submitted to the Contract Administrator in writing.

A copy of the Technical Data Sheet and Safety Data Sheet of the release agent(s) shall be submitted to the Contract Administrator.

313.05 MATERIALS

313.05.01 Hot Mix Asphalt

HMA shall be according to OPSS 1151. Asphalt cement, tack coat, anti-stripping treatments, release agents, and other additives shall be compatible with the other components of the hot mix asphalt.

313.05.02 Tack Coat

Tack coat shall be according to OPSS 308.

313.05.03 Release Agents

No release agents shall be used that may adversely affect the quality or performance of the HMA. Release agents shall be used according to the proprietary requirements.

Petroleum based release agents, excess water, or excess release agents shall not be used.

313.05.04 Warm Mix Asphalt

WMA shall be according to OPSS 1151 and the following:

The mix shall be produced at a facility capable of producing the mix according to the WMA technology supplier's instructions for the use of their WMA technology. All information required for the proper preparation, handling, storage, and use of the WMA materials shall be obtained from the WMA technology supplier.

313.05.05 Grit for Stone Mastic Asphalt

Grit for SMA shall be as specified in the Contract Documents.

313.06 EQUIPMENT

313.06.01 Rollers

A Class R Roller is a self-propelled pneumatic-tired roller.

A Class S Roller is self-propelled steel-drum, tandem, or three-wheel roller.

A Class V Roller is a self-propelled vibratory roller specifically designed for HMA compaction having either dual vibratory rolls or a combination of vibratory roll and pneumatic tires with a contact area equal to or greater than 70% of the roll width.

313.06.01.01 Rollers for Granular Grade Preparation

Finish rolling for granular grade shall be accomplished using, as a minimum:

a) A Class S roller with a minimum mass of 7 tonnes and minimum mass of 3.5 kg per mm total roll width, or
b) A Class V roller with a drum width of at least 1.2 m.

313.06.01.02 Rollers on Bridge Decks

Compaction shall be accomplished using, as a minimum:

a) A Class S roller with a minimum mass of 9 tonnes and minimum mass of 4.5 kg per mm total roll width, and
b) A Class R roller with a minimum mass of 18 tonnes and minimum mass of 2,500 kg per tire.

If Class V rollers are used, they shall be used in static mode.

At the Contract Administrator's request, rollers shall be weighed in the presence of the Contract Administrator or a representative.

313.06.02 Diamond Grinding

A diamond grinder shall be power-driven, self-propelled, and designed for grinding HMA. It shall be equipped with a grinding head with at least 50 diamond blades per 300 mm of shaft. The grinding head shall

be at least 0.9 m wide. The grinder shall be equipped with the capability to adjust the depth, slope, and crossfall to remove HMA to the required profile and shall also include a slurry pick-up system.

313.07 CONSTRUCTION

313.07.01 Quality Control

QC procedures shall be conducted to ensure HMA meets the requirements of the Contract Documents. Interpretation of QC inspections, test results, and measurements and the determination of any action to be taken shall be carried out to ensure that the work is according to the requirements of the Contract Documents.

A single sample for QC purposes may be obtained at the same time and location as QA acceptance samples. No additional loose mix samples shall be taken from the placed mix.

If the Contractor wishes to obtain additional samples for QC purposes, up to three cores may be taken in each surface lot. For binder courses, the Contractor shall be permitted to obtain one thickness core for their use from each sublot for each binder lift, prior to placement of the surface course. Cores shall not be spaced closer than 1 m from any other core. If further additional samples are required, a written request shall be made to the Contract Administrator, and samples shall only be taken upon written approval of the Contract Administrator. All sample locations shall be restored as specified in the Contract Documents.

313.07.02 Laboratory Correlations

On request, the Contract Administrator shall provide the opportunity to conduct a correlation of mix properties or compaction or both between the QA and QC laboratories prior to placement of HMA. The correlation may occur once for each mix type and shall be a maximum of 3 samples per mix type.

The Contract Administrator shall be provided with the samples and all information required to conduct the correlation testing. The Contract Administrator shall provide the QA test results on completion of the correlation testing.

313.07.03 Preparation of Foundation and Existing Pavement

Prior to placing any course of HMA on:

a) A granular grade, a Class S roller or an equivalent Class V roller shall be used to finish roll the grade ahead of the paver. The granular grade after rolling shall be a compacted, smooth, float-free surface, free from contamination of foreign materials. Any distortion that will impact the specified thickness of the pavement to be placed shall be repaired.

b) HMA or concrete surfaces, the HMA and concrete surfaces shall be clean and free of all loose, broken, and foreign materials.

c) Milled surfaces, the milled surface shall be clean of all loose, broken, and foreign materials and shall be swept with a power broom.

The Contractor shall be responsible for preparing the existing surface to be paved by milling or padding or a combination, as the Contractor deems necessary, to place and compact each lift to the thickness as specified in the Contract Documents, provided such corrections do not reduce the thickness of existing pavement materials or underlying materials by more than 5 mm below the general profile of the surrounding existing unground or unmilled pavement surface.

313.07.04 Correction of Pavement Beneath Surface Courses

Unless otherwise specified in the Contract Documents, the Contractor may correct any pavement course underlying the surface course by padding, milling, grinding or a combination, in order to meet the surface smoothness requirements. Padding shall be completed using a mix type acceptable to the Owner. The thickness of those pavements after milling or grinding shall not be reduced by more than 5 mm below the general profile of the surrounding unground or unmilled pavement surface. The milled surface shall not exceed 25 mm from ridge to ridge, and the ridge to valley depth of the milled surface shall not exceed 10 mm.

313.07.05 Tack Coat

Tack coat shall be applied to surfaces according to OPSS 308 prior to placing HMA.

313.07.06 Transportation of Hot Mix Asphalt

Truck boxes used to transport HMA shall be clean and, if required, lightly coated with a uniform application of a release agent. Truck boxes shall be drained after each application and before loading.

313.07.07 Placing Hot Mix Asphalt

313.07.07.01 Operational Constraints

Paving shall not be carried out if the roadbed is frozen. When placing the mixture on a granular grade, the granular grade shall not be saturated and shall be free of standing water. The surface of a pavement upon which HMA is to be placed shall be clean and dry at the time of HMA placement.

For paving on bridge decks, an HMA course shall not be placed over the waterproofing membrane and protection board until a minimum 4 hours has elapsed following completion of the waterproofing system or, until the waterproofing system has set sufficiently that the integrity of the waterproofing system is not jeopardized.

An HMA course shall not be placed upon a previously laid course until the temperature of the previous course is 50 °C or less. For a HMA lift thickness of 60 mm or less, this temperature shall be measured at the surface. For a HMA lift thickness greater than 60 mm, this temperature shall be measured internally.

HMA binder courses shall be not placed unless the ambient air temperature is at least 2 °C. HMA surface courses shall not be placed unless the ambient air temperature is at least 7 °C.

Public traffic shall not be permitted on freshly laid HMA until the temperature of the mat is 50 °C or less.

When WMA is used, the WMA technology supplier's recommendations for placing the WMA mix shall be followed. Placement and compaction temperatures of WMA shall be according to the WMA technology supplier's recommendations but shall also meet the operational constraints listed in this clause.

313.07.07.02 Paving

313.07.07.02.01 General

Levelling, binder, and surface courses shall be laid by means of mechanical self-propelled pavers. Prior to roller compaction, obvious defects in the HMA placed shall be corrected. Irregularities in the alignment and grade along the outside edges shall be corrected. Excess HMA shall not be cast onto the surface of the freshly laid mat. After final compaction of each course the surface shall be smooth and true to the established crown and grade, uniform in texture and shall be free of any defects including segregation, fat spots, oil spills, chatter, and roller marks.

If the Contractor's actions fail to prevent continued medium or severe segregation regardless of cause, the Contract Administrator may instruct the Contractor to cease paving until the problem has been corrected.

All through lane paving courses shall be completed prior to the placement of adjacent sideroads, speed change lanes, and other paved areas.

HMA shall be placed and compacted to the thickness as specified in the Contract Documents for each lift.

At the end of each completed portion of the lanes and prior to opening them to traffic, the ends of completed sections of HMA course shall be temporarily ramped down to the existing pavement according to the Temporary

If paving is being carried out under lane closures, paving shall be completed to the same station for the full pavement width, including paved shoulders, prior to the roadway being reopened to traffic except as noted in the Partial Paving of Full Pavement Width clause.

313.07.07.02.02 Paving in Echelon

For the purpose of laying levelling, binder and surface courses as required under this Contract, paving in echelon shall be used, at the Contractor's option for the whole contract.

When paving in echelon, the pavers shall be operated at the same time within 60 m of the next paver so that a hot joint is obtained between the lanes of HMA being placed. Should one paver break down while placing levelling, binder, or surface course, the Contract Administrator may permit the day's work to be completed with the remaining paver only.

313.07.07.02.03 Paving on Bridge Decks

The temperature of the HMA immediately after spreading shall be equal to or greater than the minimum temperature recommended by the AC supplier. When the HMA is produced using WMA technology, the temperature of the WMA immediately after spreading shall be equal to or greater than the minimum temperature recommended by the WMA technology supplier. Breakdown rolling shall commence immediately after spreading.

313.07.07.02.04 Paving Widenings and Irregular Sections

The HMA shall be placed in widenings such that the top of the compacted HMA is placed to the top of the existing pavement. When stepped joints are specified in the Contract Documents, the layers placed in the widening shall be placed to the top of each step in separate operations. HMA shall be placed in the widening using equipment specially designed for this purpose.

In turnouts, driveways, and other irregular sections, other methods may be used to spread and finish the HMA.

313.07.07.02.05 Partial Paving of Full Pavement Width

Partial paving of the full pavement width is permitted except with the conditions listed below.

Partial paving of the full pavement width is not permitted when one or more of the following conditions exist:

a) When the ramping height would be greater than 50 mm,

b) At the longitudinal edges that will form the hot joint of lanes to be paved in echelon when specified under the Paving in Echelon clause, or

c) The pavement slope would cause water to accumulate at the edge of the ramping and extend onto an adjacent lane or shoulder that will be open to traffic.

When partial paving of the full pavement width is permitted, temporary longitudinal and transverse ramp downs shall be placed regardless of the difference in height elevations between adjacent pavement surfaces.

313.07.07.02.06 Temporary Ramp Downs

HMA courses shall be temporarily ramped down to the existing pavement at a slope of 120H:1V transversely. Transverse ramps downs shall not form part of the permanent pavement and shall be removed prior to paving of the adjacent section.

Where longitudinal ramp downs are permitted or if, due to unforeseen circumstances such as equipment breakdown occurring during paving, paving cannot be completed to the same station across the full pavement width, the HMA course shall be temporarily ramped down to the existing pavement at a slope of 10H:1V. Only one temporary longitudinal ramp down shall be in place across the width of the pavement at any time. The temporary longitudinal ramp down shall not form part of the permanent pavement and shall be removed prior to paving the adjacent section. The adjacent paving shall be completed such that the ramping is not in place more than 5 Days.

Loose particles generated during construction of the longitudinal or transverse ramp downs or both shall be removed from the roadway surface prior to re-opening the roadway to traffic. Temporary ramp downs shall remain intact and in place until they are removed prior to paving the adjacent section.

Temporary ramp downs shall be removed to produce a straight clean vertical surface for the full depth of the course prior to paving the adjacent lane or shoulder. After removal of the temporary longitudinal ramp down, traffic shall not be permitted to cross over the vertical surface at the longitudinal edge before the adjacent paving is completed.

313.07.07.03 Longitudinal and Transverse Joints

313.07.07.03.01 General

All joints shall be made to obtain a complete bond between the two pavement edges and a smooth riding surface. The existing or previously placed pavement edge shall be a straight clean vertical surface for the full

depth of the course. Where ramping or damage has occurred, trimming shall be required. All dirt or other foreign material and all loose material shall be removed from all vertical surfaces.

313.07.07.03.02 Longitudinal Joints

The longitudinal joints shall be parallel to the lane and visually uniform longitudinally. The width of subsequent courses shall be staggered to an offset of 150 to 300 mm so that longitudinal joints do not coincide. The longitudinal joints in the surface course shall be offset 50 mm from the edge of the demarcation between the lanes as specified in the Contract Documents.

313.07.07.03.03 Transverse Joints at Limits of Paving

Joints between HMA pavement laid under this Contract and existing HMA courses not laid under the Contract shall be constructed as follows:

a) Where a binder course is placed flush against an existing HMA pavement and a butt joint is to be made, the existing pavement shall be trimmed back to form a straight vertical surface.

b) Where a surface course is placed flush against an existing HMA pavement, a butt joint shall be prepared by removing the existing pavement to the full depth of the existing surface course, to form a straight vertical surface, and for a longitudinal distance not less than 5 m so that the surface course placed has a thickness equal to the full depth of the existing surface course over the 5 m section.

c) Where a binder course and surface course are not placed flush against an existing HMA pavement, the binder course shall be feathered out removing the existing surface course to a minimum depth of not less than 40 mm, to form a straight vertical surface, and for a longitudinal distance not less than 5 m so that the surface course placed has a minimum thickness of 40 mm over the 5 m section.

d) Where multiple courses are placed flush against an existing HMA pavement, the joint for each course shall be offset at least 150 mm from the joint on the course below.

313.07.07.04 Compaction

Compaction of the HMA shall be conducted using appropriate methods and equipment to provide a uniformly compacted mat according to the requirements of this Contract. Class R rollers shall not be used to compact SMA.

At all places not accessible to rollers, the HMA shall be compacted by mechanical self-powered gas-, electric-, or air-powered equipment.

313.07.07.05 Gritting of Stone Mastic Asphalt

Hot grit shall be embedded in the SMA surface as specified in the Contract Documents.

313.07.08 Field Adjustments to the Job Mix Formula

The Contractor shall be permitted to adjust the JMF to more closely reflect the mix being produced. The number of field adjustments to the JMF shall be limited to three for each mix design submitted, one prior to the start of production and a maximum of two during production. Field adjustments to the JMF shall be limited in scope such that the net impact of all field adjustments to the JMF does not exceed any of the

maximum field adjustments to the JMF in Table 1 in comparison to the original JMF submitted under the current mix design.

JMF adjustments shall not be accepted once placement of the specific mix type has been completed. The adjusted JMF shall be submitted in writing on a form supplied by the Contract Administrator. Upon receipt of the JMF adjustment submission, the Contract Administrator shall give a written confirmation of receipt of the adjusted JMF. Within 1 Business Day of receipt of the JMF adjustment, the Contract Administrator shall give written notice confirming conformance to the Contract requirements or advising of any non-conformance. The revised JMF may be applied to the lot being placed at the time the confirmation of receipt of the revised JMF is issued and the previous lot, if requested by the Contractor as part of the written submission for a JMF change. If this request is not made, the revised JMF shall only apply to mix placed subsequent to the receipt of the revised JMF.

313.07.09 Sampling

313.07.09.01 Asphalt Cement

Samples of the AC shall be taken according to OPSS 1101.

When the selected WMA technology requires that additives be added to the AC, the samples for acceptance of the AC shall be taken after the additive has been added to the AC.

313.07.09.02 Hot Mix Asphalt Aggregates for Density Testing

The Contractor shall procure samples for RAP and the aggregates identified in the mix design for each mix type using methods as specified in the Contract Documents. The first set of samples shall be taken no later than 10 Days prior to the start of production of the first lot of HMA. Subsequent samples shall be taken immediately following the completion of 15,000 tonnes ± 1,000 tonnes of mix production, and thereafter at further intervals of 20,000 tonnes as required. The aggregate and RAP sampling program shall be established in consultation with the Contract Administrator prior to paving. If the Contractor determines that a sampling interval needs to be reduced to reflect changes in the aggregate properties, the Contract Administrator shall be notified, and samples shall be taken as warranted.

A set of two samples shall be taken. One of these samples shall be for QA testing and the other shall be for referee testing. Samples for QA and referee testing shall be obtained concurrently.

Each sample shall be clearly identified as to the date of sampling, the lot number, and the item hot mix tonnage being produced when the sample was taken.

313.07.09.03 Hot Mix Asphalt Mix Properties

Samples shall be appropriately labelled with the Contract number, highway number, Region, lot number, sublot number, mix type, lift number, station, and date and time of sampling.

The Contract Administrator shall advise the Contractor of each random sample location or the tonnage from which the sample is to be taken. A set of two samples shall be taken as per Table 2. One of these samples shall be for QA testing and the other shall be for referee testing. Samples for QA and referee testing shall be obtained concurrently.

When the mass of the sample does not meet the requirements of Table 2, the sample shall be discarded and a new one taken immediately.

The SMA sample for draindown testing shall coincide with one of the other sublot samples as designated by the Contract Administrator. The samples shall be transferred to a clean stainless steel bowl or pan of suitable size, immediately after splitting, for delivery to the QA laboratory.

If the Owner's QA laboratory chooses LS-292, the Contractor shall provide, for each mix design, two sets of samples consisting of:

a) 2 one-litre cans of AC,
b) 25 kilograms of each aggregate type, and
c) 1 kilogram of baghouse fines, if used in the mix design.

One sample is for Owner's QA testing and the other for referee testing for the purpose of ignition oven calibration, including aggregate correction factors. The samples shall be submitted to the Owner's QA laboratory at least 5 Business Days prior to the start of paving with the applicable HMA type. If materials have changed from the mix design, an additional two sets of samples, as detailed above shall be provided.

313.07.09.04 Compaction

Upon completion of each sublot, the Contract Administrator shall provide notification of each random sample location in writing. Pavement core samples shall be obtained in duplicate, from each sublot no later than the next Business Day after the completion of the sublot. Each core shall have a minimum nominal diameter of 150 mm and a maximum nominal diameter of 200 mm, and shall consist of the full layer being sampled and at least one underlying layer, if one is present. Cores shall not be taken within 250 mm of a longitudinal or transverse joint or the edge of pavement. Cores for compaction shall not be taken on bridge decks.

Each set of samples shall be taken from the same lane, same transverse offset, and at a spacing of $1.0\ m \pm 0.1\ m$ between each individual core edge.

Care shall be taken to ensure that cores are not damaged during coring operations or in transit. If a core is damaged, a replacement core shall be extracted at a location adjacent to the original core.

Core samples shall also include design lift thickness on the label. The lot and sublot numbers shall be clearly marked with a permanent marker on all compaction cores.

HMA and compaction requirements for filling the sample holes shall be the same as the adjacent undisturbed pavement. Sample holes shall be cleaned, dried, and filled and then compacted using a mechanical self-powered gas-, electric-, or air-powered compactor immediately after sampling.

A 1 litre sample of the release agent(s) shall be delivered to the Contract Administrator upon request.

313.07.09.05 Warm Mix Asphalt

Samples of WMA shall be obtained at the paver from sublots according to Table 2 for moisture sensitivity testing. The sublots are to be selected randomly from the sublots identified for mix properties by the Contract Administrator. These samples shall be designated for QA testing for moisture sensitivity as per AASHTO T 283. A complete sample data sheet shall accompany the samples. The data sheet shall also identify corresponding mix properties lot/sublot number and that the samples are for moisture sensitivity testing. Moisture sensitivity testing is required for information only.

313.07.09.06 Lift Thickness

For HMA items measured by square metres, single cores consisting of all lifts placed shall be used to evaluate the lift thickness of all lifts. Sample locations shall be determined based on the surface area of the upper most lift placed on the Contract.

All areas of hot mix paving within the Contract limits, including paved shoulders, shall be sampled for lift thickness with the following exceptions:

a) Detours and other temporary pavement.
b) Miscellaneous hot mix.
c) Bridge decks.

Upon completion of each sublot, the Contract Administrator shall provide notification in writing of the location to be used for sampling. One pavement core sample shall be obtained from each sublot not later than the next Day after the completion of the sublot. This one core shall be used for both QA and referee testing.

Each core shall have a nominal diameter of 50 mm and shall consist of all the hot mix lifts placed in the sublot and at least one underlying hot mix layer if one exists. Each core shall have its vertical side cored perpendicular to the upper surface of the core. Each sample shall be placed in a suitable container to protect the sample integrity during transport and until testing. The sublot number shall be clearly marked with a permanent marker on each core. In addition, the sample documentation as specified elsewhere in the Contract Documents shall also note the number of lifts for which the thickness measurements are required and mix type for each.

No replacement thickness cores shall be obtained for QA or referee testing. When a core thickness is reported as “indeterminate”, a new 150 mm core shall be taken centred over the sublot’s previously taken 50 mm core.

Holes resulting from the removal of thickness core samples shall be cleaned, dried and filled with a material acceptable to the Contract Administrator immediately after sampling.

313.07.10 Identification of Warm Mix Asphalt Paving Limits

When WMA is used, GPS coordinates for the WMA paving limits shall be submitted to the Contract Administrator no later than 7 Days after completion of WMA paving.

313.07.11 Management of Excess Material

Management of excess material shall be according to the Contract Documents.

313.08 QUALITY ASSURANCE

313.08.01 Acceptance Criteria

Acceptance of HMA shall be based on the following criteria:

a) AC Physical Requirements
b) Mix Properties and Compaction
c) Surface Tolerance
d) Surface Appearance
e) Surface Smoothness

f) Lift Thickness
g) Geometrics and Longitudinal Joint Location

313.08.01.01 Asphalt Cement Physical Requirements

The Contract Administrator shall determine the acceptability of the AC according to OPSS 1101 and requirements specified elsewhere in the Contract Documents.

When the selected WMA technology requires that additives be added to the AC, acceptance of the AC shall be based on the samples that contain the WMA additive subject to the conditions as specified in the Contract Documents. The Contractor may request that an allowance be made for the impact of the WMA and AST on a PGAC grade for QA or referee purposes provided that when production begins the Contractor submits to the Contract Administrator complete AASHTO M 320 test results for the following:

a) AC with WMA and AST at the percentage identified in the mix design.
b) AC without the additives.

The combined allowance shall be limited to maximum 2 °C colder than the high temperature grade or maximum 2 °C warmer than the low temperature grade.

313.08.01.02 Mix Properties and Compaction

313.08.01.02.01 Lot Size

313.08.01.02.01.01 General

The Contract Administrator shall determine the size and location of the lots and sublots, after discussion with the Contractor and before HMA production for the tender item starts. Guidelines for the breakdown of the tender item quantity into lots are as listed in Table 3.

When only one or two sublots are completed at the end of paving for the tender item due to a change in the JMF or when a delay of more than 20 Business Days occurs in placing the complete lot, the test results obtained shall be considered as part of the previous lot and the previous lot shall then have 11 or 12 sublots. When only 3 to 9 sublots are completed due to the above circumstances, then the 3 to 9 sublots shall be considered as a lot.

When a delay of more than 20 Business Days occurs in placing the complete lot and this lot shall be completed during the same calendar year, the Contractor may, prior to the end of the 20 Business Days, request in writing to the Contract Administrator that the lot be continued upon the resumption of paving for that tender item. If the request is not made or is not accepted by the Contract Administrator, the lot shall be terminated and evaluated for acceptance.

313.08.01.02.01.02 Optional Surface Trial

When the surface hot mix tender item is 5,000 tonnes or more, an optional trial of one lot, not exceeding 500 tonnes, with one sublot shall be permitted. The trial shall be placed in a binder course, and the lift thickness shall not be greater than 60 mm. If the Contractor elects to place this optional trial, the Contract Administrator shall be advised in writing prior to placing the trial lot. The optional trial shall not be placed in a critical location such as bridge decks. The optional trial lot will be treated as a small quantity lot for basis of acceptance and payment.

313.08.01.02.01.03 Lot Size for Bridge Decks

Hot mix placed on a bridge deck should be treated as a separate lot. Where hot mix is placed in multiple stages, each stage shall be treated as a separate lot.

The lot shall be either a single sublot or divided into 3 approximately equal sublots as determined by the Contract Administrator, in consultation with the Contractor.

313.08.01.02.01.04 Lot Size for Tonnage Items

Lot size is generally 5,000 tonnes. Sublots are generally 500 tonnes, however, sublot sizes may be adjusted to ensure a minimum of 3 sublots per lot.

When the tendered item quantity is less than 1,000 tonnes, the sublots shall be determined by the Contract Administrator based upon such testing as is deemed necessary by the Contract Administrator to determine substantial conformance with the Contract.

313.08.01.02.01.05 Lot Size for Square Metre Items

For lift thicknesses in the order of 40 to 50 mm, lot size is generally 40,000 m² with sublots of 4,000 m², however, sublot sizes may be adjusted to ensure a minimum of 3 sublots per lot. For lift thicknesses in the order of 60 to 80 mm, the lot size would generally be adjusted to 25,000 m² with sublots of 2,500 m².

When the tendered item quantity is less than 4,000 m², the sublots shall be determined by the Contract Administrator based upon such testing as is deemed necessary by the Contract Administrator to determine substantial conformance with the Contract.

313.08.01.02.02 Acceptance Testing

The Owner shall conduct tests, carry out calculations and provide values according to Table 4. The Contractor shall be provided with results from the completed tests.

The QA laboratory shall conduct density tests for RAP and aggregates identified in the mix design for each mix type using methods as specified in the Contract Documents.

When new aggregate samples are received, QA testing on the new aggregate samples shall be conducted and the calculation of VMA for the subsequent lot(s) shall be based on the most recent samples submitted. When the Contractor notes a change in aggregate density and requests that new samples be obtained between routine random samples, the Contractor shall state in the sample request if the current lot will be closed, or if the lot will be completed and the new density tests results will not be used for calculation of VMA until the next lot.

313.08.01.02.03 Basis of Acceptance

Acceptance for all mixes for mix properties and compaction is based on the lot PWL for each attribute, excluding VMA. PWL shall be determined using lot test results, LS-101, and lower and upper limits as specified in Table 5. The PWL of the lot for each criterion shall be used to determine the payment adjustment factor from Table 6. If the PWL is less than 50% for AC content, air voids or compaction, or less than 25% for any payment adjustment sieve, the lot is rejectable and shall be subject to repair or payment adjustment. VMA shall meet the minimum mix design requirements according to OPSS 1151 for each lot and payment shall be based on the lot mean as specified in the Payment Factor for Voids clause. If the VMA payment

factor is less than 0.500, the lot shall be considered rejectable. SMA lots shall be considered rejectable if the draindown is more than 0.3%.

When the tendered item quantity is less than 1,000 tonnes, the HMA may be accepted by the Contract Administrator based upon such testing as is deemed necessary by the Contract Administrator to determine substantial conformance with the Contract. When 3 or more tests have been completed for a lot the Material shall be accepted at the full Contract price, subjected to a payment adjustment or rejected as specified in Contract Documents.

Any lot comprised of one or two sublots, shall not be subject to payment adjustment unless the mix is rejectable. Acceptance for these lots shall be on a sublot by sublot basis. The sublot shall be considered acceptable if the AC content, gradation, air voids, and compaction of each sublot comply with the limits specified in Table 5, and the VMA shall be no more than 0.50% below the design minimum. Mix that does not comply with the requirements shall be considered rejectable.

The Contract Administrator shall determine if a rejectable lot may remain in the work without repairs. When the Contract Administrator has determined that a rejectable lot may remain in the work without repair, the lot shall be subjected to an additional payment adjustment reflecting the extent of the non-conformance as determined by the Contract Administrator. If the Contractor elects to repair the lot in lieu of a payment adjustment, or if the Contract Administrator determines that a rejectable lot requires repair, the lot shall be repaired and re-evaluated as specified in the Repairs for Mix Properties and Compaction clause.

313.08.01.02.04 Referee Testing

A single request for referee testing for a given lot can only be invoked by the Contractor within 5 Business Days of the Contractor receiving the Contract Administrator's calculated QA payment factors for that lot. Referee testing for aggregate density can only be invoked by the Contractor within 5 Business Days of the Contractor receiving the test results for aggregate density.

For mix properties and compaction, the Contractor may request testing by a referee laboratory for the entire lot, or a maximum of two sublots from that lot. Referee testing shall fall into one of three categories:

a) Mix properties only,
b) Compaction only, or
c) Mix properties and compaction.

The Contractor may request referee testing for determining the draindown of a SMA sample.

The referee laboratory shall use the same test method as the QA laboratory except that when the QA laboratory chooses LS-292, the referee laboratory shall use that method provided the calibration requirements are met. If they are not met, the referee laboratory shall use LS-282.

When referee testing of mix properties is invoked, the referee laboratory shall conduct all necessary testing, with the exception of the combined aggregate density which shall be supplied by the Contact Administrator.

When referee testing for compaction is invoked, the referee laboratory shall determine the MRD of the loose mix sample for the sublot, and this value shall be used in the calculation of compaction for the referee core.

The results generated by the referee laboratory shall be used to re-evaluate the lot to determine the payment factors for the acceptance of the disputed properties for the disputed lots of HMA. The referee test results are binding on both the Owner and the Contractor.

313.08.01.02.05 Outliers in Referee Results

Where an entire lot of 3 or more sublots has been referee tested, the Contractor may question an individual value for any attribute of a sublot's test result, excluding VMA. The request shall be made within 3 Business Days of the Contractor receiving all of the test results for the lot, and only when the payment factor for the attribute with an outlier is less than 1.0. The validity of the questioned attribute shall be ascertained in accordance with ASTM E 178 using a T test at a 10% significance level.

If the T test procedure shows that the questioned value of the attribute is not an outlier, then the test result shall be used in the calculations. If the T test procedure shows that the questioned value of the attribute is an outlier, then the test result for the sublot shall be checked for mathematical errors. If there are no mathematical errors, the sublot with the outlier is treated as a lot with one sublot and the remaining sublots shall form a separate lot with no further consideration for outliers.

If only two sublots remain, the two sublots shall be treated as two separate lots each with one sublot.

313.08.01.03 Surface Tolerance

The surface tolerances of any pavement surface shall be such that when tested with a 3 m straight edge placed anywhere, including the edge of the pavement, in any direction on the surface, except across the crown or drainage gutters, there shall not be a gap between the bottom of the straight edge and the surface of the pavement:

a) Greater than 6 mm for all binder courses, levelling courses and padding, or
b) Greater than 3 mm for all surface courses.

The Contractor shall provide all traffic control, as required, for the Owner to conduct surface tolerance measurements. All tolerance-related repairs shall be carried out according to the Repairs subsection.

Longitudinal joints shall be constructed such that the elevation difference across the longitudinal joints shall not exceed 5 mm, when measured with a straight edge placed on the asphalt surface with the higher elevation and overhanging the joint by not more than 50 mm. All joints which exceed the 5 mm tolerance shall be repaired such that the tolerance is met.

313.08.01.04 Surface Appearance

HMA deemed by visual appearance to have flushing, bleeding, segregation, fat spot, surface damage, cracking, chatter, or surface contamination but not limited to these, shall be considered deficient material or work. The Contractor shall provide traffic control, for all surface appearance assessments. Deficient material, mixture, and work shall be removed and replaced or repaired or assessed a payment reduction.

313.08.01.04.01 Segregation

HMA exhibiting medium or severe mid-lane segregation shall be assessed a payment reduction or shall be repaired at the discretion of the Contract Administrator.

From the time the Contract Administrator provides notification of mid-lane segregation, a maximum of 500 tonnes of HMA may be placed, to demonstrate the effectiveness of any repairs or adjustments or both made to a defective paver. The repairs or adjustments or both shall be demonstrated to the Contract Administrator. If the repairs or adjustments or both to the paver do not eliminate midlane segregation to the satisfaction of the

Contract Administrator within the allowable 500 tonnes of HMA, then the use of that paver shall be discontinued.

Other segregation shall be addressed in accordance with the following:

a) Slightly segregated mix shall be accepted into the work with no payment reduction.

b) Medium segregation in levelling courses or padding with a thickness greater than 40 mm, and binder courses shall normally be left in place with no payment reduction. However, any areas of medium segregation that deteriorates prior to being overlaid by another pavement course shall be repaired at no cost to the Owner.

c) Medium segregation in surface courses shall be assessed a payment reduction or repaired at the discretion of the Contract Administrator.

d) Severely segregated mix shall be repaired by removal and replacement.

Levelling courses and padding with a total thickness less than 40 mm, bullnoses, and tapers that were not machine-laid and any areas of handwork shall not be assessed on the basis of segregation but on the basis of other workmanship-related problems. However, if they deteriorate prior to being overlaid by another pavement course, the Contract Administrator shall assess the causes of the deterioration before determining responsibility for the cost of repairs.

313.08.01.04.02 Challenging Severity of Segregation

The Contractor may challenge, in writing, the severity of any segregated area assessed as either medium or severe, within 5 Business Days of receiving the Owner's first visual assessment. The written challenge shall list the dimensions and the Contractor's assessment of the severity of each disputed area.

For Contracts with up to 30,000 tonnes of HMA, the Contractor shall be allowed a maximum of two separate written challenges for each tender item. However, for Contracts with more than 30,000 tonnes of HMA, the Contractor shall be allowed a maximum of four separate written challenges for each tender item. Each written challenge may involve more than one disputed segregated area.

A representative of the Owner, who did not carry out the original assessment and who is not the Contract Administrator shall make a second visual assessment of the disputed areas. This second visual assessment shall be carried out within 5 Business Days after the Contract Administrator has received the Contractor's written challenge and the results of that second visual assessment shall be binding on both the Owner and Contractor.

The Contractor may further challenge the Owner's second visual assessment of the segregation severity, if the segregation has occurred in any one of the mixes listed in Table 7. Such a challenge shall be resolved by a representative of the Owner determining the Macrotexture Ratio, according to LS-317. Table 7 shall be used with the Macrotexture Ratio to determine the degree of severity and the disposition of the disputed area of segregation. The results of that testing shall be binding on both the Owner and the Contractor.

313.08.01.05 Acceptance Criteria for Surface Smoothness

The acceptability of surface smoothness shall be as specified in the Contract Documents.

313.08.01.06 Lift Thickness for Square Metre Items

313.08.01.06.01 Lot Size

The Contract Administrator shall determine the size and location of the lots and sublots before hot mix production for the item starts. Generally, there shall be one lot of the total pavement quantity. When the number of lifts is different or the tender item for any of the lifts is different, there shall generally be a separate lot for each of these areas. Each lot shall be divided into sublots, corresponding to the upper most lift of hot mix thickness sublots, which generally is the surface course. Sublots shall normally be 2,000 m² in size. A minimum of 3 sublots are required for each lot.

313.08.01.06.02 Acceptance Testing

The Owner shall conduct tests, carry out calculations, and provide values according to Table 4. The Contract Administrator shall provide the Contractor with a copy of each lift thickness measurement for each lift placed at each sample location upon completion of the sublot measurement.

313.08.01.06.03 Basis of Acceptance

The acceptance of lift thickness is based on lift thickness measurements. The Contract Administrator shall calculate the thickness payment adjustment for the lot once all measurements for the lot have been completed.

Sublot measurements shall be acceptable if they are equal to or greater than the minimum sublot lift thickness as specified in Table 8 for the item's T_D.

The sublot shall be deemed rejectable and shall be repaired if:

a) The lift thickness measurement is less than the minimum sublot lift thickness as specified in Table 8, or

b) For successive binder lifts of the same mix type, the combined lift thickness for these successive lifts is less than the minimum sublot lift thickness as specified in Table 8, or

c) Both a) and b) apply.

In addition, when a core taken for compaction testing does not meet the minimum lift thickness as specified in Table 8, the thickness sublot in which the compaction core was located shall be rejectable and shall be repaired.

When a lot contains any sublot that is deemed rejectable, the lot is rejectable until the sublot has been repaired and re-evaluated as acceptable. When the Contract Administrator allows a rejectable sublot to remain in place without repair, the Contractor shall receive a payment reduction for the sublot according to the Payment Adjustment for Lift Thickness clause. A sublot lift thickness measurement for a rejectable sublot that receives a payment reduction shall not be used to assess the lot mean.

The Contract Administrator shall calculate the lot mean to one decimal point and the lot thickness payment adjustment based on all the sublot lift thickness measurements in the lot, according to LS-101 and Table 9. If the lot mean is less than 85% of the T_D the lot is rejectable.

The Contract Administrator shall determine if a rejectable surface course lot may remain in the work without repairs. When the Contract Administrator has determined that a rejectable surface course lot may remain in

the work without repair, the lot shall be subjected to a payment adjustment as determined by the Contract Administrator.

313.08.01.06.04 Referee Testing

The Contractor may only challenge an individual lift thickness measurement by requesting referee testing within 5 Business Days of the Contractor receiving the sublot lift thickness measurement and shall submit the request in writing to the Contract Administrator. The Contractor shall then have the opportunity to view the re-measurement of the QA designated pavement core for that sublot at an alternative Owner designated QA laboratory together with the Owner's representative. The re-measurement shall include the individual lift thickness that was challenged and shall also include any other lifts or combination of lifts in the core. The re-measured lift thickness measurements shall be considered binding and shall replace the original lift thickness measurements for assessment of all lifts measured for the core.

313.08.01.07 Geometrics and Longitudinal Joint Location

313.08.01.07.01 General

After final compaction, the HMA shall be smooth and true to the design profile and cross-section and constructed to the design width.

313.08.01.07.02 Pavement Width

The Contract Administrator shall conduct random spot checks of the width of each binder and surface course HMA lift for acceptance. The Contractor shall provide and maintain offset stakes on both sides of the roadway, or other identifiers acceptable to the Contract Administrator, for use in checking the pavement width at 25 m maximum intervals until the Contract Administrator advises the Contractor that the stakes or identifiers are no longer required.

The width of each lift shall be accepted provided:

a) The outside edges of the lanes and the paved shoulders are parallel to the centreline and visually uniform.

b) The width across all the adjacent lanes from the outside edge to outside edge is not less than the sum of the specified lane widths, and

c) The width of the paved shoulders is not less than the paved shoulder width as specified in the Contract Documents.

If the width is not acceptable at any location, the Contract Administrator shall notify the Contractor in writing that the pavement is rejectable, and the Contractor shall submit a written proposal for corrective action to the Contract Administrator within 3 Business Days of receiving the notification.

313.08.01.07.03 Longitudinal Joint Location

Longitudinal joints not meeting the Contract requirements shall be removed and replaced, or assessed a payment reduction.

313.08.02 Repairs

313.08.02.01 General

The Contractor shall perform all repairs at no cost to the Owner.

All transverse joints in surface course repairs shall butt up to a full depth vertical surface. Repairs shall consist of the removal and replacement of the full thickness of the hot mix lift or the placement of an overlay when permitted by the Contract Administrator. A paver shall be used in carrying out the repair.

Repairs shall be full lane or full shoulder width except where localized repairs are allowed as specified in the Contract Documents.

The materials and the construction of repairs shall meet the requirements as specified in the Contract Documents.

The limits and type of repairs shall be subject to the approval of the Contract Administrator and shall be approved prior to the repair being carried out.

Repairs of an urgent nature, including moderate to very severe aggregate loss, moderate to very severe flushing, and wheel track rutting 16 mm in depth or greater shall be repaired within 7 Days, unless extended by mutual agreement.

With the exception of urgent repairs, repairs shall be completed within 60 Days or prior to seasonal shutdown each year, whichever is the lesser, unless extended by mutual agreement.

313.08.02.02 Repairs for Mix Properties and Compaction

The Contractor may elect to carry out repairs in lieu of accepting a payment adjustment, if the lot is not rejectable and the total payment factor for the lot is less than 0.940. When the Contract Administrator requires a rejectable lot to be repaired or the Contractor elects to carry out repairs in lieu of accepting a payment adjustment, the Contractor shall determine what areas of HMA in a lot are to be repaired subject to the minimum lengths and widths as specified in the Contract Documents. Each repair area shall include at least one of the loose mix or core sample locations or both representing that sublot.

The minimum length of a single-repair to one lane shall be 250 m. The minimum length of a single-repair that extends over more than one lane shall be 250 lane-metres and no portion of the single-repair in a lane shall be less than 125 m in length.

The minimum limits of each repair shall be at least 125 lane-metres from the location of the loose mix or compaction core or both that represents the sublot; otherwise, a repair limit shall coincide with one end of the sublot when the sample location is less than 125 lane-metres from it. If the proposed limit of a single-repair falls within the proposed limit of another single-repair, the overlap shall count towards the 250 lane-metre minimum for both repairs. Repair areas within a single lane shall be separated by at least 100 m. If the delineation of repair areas results in patches less than 100 m apart, these repair areas shall be re-established to form a continuous repair.

The Contractor shall submit a list and sketch identifying the proposed locations of the repairs to the Contract Administrator for review at least 5 Business Days prior to the intended start of the repair work. Each sublot and single-repair shall be uniquely labelled. Overlapping repair areas and discontinuous portions of a single-repair shall be labelled so that they are readily identified with their single-repair.

Prior to the repair, the Contractor shall take slab samples or cores for testing of mix properties or compaction or both in the unrepaired area within 1 m of the limits of each end of the repair area. The Contractor shall not be permitted to take additional samples or cores beyond these locations until after QA or referee testing demonstrates that the remaining Material in the sublot proposed for repair is deemed to be rejectable. If the proposed repair limit coincides with the beginning of a sublot that is being left unrepaired, samples are not required at this location. Sufficient material shall be obtained for testing by the Owner's QA laboratory and for possible referee testing.

Testing shall demonstrate that the remaining Material in the sublot proposed for repair is not rejectable. To determine if the mix is rejectable, the mix properties and compaction shall comply with the basis of acceptance of lots with one or two sublots. If the Material is deemed to be rejectable, the proposed limit of the repair shall be extended by a minimum of 25 m, and the sampling and testing repeated. The repair area selected by the Contractor shall incorporate the location used for obtaining samples that shall be used to confirm that the remaining mix is not rejectable. If the contractor's repair proposal results in the removal of at least half the sublot tonnage, the Contract Administrator may waive testing demonstrating the suitability of the remainder of that sublot.

The unrepaired sublots combined with the unrepaired areas of any repaired sublots shall comprise one lot and shall be assessed on the basis of the loose mix or core samples or both representing the unrepaired sublots. If there are only one or two sublots in a lot that are not repaired, the Contract Administrator shall include those sublots as part of the previous or next lot.

The mix used for the repair shall comprise a separate lot or the Contract Administrator in conjunction with the Contractor may decide to include it as part of the current lot being produced. The repaired area shall be tested for all criteria.

The two reconfigured lots shall be accepted at the full Contract price, subjected to a payment adjustment according to the Payment Adjustment for Mix Properties and Compaction clause, or rejected.

313.08.02.03 Repairs for Surface Tolerance

All areas not meeting the surface tolerance requirements shall be repaired by diamond grinding to a maximum of 5 mm or removed and replaced. Slurry produced from diamond grinding shall be removed from the site by the Contractor and managed as specified in the Contract Documents.

313.08.02.04 Repairs for Segregation

Repairs for segregation shall meet the requirements of the General Repairs clause. In binder courses, localized repairs for mid-lane segregation less than 300 mm in width are permitted.

313.08.02.05 Repairs for Thickness

The Contractor shall not be permitted to make any repairs solely to correct for excess lift thickness.

The minimum length of a repair is the entire length of the sublot being repaired.

Acceptance for lift thickness of the repaired sublot shall be based on the individual sublot lift thickness measurement and the lot thickness payment adjustment shall be calculated based on the re-evaluated sublot measurement.

313.09 MEASUREMENT FOR PAYMENT

313.09.01 Actual Measurement

313.09.01.01 SMA 9.5
SMA 9.5 - ... mm Lift Thickness
SMA 12.5
SMA 12.5 - ... mm Lift Thickness
SMA 19.0
SMA 19.0 - ... mm Lift Thickness
Superpave 4.75
Superpave 9.5
Superpave 9.5 - ... mm Lift Thickness
Superpave 12.5
Superpave 12.5 - ... mm Lift Thickness
Superpave 12.5 - Warm Mix
Superpave 12.5 - Warm Mix - ... mm Lift Thickness
Superpave 12.5FC 1
Superpave 12.5FC 1 - ... mm Lift Thickness
Superpave 12.5FC 1 - Warm Mix
Superpave 12.5FC 1 - Warm Mix - ... mm Lift Thickness
Superpave 12.5FC 2
Superpave 12.5FC 2 - ... mm Lift Thickness
Superpave 12.5FC 2 - Warm Mix
Superpave 12.5FC 2 - Warm Mix - ... mm Lift Thickness
Superpave 19.0
Superpave 19.0 - ... mm Lift Thickness
Superpave 19.0 - Warm Mix
Superpave 19.0 - Warm Mix - ... mm Lift Thickness
Superpave 25.0
Superpave 25.0 - ... mm Lift Thickness
Superpave 25.0 - Warm Mix
Superpave 25.0 - Warm Mix - ... mm Lift Thickness
Superpave 37.5
Hot Mix Asphalt Miscellaneous

313.09.01.01.01 By Area

Measurement of HMA by area shall be the horizontal area in square metres in place.

The quantities of HMA used for temporary ramping shall not be measured for payment. The removal of HMA used for temporary ramping shall not be measured for payment.

313.09.01.01.02 Tonne to Square Metre Conversion

When the unit of measure for a HMA tender item is square metres, and the Contract Documents refer to a quantity of mix for that tender item in tonnes and the Contract Documents do not already modify the quantity to relate to square metres, the Contract Administrator shall determine the theoretical HMA quantity in square metres (Q_A) that shall replace the non-payment tonnage quantity (Q_t) references as follows:

$Q_A = Q_t / [0.975 \times BRD_{MD} \times (T_D/1000)]$ (Formula 1)

Where:

BRD_{MD} = the bulk relative density in t/m³, provided in the HMA design submitted for mix, the Q_A is calculated for

T_D = the design thickness, in millimetres, of the mix

Q_t = non-payment tonnage quantity referred to elsewhere in the Contract Documents for the mix under the measurement by square metre item

313.09.01.01.03 By Mass

Measurement of HMA by mass shall be in tonnes according to the requirements of the Contract Documents.

The quantities of HMA used for temporary ramping shall not be measured for payment. The removal of HMA used for temporary ramping shall not be measured for payment.

313.09.01.02 Hot Mix Asphalt Miscellaneous

Measurement of HMA Miscellaneous shall be by area in square metres, regardless of the number of lifts placed.

313.09.02 Plan Quantity Measurement

When measurement is by Plan Quantity, such measurement is based on the units shown in the clauses under Actual Measurement. The Plan Quantity shall not be adjusted due to any of the exceptions specified in the Lift Thickness clause under the Sampling clause.

313.10 BASIS OF PAYMENT

313.10.01 Hot Mix

313.10.01.01

SMA 9.5 - Item
SMA 9.5 - ... mm Lift Thickness - Item
SMA 12.5 - Item
SMA 12.5 - ... mm Lift Thickness - Item
SMA 19.0 - Item
SMA 19.0 - ... mm Lift Thickness - Item
Superpave 4.75 - Item
Superpave 9.5 - Item
Superpave 9.5 - ... mm Lift Thickness - Item
Superpave 12.5 - Item
Superpave 12.5 - ... mm Lift Thickness - Item
Superpave 12.5 - Warm Mix - Item
Superpave 12.5 - Warm Mix - ... mm Lift Thickness - Item
Superpave 12.5FC 1 - Item
Superpave 12.5FC 1 - ... mm Lift Thickness - Item
Superpave 12.5FC 1 - Warm Mix - Item
Superpave 12.5FC 1 - Warm Mix - ... mm Lift Thickness - Item
Superpave 12.5FC 2 - Item
Superpave 12.5FC 2 - ... mm Lift Thickness - Item
Superpave 12.5FC 2 - Warm Mix - Item

Superpave 12.5FC 2 - Warm Mix - ... mm Lift Thickness - Item
Superpave 19.0 - Item
Superpave 19.0 - ... mm Lift Thickness - Item
Superpave 19.0 - Warm Mix - Item
Superpave 19.0 - Warm Mix - ... mm Lift Thickness - Item
Superpave 25.0 - Item
Superpave 25.0 - ... mm Lift Thickness - Item
Superpave 25.0 - Warm Mix - Item
Superpave 25.0 - Warm Mix - ... mm Lift Thickness - Item
Superpave 37.5 - Item
Hot Mix Asphalt Miscellaneous - Item

Payment at the Contract price for the above tender items shall include full compensation for all labour, Equipment, and Materials required to do the work (including the HMA quantities used for temporary ramping), the removal of HMA used for temporary ramping, and the applicable payment adjustments.

When repairing HMA, the Contractor shall be responsible for and shall carry out all associated work and replace or restore all associated damage and removals at no cost to the Owner.

When the Contract Administrator instructs the Contractor to cease paving due to continued medium or severe segregation regardless of cause, the Owner shall not be held responsible for any additional costs that the Contractor may incur.

The preparation and correction of existing surfaces and pavement beneath surface courses carried out in order to meet the requirements of the Contract Documents, including milling, padding, and diamond grinding, shall be at no cost to the Owner.

313.10.01.02 Payment Adjustment for Mix Properties and Compaction

For all mixes, when the Contractor is not required to or does not elect to repair a lot, the payment adjustment for that lot due to mix properties and compaction requirements shall be:

PA_{MC} = lot quantity x price x [PF_{MC} - 1.000] (Formula 2)

Where:

PA_{MC}	=	payment adjustment for mix properties and compaction
lot quantity	=	the quantity of the mix in the lot. For SMA 19.0, SMA 12.5, SMA 9.5, Superpave 12.5FC 1, and Superpave 12.5FC 2 items measured by tonnage, the lot quantity is the quantity of the mix in the lot multiplied by the applicable mass multiplier factor (MF) in the Payment Adjustment for Aggregate Density clause.
price	=	the Contract price of the hot mix tender item
PF_{MC}	=	payment factor for mix properties and compaction

For all mixes, when the PF_{MC} is:

a) Less than 1.000, there shall be a reduction in payment, and
b) Equal to 1.000 there shall be no adjustment.

313.10.01.02.01 Calculations

313.10.01.02.01.01 General

The PF_{MC} shall be based on the individual payment factors obtained from Table 6, based on PWL, determined for gradation, AC content, voids, and compaction using LS-101, Table 5, and the formulae in the Payment Factor for Gradation clause, the Payment Factor for Combined Gradation and Asphalt Cement Content clause, the Payment Factor for Voids clause, the Payment Factor for Combined Mix Properties clause, and the Payment Factor for Combined Mix Properties and Compaction clause. Rounding-off procedures for all calculations shall follow LS-100.

When there is no sampling or testing specified in the Contract Documents for an attribute or when the requirement for sampling or testing for an attribute is waived by the Owner, the payment factor for that attribute shall be equal to the payment factor it is added to in Formulae 5, 10, 11 or 12.

313.10.01.02.01.02 Payment Factor for Gradation

The payment factor for gradation shall be calculated using the following formulae:

For Superpave 37.5, Superpave 25.0, Superpave 19.0, Superpave 12.5, Superpave 12.5FC 1, Superpave 12.5FC 2, SMA 19.0, and SMA12.5:

$$PF_G = (PF_{DLS} + PF_{4.75} + PF_{75}) / 3 \qquad \text{(Formula 3)}$$

For Superpave 9.5, Superpave 4.75, and SMA 9.5:

$$PF_G = (PF_{4.75} + PF_{75}) / 2 \qquad \text{(Formula 4)}$$

Where:
PF_G = payment factor for gradation
PF_{DLS} = payment factor for designated large sieve
$PF_{4.75}$ = payment factor for the 4.75 mm sieve
PF_{75} = payment factor for the 75 µm sieve

313.10.01.02.01.03 Payment Factor for Combined Gradation and Asphalt Cement Content

The payment factor for combined gradation and AC content shall be calculated using the following formula:

$$PF_{GAC} = (PF_G + PF_{AC}) / 2 \qquad \text{(Formula 5)}$$

Where:
PF_{AC} = payment factor for AC content
PF_{GAC} = payment factor for combined gradation and AC content

313.10.01.02.01.04 Payment Factor for Voids

For Superpave mixes, if the lot mean VMA is not more than 0.5 per cent below the minimum VMA as specified in the Contract Documents for mix design purposes, the payment factor for VMA is 1.000. For lot mean VMA results more than 0.5 per cent lower than the minimum specified for mix design purposes, a payment factor for the subject lot shall be calculated in accordance with the following:

If (VMA_{min} - VMA_{mean}) ≥ 2.5, then PF_{VMA} = 0.0 (Formula 6)
If (VMA_{min} - VMA_{mean}) < 2.5 then, PF_{VMA} = 0.8000 - 0.4 x (VMA_{min} - 0.5 - VMA_{mean}) (Formula 7)

Where:
PF_{VMA} = payment factor for VMA
VMA_{mean} = lot mean VMA
VMA_{min} = minimum VMA specified for mix design

For Superpave mixes, the payment factor for VMA shall be compared to the payment factor for air voids and the lesser of the two is the payment factor for voids (PF_{VOIDS}).

For SMA mixes, if the lot mean VMA is not more than 1.0 per cent below the minimum VMA as specified in the Contract Documents for mix design purposes, the payment factor for VMA is 1.000. For lot mean VMA results more than 1.0 per cent lower than the minimum specified for mix design purposes, a payment factor for the subject lot shall be calculated in accordance with the following:

If (VMA_{min} - VMA_{mean}) ≥ 3.0, then PF_{VMA} = 0.0 (Formula 8)
If (VMA_{min} - VMA_{mean}) < 3.0 then, PF_{VMA} = 0.8000 - 0.4 x (VMA_{min} - 1.0 - VMA_{mean}) (Formula 9)

Where:
PF_{VMA} = payment factor for VMA
VMA_{mean} = lot mean VMA
VMA_{min} = minimum VMA specified for mix design

For SMA mixes, the payment factor for VMA shall be compared to the payment factor for air voids and the lesser of the two is the payment factor for voids (PF_{VOIDS}).

313.10.01.02.01.05 Payment Factor for Combined Mix Properties

The payment factor for combined mix properties shall be calculated using the following formula:

$PF_M = (PF_{GAC} + PF_{VOIDS}) / 2$ (Formula 10)

Where:
PF_M = payment factor for combined mix properties

313.10.01.02.01.06 Payment Factor for Combined Mix Properties and Compaction

The payment factor for combined mix properties and compaction shall be calculated using Formula 11.

$PF_{MC} = (PF_C + PF_M) / 2$ (Formula 11)

Where:
PF_C = payment factor for compaction

The PF_{MC} shall be rounded and reported to four decimal places.

When the Contract Administrator decides that the unrepaired area of an original lot that has been partially repaired shall not be resampled, the PF_{MC} for the unrepaired area shall be 1.000.

313.10.01.02.01.07 Small Quantity Lots

For any lot comprised of one or two sublots, each sublot shall be assigned a PF_{MC} of 1.000 if the sublot is not rejectable. If the sublot is determined to be rejectable, it shall be administered as described in the Repairs for Mix Properties and Compaction clause. When the Contract Administrator has determined that a rejectable sublot may remain in the work without repair, the lot shall be subjected to a payment adjustment reflecting the extent of the non-conformance as determined by the Contract Administrator.

313.10.01.03 Payment Adjustment for Surface Smoothness

Payment adjustment for surface smoothness shall be as specified in the Contract Documents.

313.10.01.04 Payment Adjustment for Segregated HMA

For all surface courses, where payment reduction for segregation is allowed in lieu of repairs, the payment reduction shall be calculated as follows:

a) $2,000 once for each applicable surface course tender item,
b) An additional payment reduction of $2.50/m for mid-lane segregation, and
c) An additional payment reduction of $5.00/m² for other segregation. The area of repair shall be computed by multiplying the full lane width by the length of the repair and rounded to the next whole square metre.

313.10.01.05 Payment Adjustment for Aggregate Density

For Superpave 12.5FC 1, Superpave 12.5FC 2, SMA 19.0, SMA 12.5, and SMA 9.5 items measured in tonnes, the tender quantity is based on reference densities according to Table 10. A payment adjustment for aggregate density for each lot for these tender items shall be calculated by the following formulae:

$MF = D_R/(BRD_{mix})$ (Formula 12)

$PA_{AD} = M_{mix}$ x Contract Price x [MF - 1.000] (Formula 13)

Where:

D_R	=	the reference density in t/m³, as specified in Table 10
BRD_{mix}	=	the lot average bulk relative density in t/m³, calculated from values obtained in the testing of bulk samples obtained during production. The values shall be the same as those used in calculating the final air voids payment factor for the lot.
PA_{AD}	=	payment adjustment for aggregate density
M_{mix}	=	the weighed mass of the mix in the lot incorporated into the work
MF	=	the mass multiplier factor calculated to 3 decimal places
Contract Price	=	the Contract price of the tender item for the mix

For all mixes, when the mass multiplier factor is:

a) Less than 1.000 there shall be a reduction in payment,
b) Equal to 1.000 there shall be no adjustment, and
c) Greater than 1.000 there shall be an increase in payment for the lot.

There shall be no payment adjustment for aggregate density for HMA items measured by square metres.

313.10.01.06 Payment Adjustment for Asphalt Cement Content and Changes in the Price Index

313.10.01.06.01 Hot Mix Asphalt Quantity Calculation

The quantity of HMA for use in the calculations (T_{mix}) shall be the tonnage of HMA accepted into the work.

When the unit of measure is square metres, T_{mix} shall be determined using the theoretical tonnage. The theoretical tonnage shall be calculated by the Contract Administrator as follows and rounded to one decimal according to LS-100:

$$T_{mix} = [0.975 \times BRD_{mix} \times (T_D/1000) \times A_{mix}] \quad \text{(Formula 14)}$$

Where:

BRD_{mix} = the lot average bulk relative density in t/m³, calculated from values obtained in the testing of bulk samples obtained during production of the first complete lot of at least 3 sublots of HMA placed in the work. The values shall be the same as those used in calculating the final payment factor for air voids for the lot.

T_D = the design thickness, in millimetres, of the HMA

A_{mix} = area of hot mix placed in square metres

313.10.01.06.02 Payment Adjustment for Asphalt Cement Content

The payment adjustment for AC content shall be calculated using the following formula:

$$PA_{AC} = T_{mix} \times [Price_{AC} \times (AC_{ERS} - AC_{BID})/100] \quad \text{(Formula 15)}$$

Where:

PA_{AC} = payment adjustment for asphalt cement content

T_{mix} = the quantity of the HMA accepted into the lot according to the Hot Mix Asphalt Quantity Calculation clause

$Price_{AC}$ = the purchase price per tonne of the AC used in the mix according to the invoice submitted as per the Submission Requirements subsection

AC_{ERS} = the average percentage by mass of AC in the lot

AC_{BID} = the percentage by mass of AC specified for bidding purposes elsewhere in the Contract Documents

For progress payment purposes, payment adjustments are made on the monthly progress payment certificate for the months in which hot mix paving occurs.

313.10.01.06.03 Payment Adjustment for Changes in the Asphalt Cement Price Index

A payment adjustment is applied based on changes to the Ministry's PGAC price index unless the Contractor opts out by notifying the Ministry in writing within 5 Business Days of receiving permission to start work. Once the Contractor has opted out of payment adjustments based on the price index, the Contractor shall not be permitted to opt back in. The price index is published monthly in the Contract Bulletin. The price index is used to calculate the amount of the payment adjustment per tonne of new AC accepted into the Work.

The price index is based on the price, excluding taxes, FOB the depots in the Toronto area, of AC grade PG 58-28 or equivalent. One index is used to establish and calculate the payment adjustment for all grades.

A payment adjustment per tonne of new AC is established for each month in which paving occurs when the price index for the month differs by more than 5% from the price index for the month prior to Tender Opening. When the price index differential is less than 5%, there is no payment adjustment established for that month. Payment adjustments due to changes in the price index are independent of any other payment adjustments made to the hot mix tender items.

The payment adjustment for the month is calculated from the formulae in Table 11.

The payment adjustment per tonne applies to the quantity of new AC in the HMA accepted into the Work during the month for which it is established. The quantity of new AC includes all grades of AC supplied by the Contractor with and without polymer modifiers.

For each month in which a payment adjustment has been established, the quantity is calculated using the HMA quantity accepted into the Work and its corresponding AC content as required by the JMF except for mixes which contain reclaimed asphalt pavement.

For mixes which contain reclaimed asphalt pavement the percentage of new AC is determined from the difference between the AC content required by the JMF and the AC content of the reclaimed asphalt pavement incorporated into the HMA, as calculated by the Contract Administrator.

For mixes containing an AST-AC, the percentage of AST-AC is deducted from the percentage of new AC. No other deductions are made for any other additives.

For progress payment purposes, payment adjustments are made on the monthly progress payment certificate for the months in which HMA paving occurs.

313.10.01.07 Payment Adjustment for Lift Thickness

The payment adjustment for lift thickness shall apply to all placed and compacted HMA measured by square metre items using the horizontal area of the surface course in the lot or overlying the lot. When the thickness payment adjustment is determined using a T_L calculated using a combination of tender items of the same mix type, the thickness payment adjustment shall apply to each binder course tender item included in T_L. The thickness payment adjustment shall be a reduction in payment. The formulae provided in Table 9 shall be used to calculate the thickness payment adjustment.

When a rejectable sublot remains in the work without repair, the sublot shall be subject to a payment adjustment. The payment adjustment shall be a reduction in payment. The sublot thickness payment adjustment shall be:

$PA_T = 0.5 \times (\text{sublot quantity} \times \text{Contract price})$ (Formula 16)

Where:

PA_T	=	payment adjustment for lift thickness
sublot quantity	=	the area of the sublot
Contract price	=	the Contract price of the tender item for the mix

313.10.02 Anti-Stripping Treatments

When aggregates have been processed from commercial sources for use in hot mix surface course paving, payment at the Contract price for the applicable HMA tender item shall be full compensation for all labour, Equipment, and Materials required to test, supply, and incorporate, the AST.

When aggregates have been processed from MTO/Crown, Wayside, and/or Letter of Approval quarries for use in hot mix surface course paving and the use of an AST was required, payment at the Contract price for the applicable HMA tender item shall be full compensation for all Labour, Equipment, and Materials required to test, supply, and incorporate the AST. When hydrated lime is used as the AST, payment includes full compensation for the amount up to 1.0% by mass of total dry aggregate. When an alternate AST-AGG is used as the AST, payment includes full compensation for the amount up to the listed minimum dosage from the DSM listing for Anti-Stripping Treatments by mass of aggregate. When an AST-AC is used as the AST, payment includes full compensation for the amount up to the listed minimum dosage from the DSM listing for Anti-Stripping Treatments by mass of AC. Payment for additional AST above the listed minimum dosages shall be administered as a Change in the Work.

313.10.03 Hot Mix Asphalt Miscellaneous

Payment at the Contract price for the above tender item shall be full compensation for all labour, Equipment, and Materials to do the work except that the HMA Material shall be paid for under the appropriate HMA tender item.

313.10.04 Tack Coat

Where there is no separate tender item for tack coat, payment at the Contract price for the applicable HMA tender item to be placed on the tack coat shall be full compensation for all labour, Equipment, and Materials for the tack coating.

313.10.05 Repair

No payment shall be made for the:

a) Quantity of HMA that is removed and replaced, overlaid, or otherwise repaired; or
b) For additional shouldering, traffic control, and other work such as zone painting or bridge deck waterproofing,

when:

a) In lieu of a reduction in payment, the Contractor repairs the lot, sublot, or visually defective HMA; or
b) The Contract Administrator has determined that a rejectable lot or sublot requires repair.

The Contractor shall be charged for all additional testing resulting from a repair to a lot at the rates established by the Owner for the year in which the testing was carried out.

313.10.06 Referee Testing and Segregation Challenge

313.10.06.01 Mix Properties and Compaction

If the referee test results show that the referee payment factor for compaction or mix properties is higher than the payment factor for compaction or mix properties based on the original QA test results by more than 0.025 and the referee results show that the lot is not rejectable, the Owner shall bear the cost of the referee testing for that attribute.

If the referee test results show that the lot is rejectable or the referee test results show that the referee payment factor for compaction or mix properties is not higher than the payment factor for compaction or mix

properties based on the original QA test results by more than 0.025, the Contractor shall be charged the cost of the referee testing.

For density testing of aggregates, if referee testing is invoked, the cost of referee testing is assigned as follows:

a) If the combined aggregate density as determined by the referee laboratory is within 0.010 of the result determined by the QA laboratory, the cost of referee testing shall be borne by the Contractor.

b) If the referee result is between 0.011 and 0.020 of the QA result, the cost of referee testing shall be shared equally between the Contractor and Owner.

c) If the difference in results is equal to or in excess of 0.020, the cost of referee testing shall be borne by the Owner.

When there is an outlier in the referee test results, the Contractor shall be charged 50% of the total cost for referee testing of all sublots in the original lot.

The cost of the referee testing shall be based on the referee testing rates as specified elsewhere in the Contract Documents.

313.10.06.02 Lift Thickness

If the referee test result is at least 3 mm greater than the original QA test result, the Owner shall bear the cost of the thickness measurement referee testing. If the referee test result is not 3.0 mm or greater than the original QA test result for the sublot retested, the Contractor shall be charged the cost of the referee testing.

313.10.06.03 Segregation Challenge

If, under a challenge, as described in the Challenging Severity of Segregation clause, the Contractor is successful, the Owner shall pay for the cost of the traffic control, if the traffic control was not necessary for any other reason. The Owner shall not be responsible for any other costs associated with the second visual assessment, including the cost of delays.

If the Contractor is not successful, the Contractor shall be responsible for all costs associated with the second visual assessment, including the cost of traffic control and delays.

TABLE 1
Maximum Field Adjustments for JMF

JMF Properties	**Maximum Field Adjustment** **%** (Notes 1 and 2)
AC content (all mixes except SMA mixes)	± 0.2
AC content (SMA mixes only)	± 0.4
Per cent RAP	- 5.0
Per cent passing 26.5 mm, 25.0 mm, 19.0 mm, and 16.0 mm sieves	± 5.0
Per cent passing 13.2 mm, 12.5 mm, and 9.5 mm sieves	± 4.0
Per cent passing 4.75 mm, 2.36 mm, and 1.18 mm sieves	± 3.0
Per cent passing 300, and 150 µm sieves	No limits
Per cent passing 75 µm sieve (all mixes except SMA mixes)	± 1.0
Per cent passing 75 µm sieve (SMA mixes only)	± 2.0

Notes:
1. The maximum field adjustment is applied against the original JMF submitted with the mix design.
2. The adjusted JMF shall meet the requirements of the Contract, including AC content and gradation on all sieves.

TABLE 2
Sample Size and Frequency

Material	**Sample Size**	**Frequency of Sampling**
SMA mixes, Superpave 9.5, 12.5, 12.5FC 1, 12.5FC 2, and 19.0 (Note 1)	20 to 30 kg or 30 to 40 kg (Note 2)	Every sublot
Superpave 25.0 and 37.5 (Note 1)	25 to 35 kg or 35 to 45 kg (Note 2)	Every sublot
HMA Compaction Cores	150 to 200 mm diameter	Every mix properties sublot
HMA Thickness Cores	50 mm diameter	Every thickness sublot
HMA Aggregates for Density Testing	Coarse aggregate 10 kg Fine aggregate, RAP 5 kg	Every 20,000 tonnes or when new samples requested
SMA mixes for draindown testing	3 to 5 kg	Once per lot
WMA for moisture sensitivity testing (Note 1)	50 kg	3 sublots per mix type

Notes:
1. Each material sample receptacle shall have a maximum mass of 30 kg. For ease of handling, especially when the larger sample size is required, splitting of material at the paving site is permitted such that a sample is contained in a maximum of two receptacles whose total mass does not exceed the maximum specified above. Once delivered to testing laboratories, combining of the material from the two receptacles is only mandatory if a single receptacle contains insufficient material to carry out the full suite of tests required.
2. The larger sample size shall be applicable when samples are designated for testing to the maximum number of gyrations. The frequency of the larger samples shall be one per lot, as designated by the Contract Administrator.

TABLE 3
Breakdown of the Tender Item Quantity into Lots for Mix Properties and Compaction

Number of Tonnes	Quantity of Square Metres		Number of Lots
	40 to 50 mm Lift Thickness	60 to 80 mm Lift Thickness	
< 5,000	40,000	25,000	1
5,000 to 10,000	40,000 to 80,000	25,000 to 50,000	2
10,000 to 12,000	80,000 to 100,000	50,000 to 60,000	2 or 3 (Note 1)
> 12,000	> 100,000	> 60,000	3 +

Notes:
1. As determined by the Contract Administrator in consultation with the Contractor.

TABLE 4
Testing Requirements

Properties and Attributes	Testing Method	Calculations, Values, and Results Required
Mix Properties		
AC Content and Aggregate Gradation for mix samples	LS-291, LS-282, or LS-292	% AC, % passing DLS sieve, 4.75 mm sieve, 75 μm sieve
Volumetric Properties		
Laboratory Compaction to: i. Design number of gyrations (N_{des}) ii. Maximum number of gyrations (N_{max}) Maximum Theoretical Specific Gravity (G_{mm})	AASHTO T 166 using the same laboratory compaction protocol as was used in mix design. (Note 1) AASHTO T 312, LS-264 Superpave Mixes only: in addition to compacting all samples to the design number of gyrations, one sample from each lot of HMA shall be compacted to the maximum number of gyrations. Bulk Relative Density for mix samples, BRD_m	BRD_m BRD at N_{des} BRD at N_{ini} BRD at N_{max} G_{mm} $\%G_{mm}$ @ N_{ini} $\%G_{mm}$ @ N_{des} $\%G_{mm}$ @ N_{max}
Voids in Mineral Aggregate (VMA)	LS-604, LS-605, LS-266 (Note 2)	VMA
Voids Filled with Asphalt (VFA)	AASHTO R 35	VFA
Air voids for mix (V_a)	LS-265	V_a
Dust to Binder Ratio (D_P) for Superpave mixes	AASHTO R 35	D_P
Compaction		
Compaction and Thickness of Cores	BRD_c = Bulk Relative Density for core samples, LS-262 (Note 1) $MRD_m = G_{mm}$ (Maximum Relative Density for loose mix samples, LS-264) % Compaction = ($100 \times BRD_c/MRD_m$)	Thickness of Core % Compaction
Lift Thickness		
Thickness of Cores	LS-294	Lift Thickness
SMA Mix Properties		
Draindown for mix	AASHTO T 305	% Draindown
WMA Mix Properties		
WMA Moisture Sensitivity	AASHTO T 283 including Table 1	TSR Visual Stripping Rating

Notes:
1. For all gyratory-compacted specimens and cores of SMA mixes and Superpave mixes, if the per cent water absorbed by the specimen is found to exceed 2% by volume, as described in AASHTO T 166, then the bulk relative density shall be determined using either LS-306 or ASTM D 6752
2. Calculate to two decimal places for each sublot using the BRD_m for the sublot, and the combined aggregate densities of the blended coarse and blended fine aggregate, as specified in the Contract Documents, to provide a lot mean VMA to one decimal place.
3. The rounding-off procedure, for all values, shall be according to LS-100.

TABLE 5
Specification Limits for HMA Acceptance Attributes

Attributes	HMA Type	Lower Limit (LL) %	Upper Limit (UL) %
AC Content	All HMA types	JMF - 0.40 (Note 1)	JMF + 0.50
Designated Large Sieve	All HMA types	JMF - 5.0	JMF + 5.0
4.75 mm Sieve	All HMA types	JMF - 5.0	JMF + 5.0
75 µm Sieve	All HMA types	JMF - 2.0	JMF + 2.0
Air Voids	All HMA types	2.5	5.5
Pavement Compaction	Superpave 37.5, 25.0, 19.0,12.5, 9.5 and 12.5FC 1	92.0	97.0
	Superpave 12.5FC 2	92.0	98.0
	SMA	93.0	98.0

Notes:
1. When a JMF change results in a decrease in the design AC content, the lower limit (LL) shall be set at the revised JMF minus 0.3% for all lots to which the JMF change applies.

TABLE 6
Payment Factors Based on Per Cent Within Limits

PWL	Designated Large Sieve	4.75 mm Sieve	75 µm Sieve	AC Content	Air Voids	Compaction
100	1.000	1.000	1.000	1.000	1.000	1.000
99	1.000	1.000	1.000	1.000	1.000	1.000
98	1.000	1.000	1.000	1.000	1.000	1.000
97	1.000	1.000	1.000	1.000	1.000	1.000
96	1.000	1.000	1.000	1.000	1.000	1.000
95	1.000	1.000	1.000	1.000	1.000	1.000
94	1.000	1.000	1.000	1.000	1.000	1.000
93	1.000	1.000	1.000	1.000	1.000	1.000
92	1.000	1.000	1.000	1.000	1.000	1.000
91	1.000	1.000	1.000	1.000	1.000	1.000
90	1.000	1.000	1.000	1.000	1.000	1.000
89	1.000	1.000	1.000	1.000	1.000	0.991
88	1.000	1.000	1.000	1.000	1.000	0.983
87	1.000	1.000	1.000	1.000	1.000	0.974
86	1.000	1.000	1.000	1.000	1.000	0.965
85	1.000	1.000	1.000	1.000	1.000	0.956
84	0.997	0.997	0.997	0.992	1.000	0.948
83	0.994	0.994	0.994	0.984	1.000	0.939
82	0.992	0.992	0.992	0.976	1.000	0.930
81	0.989	0.989	0.989	0.968	1.000	0.921

PWL	Designated Large Sieve	4.75 mm Sieve	75 µm Sieve	AC Content	Air Voids	Compaction
80	0.986	0.986	0.986	0.960	1.000	0.913
79	0.983	0.983	0.983	0.952	0.999	0.904
78	0.980	0.980	0.980	0.944	0.998	0.895
77	0.977	0.977	0.977	0.936	0.995	0.886
76	0.974	0.974	0.974	0.928	0.991	0.878
75	0.972	0.972	0.972	0.920	0.986	0.869
74	0.969	0.969	0.969	0.912	0.980	0.860
73	0.966	0.966	0.966	0.904	0.973	0.851
72	0.963	0.963	0.963	0.896	0.964	0.843
71	0.960	0.960	0.960	0.888	0.955	0.834
70	0.957	0.957	0.957	0.880	0.944	0.825
69	0.954	0.954	0.954	0.872	0.933	0.816
68	0.951	0.951	0.951	0.864	0.920	0.808
67	0.949	0.949	0.949	0.856	0.906	0.799
66	0.946	0.946	0.946	0.848	0.891	0.790
65	0.943	0.943	0.943	0.840	0.875	0.781
64	0.940	0.940	0.940	0.832	0.858	0.773
63	0.937	0.937	0.937	0.824	0.839	0.764
62	0.934	0.934	0.934	0.816	0.820	0.755
61	0.931	0.931	0.931	0.808	0.799	0.746
60	0.929	0.929	0.929	0.800	0.778	0.738
59	0.926	0.926	0.926	0.790	0.755	0.729
58	0.923	0.923	0.923	0.780	0.731	0.720
57	0.920	0.920	0.920	0.770	0.706	0.711
56	0.917	0.917	0.917	0.760	0.680	0.703
55	0.914	0.914	0.914	0.750	0.653	0.694
54	0.911	0.911	0.911	0.740	0.624	0.685
53	0.909	0.909	0.909	0.730	0.595	0.676
52	0.906	0.906	0.906	0.720	0.564	0.668
51	0.903	0.903	0.903	0.710	0.533	0.659
50	0.900	0.900	0.900	0.700	0.500	0.650
49	0.882	0.882	0.882	0.686	0.490	0.637
48	0.864	0.864	0.864	0.672	0.480	0.624
47	0.846	0.846	0.846	0.658	0.470	0.611
46	0.828	0.828	0.828	0.644	0.460	0.598
45	0.810	0.810	0.810	0.630	0.450	0.585
44	0.792	0.792	0.792	0.616	0.440	0.572
43	0.774	0.774	0.774	0.602	0.430	0.559
42	0.756	0.756	0.756	0.588	0.420	0.546
41	0.738	0.738	0.738	0.574	0.410	0.533
40	0.720	0.720	0.720	0.560	0.400	0.520

PWL	Designated Large Sieve	4.75 mm Sieve	75 µm Sieve	AC Content	Air Voids	Compaction
39	0.702	0.702	0.702	0.546	0.390	0.507
38	0.684	0.684	0.684	0.532	0.380	0.494
37	0.666	0.666	0.666	0.518	0.370	0.481
36	0.648	0.648	0.648	0.504	0.360	0.468
35	0.630	0.630	0.630	0.490	0.350	0.455
34	0.612	0.612	0.612	0.476	0.340	0.442
33	0.594	0.594	0.594	0.462	0.330	0.429
32	0.576	0.576	0.576	0.448	0.320	0.416
31	0.558	0.558	0.558	0.434	0.310	0.403
30	0.540	0.540	0.540	0.420	0.300	0.390
29	0.522	0.522	0.522	0.406	0.290	0.377
28	0.504	0.504	0.504	0.392	0.280	0.364
27	0.486	0.486	0.486	0.378	0.270	0.351
26	0.468	0.468	0.468	0.364	0.260	0.338
25	0.450	0.450	0.450	0.350	0.250	0.325
24	0.432	0.432	0.432	0.336	0.240	0.312
23	0.414	0.414	0.414	0.322	0.230	0.299
22	0.396	0.396	0.396	0.308	0.220	0.286
21	0.378	0.378	0.378	0.294	0.210	0.273
20	0.360	0.360	0.360	0.280	0.200	0.260
19	0.342	0.342	0.342	0.266	0.190	0.247
18	0.324	0.324	0.324	0.252	0.180	0.234
17	0.306	0.306	0.306	0.238	0.170	0.221
16	0.288	0.288	0.288	0.224	0.160	0.208
15	0.270	0.270	0.270	0.210	0.150	0.195
14	0.252	0.252	0.252	0.196	0.140	0.182
13	0.234	0.234	0.234	0.182	0.130	0.169
12	0.216	0.216	0.216	0.168	0.120	0.156
11	0.198	0.198	0.198	0.154	0.110	0.143
10	0.180	0.180	0.180	0.140	0.100	0.130
9	0.162	0.162	0.162	0.126	0.090	0.117
8	0.144	0.144	0.144	0.112	0.080	0.104
7	0.126	0.126	0.126	0.098	0.070	0.091
6	0.108	0.108	0.108	0.084	0.060	0.078
5	0.090	0.090	0.090	0.070	0.050	0.065
4	0.072	0.072	0.072	0.056	0.040	0.052
3	0.054	0.054	0.054	0.042	0.030	0.039
2	0.036	0.036	0.036	0.028	0.020	0.026
1	0.018	0.018	0.018	0.014	0.010	0.013
0	0.000	0.000	0.000	0.000	0.000	0.000

TABLE 7
Allowable Macrotexture Ratios for Various Mixes

Mix Type	Macrotexture Ratio (M_R)		
	Degree of Segregation		
	Slight	Medium	Severe
Superpave 12.5, 12.5FC 1, 12.5FC 2	< 1.6	1.6 to 2.2	> 2.2
Superpave 19.0	< 1.8	1.8 to 2.6	> 2.6
Superpave 25.0	< 2.0	2.0 to 3.5	> 3.5

TABLE 8
Minimum Sublot Lift Thickness

Mix Course	Design Lift Thickness (T_D) mm	Minimum Sublot Lift Thickness mm
All Courses	25 to 39	T_D - 7
	40 to 59	T_D - 10
Surface Course	60 and greater	T_D - 15
Binder Courses	60 and greater	0.70 x T_D

TABLE 9
Lot Thickness Payment Adjustment

Course	T_L	Thickness Payment Adjustment, PA_T
Surface Course (Note 1)	$T_L \geq [0.85 \times T_D]$	PA_T = lot quantity x price x {[1.000 - (T_L / T_D)] x 2.0}
Binder Course	$T_L \geq [0.95 \times T_D]$	PA_T = lot quantity x price x {[1.000 - (T_L /T_D)]}
	$[0.95 \times T_D] > T_L \geq [0.85 \times T_D]$	PA_T = lot quantity x price x {[1.000 - (T_L /T_D)] x 2.0}
	$T_L < [0.85 \times T_D]$	PA_T = lot quantity x price x {[1.000 - (T_L /T_D)] x 3.0}

Where:
T_L = lot mean, if lot mean is less than or equal to T_D (see definition), or
$T_L = T_D$, if lot mean is greater than T_D
lot quantity = the horizontal area of the upper most lift of hot mix in the lot (normally surface course)
price = the Contract price of the hot mix tender item

Notes:
1. A lot is rejectable when $T_L < [0.85 \times T_D]$. When the Contract Administrator has determined that a rejectable surface course lot may remain in the work without repair, the lot shall be subjected to a payment adjustment as determined by the Contract Administrator.

TABLE 10
Reference Densities, D_R

Region	Reference Densities, D_R tonnes/m³
West Region	2.530
Central Region Northeastern Region Northwestern Region	2.520
Eastern Region	2.390

TABLE 11
AC Price Adjustment

I_P	AC Price Adjustment, PA
$I_P > 1.05\ I_{TO}$	$PA = (I_P - 1.05\ I_{TO}) \times T_{AC}$
$I_P < 0.95\ I_{TO}$	$PA = (0.95\ I_{TO} - I_P) \times T_{AC}$

Note:
If $I_P > 1.05\ I_{TO}$ the Contractor receives compensation; however, if $I_P < 0.95\ I_{TO}$ the Owner receives a rebate.
Where:
PA = payment adjustment for new AC, in dollars
I_{TO} = PGAC price index for the month prior to Tender Opening
I_P = PGAC price index for the month in which paving occurs
T_{AC} = quantity of new AC in tonnes
T_{AC}, shall be calculated as follows:
$T_{AC} = [AC_{new} /100] \times T_{mix_mnth}$
Where:
AC_{new} = the percentage of new AC in the mix as required by the JMF.
T_{mix_mnth} = the tonnage of HMA, as calculated in the Hot Mix Quantity Calculation clause, accepted into the work during the month for which the payment adjustment was calculated.

ASPHALTIC CONCRETE SURFACE SMOOTHNESS - Asphaltic Concrete Payment Adjustment for Surface Smoothness Based on Quality Assurance Measurements Taken by an Inertial Profiler

Special Provision No. 103F31 June 2017

1.0 SCOPE

This Special Provision covers all surface smoothness requirements for hot mix asphalt construction.

2.0 REFERENCES

Ontario Provincial Standard Specifications, Construction

OPSS 313 Hot Mix Asphalt – End Result

Ontario Ministry of Transportation Publications

LS-100 Rounding-Off of Test Data and Other Numbers
LS-296 Method of Test for Calibrating, Correlating and Conducting Surface Smoothness Measurements Using an Inertial Profiler

American Association of State Highway and Transportation Officials (AASHTO)

M 328 Standard Specification for Inertial Profiler
R 56 Standard Practice for Certification of Inertial Profiling Systems
R 57 Standard Practice for Operating Inertial Profiling Systems

ASTM International

E 950 Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference

3.0 DEFINITIONS

For the purpose of this Special Provision, the definitions in OPSS 313 and the following definitions apply:

Category B Pavement Treatment means the application of one lift of HMA after:
a) Milling; or
b) Cold in-place recycling; or
c) Full depth reclamation.

Existing Surface means the original pavement surface prior to construction under the Contract.

Expanded Asphalt Mix (EAM) means "Full Depth Reclamation with Expanded Asphalt Stabilization" which is a mixture of reclaimed existing asphalt pavement, granular base, corrective aggregate if required, and expanded asphalt.

Final Measurements means the set of three measurements used for acceptance purposes.

Inertial Profiler means a device used for surface smoothness measurements conforming to requirements of a Class 1 Profilometer according to ASTM E 950 and meeting the additional requirements stated in LS-296.

Initial Measurements means the first set of three measurements taken by an inertial profiler on a given pavement section.

International Roughness Index (IRI) means a specific mathematical transform of a true profile in which a low pass filter (usually consisting of a moving average with a 250 mm base length) followed by a "Quarter Car Filter" are applied to the true profile then the absolute values of the vertical vibration of the "Quarter Car Filter" are accumulated and divided by the sublot length. It's expressed in units of m/km.

Localized Roughness is calculated using smoothness assurance module of ProVAL based on MRI Ride Quality Index and Short Continuous Analysis with 7.62 m baselength. Incident of Localized Roughness is a location where localized roughness has been identified at stations that are within ± 2 m of one another in at least two of the three runs that were measured by the applicable inertial profilers. Its station and average MRI shall respectively be considered to be the average station and the average MRI for the individual localized roughness locations that were identified in the 2 or 3 applicable runs.

Mean Roughness Index (MRI) means the number calculated by averaging the IRI values from the two wheel path profiles.

Profiler Operator means any person who has been adequately trained by the manufacturer of an inertial profiler to operate the inertial profiler and to use ProVAL software and has received a certificate of training.

Quarter Car Filter calculates the suspension deflection of a simulated mechanical system with a response similar to one corner (a quarter) of a passenger car travelling at 80 km/hr.

Sublot means a continuous traffic lane of pavement; excluding the shoulder, which has been measured by inertial profiler for purposes of repairs/payment adjustments and normally having a length of 100 m.

Subsequent Measurements means any measurements by an inertial profiler taken after the initial measurements.

Unfiltered Data File means a data file representing the profile of a pavement surface taken by the inertial profiler before any user-controlled filtering is applied.

Wheel path means 0.9 m on each side of the centreline of the actual trafficked lane. The trafficked lane does not include adjacent paved areas such as paved shoulders or tapers.

4.0 DESIGN AND SUBMISSION REQUIREMENTS - Not Used

5.0 MATERIALS - Not Used

6.0 EQUIPMENT

6.01 Inertial Profiler

The Owner shall measure smoothness using an inertial profiler.

7.0 CONSTRUCTION - Not Used

8.0 QUALITY ASSURANCE

8.01 Surface Smoothness

8.01.01 Lot Size

A lot for surface smoothness shall consist of the total pavement quantity in a given surface course Contract item that was measured by the QA inertial profiler. Each lot shall generally be divided into 100 metre single lane sublots. Lot acceptance for surface smoothness shall be based on measurements of IRI and incident(s) of localized roughness.

8.01.02 Surface Smoothness Measurement

The Owner shall measure all through lane pavement surfaces using an approved inertial profiler, with the following exceptions:

a) Where the posted speed is 60 km/hour or less.

b) Where a single lift is placed on an existing surface.

c) Within 10 m of the end of a placement where the paving Contractor is not responsible for the adjoining surface.

d) Bridge decks and within 10 m of bridge deck expansion joints.

e) Detours and other temporary pavement that shall be removed or overlaid under this Contract.

f) The first adjacent lane consisting of one or more lifts of hot mix asphalt where the Contractor must match to an existing surface that is not being resurfaced under this Contract.

g) Within 10 m of any access holes, water valves, or similar structures which are located within the lane or within 1.5 m of the outside edge of the lane.

h) Lanes less than 400 m in length.

i) Curves with a centerline radius of less than 300 m and pavement within the superelevation transition, i.e. slope changes, of such curves.

j) 100 m either side of a stop bar at signalized intersections.

k) 100 m either side of a stop bar at stop controlled intersections for the lanes being measured for smoothness.

l) The following additional stations, roadways, major commercial entrances, and major intersections:

N/A

8.01.02.01 Sublots to be Measured

The Contract Administrator shall provide a draft sketch to the Contractor at the pre-paving meeting showing the proposed details for the numbering and stations of each sublot to be measured. During preparation of the sublot sketch, when the last sublot is less than 50 m in length, it shall be added to the previous sublot in the lane. The sketch shall be finalized by the Contract Administrator before the beginning of surface course paving. Prior to beginning the construction of the surface course, the Contractor may propose changes to the sketch or any areas for consideration by the Contract Administrator.

8.01.02.02 Inertial Profiler Acceptance Testing

The Contractor shall notify the Contract Administrator, in writing, when the surface course is ready for QA inertial profiler acceptance testing. The Owner shall perform QA inertial profiler acceptance testing only when, regardless of the number of surface course tender items involved, the surface course has been completed to one of the following milestones:

a) 50% completed; or

b) Once within a given calendar year; or

c) Surface course completed.

Prior to testing, the sublot number and the station at the beginning of each sublot shall be clearly marked out by the Contractor in a manner that remains visible to the QA profiler operator until the final measurements are completed and accepted.

Within 10 Business Days of receiving the Contractor's written notification that QA testing can begin and, the Contract Administrator is fully satisfied that the locations of the sublots that are to be measured have been properly marked out, surface smoothness acceptance testing with the inertial profiler shall begin. When weather conditions as determined by the manufacturer of the inertial profiler will not provide reliable results, the testing shall be suspended and not resume until reliable results can be obtained.

When reflectors are used for QA or referee measurements, the Contractor shall obtain the reflectors from the profiler operator and place them on the left/right shoulder or the highway median at the beginning and end of each profile run as required by the profiler operator. After smoothness measurements are completed each day, the Contractor shall remove the reflectors and return them to the profiler operator.

When Global Position System-Distance Measuring Instrument (GPS-DMI) technology is used for QA or referee measurements, the profiler operator shall collect static GPS coordinates while stopped on the shoulder. Traffic protection for the collection of static GPS coordinates shall be provided by the Contractor.

An inertial profiler shall be required to do three runs of any particular pavement section. However, when the profiler operator deems that the results for one or more sublots within a particular run are invalid, due to technical difficulties or other reasons, then the profiler operator, after consultation with the Contract Administrator, shall be allowed to repeat that run and the data file for the repeated run shall be used to calculate the IRI for all of the sublots and all of the localized roughness that are identified within that run.

The profiler operator shall run all of the applicable unfiltered data files through the ProVAL Version 3.40 or 3.50, according to the procedures specified in LS-296. After the measurements by the QA inertial profiler are analyzed, all areas to be repaired due to rejectable sublots and/or incidents of localized roughness shall be marked on the pavement surface by the Contractor at the direction of the Contract Administrator and prior to the Contractor doing any corrective work.

The Contract Administrator shall provide the following information to the Contractor within 7 Business Days after the surface smoothness measurements have been completed to any of the milestones listed above:

a) All of the unfiltered data files from the final measurements that are generated by the inertial profiler in ppf or erd format for each profile run;

b) A summary of the longitudinal reference lines and offsets that were used for each profile run;

c) A summary of all "lead-in" distances that the inertial profiler required, prior to the start of the first sublot being measured in every profile run;

d) Summaries of all IRI measurements and the locations and values of all localized roughness in both wheel paths for each run of each sublot, as determined by the ProVAL software in accordance with LS-296, in Microsoft Excel spreadsheet file(s).

The information shall be provided to the Contractor on CD's or DVD's for use by IBM compatible personal computers or by email.

8.01.03 Referee Testing

For each measurement results taken by the QA inertial profiler at any milestone identified in Inertial Profiler Measurements clause, the Contractor may make a single written request for "Referee testing" no more than 5 Business Days after the Contractor has received all of the summary sheets and the QA profiler's applicable files. Each request shall state the sublots that are to be re-measured. The referee inertial profiler shall be chosen from a list of certified profilers maintained by the Ministry.

All sublots that are requested for referee testing shall be re-measured three times using a "referee inertial profiler", within 15 Business Days of the Contract Administrator receiving the Contractor's written request for referee testing.

When weather conditions as determined by the manufacturer of the inertial profiler will not provide reliable results, the testing shall be suspended and not resume until reliable results can be obtained. The disposition of all of the re-measured sublots and all incident(s) of localized roughness that are located within those sublots shall be based on the Referee measurements and the results shall be binding on both the Contractor and the Owner.

8.01.04 Damage to Existing Pavement Surface after Preparation or Damage to Surface Course Prior to Smoothness Measurements

The Contractor shall provide written documentation to the Contract Administrator within 1 Business Day of becoming aware of the damage to areas of:

a) existing pavement surfaces underlying a sublot, which have been milled and/or padded; or

b) surface course within a sublot;

when such damage was due to circumstances beyond the Contractor's control and occurred prior to measurement for surface smoothness.

The Contractor shall not cover the affected area with hot mix asphalt until a decision is made by the Contract Administrator. The Contract Administrator shall evaluate the Contractor's submission and may exclude all or part of the affected area from the final calculation for the payment factor.

8.01.05 Repairs and Redecisioning

8.01.05.01 General

Smoothness-related or surface tolerance-related repairs are not allowed prior to initial smoothness measurements.

Any incident of localized roughness shall either be repaired or receive a payment adjustment according to the requirements given in Table 2.

For any sublot with an IRI which is greater than 1.25 m/km, the sublot is rejected and the Contractor shall repair at least a portion of the sublot.

All repairs and redecisioning of all sublots which are constructed in a given construction season shall be completed within 30 Days of the Contractor receiving written notice from the Contract Administrator that the last set of measurements had indicated repairs for those sublots. However, if such repairs cannot be made,

due to rapid changes in weather or other issues that are no fault of the Contractor, then, at the discretion of the Contract Administrator, the Contractor may be requested to delay those repairs until the beginning of the next construction season, at no additional cost to the Owner.

The Contractor shall inform the Contract Administrator, in writing, when the repaired sublots are ready for QA inertial profiler acceptance re-testing. The Contractor shall be responsible for the cost of QA inertial profiler acceptance re-testing.

8.01.05.02 Repairs

8.01.05.02.01 General

At least 5 Business Days prior to beginning any surface smoothness-related or tolerance-related repairs, the Contractor shall submit a written proposal to the Contract Administrator with the sublot and repair locations including the appropriate stations, length of each repair area, distance between the ends of the repair areas on the same lane that are within 100 m of each other, and the method(s) of repair that the Contractor intends to use for each repair area. The Contractor shall not start repairs unless the Contract Administrator has given written permission. If permission is denied, then the Contract Administrator shall provide the Contractor with the reason(s) in writing.

Surface smoothness-related or tolerance-related repairs shall consist of one or more of the following corrective measures:

a) Diamond grinding;

b) A hot mix asphalt overlay, where permitted;

c) Remove and replace; and/or

d) Other methods of repair, if approved by the Contract Administrator, in consultation with the Ministry.

8.01.05.02.02 Diamond Grinding

Diamond grinding shall not be allowed in any area of the surface course where that area:

a) Consists of a single lift of hot mix asphalt placed on a granular surface, Expanded Asphalt Mix (EAM) base or on pulverized grade; or

b) Will be reduced by more than 5 mm below the general profile of the surrounding pavement surface after the repair.

A sublot shall be limited to no more than three separate diamond ground repair areas. If additional repair areas are identified within a sublot, then other methods of repair shall be used, subject to approval by the Contract Administrator.

The slurry produced from diamond grinding shall be removed from the site by the Contractor and managed as specified elsewhere in the Contract Documents.

8.01.05.02.03 Hot Mix Asphalt Overlay / Remove and Replace

Overlays on traffic lanes beneath structures may be allowed, if clearances between the pavement surface and the underside of the structure after overlay meet the established minimum requirements. Overlays on traffic lanes adjacent to curb-and-gutter or on bridge decks shall not be permitted.

A paver shall be used wherever corrective measures include overlay / remove and replace. Hot mix asphalt used in such repairs shall meet all of the requirements specified for the item in the Contract. The minimum width of every repair by "remove and replace" or a "hot mix asphalt overlay" shall be the width of the lane being repaired.

8.01.05.03 Redecisioning

When repairs are made to all or part(s) of any smoothness sublot, then the entire sublot shall be re-tested by the QA inertial profiler at the Contractor's cost. Re-testing by QA inertial profiler shall include at least 15 m on either side of the repaired area. If this requirement extends the testing onto an adjacent sublot, then the adjacent sublot shall also be re-tested. After such repairs to the sublot, subsequent measurements shall be used in the final calculations for the payment adjustment to the lot.

After a sublot is repaired/overlaid, then the subsequent measurements of the sublot shall have no incident(s) of localized roughness and its IRI shall be less than or equal to 1.25 m/km.

9.0 MEASUREMENT FOR PAYMENT - Not Used

10.0 BASIS OF PAYMENT

10.01 Payment Adjustment for Surface Smoothness

10.01.01 Hot Mix Asphalt Quantity Calculation

Where the unit of measure is by square metres; the quantity of HMA for use in the calculations (Q_{mix}) shall be the theoretical area of surface course in the lot using the length of pavement on which the inertial profiler measurements were made and the design widths of the finished lane; excluding any paved shoulder.

When the unit of measure is tonnes, Q_{mix} shall be determined using the theoretical tonnage. The theoretical tonnage shall be calculated by the Contract Administrator as follows and rounded to one decimal according to LS-100:

$$Q_{mix} = [0.975 \times BRD_{mix} \times (T_D/1000) \times A_{mix}] \quad \text{(Formula 1)}$$

Where:

BRD_{mix} = the lot average bulk relative density in t/m^3, calculated from values obtained in the testing of bulk samples obtained during production of the first complete lot of at least 3 sublots of HMA placed in the work. The values shall be the same as those used in calculating the final payment factor for air voids for the lot.

T_D = the design thickness, in millimetres, of surface course.

A_{mix} = theoretical area of surface course in the lot using the length of pavement on which the inertial profiler measurements were made and design widths of the finished lane; excluding any paved shoulder, in square metres.

10.01.02 Payment Adjustment Calculation

A sublot's payment factor for smoothness shall be based on the initial measurements using a QA inertial profiler, unless that sublot has been repaired or the initial quality assurance IRI has been substituted as a result of referee testing. Where a sublot has been repaired, the subsequent measurements taken after the repair shall be used in the calculation for the payment adjustment to that sublot. Subsequent measurements of IRI shall not be used to increase a payment factor, unless the sublot has been repaired. No sublot that has been repaired for any reason shall receive a payment factor greater than 1.0.

For any sublot with an initial average IRI measurement for the three runs that is greater than 1.000 m/km but less than or equal to 1.250 m/km, the Contractor may either accept the inclusion of its payment factor in the calculation for the lot or the Contractor may choose to repair at least a portion of the sublot.

The payment factors for sublots shall be determined by the Contract Administrator according to Table 1A or Table 1B, as applicable. Table 1B shall be used only for sublots consisting of Category B pavement treatment.

The sublot payment factor shall be rounded to three decimal places, according to LS-100. The payment factor for smoothness (PFS) for the entire lot shall be the lesser of the following:

a) The average of the individual payment factors for all measured sublots of surface course within the lot, rounded to three decimal places, according to LS-100, or;

b) 1.050.

If the average payment factor for the lot is equal to 1.000, the payment adjustment shall be zero.

If the average payment factor for the lot is greater than 1.000, the payment adjustment shall be:

$$(PFS - 1.000) \times Price \times Q_{mix} \qquad \text{(Formula 2)}$$

If the average payment factor for the lot is less than 1.000, the payment adjustment shall be:

$$(1.000 - PFS) \times Price \times Q_{mix} \qquad \text{(Formula 3)}$$

Where:

Price = means the Contract price of the hot mix asphalt surface course tender item.

TABLE 1A
Sublot Payment Factor Based on IRI for all Pavement Treatments Except Category B

Average IRI of both wheel paths from a set of 3 measurements taken by an Inertial Profiler in each sublot (m/km)	Sublot Payment Factor
≤ 0.500	1.200 (subject to Note 1 below)
> 0.500 to 0.600	2.2 - (2.0 x IRI) (subject to Note 1 below).
> 0.600 to 1.000	1.000
> 1.000 to 1.250	1.40 - (0.4 x IRI) (subject to Note 2 below)
> 1.250	REJECTED (Requires repairs – subject to Note 2 below)

Notes:
1. The payment factor shall not exceed 1.000 for subsequent IRI measurements which are taken after repairs regardless of the reason for the repairs.
2. Sublots with IRI's between 1.000 and 1.350 m/km and located in areas of hot-in-place recycling being used as a surface course shall receive a payment factor of 1.00. Sublots with IRI's greater than 1.350 m/km and located in areas of hot-in-place recycling being used as a surface course shall be repaired.

TABLE 1B
Sublot Payment Factor Based on IRI for Category B Pavement Treatments

Average IRI of both wheel paths from a set of 3 measurements taken by an Inertial Profiler in each sublot (m/km)	Sublot Payment Factor
≤ 0.500	1.200 (subject to Note 1 below)
> 0.500 to 0.600	2.2 - (2.0 x IRI) (subject to Note 1 below).
> 0.600 to 1.250	1.000
> 1.250	REJECTED (Requires repairs)

Notes:
1. The payment factor shall not exceed 1.000 for subsequent IRI measurements which are taken after repairs regardless of the reason for the repairs.

10.01.03 Incident(s) of Localized Roughness:

The Contractor shall either be given payment adjustments or be required to repair all incidents of localized roughness according to Table 2. However, where two or more incidents of localized roughness are found to be within 3 m of one another and they are left unrepaired, then the localized roughness at those locations shall be respectively treated as a single incident of localized roughness and the MRI of that single incident of localized roughness shall be considered to be the average MRI for all of the individual incidents of localized roughness within that 3 m for assessment of payment adjustment.

The payment adjustment for any sublot which includes any unrepaired incidents of localized roughness shall be unaffected by any payment adjustment given for such incidents of localized roughness.

TABLE 2
Payment Adjustments / Repairs for Localized Roughness

Incidents of Localized Roughness (Average MRI determined from three sets of measurements taken by an Inertial Profiler, run through ProVAL Version 3.40 or 3.50, m/km)	Payment Adjustment
2.400 to 3.499	The Contractor shall receive a payment reduction (subject to Notes 1 and 2) of $2,500 for each incident of localized roughness located in multi-lane freeways, and $2,000 for each incident of localized roughness located in all other highway types. Repairs shall be allowed for any incident of localized roughness in this amplitude range subject to Note 1.
≥ 3.500	All incidents of localized roughness shall be repaired in this range (subject to Note 1).

Notes:
1. Subject to the restrictions on repairs stated in Repairs clause, the Contractor may repair an incident of localized roughness with an average MRI greater than 2.400 m/km. If the repair removes that incident of localized roughness, then the payment adjustment for that incident of localized roughness shall be waived.
2. Payment adjustment shall be waived for any incident of localized roughness located within transition zones. Transition zone is the section of a through lane adjacent to the taper of an added or terminated new lane and includes an additional 10 m either side of the start and end of the taper.

10.01.04 Repair Costs

All repairs shall be made entirely at the Contractor's expense. Where overlays are allowed, any other associated costs such as additional granular materials for shoulders, shall also be borne by the Contractor.

10.01.05 Costs for QA Re-Testing and Referee Testing

The Contractor shall be responsible for the cost of QA inertial profiler acceptance re-testing.

If the Contractor requests Referee testing and the average IRI for the sublots tested by the referee profiler in that request is larger or less than 10% smaller than the average IRI determined from the measurements taken by the QA inertial profiler for the same sublots, then the cost of the referee testing shall be borne by the Contractor. Otherwise, the Owner shall be responsible for the costs of referee testing.

10.01.06 Tolerance/Smoothness Measurements and Associated Traffic Control

No additional payment shall be made to the Contractor for the cost of tolerance measurements that are required by the Contract Administrator.

No additional payment shall be made to the Contractor for the cost of traffic protection provided to the profiler for daily placement and removal of the reflectors or for collection of static GPS coordinates as specified in Inertial Profiler Acceptance Testing clause unless placement or removal of the reflectors or collection of static GPS coordinates requires the closure of a traffic lane, in which case, the cost of such traffic control shall be administered as a Change in the Work.

TRANSPORTATION OF STRUCTURAL COMPONENTS

Special Provision No. 109F16 February 2009

Background

Many pre-fabricated structural components used in bridge construction cannot be transported within legal weights or dimensions specified under the Highway Traffic Act (HTA). Any overdimensional/overweight vehicle transporting loads or equipment pursuant to the terms of this contract must, before operating on a public highway, obtain the necessary oversize/overweight (O/O) permit from the respective authority having jurisdiction over the route(s) to be travelled, and must abide by the conditions and restrictions set out within the permit(s).

Travel over any of the King's Highways, must be under the authority of a permit issued by the Ministry of Transportation (MTO). The maximum permitted O/O loads on the Kings Highways are as follows and subject to the approval process and the travel restrictions indicated.

For the purposes of this document, the loads have been categorized into 3 classes (A, B & C), each being subject to incrementally more stringent approval processes and travel restrictions. (Note: Dimensions include vehicle and load unless otherwise stipulated.)

(A) Routine Oversize/Overweight loads

Length: 23.0m to 36.75m, or
Width : 2.60m to 4.30m, or
Height: 4.15m

Vehicles with dimensions satisfying any of the limits given above shall require clearance approval by the MTO Oversize/Overweight Permits Section.

Weight: Gross vehicle weight in excess of HTA allowances and up to 70,000 kg; axle weight shall not exceed 11kg/mm tire width or weights shall not exceed manufacturer's rated capacities for any vehicle or tire component, or Highway Traffic Act axle weight limits plus 10,000 kg, whichever is less. (Overweight allowance will not be permitted during the reduced load period March 1 to April 30.)

Travel Restrictions

1. Transportation in congested traffic conditions will not be permitted. The MTO Oversize/Overweight Permits Section may also restrict the permitted hours of travel through any designated urban area.

2. Loads shall be moved only during hours of daylight. Loads may not be moved during periods when due to insufficient lighting or atmospheric conditions, persons and vehicles are not clearly discernable at a distance of 150m or less.

3. A permit issued by the Ministry is valid only on the King's highways specified. Transit over any highway under the jurisdiction of a municipality requires a separate permit issued by the Municipality and shall be subject to such conditions as may be imposed by the Municipality.

4. Permits shall be conditional upon axle loadings, gross weight loadings and overhang as required by the MTO Oversize/Overweight Permits Section. Requirements for flagging, warning devices and private escort vehicles may be obtained by contacting the MTO Oversize/Overweight Permit Section at 1-800-387-7736, extension 6306.

5. MTO is not responsible for any cost or delay arising from any route(s), vehicles or axle weights being rejected by the MTO Oversize/Overweight Permits Section or other authorities.

(B) Non Routine Oversize/Overweight Loads

Length: 36.76m to 55.0m, or
Width: 4.31m to 4.99m, or
Height: > 4.15m.

Vehicles with dimensions satisfying any of the limits given above shall require clearance approval by the MTO Oversize/Overweight Permits Section.

Weight: Gross vehicle weight up to 120,000 kg, subject to the Weight & Load Engineer's evaluation and approval; axle weight shall not exceed 11kg/mm tire width or weights shall not exceed manufacturer's rated capacities for any vehicle or tire component, or Highway Traffic Act axle weight limits plus 10,000 kg, whichever is less. (Overweight allowance will not be permitted during the reduced load period March 1 to April 30.)

Travel Restrictions

In addition to A, the following apply:

1. Vehicle and load exceeding 36.75m in length require one private escort vehicle. Vehicle and load, exceeding 45.74m in length or gross vehicle weight in excess of 100,000 kg, require two (2) Ontario Provincial Police (OPP) escort vehicles. Regional or municipal police may be used for short duration highway travel, with prior authorization of the OPP.

2. Contractor is responsible for escort arrangements and cost of escort.

3. No convoy moves are permitted. En route, a minimum spacing of 10 km is to be maintained.

4. Permit application shall be submitted three (3) weeks in advance to the MTO Oversize/Overweight Permit Section.

(C) Extra Heavy and/or Over-dimensional Loads

Extra heavy and/or over-dimensional loads are indivisible loads exceeding the categories (A) and (B) weight or dimension limits or large number of category (B) loads that require minimal travel separation.

Approvals for road transportation from MTO or other authorities are granted in principle, but subject to the travel restrictions documented herein.

AMENDMENT TO OPSS 922, NOVEMBER 2016

Special Provision No. 109F30 October 2018

922.03 DEFINITIONS

Section 922.03 of OPSS 922 is amended by the deletion of the definitions for **Certificate of Conformance** and **Quality Verification Engineer**.

922.07 CONSTRUCTION

922.07.08 Permission to Proceed

Subsection 922.07.08 of OPSS 922 is deleted in its entirety.

922.07.12 Certificate of Conformance

Subsection 922.07.12 of OPSS 922 is deleted in its entirety and replaced with the following:

922.07.12 Inspection after Installation of the Bearings

A Request to Proceed shall be submitted to the Contract Administrator upon completion of the installation of the bearings on the substructure and prior to any loading on the bearings.

Any loading on the bearings shall not proceed until a Notice to Proceed has been received from the Contract Administrator.

A Request to Proceed shall be submitted to the Contract Administrator after loading of the bearings and any specified jacking, but prior to opening to traffic.

Opening the bridge to traffic shall not proceed until a Notice to Proceed has been received from the Contract Administrator.

AMENDMENT TO OPSS 903, APRIL 2016

Special Provision No. 109F57 April 2018

903.03 DEFINITIONS

Section 903.03 of OPSS 903 is amended by the deletion of the definitions for Certificate of Conformance and Quality Verification Engineer.

903.04 DESIGN AND SUBMISSION REQUIREMENTS

903.04.02.04.02.01 Milestone Inspections

Clause 903.04.02.04.02.01 of OPSS 903 is deleted in its entirety.

903.04.02.06 Review of Splice Test Results and Permission to Proceed

Clause 903.04.02.06 of OPSS 903 is deleted in its entirety.

903.07 CONSTRUCTION

903.07.02.07.01 General

Clause 903.07.02.07.01 of OPSS 903 is amended by deleting the first paragraph in its entirety and replacing it with the following:

The driving of piles shall be carefully monitored and controlled and pile driving records produced for each pile under the direction of the Contractor. A pile driving record shall be submitted to the Contract Administrator.

903.07.02.07.03 Driving to a Specified Ultimate Resistance

903.07.02.07.03.01 General

Clause 903.07.02.07.03.01 of OPSS 903 is deleted in its entirety and replaced with the following:

When piles are specified to be driven to a specified ultimate resistance, the specified ultimate resistance shall be determined using the High-Strain Dynamic Testing at end of initial driving as specified in the Contract Documents. If the specified ultimate resistance is not achieved, retap/restrike shall be conducted after initial driving as specified in the Contract Documents.

A Request to Proceed shall be submitted to the Contract Administrator after the design ultimate resistance is achieved.

The next operation shall not proceed until a Notice to Proceed has been received from the Contract Administrator.

903.07.02.07.03.03 Driving to Bedrock

Clause 903.07.02.07.03.03 of OPSS 903 is amended by deleting the last sentence in its entirety.

903.07.02.07.04 Wave Equation Analysis

Clause 903.07.02.07.04 of OPSS 903 is deleted in its entirety and replaced with the following:

When requested by the Contract Administrator, all equipment, material, and personnel shall be supplied to conduct the wave equation analysis procedure.

903.07.03.07 Concrete

903.07.03.07.01 General

Clause 903.07.03.07.01 of OPSS 903 is deleted in its entirety and replaced with the following:

A Request to Proceed shall be submitted to the Contract Administrator before the concrete placement.

The reinforcement shall not be displaced or distorted during the construction of the caisson.

The placement of concrete shall not proceed until the Contract Administrator has inspected the caisson hole and issued to the Contractor a Notice to Proceed.

Concrete shall be placed immediately after the Notice to Proceed has been received and shall be placed in the caisson according to OPSS 904 and as specified herein.

Arching of concrete during casing withdrawal shall be prevented.

903.07.03.07.05 Founding Elevation

Clause 903.07.03.07.05 of OPSS 903 is amended by deleting the last paragraph in its entirety and replacing it with the following:

Complete access to inspect the bearing area of the caisson pile prior to the placement of concrete shall be given to the Contract Administrator.

903.07.06 Load Test

Subsection 903.07.06 of OPSS 903 is amended by deleting the first paragraph in its entirety and replacing it with the following:

When a load test is specified in the Contract Documents, the testing shall be according to ASTM D 1143M for piles under vertical static load, ASTM D 3689 for piles under tensile load, and ASTM D 3966 for piles under lateral loads. The Contract Administrator shall witness the pile load test. All records and results of the pile load test shall be submitted to the Contract Administrator.

903.07.08.01.02 Visual Inspection of Welds

Clause 903.07.08.01.02 of OPSS 903 is deleted in its entirety and replaced with the following:

Complete access to visually inspect the welds shall be given to the Contract Administrator.

A representative sample of not less than 30% of the welds, as determined by the Contract Administrator, shall be visually inspected for conformance to the requirements of CSA W59 and the Contract Documents.

903.07.08.01.03 Non-Destructive Testing of Welds

Clause 903.07.08.01.03 of OPSS 903 is deleted in its entirety and replaced with the following:

Radiographic or ultrasonic testing shall be carried out using procedures according to CSA W59.

Ultrasonic or radiographic testing shall be carried out on the entire length of selected splice welds chosen at random by the Contractor's welding inspector assigned to carry out visual inspections.

Selection shall be based on the following criteria:

a) For pile groups other than at integral abutments, 10% of the splice welds, rounded to the next highest number, but no fewer than two.

b) For pile groups at integral abutments, 10% of the splice welds, rounded to the next highest number, but no fewer than two of when the welds are below 6 m of the pile cut-off elevation.

c) For pile groups at integral abutments, all splice welds within 6 m of the pile cut-off elevation.

903.07.08.03 Certificate of Conformance

Clause 903.07.08.03 of OPSS 903 is deleted in its entirety.

903.10 BASIS FOR PAYMENT

903.10.01 Supply Equipment for Installing Driven Piles - Item
Supply Equipment for Installing Caisson Piles - Item
Supply Equipment for Installing Displacement Caisson Piles - Item

Subsection 903.10.01 of OPSS 903 is amended by deleting the second paragraph in its entirety and replacing it with the following:

For payment purposes, 50% of the work under this item shall be paid when the satisfactory performance of the equipment has been demonstrated to the Contract Administrator by the installation of 1% of piles.

Another 40% shall be paid by progress payments proportional to the work completed. The remaining 10% shall be paid on the satisfactory completion of the installation of piles.

USE OF AIR COOLED IRON BLAST FURNACE SLAG AS GRANULAR MATERIAL

Special Provision No. 110F10 September 2001

SCOPE

This special provision covers the requirements for the use of air cooled iron blast furnace slag as granular material in road construction.

DEFINITIONS

Slag: means air cooled iron blast furnace slag.

CONSTRUCTION

General Operational Constraints

For those applications permitted in this special provision, it is the Contractor's responsibility to notify the District Manager of the local District Office of the Ministry of the Environment (MOE), of the locations where slag will be utilized.

The Contractor shall prepare a contingency plan that specifically addresses management by the Contractor, during construction, of any odour and leachate which may be generated by the slag material. The plan shall include but not be limited to the following:

a. a strategy for containment, cleanup and disposal of leachate to ensure a quick and comprehensive response to any escape of leachate from the construction site;

b. a strategy for communicating with MOE and other regulatory authorities in the event of any escape of leachate;

c. a strategy to identify the project specific causes of leachate problems as well as a commitment to developing short and long term corrections; and

d. a strategy for dealing with public complaints about odour problems which may occur.

Restrictions On the Use of Slag

a. Slag is prohibited for any application below top of subgrade.

b. Slag may be applied above subgrade with the following exceptions:

Entire Contract

c. During construction, water shall not be directed, through means such as channelized flow or dewatering effluent, to areas where slag has been placed.

d. When placing slag, the Contractor shall ensure that the material is graded and placed in a manner which ensures free drainage and prevents ponding on, within or against the material.

SUBMISSION AND DESIGN REQUIREMENTS

Notification of Sites Intended to be Used for the Placement of Slag

Three weeks prior to receipt of the slag material at the job site, a completed Notification of Intended Placement of Slag Form, included in this special provision, shall be submitted to the attention of the District Manager of the appropriate local District Office of the Ministry of the Environment. The notification shall include a copy of this special provision and a copy of the contingency plan required by this special provision.

Three weeks prior to receipt of the slag material on the job site, copies of the completed Notification of Intended Placement of Slag Form and the Contractor's contingency plan for the use of slag material shall be supplied to the Contract Administrator, and to the Manager/Supervisor of the MTO Regional Environmental Office/Unit.

Notification of Intended Placement of Air Cooled Iron Blast Furnace Slag Form

Highway: _____ MTO Contract No. _____

Location of Contract: _____

Contractor: _____ Telephone: _____

Construction Administrator: _____

The following describes the Contractor's intended locations for placement of slag on the noted MTO Contract currently under construction. By signing this form the noted Contractor acknowledges to the Ministry of the Environment that all locations proposed to be used by the Contractor for the placement of slag meet the requirements of the special provision attached.

_____

1. Source of Slag

The material source is as follows:

Name and address of the commercial source;
_____
_____
_____
_____

2. Site Description

The site description includes the following:

An identification of the location of the work project including a map reference;
_____
_____
_____
_____
_____

3. Location for Placement of Slag

Attach descriptions (including station numbers) detailing the following:

a) use and location of the slag, including a detailed plan of the material placement site (and typical cross section if necessary); and

b) quantities/volume of material to be placed at the location specified.

Dated this _____ day of _____ 2___

_____
Contractor's Signature

_____
Name of Construction Company

AMENDMENT TO OPSS 1151, NOVEMBER 2016

Special Provision No. 111F06 October 2018

1151.03 DEFINITIONS

Section 1151.03 of OPSS 1151 is amended by deleting the definition of **RAP Content**.

Section 1151.03 of OPSS 1151 is further amended by the addition of the following definitions:

Binder Replacement means the asphalt cement from the RAP contributing to the total asphalt cement content in the mix, expressed as a percentage.

Roof Shingle Tabs (RST) means as defined in OPSS 313.

1151.04 DESIGN AND SUBMISSION REQUIREMENTS

1151.04.01 Design Requirements

1151.04.01.01 General

Clause 1151.04.01.01 of OPSS 1151 is deleted in its entirety and replaced with the following:

A laboratory that has current CCIL Type A certification, AMRL, or AMRL equivalent certification shall be used to conduct all mix designs and mix checks.

Superpave mixes shall be designed using the procedures specified in LS-309, with the exception of WMA mixes. WMA mixes shall be designed using the procedures specified in LS-318 at the anticipated WMA production temperature. In the mix design procedure, all references to RAP Content shall be deleted and replaced with % binder replacement.

Superpave materials, mix designs, and the JMF shall be according to the requirements specified in Tables 1, 2, 3 and 4 for the HMA mix type specified in the Contract Documents.

The use of RST is not permitted in the HMA.

SMA mixes shall be designed using the procedures specified in LS-311. SMA materials, mix designs, and the JMF shall be according to the requirements specified in Tables 1, 4, and 5 for the SMA mix type specified in the Contract Documents. Cellulose or mineral fibres shall be used as a stabilizing additive in dosage rates of 0.3% or 0.4%, respectively, by mass of the total mixture. Regardless of the type of fibre used, the manufacturer's recommendations for any product used shall be followed.

The composition of the HMA may be modified as permitted in Table 6.

The amount of RAP allowable by mass in a mix will be calculated by the Asphalt Binder Replacement method according to the following formula:

% Binder Replacement = [(% asphalt cement content of RAP x % RAP by mass of mix) / (% total asphalt cement content of mix)] x 100%

RAP as processed and ready for use in a HMA shall be tested using LS-282 or LS-292 to determine the average percentage asphalt cement and the average gradation for the extracted RAP aggregates.

Density testing of aggregates and RAP shall be conducted for the purpose of developing the mix design for each mix type in the Contract. Such testing shall be performed during production of each aggregate, RAP, or during stockpiling of the materials at the HMA plant.

In addition, if the composition of the mix is modified by including RAP, the high and low grade of PGAC required shall be lowered by 6 °C when:

% Binder Replacement > 20 %

The JMF selected for use shall produce HMA that meets all the requirements specified in the Contract Documents.

For HMA in this Contract, the mix properties, the compaction effort, and the aggregate properties specified in the Contract Documents, shall conform to the requirements for the traffic category specified in Table A. The use of a mix designed with a traffic category different than specified in Table A is not permitted.

The asphalt cement (AC) added to the hot mix types shall be performance graded asphalt cement, PGAC as specified in Table A. For bidding purposes only, the percentage by mass of asphalt cement, AC_{BID} contained in the various HMA mix types shall be as specified in Table A.

TABLE A
HMA Mix Design Criteria

HMA Type	**Location in Contract**	**Traffic Category**	**PGAC Grade**	**AC_{BID} %** (Note 1)
SP 12.5 FC2	All locations	E	64-28	5.2
SP 19.0	All locations	E	64-28	4.8
SP 25.0	All locations	E	64-28	4
Note 1: For SMA Mix Types a minimum AC Content is specified in Table 5 based on combined aggregate bulk relative density.				

1151.04.02 Submission Requirements

1151.04.02.01 Mix Design

Clause 1151.04.02.01 of OPSS 1151 is amended by the addition of the following:

The % Binder Replacement shall be calculated and submitted with the mix design.

The asphalt film thickness (T_F) shall be calculated according to the procedure given in Appendix A enclosed with this specification and submitted with the mix design.

1151.05 MATERIALS

1151.05.02 Aggregates

1151.05.02.01 Reclaimed Asphalt Pavement and Roof Shingle Tabs

Clause 1151.05.02.01 of OPSS 1151 is deleted in its entirety and replaced with the following:

1151.05.02.01 Reclaimed Asphalt Pavement

The aggregate contained in the RAP, where permitted in a HMA, shall be according to the aggregate requirements of OPSS 1003 for the mix type specified in the Contract Documents.

RAP that is contaminated with deleterious material shall not be used and shall be removed from the work. RAP shall be stockpiled conforming to the stockpiling requirements for coarse aggregates according to OPSS 1001, except that when the material is stockpiled on a compacted granular pad, the top 75 mm of the pad shall be the coarse aggregate that is required for a new (virgin) mixture of the tendered hot mix item.

The use of RAP that is obtained from existing stockpiles that do not have a foundation conforming to the above paragraph shall be permitted provided that the bottom 0.3 m of the stockpile is not incorporated into the work.

Process control sampling and testing of the RAP shall be as specified in the Contract Documents.

Table 6 of OPSS 1151 is deleted in its entirety and replaced with the following:

TABLE 6
Maximum % Binder Replacement

Traffic Category (Note 1)	**Binder Course 150 mm or More Below Pavement Surface**	**Binder Course Within 150 mm of Pavement Surface**	**Surface Course**
A, B	40%	40%	0%
C, D	40%	20%	0%
E	40%	20%	0%
Note 1: Traffic category as specified in the Contract Documents.			

Table 8 of OPSS 1151 is deleted in its entirety and replaced with the following:

TABLE 8
Sample Quantities for Mix Design Monitoring

Material	**Quantity** (Note 1)
Asphalt Cement	4 litres evenly split between 2 containers
Aggregate	75 to 100 kg of each type
RAP	75 to 100 kg required when RAP contained in the mix
Fines material passing 75 μm sieve	5 to 10 kg when the mix is to be produced with a plant that returns fines to the mix
Mineral Filler	5 to 10 kg sample for SMA mixes
Any other material samples including anti-stripping agents and fibres to be used in HMA	Quantity large enough to allow for a complete mix design
Note 1: Each material sample receptacle shall have a maximum mass of 30 kg.	

Table 9 of OPSS 1151 is deleted in its entirety.

APPENDIX A
METHOD OF TEST FOR DETERMINING ASPHALT FILM THICKNESS (T_f)

The procedure for determining asphalt film thickness (T_F) was referenced from NCHRP Report 673, pages 57 to 60.

- The asphalt film thickness, T_F, is calculated using the following equation:

  $T_F = (1{,}000 \times VBE) / (S_s \times P_s \times G_{mb})$

  Where,
  T_F = Asphalt Film Thickness, µm;
  VBE = Effective asphalt cement content, % by total mix volume
  S_s = Aggregate specific surface, m^2/kg
  P_s = Total aggregate content, % by mix mass, $(100-P_b)$
  G_{mb} = Bulk specific gravity of the asphalt mix

- The aggregate specific surface, S_s, is calculated using the following equation:

  $S_s = [1 / (1{,}000 \times G_{sb})] \times [2.0 \times (P_{37.5} - P_{25}) + 2.8 \times (P_{25} - P_{19.5}) + 3.9 \times (P_{19.5} - P_{12.5}) + 5.5 \times (P_{12.5} - P_{9.5}) + 8.9 \times (P_{9.5} - P_{4.75}) + 17.9 \times (P_{4.75} - P_{2.36}) + 36.0 \times (P_{2.36} - P_{1.18}) + 71.3 \times (P_{1.18} - P_{0.60}) + 141 \times (P_{0.60} - P_{0.30}) + 283 \times (P_{0.30} - P_{0.15}) + 566 \times (P_{0.15} - P_{0.075}) + 1{,}600 \times (P_{0.075})]$

  Where,
  The P values represent the % of aggregate passing the designated sieve sizes in mm.

  For example,
  P_{25} = % of aggregate passing 25-mm sieve
  $P_{0.15}$ = % of aggregate passing 0.15-mm sieve
  Each successive pair of sieves are multiplied by a factor (2.0, 2.8, 3.9, etc.)

  G_{sb} = Average bulk specific gravity for the blended aggregate

  G_{sb} can be calculated using the following equation:

  $G_{sb} = [P_{S1/A} + P_{S2/A} + P_{S3/A} + ...] / [(P_{S1/A}/G_{sb1}) + (P_{S2/A}/G_{sb2}) + (P_{S3/A}/G_{sb3}) + \ldots]$

  Where,
  $P_{S1/A}$ = volume % of Aggregate 1 in aggregate blend
  $P_{S2/A}$ = volume % of Aggregate 2 in aggregate blend
  $P_{S3/A}$ = volume % of Aggregate 3 in aggregate blend
  G_{sb1} = bulk specific gravity for Aggregate 1
  G_{sb2} = bulk specific gravity for Aggregate 2
  G_{sb3} = bulk specific gravity for Aggregate 3

- The total aggregate content, P_s, is calculated using the following equation:

  $P_s = 100 - P_b$

  Where,
  P_b = Total asphalt cement content, % by mix mass

P_b can be calculated using the following equation:

$P_b = 100 \times [M_b / (M_s + M_b)]$

Where,
M_b = Mass of asphalt cement in specimen
M_s = Mass of aggregate in specimen

- Sequential steps to calculate the effective asphalt cement content, VBE, are detailed below:

1. Determine the total asphalt cement content by mass, P_b, using the equation outlined above.

2. Determine the total asphalt cement content by volume, VB, using the following equation:

   $VB = (P_b \times G_{mb}) / G_b$

   Where,
   VB = Total asphalt cement content, % by total mix volume
   P_b = Total asphalt cement content, % by mix mass
   G_{mb} = Bulk specific gravity of the asphalt mix
   G_b = Specific gravity of asphalt cement

3. Determine the absorbed asphalt cement content, VBA, using the following equation:

   $VBA = G_{mb} \times [(P_b / G_b) + (P_s / G_{sb}) - (100 / G_{mm})]$

   Where,
   VBA = Absorbed asphalt cement content, % by total mix volume
   G_{mb} = Bulk specific gravity of the asphalt mix
   P_b = Total asphalt cement content, % by mix mass
   G_b = Specific gravity of asphalt cement
   P_s = Total aggregate content, % by mix mass, $(100-P_b)$
   G_{sb} = Average bulk specific gravity for the blended aggregate
   G_{mm} = Maximum specific gravity of the asphalt mix

4. Determine the effective asphalt cement content, VBE, using the following equation:

   $VBE = VB - VBA$

   Where,
   VBE = Effective asphalt cement content, % by total mix volume
   VB = Total asphalt cement content, % by total mix volume
   VBA = Absorbed asphalt cement content, % by total mix volume

AMENDMENT TO OPSS 1101, NOVEMBER 2014 - Additional Test Results and Samples for Performance Graded Asphalt Cement (PGAC)

Special Provision No. 111F09 August 2018

1101.02 REFERENCES

Section 1101.02 of OPSS 1101 is amended by the addition of the following under **Ontario Ministry of Transportation Publications**:

LS-100 Method for Rounding-Off of Test Data and Other Numbers

Section 1101.02 of OPSS 1101 is amended by the deletion of the following under **American Association of State Highway and Transportation Officials (AASHTO)**:

TP 70 Multiple Stress Creep and Recovery (MSCR) of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)

Section 1101.02 of OPSS 1101 is further amended by the addition of the following under **American Association of State Highway and Transportation Officials (AASHTO)**:

T 350-14 Standard Method of Test for Multiple Stress Creep Recovery (MSCR) Test of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)

1101.04 DESIGN AND SUBMISSION REQUIREMENTS

1101.04.01 Submission Requirements

Subsection 1101.04.01 of OPSS 1101 is amended by the addition of the following clause:

1101.04.01.02 PGAC Documentation

For each grade of PGAC specified in the Contract Documents, the Contractor shall supply the following items to the Contract Administrator prior to the commencement of HMA production:

a) PGAC documentation from the asphalt cement supplier in the form of bill of lading and certificate of analysis, confirming the grade of PGAC. The bill of lading and certificate of analysis shall also be supplied for each subsequent delivery of PGAC that will be used for the HMA production.

b) Documentation identifying the PGAC storage tank that the PGAC will be supplied from for the HMA production. The Contractor shall notify the Contract Administrator and provide updated documentation prior to changing the storage tank that is being used to supply PGAC for the HMA production.

1101.08 QUALITY ASSURANCE

1101.08.02 Anti-Stripping Additive

Subsection 1101.08.02 of OPSS 1101 is deleted in its entirety and replaced with the following:

1101.08.02 Asphalt Cement Anti-Stripping Treatment

The Contractor may request that an allowance be made for the impact of the asphalt cement anti-stripping treatment on a PGAC grade for QA or referee purposes provided that when production begins the Contractor submits to the Contract Administrator complete AASHTO M 320 test results for the following:

a) Asphalt cement with anti-stripping treatment at the percentage identified in the mix design.

b) Asphalt cement without the anti-stripping treatment.

1101.08.03 Sampling

Subsection 1101.08.03 of OPSS 1101 is amended by deleting the last paragraph in its entirety and replacing it with the following:

Sampling frequency, minimum quantities and additional labelling shall be as shown in Table 2.

1101.08.06 Referee Testing

Subsection 1101.08.06 of OPSS 1101 is amended by deleting the first paragraph in its entirety and replacing it with the following:

Referee testing by an independent laboratory may be invoked by the Contractor for any lot of PGAC within 5 Days of receiving all the QA test results for the lot.

Table 1 is deleted in its entirety and replaced with the following:

Table 1
Additional Testing Requirements and Acceptance Criteria for All PGAC Grades (Notes 1 and 2)

PGAC Grade	Property and Attributes (Unit)	Test Method	Results Reported Rounded to Nearest	Acceptance Criteria	Major Borderline	Rejectable
All PGAC Grades except PG58-28	Ash Content, % by mass of residue (%)	LS-227	0.01	≤ 0.60	> 0.60 and ≤ 0.80	> 0.80
PG58-28				≤ 0.40	> 0.40 and ≤ 0.60	> 0.60
All PGAC Grades Except PG58-28 and PG52-34	Non-recoverable creep compliance at 3.2 kPa ($J_{nr-3.2}$) (kPa^{-1})	AASHTO T 350 testing conducted at 58°C	0.01	< 4.50	N/A	≥ 4.50
	Average percent recovery at 3.2 kPa ($R_{3.2}$) (%)		0.1	> the lesser of 55.0 or [(29.371) $(J_{nr-3.2})^{-0.2633}$]	N/A	≤ the lesser of 45.0 or [(29.371) $(J_{nr-3.2})^{-0.2633}$-10]
	Percent difference in non-recoverable creep compliance between 0.1 kPa and 3.2 kPa, J_{nrdiff} (%)		0.1	Testing carried out for information purposes only		
PG70-28, PG64-28	CTOD, δ_t (mm)	LS-299	0.1	≥ 10.0	< 6.0 and ≥ 4.0	< 4.0
	Low temperature limiting grade (LTLG) (°C)	LS-308	0.1	≤ -28.0	> -25.0 and ≤ -22.0	> -22.0
	Grade Loss (°C)	LS-308	0.1	≤ 6.0	> 6.0 and ≤ 8.0	> 8.0
PG58-28	CTOD, δ_t (mm)	LS-299	0.1	≥ 6.0	N/A	< 4.0
	Low temperature limiting grade (LTLG) (°C)	LS-308	0.1	≤ -25	> -25 and ≤ -22.0	> -22.0
	Grade Loss (°C)	LS-308	0.1	≤ 4	N/A	> 6.0
PG70-34, PG64-34, PG58-34, PG52-34	CTOD, δ_t (mm)	LS-299	0.1	≥ 14.0	< 10.0 and ≥ 8.0	< 8.0
	Low temperature limiting grade (LTLG) (°C)	LS-308	0.1	≤ -34.0	> -31.0 and ≤ -28.0	> -28.0
	Grade Loss (°C)	LS-308	0.1	≤ 6.0	> 6.0 and ≤ 8.0	> 8.0
PG58-40, PG52-40	CTOD, δ_t (mm)	LS-299 (Note 3)	0.1	≥ 18.0	< 14.0 and ≥ 12.0	< 12.0
	Low temperature limiting grade (LTLG) (°C)	LS-308	0.1	≤ -37.0	> -37.0 and ≤ -34.0	> -34.0
	Grade Loss (°C)	LS-308	0.1	≤ 6.0	> 6.0 and ≤ 8.0	> 8.0

PGAC Grade	Property and Attributes (Unit)	Test Method	Results Reported Rounded to Nearest	Acceptance Criteria	Major Borderline	Rejectable

Notes:
1. PGAC grades are as specified in the Contract Documents.
2. The rounding-off procedure, for all values, shall be according to LS-100.
3. Sections 6.1 and 6.3 of LS-299 (Rev 31 dated 2017 09 01) are deleted and replaced with the following:
   6.1 After trimming, condition the samples on their base plates at 15 ± 0.5°C for 3 h ± 5 min in their molds in a temperature-controlled bath under a minimum of 25 mm of water.
   6.3 Run the test according to AASHTO T 300 at a displacement rate of 50 ± 2.5 mm/min in a bath maintained at 15 ± 0.5°C, until ductile failure is reached, or a stroke length of 1000 mm is reached.

Table 2 is deleted in its entirety and replaced with the following:

Table 2
Sampling Requirements

Samples	Frequency	Minimum Sample Quantity	Labelling
QA	Each Lot	2 litres (Note 1)	Label shall include: - Grade - Supplier
Referee	Each Lot	2 litres (Note 1)	
Samples for possible Owner testing (Note 2)	First Lot for each grade and source of asphalt cement used on the Contract and for any subsequent Lot requested by the Contract Administrator.	2 litres (Note 1)	Label shall include: - Grade - Supplier - MERO Sample

Notes:
1. Two litres shall be provided in 2 suitable one litre containers or a container able to hold a minimum of 2 litres.
2. Samples for possible Owner testing shall be delivered to:
   Materials Engineering and Research Office (MERO)
   Bituminous Laboratory, Room 15
   145 Sir William Hearst Avenue
   Downsview, Ontario M3M 0B6

ADVANCED TRAFFIC MANAGEMENT SYSTEM OPERATIONS

Special Provision No. 168F10 September 2007

INTERFERENCE WITH ATMS OPERATIONS

The Contractor shall not interfere with the existing COMPASS subsystems except as otherwise directed in the Contract. The following general restrictions to operating subsystems apply:

1. Individual Elements

Work on individual elements (such as cabinets, enclosures, signs, cameras) may be carried out at any time permitted in the Contract.

The Contractor shall submit a detailed element interference plan to the Contract Administrator for approval a minimum of four weeks prior to commencing any work that may result in an element outage or prevent the element from performing its normal functions. The plan shall include what work will be done, any dependencies or staging, and maximum element interference duration. The plan shall be prepared to minimize interference durations and overall COMPASS impacts. The Contractor shall provide a minimum 72-hour notice to the Contract Administrator prior to the start of any work resulting in element interference.

2. Subsystems

Work requiring outage of a full or a substantial part of a subsystem shall be subject to the following allowable downtime constraints:

VMS: N/A
PVMS: N/A
QWS: Duration of Highway Construction – Limited to QWS Site 1 Only
CCTV: Not Allowed
VDS: Duration of Highway Construction – Limited to QWS Site 1 Only
Ramp Metering: N/A
Communications: Duration of Highway Construction – Limited to QWS Site 1 Only
Power: Duration of Highway Construction – Limited to QWS Site 1 Only

The Contractor shall provide 72 hours advance notice prior to the intended disconnect of the above operational components and obtain the approval of the Contract Administrator prior to proceeding with this work. The subsystem shall be returned to full operation at all other times.

3. Access to Traffic Operations Centre (TOC)

Where the Contractor's work requires access to the Traffic Operations Centre (TOC), the Contractor shall make arrangements for the timing of the work and access to the Traffic Operations Centre (TOC) by contacting the Contract Administrator 72 hours in advance of the work.

Work within the Traffic Operations Centre (TOC) may be carried out between N/A Monday to Friday unless such work interferes with operational subsystems for which constrains are included in section 2 apply.

4. Impacts of New Installations on Existing System

Where new equipment is connected to or activated with the existing network and this equipment causes a network problem or failure, the Contractor shall remedy the situation immediately upon notification by the Contract Administrator. The network failures or problems shall be restored to the prior full functional condition and to the satisfaction of the Contract Administrator. If the Contractor fails to remedy the situation within the prescribed time, the Owner will apply the applicable sum as liquidated damages.

QUALITY CONTROL, TESTING AND DOCUMENTATION FOR ADVANCED TRAFFIC MANAGEMENT SYSTEM WORK

Special Provision No. 168F14 December 2017

1. SCOPE

This Special Provision describes the general requirements for the Contractor's quality control, testing and documentation for products furnished under the Contract. Specific requirements are included in the Special Provisions for the various items of equipment to be furnished by the Contractor.

2. REFERENCES

This Special Provisions refers to the following standards, specifications or publications:

International Organisation for Standardization (ISO):

ISO 9660 Information processing - Volume and file structure of CD-ROM for information interchange

3. DEFINITIONS

For the purpose of this Special Provision, the following definitions apply:

Environmental Testing means verification of equipment operation meeting the specifications, at both cold and hot temperature limits specified for the equipment.

Equipment means all materials and components supplied by the Contractor.

PIT means Pre-Installation Testing and includes all testing undertaken prior to installation of equipment and may also include testing of mock-ups, prototype testing and normal factory production testing.

POP means Proof of Performance Testing and includes all testing undertaken following the installation of equipment to verify the physical and operational features of each item of equipment and each ATMS subsystem.

SIT means System Integration Testing and includes all testing required to verify the harmonious operation of all ATMS subsystems described in the Contract.

TRT means Testing Requirements Table and identifies the PIT, POP, and SIT equipment testing requirements for specific Contract items.

4. DESIGN SUBMISSION AND REQUIREMENTS

4.1 General

Documentation, including shop drawings, catalogue sheets, calculations, drawings, diagrams, test print-outs, photographs and text shall be provided by the Contractor to a level of detail such that the Contract Administrator can achieve a reasonable level of assurance that the equipment that is furnished by the Contractor is in accordance with the specifications of the Contract. The documentation shall also be used to

provide records for future operational and maintenance activities. The Contractor shall show the appropriate document submittal and review timeframes on the Contract schedule.

4.2 Submission of Documentation

The following documentation submissions are required:

a) Material selection documentation.

b) Design documentation (if applicable).

c) Test procedures documentation (including for prototype where required).

d) Test results documentation (including for prototype where required).

e) Software documentation (if applicable).

f) Data communications protocol documentation (if applicable).

g) Network devices IP address table (if applicable).

h) System documentation (if applicable).

i) As-built drawings.

j) Installation and operation manual.

k) Maintenance and service manual.

For all submissions, the Contractor shall initially provide one (1) hard copy and one (1) electronic copy of all documentation to the Contract Administrator required for the submission. The documentation shall be complete, and no partial submissions will be accepted.

The Contract Administrator will return the hard copy within three (3) weeks of the initial documentation submission noting the submission is reviewed with or without comments. If the documents are returned with comments, the Contractor shall make a single second submission of the amended documents within three weeks (3) and the Contract Administrator will return the submission within two (2) weeks. The second submission shall be complete and shall address all comments made under the first submission. An incomplete submission will not be accepted. Following resolution of all comments, the Contractor shall provide the final submission To the Contract Administrator. The final submission shall consist of two (2) hard copies and two (2) electronic copies of all required documentation.

The documentation shall be of professional quality including printed text, CAD produced drawings and photographic material if applicable. All hard copy documentation shall be properly bound in separately indexed 3-ring binders of 75 mm maximum thickness, indexed by item. All electronic documentation shall be submitted on one or more labelled CD disk media formatted with ISO 9660 file system, organized with a folder for each submission, with subfolders for each item, as shown in the following example:

Material Selection Documentation
Item #24 Fibre Optic Communications Cables, In Ducts
Item #25 Ethernet Hubs
Item #26 Portable Variable Message Signs
. . .
Pre-Installation Test Procedures
Item #24 Fibre Optic Communications Cables, In Ducts
Item #25 Ethernet Hubs
Item #26 Portable Variable Message Signs
. . .

The files for each item shall be provided in the Owner's current standards of MS Word or Adobe Acrobat for text and the Owner's current standard of AutoCAD for drawings. These texts and drawing files shall also be consolidated into a single Adobe Acrobat file for each item.

4.3 Material Selection Documentation

The material selection documentation shall demonstrate compliance with all clauses in the specifications, and consist of the following:

a) Name, address and telephone number of the proposed manufacturer;

b) An electronic copy of a schedule in MS Project outlining the times for preparation and submission of design documentation, software documentation and data communications protocol documentation (as applicable);

c) Brochures, catalogue materials, references or other materials which would be helpful to the Contract Administrator for acceptance of the submission;

d) Specifications for all interconnection cables;

e) Development/Milestone and Production Schedules.

Where catalogue information is provided for an item and the Contractor proposes to supply that particular product, the equipment shall be supplied with any enhancements or modifications necessary to meet the requirements as set out in the Contract Documents. Documentation shall be submitted describing those enhancements or modifications in addition to the catalogue information.

No later than three weeks following the Contract award date, the Contractor shall provide the initial submission of all required documentation. The submission will be returned to the Contractor and noted "Submission Review - No comments" by the Contract Administrator if found to be acceptable, or will be marked with "See comments" where found to be non-acceptable. Where "Submission Review - No comments" has been indicated, the final submission shall be made to the Contract Administrator.

The "Submission Review - No comments" stamp or label, indicating acceptance in principle by the Contract Administrator, shall not relieve the Contractor of any responsibilities under the Contract for full performance

of the work should errors or omissions in the documentation be discovered at a later date. Fabrication shall not commence until "Submission Review - No comments" has been granted.

Once fabrication of the equipment has commenced, materials and dimensions shown in the accepted documentation shall not be changed without review of the Contract Administrator. Where the Contractor wishes to make changes, it is the responsibility of the Contractor to notify the Contract Administrator of any Contract non-compliance with respect to the equipment to be supplied and to submit documentation of the changes for review.

4.4 Design Documentation

Design documentation for each item shall be provided for review by the Contract Administrator prior to acquiring any components of custom design for equipment. Design documentation shall consist of all shop drawings, parts lists and text required to define the configuration of the product.

Where physical strength requirements for outdoor exposure of equipment form a part of the Contract specifications, the design documentation shall include a signed statement from an Engineer attesting to the strength of the product.

4.5 Test Procedures Documentation

The Contractor shall provide test procedure documentation for all tests required under the Contract. The test procedures documentation shall detail the intended method of testing based on the item requirements referenced in the testing requirements table (TRT). The following is a sample of the TRT:

Clause	PIT	POP	SIT
5.1.1	√		
5.2.2	√	√	√
5.4.2	√	√	

The method of testing must ensure that each clause listed in the TRT can be successfully demonstrated. The procedures shall include diagrams to show the system test set-up and test points for recordings. The documentation shall also address the format of the test results documentation. The following is a sample format for the test results documentation:

Item #: Item Description: Test:	Tester: Date:
Test Set-up:	

Clause	Test Procedure	Expected Results	Actual Results

Witnessed:

(This Does Not Constitute Approval)

Reviewed and Approved:

The Contractor shall coordinate the timing of submissions and reviews such that the final test procedures documentation is submitted at least three (3) weeks in advance of the scheduled test activity. The Contractor shall not proceed with the test activities before the test procedures are reviewed and approved by the Contract Administrator.

4.6 Test Results Documentation

Test results documentation shall demonstrate the results of all tests in the format previously accepted under the test procedures documentation submission. Communications system PIT and POP test results shall be presented in a line diagram and/or tabular format denoting the test points, expected results, and actual results. All areas of non-compliance with the specifications shall be noted as well as the action to be taken.

Test results documentation shall be submitted to the Contract Administrator within two (2) weeks of completion of each stage of testing (i.e. PIT, POP, etc.).

4.7 Software Documentation

Where software is required under the Contract and where configuration, modification or development is required in order to achieve the functionality described in the Contract, the following documentation shall be supplied:

a) Compiled media copy of the software with all required installation media on CD(s) or DVD.

b) Installation and Operation Manuals.

c) Configuration and System Administration Manual.

d) Maintenance and Service Manuals.

e) All applicable licences.

f) MIB definitions.

At the sole discretion of the Contract Administrator, certain documents may not be required to be supplied.

The final software documentation submission shall be provided to the Contract Administrator a minimum five (5) weeks prior to the site installation of the equipment.

4.8 Data Communications Protocol Documentation

Full documentation shall be supplied to the Contract Administrator for any and all data communications protocol for the following equipment supplied under this Contract:

N/A

For NTCIP interfaces and/or vendor specific private interfaces, the documentation shall include object definitions with valid ranges in ASN.1 notation in electronic format.

The Owner shall be permitted to use the protocol for any purpose deemed necessary. This does not include the right to market, sell or disclose the protocol to a third party but does include the right to share, under a non-disclosure agreement, with other parties for Owner's use.

The final data communications protocol documentation submission shall be provided to the Contract Administrator at least five (5) weeks in advance of site installation of the equipment.

4.9 Network Devices IP Address Table

Where network devices supplied require IP addresses to complete the system configuration, the Contractor shall submit a request to the CA listing the network devices requiring the IP addresses in the following format.

Device	Cabinet ID	Camera ID	VMS ID	VDS ID	IP Address	Subnet Mask	Gatewa y
Ethernet Switch	401CE1450KE R						
NITS or Port Server	401CE1450KE R			OD1 401DE0920DE E 401DE0920DE C			
ATC	401CE1450KE R						
VMS Controller	401CE1450KE R		401VE0110VE S				
IP camera	401CE1450KE R	401TE1470TE R					

4.10 Final System Documentation

The Contractor shall prepare documentation compiling the test procedures, test results and areas of non-compliance with the Contract specifications and shall detail overall system configuration, operation and maintenance with the use of block level diagrams. All equipment in the system shall be identified with module and block numbers.

A functional description of each element of the system and how they function together in a complete system should be explained.

Operating procedures shall be provided describing the initial turn-on, adjustments to ensure the system is operating within the performance requirements and system level corrective maintenance procedures.

The final system documentation submission shall be provided to the Contract Administrator as a condition of Contract Phase I acceptance.

4.11 As-built Drawings

The Contractor shall submit as-built drawings to the Contract Administrator in hard copy with as-constructed revisions marked in red colour. The final as-built drawing submission shall be provided to the Contract Administrator as a condition of Contract Phase I acceptance.

4.12 Installation and Operation Manuals

The manual shall document in detail the installation and operation of the equipment on an item by item basis with clearly detailed illustrations including layout of controls, displays, and all other information required to correctly operate a fully functional unit. The model number(s), all options provided, and the correct settings and configuration shall be clearly shown. All modifications to equipment must be documented.

The manual shall detail, at the system engineering level, the procedures for installation of the software on the given computer system. The manual shall also address the operation of the software at three different levels; beginner, intermediate and advanced.

The Contractor is responsible for generating the required documentation in the event that it is not available from the manufacturer.

The final installation and operation manual submission shall be provided to the Contract Administrator as a condition of Contract Phase I acceptance.

4.13 Maintenance and Service Manuals

The manual shall document in detail the maintenance and service aspects of the equipment on an item by item basis with clearly detailed illustrations including schematic diagrams. The manual shall contain a troubleshooting guide to enable technicians of the Owner, or others, to carry out maintenance operations down to the modular block level.

The manual shall provide sections which completely describe the theory of operation using block diagrams and schematic drawings, diagnostic and repair procedures for corrective maintenance of the unit, assembly and disassembly instructions and drawings, layout drawings showing location of all components, complete components listing showing component type, ratings, cost and acceptable manufacturers. Complete schematic diagrams to the component level shall be provided. The manual shall fully describe all adjustments

and alignment procedures and provide descriptions of expected signals at all test points and outputs. Detailed specifications of equipment performance shall be provided.

The final maintenance and service manual submission shall be provided to the Contract Administrator as a condition of Contract Phase I acceptance.

4.14 Documentation for Phase I Acceptance

The following documentation must be submitted and approved in order to achieve acceptance of Phase I of the Contract:

a) Material Selection Documentation.

b) Design Documentation.

c) Test Procedures and Results for all levels of testing.

d) Software Documentation.

e) Data Communications Protocol Documentation.

f) Network devices IP address table (if applicable).

g) Final System Documentation.

h) As-built Drawings.

i) Installation and Operation Manuals.

j) Maintenance and Service Manuals.

k) Contract Deficiency List.

l) Letter of Credit for Contract Phase II.

5. MATERIALS – Not Used

6. EQUIPMENT – Not Used

7. CONSTRUCTION

Where testing of representative samples of equipment is required, the test shall include a sample of 10% of the units intended for supply under this Contract, selected at random by the Contract Administrator or independent test facility representative. Any additional testing required as a result of test failures shall be done at no additional cost to the Owner. If tests on representative samples of equipment are not successful, the Contractor shall be prepared to test up to 100% of the units intended for supply under this Contract at no additional cost.

The Contractor shall endeavour to ensure that production facilities for the equipment as supplied carry out a thorough and conscientious Quality Control program. Where quality and testing standards issued by

independent authorities are called for in the specifications, the Contractor shall ensure that the proper equipment and facilities are available for carrying out of the tests.

Where defects in the performance of the Owner's existing subsystems or components are found, the existing systems shall be repaired as directed by the Contract Administrator, and shall be administered under the Change Order provisions of the MTO General Conditions of Contract.

7.1 Quality Control

As proof of equipment certification, the Owner will accept one of the following:

a) A compliance and test results certificate from an approved independent testing laboratory operating at arm's length from the Contractor, his supplier and the manufacturer.

b) A compliance and test results memorandum from an Engineer.

The Contract Administrator and agents of the Owner may request to attend any test. The Contractor shall arrange suitable times and locations for the tests and shall co-ordinate with the Contract Administrator such that witnessing of tests is practical. The Contractor shall provide the Contract Administrator a minimum of seven (7) days notice of when all tests shall take place.

7.2 Testing

Equipment testing shall apply to all equipment. Equipment testing shall include PIT, POP, SIT verification of all clauses identified in each item's TRT.

8. QUALITY ASSURANCE - Not Used

9. MEASUREMENT FOR PAYMENT - Not Used

10. BASIS OF PAYMENT

Payment for quality control, testing (except SIT) and documentation shall be included in the Contract price for the applicable items.

REQUIREMENTS FOR WORKING ON, ABOVE OR BELOW CANADIAN PACIFIC RAILWAY RIGHT-OF-WAY

Special Provision No. 199F04 August 2018

1.0 SCOPE

This Special Provision covers the requirements and operational constraints for work within the Canadian Pacific (CP) Railway right-of-way and shall be read in conjunction with Canadian Pacific Railway Minimum Safety Requirements for Contractors Working on Railway Property. In the event of any inconsistency or conflict, the more restrictive requirement shall apply.

The term Railway refers to Canadian Pacific Railway.

2.0 SAFETY REQUIREMENTS

Canadian Standards Association (CSA) approved hard hats, safety footwear and safety glasses for head, foot and eye protection and safety vests for high visibility must be worn at all times while on the Railway right–of-way.

The color red shall not be used for hard hats, safety vests or survey markers on or adjacent to the Railway right-of-way in order to avoid conflict with Railway operational practices. Other highly visible colors such as yellow, orange or white are acceptable.

3.0 CONTACT INFORMATION

Railway contact is:

Peter V. Johnson, P.Eng.
Senior Public Works Consultant –Transportation Rail
AECOM
5080 Commerce Blvd.
Mississauga, Ontario, L4W 4P2
Cell Phone: (905) 301-4105
Telephone: (905) 238-0007
Fax: (905) 238-0038
Email: peter.johnson@aecom.com

4.0 GENERAL REQUIREMENTS

All work within the Railway right-of-way shall comply with the regulatory requirements and health and safety guidelines of the Railway authorities, including but not limited to, the following safety guidelines issued by the Railway:

1) Minimum Safety Requirements for Contractors Working on CP Property in Canada.

In addition, the Contractor shall comply with the ACCESS PROTOCOLS AND SAFETY AND SECURITY PROTOCOLS of Canadian Pacific Railway-MTO Legal Agreement on the behalf of the Owner.

5.0 OPERATIONAL CONSTRAINTS

The Contractor shall comply fully with all requirements of the Railway in planning, scheduling and control of the works within the Railway right-of-way.

Work shall not begin on, above or below the Railway right-of-way until the proof of liability insurance specified in the Contract Documents has been complied with.

All Railway costs including cable locate fees and damage or delay costs, except flagging costs, resulting from the Contractor's operations shall be the Contractor's responsibility.

The Contractor shall be liable for a period of one year from the date of completion of the work all costs, direct and indirect, incurred by the Railway due to the settlement of track(s) or any other problems related to the Railway's operations, property or infrastructure that occur as a result of the Contractor's operations. The settlement will be assessed by the Railway.

All communications with the Railway shall be done through the Contract Administrator. The Contractor shall have a Superintendent present at all times, capable of receiving instructions from the Contract Administrator regarding work on the Railway right-of-way.

Work may be stopped under the authority of the Railway flagperson at any time to accommodate train movements.

All work executed by the Contractor shall not interfere with the continued, safe movement of CN or CP rail traffic.

8.0 CONSTRUCTION REQUIREMENTS

The Contractor shall maintain positive drainage during construction.

No material or debris will be permitted to be stored or stockpiled on the Railway right-of-way. The Railway right-of-way shall be restored to its original condition at the end of the project, including track ballast that has become fouled as a result of the construction, with no additional cost to the owner or Railway.

ENVIRONMENTALLY SENSITIVE AREAS

Special Provision No. 199F12 November 2014

The areas formed by a line joining the points in the table below are environmentally sensitive. Entry onto or use of these areas for any purpose is prohibited, except for the specific, limited purposes specified below.

Area No.	Highway	Points				Description	Exceptions
		No.	Township	Station	Offset		
1	Queen Elizabeth Way	1	Fort Erie	13+100	N/A	Baker Creek Wetland Complex (Environmentally Sensitive Area) occurs outside of construction disturbance area east of QEW.	None
		2	Fort Erie	13+450	N/A		
2	Queen Elizabeth Way	1	Fort Erie	13+610	N/A	Millers Creek Wetland Complex (Environmentally Sensitive Area) occurs outside of construction disturbance area east of QEW.	None
		2	Fort Erie	13+880	N/A		
		3	Fort Erie	14+140	N/A		
		4	Fort Erie	14+620	N/A		
		5	Fort Erie	15+200	N/A		
		6	Fort Erie	14+600	N/A		

3	Queen Elizabeth Way	1	Fort Erie	Site 34-454C	140metres northeast	Frenchmans Creek Wetland Complex (Environmentally Sensitive Area) northeast of Site 34-454/C, east of Petit Rd, north of Gilmore Rd, and southwest of Site 34-455/C, north of Petit Rd, west of QEW, along the watercourse.	None
4	Queen Elizabeth Way Queen Elizabeth Way		Fort Erie Fort Erie	14+325.2	59mLT	Archaeology Site Will be fenced off delineated "no go" areas	No Exceptions
				14+325.2	24m LT		
				14+479.2	22.3m LT		
				14+479.2	55.5m LT		
5	Queen Elizabeth Way		Fort Erie	14+054	6.0mRT	Archaeology Site Will be fenced off delineated "no go" areas	Cannot be entered until authorized by the contract administrator
				14+054	35.6mRT		
				14.224.5	35.8 RT		
				12+224.5	11.1 RT		
6	Queen Elizabeth Way		Fort Erie	13+305.9	N/A	Bat Habitat buffer zone. Night work and temporary lighting restrictions imposed between March 31st and October 1st.	None unless otherwise authorized by the contract administrator
				9+360.0	N/A		
				15+110.4	N/A		
				10+570	N/A		

Areas may extend and other areas may be present beyond the Highway right-of-way, and may be subject to regulation.

INFORMATION TO BIDDERS REGARDING AGGREGATE SOURCES

Special Provision No. 199F14 August 2018

General

The Contractor must demonstrate the ability of aggregate sources to produce aggregate that satisfies the requirements of the Contract Documents.

During tendering, a request for approval for use of an MTO/Crown source not listed on an Aggregate Sources List (ASL) shall be made through the bid enquiry process. Any MTO/Crown sources not listed on an ASL may be used, subject to the approval of the Head, Regional Geotechnical Section. If approval is granted, the ministry's ASL Conditions of Information shall apply.

For enquiries related to Crown sources or sources under permit to MTO, Contractors may contact the appropriate Regional Geotechnical Section to request available Mineral Aggregate Inventory Data Bank (MAIDB) information.

For enquiries related to a specific commercial and/or private source, the Contractor may contact the Aggregate Unit of the appropriate Regional Geotechnical Section to access available Mineral Aggregate Inventory Data Bank (MAIDB) information provided they have written consent from the source owner.

Regional Geotechnical Section offices are located in:

Location/Office	Region	Telephone #	Fax #
Kingston	East	(613) 545-4794	(613) 540-5106
North Bay	Northeast	(705) 497-5478	(705) 497-5499
Thunder Bay	Northwest	(807) 473-2090	(807) 473-2022

For aggregate related enquiries for sources located in Central Region or West Region, please contact:

Location/Office	Region	Telephone #	Fax #
Materials Engineering and Research Office, Soils and Aggregates Section	Central	(416) 235-3736	(416) 235-4101
	West		

Access to the information in MAIDB is provided for the convenience of the Contractor only. Since MAIDB information is dated and subject to interpretation, the information is not guaranteed.

For Contracts that include concrete items, Structural Concrete Aggregate Source Lists and Concrete Base/Pavement Aggregate Source Lists, as applicable, are available on the RAQS/MERX website: www.raqs.merx.com/public/bulletin/bulletin.jsf

Earth Borrow, Rock Supply, Granular Base, and Conventional Hot Mix Aggregates

This contract does not include an Aggregate Sources List (ASL) for earth borrow, rock supply, granular base, and conventional hot mix aggregates. For information regarding commercial sources, Contractors may refer to the following sources of information:

a) Commercial Aggregate and Membership Directory, available through Ontario Stone, Sand & Gravel Association (OSSGA);

b) Aggregate License/Permit List, available through the Ministry of Natural Resources and Forestry (MNRF); www.ontario.ca/environment-and-energy/find-pits-and-quarries, and

c) Aggregate Resources Inventory Papers (ARIPs), available through the Ministry of Northern Development and Mines (MNDM). www.geologyontario.mndm.gov.on.ca/index.html

ENVIRONMENTAL EXEMPTIONS AND PERMITS

Special Provision No. 199F31 April 2016

The following environmental exemptions and permits will be obtained by the Contractor for the Work.

Exemption and Permit Identification
Exemption from Town of Fort Erie Noise By-law No. 30-09 Section 2.3 (g) allowing nighttime construction works in 2020 and 2021 is the responsibility of the contractor.

The following environmental exemptions and permits are provided for the Work.

Exemption and Permit Identification	Exemption and Permit Details and Conditions
Exemption requirements for Town of Fort Erie Noise Bylaw 30-09	Exemption granted from Section 2.3 (g) of Noise By-law No. 30-09 allowing nighttime construction works May1st-December 31st, 2019. Conditions set out in the exemption must be adhered to by MTO's delegated contractor and/or the MTO or its consultant.
Letter of Advice GU-L-001-19 For Bat Species at Risk	MNRF granted a Letter Of Advice (LOA) for the tree clearing required and outlined in the contract documents. The LOA sets out conditions that must be adhered to by MTO's delegated contractor and/or the MTO or its consultant.

The exemptions and permits provided above do not relieve the Contractor of other obligations imposed by statute or by municipal bylaw.

Pending Environmental Exemptions and Permits

The following environmental exemptions and permits are pending for the Work. The pending exemptions and permits are expected to be obtained by the date shown.

No.	Highway	Pending Exemption and Permit Identification	Date Expected
1	QEW	MTCS Acceptance of the Boyer Site Archaeology Stage 4 Report	July 2019
2	QEW	Permit to Take Water (PTTW)	July 2019

CONSTRUCTION NOISE CONSTRAINTS

Special Provision No. 199F33 June 2013

Noise Sensitive Areas

This Special Provision covers the requirements for control of construction noise produced by the Contractor's operations. With the exception of any exemptions from municipal noise control bylaws that may be specified in the Contract Documents, these requirements do not relieve the Contractor of other obligations imposed by statute or by municipal bylaw.

Noise constraints in noise sensitive areas are as follows:

Noise Sensitive Area # 1

Noise Sensitive Area Limits	
• Contract Limits	
Constraint	**Constraint Details**
Noise By-law limitations – Town of Fort Erie	Operation of construction equipment from 9:00PM one day to 7:00 AM the next is not permitted unless an exemption has been granted through a municipal noise control bylaw exemption, as specified elsewhere in the Contract.
Equipment Sound Emission Standards	Equipment shall comply with the sound emission standards for construction equipment outlined in Ministry of Environment, Conservation and Parks publications NPC-115 and NPC-118, which are available from the: Ministry of Environment, Conservation, and Parks Client Services and Information Branch or Environmental Assessment and Permissions Branch Phone: 416-314-8001 or 1-800-461-6290. Where feasible, equipment with broadband backup alarms instead of the tonal backup alarms/beepers shall be utilized.
Equipment Maintenance	Equipment shall be maintained in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components, and the lubrication of moving parts.
Equipment Operation	Idling of equipment shall be restricted to the minimum necessary to perform the specified work. Stationary equipment shall be located as far away from sensitive locations as feasible.

Blasting and Piling	Blasting and piling operations shall be conducted in compliance with Ontario Provincial Standard Specification 120 and Ministry of Environment, Conservation and Parks publications NPC-119.

OTHER CONTRACTORS WITHIN OR ADJACENT TO THE LIMITS OF THE CONTRACT

Special Provision No. 199F43 March 2018

Other work may be in progress within or adjacent to the limits of this contract.

The Contractor shall coordinate the work with other Contractors within and/or adjacent to the project limits to ensure that they do not perform work in the same area at the same time, or adversely affect each other's work.

The Contractor shall ensure that a minimum separation of 500m is maintained between the operation included in this contract and the work within and/or adjacent to this project, done by others.

The Contractor shall provide a written submission to the Contract Administrator explaining how the work with other Contractors will be coordinated.

The following work is ongoing:

Project Name: Canadian Motor Speedway
Contact person's name: Chris Andrews
Company name: EllisDon Corporation
Telephone number: 416 575 0965
Address: 1004 Middlegate Road, Suite 1000, Mississauga
Utilities and locations: To be confirmed as the CMS project is developed
Utility company involved: To be confirmed as the CMS project is developed
Locations that must be temporarily vacated by the contractor, distances, reasons, dates, etc: To be confirmed as the CMS project is developed

Project Name: QEW Welland River Bridge
Contact person's name: Emily Frazer
Company name: MTO
Telephone number: 416-235-4210
Address: 159 Sir William Hearst Avenue, Toronto, Ontario M3M 0B7
Utilities and locations: TBD
Utility company involved: TBD
Locations that must be temporarily vacated by the contractor, distances, reasons, dates, etc: TBD

GENERAL REQUIREMENTS OF SAMPLES FOR QUALITY ASSURANCE, REFEREE AND OTHER TESTING BY THE OWNER OR THE OWNER'S AGENT

Special Provision No. 199F57 December 2017

Scope

This Special Provision covers the minimum requirements for the handling, identification, and delivery of samples to a laboratory for quality assurance, referee and other testing by the Owner or the Owner's agent.

Sampling and Identification

All samples shall be obtained and packaged by the Contractor, in the presence of the Contract Administrator or a designated representative. All samples shall be provided with a unique number by the Contract Administrator for identification purposes.

Sampling, handling, and storage of samples shall be as specified in the Contract Documents. Notwithstanding, the Owner may take samples for its own purposes at any time from any location. The Contractor shall furnish all reasonable assistance to the Owner and shall require its Subcontractors and suppliers to do the same.

The Contractor shall supply sample containers and all relevant Material Safety Data Sheets or Safety Data Sheets. All containers used for samples of materials controlled under the Workplace Hazardous Materials Information System shall be appropriate for the materials and shall be labelled and accompanied with the relevant Material Safety Data Sheets or Safety Data Sheets.

The Contractor shall package all samples to minimize risk of damage or contamination during transport. Once packaging is complete, the Contractor shall inspect all samples and confirm each sample and packaging is acceptable to the Contract Administrator for delivery.

After inspecting and determining that each sample is acceptable for delivery, the Contractor shall enter the sample data information. Upon the Contractor submitting the sample data information, the Contractor accepts responsibility that the information entered is accurate.

The Contractor shall place bags or containers of samples into clear polyethylene security bags supplied by the Owner when instructed by the Contract Administrator. At this point, the Contract Administrator shall take possession of, and assume responsibility for the samples. The Contract Administrator or his representative may apply security seals.

The Contractor shall be responsible for all costs associated with obtaining new samples if the original samples did not conform to the sampling requirements (e.g. weight and size) and were deemed unsuitable for testing by the laboratory or the Owner.

Sample Delivery by the Contractor

The Contractor shall be responsible for the delivery of concrete cylinders for strength and grout cubes for strength determination, and bridge bearing pads, to the laboratory designated by the Owner. All other samples shall be delivered by the Contract Administrator.

Samples delivered by the Contractor shall be within the time limits and locations specified in the Contract

Documents. The Contractor shall normally deliver samples during normal business hours. Normal business hours are deemed to be from 8:00 a.m. to 5:00 p.m., each Business Day. Where a sample has to be delivered outside these hours, the Contractor shall give the laboratory one full Business Day notice. If the time limits or locations or both for delivering samples are not specified in the Contract Documents, then the sample shall be delivered by the Contractor no later than 1 Business Day from the date of sampling to the regional quality assurance laboratory located within a 150km radius of the Contract limits.

For all samples delivered by the Contractor, the Contractor shall maintain a record of the date and time of delivery, and the printed name and signature of the authorized individual receiving the sample. The Contractor shall sign the laboratory's records to confirm the date and time of delivery.

The Contractor shall be responsible for all costs associated with obtaining new samples if the original samples delivered by the Contractor are lost or deemed unsuitable for testing by the laboratory or the Owner.

The regional quality assurance laboratory shall be designated by the Owner.

NATIONAL ENERGY BOARD (NEB) REGULATED PIPELINES

Special Provision No. 199F59 December 2017

1.0 SCOPE

The Contractor shall comply with regulations pursuant to Section 112 of the National Energy Board Act when using power-operated equipment or explosives within the prescribed area.

The NEB Act and Regulations referenced below must be read in conjunction with and are intended to supplement the general requirements of the Ontario Occupational Health and Safety Act and Regulations for Construction Projects, specifically Section 228, Precautions Concerning Services.

2.0 REFERENCES

This Special Provision refers to the following publications:

National Energy Board Act 112(1) and 112(2)
NEB Pipeline Damage Prevention Regulations - Authorizations
NEB Pipeline Damage Prevention Regulations - Obligations of Pipeline Companies
NEB Pipeline Damage Prevention - Ground Disturbance, Construction and Vehicle Crossings

3.0 DEFINITIONS

For the purpose of this specification, the following definitions apply:

Prescribed Area means a strip of land measured 30 metres perpendicularly on each side from the centreline of a pipe controlled by the NEB.

Ground Disturbance means any activity that may disturb the ground within the prescribed area.

4.0 COMPLIANCE MEASURES

The Contractor shall contact all pipeline owners listed below and request from them a copy of their technical guidelines for work adjacent to their pipelines.

Pipeline Owner	Contact Information
Not Applicable	Not Applicable

Activities requiring permission from the pipeline owner include;

- Construction of a facility across, on, along, or under a pipeline, including the pipeline right of way;
- Ground disturbance activities in the prescribed area;
- Ground disturbance using explosives or mechanical equipment within the prescribed area;
- Operation of a vehicle or mobile equipment across a prescribed area, outside the travelled portion of a highway or public road, or;
- Seismic/vibration activity within the prescribed area.

The Contractor shall submit a written application to the pipeline owner in accordance with the requirements of the pipeline owner, seeking permission to perform the work under this Contract.

The Contractor shall immediately submit a copy of the approved application to the Contract Administrator once received from the pipeline owner.

The Contractor shall comply with all conditions, requirements and procedures of the pipeline owner and not proceed with the work until written permission has been received.

Once the pipeline owner has given its permission, the Contractor shall comply with the following:

- Initiate a locate request at least three Working Days before the day on which the construction or ground disturbance activity is planned in the prescribed area, by calling Ontario One Call, or by calling the pipeline company where there is no Ontario One Call centre, to have the pipe located and marked.
- Witness the pipe being located and marked and become familiar with the meaning of the pipeline markings.
- Review NEB requirements with all persons working on your behalf and keep a copy of the approved application on site.
- Expose the pipe by hand digging or other acceptable excavation techniques approved by the pipeline company prior to any mechanical excavation within three metres of the pipe.
- Notify the pipeline company 24 hours prior to backfilling over the pipe or facilities, where the pipe or facilities have been exposed.
- Follow the instructions of the pipeline company’s authorized field representative.

- Immediately notify the pipeline company if any contact is made with the pipe or its coating.

The Contractor shall comply with the following rules for ground disturbance within three metres of the pipe. Ground disturbance using mechanical equipment is not permitted within three metres of the pipe except under the following conditions:

a) When the excavation runs parallel to the pipe and;

   i. the pipe has been exposed by hand at sufficient intervals to confirm the pipe's location or;

   ii. the pipeline company has used a method that would permit it to confirm the pipe's exact location and has informed the person of that location.

b) When the excavation crosses the pipe and;

   i. the pipe has been exposed by hand at the point of crossing or;

   ii. the pipeline company has used a method that would permit it to confirm the pipe's exact location, has informed the person of that location and has confirmed that the pipe is at least 60 cm deeper than the proposed excavation.

And

c) When the ground conditions render it impractical to locate the pipe using any of the methods set out in (a) and (b), the pipeline company directly supervises any excavation.

The Contractor shall not move or alter the pipe or its fittings, or in any other way interfere with the pipe without the written consent of the pipeline owner.

EARTH EXCAVATION, GRADING - Item No. 5

Special Provision No. 206F06 September 2017

Amendment to OPSS 206, November 2014

206.07.03.01 Earth Excavation - Grading

206.07.03.01.01 General

Clause 206.07.03.01.01 of OPSS 206 is amended by the addition of the following paragraph:

The work shall also include the excavation of pavement, treated base, concrete base, prime, surface treatment, and mulch pavements, including any buried layers of these materials, at the following locations:

N/A

206.09.01.01 Earth Excavation, Grading

Clause 206.09.01.01 of OPSS 206 is amended by the addition of the following paragraph:

Where the work of earth excavation, grading includes the removal of pavement, treated base, concrete base, prime, surface treatment, and mulch pavements, including any buried layers of these materials, the measurement for payment of earth excavation, grading shall include the volume of these materials.

EARTH DITCH CLEANOUT - Item No. 8

Special Provision No. 299F11 September 2011

CONSTRUCTION SPECIFICATION FOR DITCH CLEANOUT

1.0 SCOPE

This specification covers the requirements for cleanout of earth and rock ditches to restore the maximum flow of water intended when the ditches were originally constructed.

2.0 REFERENCES – Not Used

3.0 DEFINITIONS

For the purpose of this specification, the following definitions apply:

Deleterious substance means any substance that, if added to a waterbody, could degrade water quality or impact fish, fish habitat and aquatic wildlife.

Earth ditch means an existing ditch in earth including but not limited to a roadside ditch or a ditch lying beyond the end of a drainage structure.

Roadside ditch means a ditch with one of its sideslopes coincident with the road frontslope.

Rock ditch means an existing ditch in rock including, but not limited to a roadside ditch or a ditch lying beyond the end of a drainage structure.

Riparian vegetation means vegetation within 30 metres of a waterbody.

Waterbody includes areas inundated by water, either permanently or intermittently, for a consecutive period of time exceeding 2 weeks of the year.

Waterbody Bank means the area of slopes and flatlands bordering on or adjacent to a waterbody, extending a minimum of fifteen metres from the edge of the waterbody.

Wetland means lands such as swamps, marshes, bogs and fens that are seasonally or permanently covered by shallow water, as well as land where the water table is close to or at the surface.

4.0 DESIGN AND SUBMISSION REQUIREMENTS – Not Used

5.0 MATERIALS - Not Used

6.0 EQUIPMENT - Not Used

7.0 CONSTRUCTION

7.01 General

The work shall include removal and management of all vegetation, earth, rock, winter sand and any other debris from the inlet and ditch surfaces of all ditches specified elsewhere in the Contract Documents, in order to restore the grades and flow of water.

Cleaned ditch surfaces shall be left in as smooth a condition as is practicable. Grooves left in ditch surfaces, such as those that may result from the use of toothed excavator buckets, shall not be acceptable.

7.02 Operational Constraints

Ditch cleanout shall be carried out in accordance with the following operational constraints:

a) Ditch cleanout shall not be conducted within the receiving waterbody or within a wetland or when water in the ditch is flowing. Ditch cleanout shall be conducted in dry weather.

b) Equipment shall arrive on site in a clean condition, be maintained free of fluid leaks and be operated from the shoulder, and in a manner that minimizes disturbance to the waterbody banks of the receiving waterbody.

c) Equipment refuelling and excess materials storage shall take place at locations as far away as practicable from the receiving waterbody in a manner that prevents the entry to the waterbody of deleterious substances including sediment.

d) Disturbance of riparian vegetation shall be minimized, especially the vegetation directly adjacent to the waterbody.

7.03 Management of Removed Materials

Any suitable materials that have been removed from ditches identified below shall be managed by reuse within the ROW as follows:

N/A

Any material that has been removed from ditches that is not able to be reused within the ROW shall be managed as follows:

Management of excess materials shall be according to the Contract Documents.

8.0 QUALITY ASSURANCE

The Contract Administrator may conduct inspections of any ditch after cleanout to verify that the Contractor has adequately restored the ditch grades and flow as specified in the Contract Documents.

9.0 MEASUREMENT FOR PAYMENT

Measurement is by Plan Quantity in metres measured along the centreline of the cleaned out ditches.

10.0 BASIS OF PAYMENT

Earth Ditch Cleanout – Item
Rock Ditch Cleanout – Item

Payment at the Contract price for the above tender items shall be full compensation for all labour, Equipment and Material to do the work.

TACK COAT - Item No. 10

Special Provision No. 308F02 February 2017

Amendment to OPSS 308, April 2012

Painting Material, Application Options, and Samples for Testing

308.05 MATERIALS

308.05.01 Tack Coat and Joint Painting Material

Clause 308.05.01 of OPSS 308 is deleted in its entirety and replaced with the following:

Tack coat and joint painting material shall consist of SS-1 or SS-1HH emulsified asphalt diluted with an equal volume of water. The undiluted material shall be according to OPSS 1103.

308.07 CONSTRUCTION

308.07.01 Application of Tack Coat

Subsection 308.07.01 of OPSS 308 is amended by the addition of the following:

f) The surface of all binder courses

308.08 QUALITY ASSURANCE

308.08.01.03 Samples for Testing

Clause 308.08.01.03 of OPSS 308 is amended by deleting the second paragraph in its entirety and replacing it with the following:

The minimum quantity of each of the QA and referee samples shall be 1 litre.

DEWATERING SYSTEM - Item No. 47
TEMPORARY FLOW PASSAGE SYSTEM - Item No. 48

Special Provision No. 517F01 July 2017

Amendment to OPSS 517, November 2016

Design Storm Return Period and Preconstruction Survey Distance

517.01 SCOPE

Section 517.01 of OPSS 517 is deleted in its entirety and replaced with the following:

This specification covers the requirements for the design, operation, and removal of a dewatering or temporary flow passage system or both to control water during construction, and the control of the water prior to discharge to the natural environment and sewer systems.

517.04 DESIGN AND SUBMISSION REQUIREMENTS

517.04.01 Design Requirements

Subsection 517.04.01 of OPSS 517 is amended by deleting the first paragraph in its entirety and replacing it with the following:

A dewatering or temporary flow passage system or both shall be designed to control water at the locations specified in the Contract Documents and at any other location where a system is necessary to complete the work. The design of the system shall be sufficient to permit the work at each location to be carried out as specified in the Contract Documents.

Subsection 517.04.01 of OPSS 517 is further amended by deleting the second last paragraph in its entirety and replacing it with the following:

Temporary flow passage systems shall be designed, as a minimum, for a 2 year design storm return period and groundwater discharge, except for the work specified in Table A. For the work specified in Table A, the temporary flow passage system shall be designed, as a minimum, for the design storm return period specified in Table A and groundwater discharge. A longer return period shall be used when determined appropriate for the work.

Intensity-Duration Factor (IDF) curve location, site specific minimum return period, return period flow estimates, and other information is provided in Table A. The IDF information can be accessed through the MTO IDF Curve Look up Tool on the Drainage and Hydrology page of MTO's website (http://www.mto.gov.on.ca/IDF_Curves/terms.shtml). The return period flow estimates do not include flow volumes from groundwater discharge. The Owner specifically excludes these flow estimates from the warranty in the Reliance on Contract Documents subsection of OPSS 100, MTO General Conditions of Contract.

Table A

IDF Curve Location	Latitude: 42.921754			Longitude: -78.970760		
Temporary Flow Passage Systems						
Site Name / Station Reference	Minimum Return Period (Years)	Return Period Flow Estimates (m^3/s)				Design Engineer Requirements (Note 1)
		2 Year	5 Year	10 Year	25 Year	
Culvert A004	10	2.59	3.36	3.86	4.49	Yes
Culvert 34-454C	10	5.12	6.54	7.45	8.59	Yes
Culvert 34-455C	10	4.81	6.14	6.99	8.06	Yes
Dewatering Systems						
Site Name / Station Reference	Preconstruction Survey Distance (Note 2) (m)					Design Engineer Requirements (Note 1)
Site No. 34-455C	N/A					No
Site No. 34-454C	N/A					No

Note:

1. "Yes" means the design Engineer and design-checking Engineer shall have a minimum of 5 years of experience in designing systems of similar nature and scope to the required work. "No" means a minimum experience level is not required for the design Engineer and design-checking Engineer.
2. "N/A" indicates a preconstruction survey is not required.

ADVANCED NOTIFICATION/WARNING/DETOUR ROUTE TC-64 SIGNS - Item No. 55

Special Provision

SCOPE

This Special Provision covers the requirements for placing Advance Notification/ Warning/ Detour Route TC-64 Signs as well as amending existing Ground Mounted and Overhead Signs.

CONSTRUCTION

The Contractor shall install, maintain, relocate, and remove Advanced Notification/ Warning/ Detour Route TC-64 Signs as indicated in the contract. In addition, the Contractor shall install and remove all temporary overlays to amend existing Ground Mounted and Overhead Signs as indicated in the contract.

All Advanced Notification/Warning/Detour Route TC-64 Signs, as well as any temporary overlays to amend existing signs, shall conform to the guidelines specified in the "*Temporary Conditions Traffic Management*" (April 2001) manual as revised by the following.

The Advanced Notification TC-64 Sign phase shall be installed a minimum of 7 calendar days prior to any lane reductions or closures. If any changes to the message details (i.e. dates, times, etc.) are required, as a

result of the contractor's operations during the construction period they shall be completed with no additional payment to the Contractor.

Placement and removal of tabs, permanent and temporary overlays, shall be as indicated in the contract.

Temporary overlays placed on Ground Mounted and Overhead Signs shall be installed with self-tapping #3 Teks screws placed at 30cm centres.

There shall be no more than 2 overlays on Advanced Notification/Warning/Detour Route TC-64 Signs at any one time.

MEASUREMENT FOR PAYMENT

Measurement is by Plan Quantity as may be revised by Adjusted Plan Quantity for each sign installed.

BASIS OF PAYMENT

Payment at the contract price for the above tender item shall be full compensation for all labour, equipment, and material required to do the work. Progress Payments shall be made on the following basis:

60% for initial installation;
20% for maintenance, relocation, placement and removal of tabs and overlays;
20% for removal.

On each occasion when the Contractor fails to install the Advanced Notification/Warning/Detour Route TC-64 Signs in accordance with the above requirements, fails to revise the TC-64 signs as required by the TCTM manual, or fails to remove the TC-64 signs within two hours of re-opening of the affected roadway, the Ministry will assess a penalty of $2,000.00. A further penalty of $2000.00 per calendar day or part thereof, with no maximum penalty, shall be assessed until such time as the situation is rectified.

To obtain a copy of the above noted manual, contact:

Ministry of Transportation of Ontario
Central Region Traffic Office
1201 Wilson Avenue, Building D, 6th Floor, Toronto, Ontario M3M 1J8
Telephone: 416-235-5595

PAVEMENT MARKING, DURABLE - Item No. 57
PAVEMENT MARKING - Item No. 59

Special Provision No. 710F07M September 2011

Amendment to OPSS 710, November 2010

Marking Requirements

710.07.06 Short Term Pavement Marking

The first paragraph of subsection 710.07.06 of OPSS 710 is deleted and replaced by the following:

Short term pavement marking is required when a paved roadway is to be opened to the general public prior to the application of permanent pavement markings, on any milled, levelling, binder or top course pavements where existing lane widths, arrangements and alignments are maintained.

The second paragraph of subsection 710.07.06 of OPSS 710 is deleted and replaced by the following:

As part of the work of the pavement marking, the Contractor shall apply short term pavement markings for the centerline, lane lines and 10 cm. wide continuous edge of pavement lines. Short term pavement markings shall not be measured for payment.

The fifth paragraph of sub-section 710.07.06 of OPSS 710 is deleted and replaced by the following:

The Contractor shall use paint for short term pavement markings, except for the short term pavement markings that are to be replaced on a final surface course which shall be temporary, preformed, removable, pavement marking tape.

PAVEMENT MARKING SYMBOLS, TEMPORARY - Item No. 60

Special Provision

OPSS 710, November 2010 is amended as follows:

710.02 REFERENCES

Section 710.02 of OPSS 710 is amended by the addition of the following:

American Society for Testing and Materials:

ASTM D 6359-98, Standard Specification for Minimum Retroreflectance of Newly Applied Pavement Marking Using Portable Hand Operated Instruments

710.03 DEFINITIONS

Section 710.03 of OPSS 710 is amended by the addition of the following:

Retroreflection – a reflection in which the reflected rays are returned in direction close to opposite of the direction of the incident rays

Retroreflectivity – property of a material or device in which, when directionally irradiated, the reflected rays are preferentially returned in directions close to the opposite of the direction of the incident rays, this property being maintained over wide variations in the direction of the incident rays.

710.05 MATERIALS

Section 710.05 of OPSS 710 is amended by the addition of the following subsection:

710.05.08 Traffic Paint

Traffic paint shall meet the performance requirements of ASTM D 6359-98.

710.07 CONSTRUCTION

710.07.09 Application

710.07.09.01 General

Clause 710.07.09.01 of OPSS 710 is revised by the addition of the following after the first paragraph:

All pavement markings shall remain retroreflective, visible and effective for the duration of their required use. Pavement markings that fail to perform as required shall be reapplied at no additional cost to the Owner.

The Owner shall be the sole authority in determining when pavement markings have failed to perform and the extent of the failure.

710.07.09.02 Organic Solvent Based Traffic Paint

Clause 710.07.09.02 of OPSS 710 is deleted and replaced with the following:

Paint shall be applied when the pavement surface temperature is 5°C and above, unless otherwise approved in writing by the Authority. Paint shall be applied at a rate which results in a uniform thickness of 230 ± 25 microns dry film. Reflectorizing glass beads, conforming to OPSS 1750, shall be applied uniformly immediately after paint application, to ensure embedment of the glass beads.

The paint temperature shall be between 40°C and 70°C when applied to the pavement.

710.07.09.06 Preformed Plastic Tape

Clause 710.07.09.06 of OPSS 710 is revised by the addition of the following:

When the Contractor elects to use preformed plastic tape and weather conditions do not permit reapplication, when required, the Contractor shall use traffic paint to provide the necessary pavement markings.

710.08 QUALITY ASSURANCE

Section 710.08.01 of OPSS 710 is amended by the addition of the following:

The Contractor shall provide access to the Owner to conduct quality testing of cured traffic paint, from which all excess glass beads have been removed, within 14 calendar days of applying the paint.

The Contractor shall provide 3 business days notice to the Owner to conduct the testing.

The Contractor shall ensure that the paint surface is dry and free of foreign debris. In the event of unacceptable testing conditions, the Contractor shall reschedule the testing date and shall notify the Owner at least 3 business days prior to the re-scheduled test date.

The Contractor shall provide the same access and test date notification to the Owner for assessment of reapplied traffic paint.

Section 710.08 of OPSS 710 is amended by the addition of the following:

710.08.04 Testing of Traffic Paint

Random testing of traffic paint will be carried out by the Owner to assess line quality.

Sampling frequency will be as described in Section 6 of ASTM D 6359-98.

710.08.04.01 Acceptance of Traffic Paint for Retroreflectance

Acceptance of traffic paint for retroreflectance will be based on criteria detailed in ASTM D 6359-98.

710.09 MEASUREMENT FOR PAYMENT

Subsections 710.09.01.01 and 710.09.02.01 of OPSS 710 are deleted in their entirety.

Subsections 710.09.01.02 and 710.09.02.02 of OPSS 710 are amended by the addition of the following:

Reapplication of pavement marking symbols will not be measured for payment.

710.10 BASIS OF PAYMENT

Subsection 710.10.01 of OPSS 710 is amended by the addition of the following:

Pavement markings shall be reapplied, when required, at no additional cost to the Owner:

If more than 30 cumulative lineal meters per lane kilometre of pavement marking tape fails to perform, the Contractor shall reapply pavement marking tape in the failed areas within 48 hours of the occurrence of the failure, at no additional cost to the Owner.

If less than 30 cumulative lineal meters per lane kilometre of pavement marking tape fails to perform, the Contractor shall reapply pavement marking tape in the failed areas within 7 calendar days of the occurrence of the failure, at no additional cost to the Owner.

If any temporary pavement marking symbol consisting of pavement marking tape fails to perform, the Contractor shall reapply the symbol within 48 hours of the occurrence of the failure, at no additional cost to the Owner.

If traffic paint fails to meet the requirement of ASTM D6359-98, the paint within the failed zone of measurement shall be reapplied within 7 calendar days of notification of failure, at no additional cost to the Owner.

Failure to reapply pavement markings within the stipulated timeframes will result a penalty of $5,000.00 per day for each calendar day, or part thereof, that the failed pavement markings remain un-repaired beyond the noted timeframes.

The Owner shall be the sole authority in determining the time of occurrence and extent of the failures.

LIGHT-DUTY SILT FENCE BARRIERS - Item No. 75
STRAW BALE FLOW CHECK DAMS - Item No. 76

Special Provision No. 805F01 December 2015

Amendment to OPSS 805, November 2015

805.07 CONSTRUCTION

805.07.01.06 Construction and Removal of Measures

Clause 805.07.01.06 of OPSS 805 is deleted and replaced by the following:

Further to requirements specified in the Contract Documents, the following items shall be installed and removed according to the timing constraints set out in Table A below:

Table A

Tender Item	Location	Timing Constraints	
		Installation	Removal
Light-Duty Silt Fence Barriers	All locations	Prior to up-gradient grading operations	After the Quality Assurance Performance Measures have been met
Straw Bale Flow Check Dams	All locations	Prior to up-gradient grading operations	After the Quality Assurance Performance Measures have been met

WILDLIFE FENCE - TYPE B, 6.35 MM FABRIC OPENING, STEEL POSTS - Item No. 77

Special Provision

All information under the above special provision is deleted in its entirety and replaced with the following:

1.0 SCOPE OF WORK

This specification describes the requirements for the installation and maintenance of Wildlife Fence-Ungulates in accordance with details specified elsewhere in the contract.

2.0 REFERENCES

This specification refers to the following standards, specifications, or publications:

Ontario Provincial Standard Specifications, Construction

OPSS 501 Compaction

OPSS 540 Construction Specification for Standard Highway Fence

Ontario Provincial Standard Specifications, Material

OPSS 1540 Standard Highway Fence Components

Ontario Provincial Standard Drawing

OPSD 971.132 Fence, Chain-Link Details and Table
OPSD 972.101 Fence, Chain-Link Component – Barbed Wire

3.0 MATERIALS

Wire Fence - 2.4 metre Knotted Joint Woven Wire Fence specifications:

a) All wires shall be single strand galvanized steel wire conforming to CAN2/CGSB-138.2.96
b) Minimum 12 ½ gauge high tensile strength wire.
c) Minimum spacing between vertical wires is 420 mm.
d) Minimum spacing between horizontal wires is 230 mm.
e) Class 3 galvanization.
f) Wire arm shall be as per OPSD 972.101.

Steel Posts specifications:

a) All post shall be of galvanized steel pipe, and shall conform to CAN2/CGSB-138.2.96; hot dipped galvanized to the requirements of CAN/CSA G164.
b) Holes to tie through as required.
c) The steel pipe will not have an outside diameter less than 73mm. The length of steel pipe may vary between 3560 and 4500mm according to installation conditions.
d) Any damage to galvanized coatings must be repaired. For damaged or cut galvanizing of steel posts and braces, two coats of an organic zinc rich paint shall be applied on thoroughly cleaned surface.
e) Steel Post footings shall be installed as per OPSD 972.130.
f) Steel posts shall be installed with galvanized steel post caps.

Bracing wire - Must be galvanized and a minimum of 9 gauge.

Wildlife Jump Outs – The contractor will install Wildlife Jump outs as identified in the contract drawings at the following locations:

Jump out	Station
1	13+643.0
2	9+644.0
3	13+850.0
4	14+0880.0
5	10+057.63

Jump outs will be constructed as per SSP 8999S02 in accordance with MTODs, dated March 8th, 2018: 0973.1310, 0973.1400, 0973.1420 and 0973.1430.

4.0 CONSTRUCTION

2.4 m High Fence Installation

1. Fence shall be installed by a Contractor experienced with high tensile strength wire fences.

2. Only steel posts shall be used.

3. Fence should be at least 2.4 m above the ground

4. Fence should be buried 20-40 cm below the ground surface and backfilled to prevent wildlife from digging under the fence.

5. A second (finer meshed) wildlife fence shall be affixed to the ungulate wildlife fence. The finer meshed fence shall be a solid permanent material or hardware cloth of fine mesh (less than ¼" mesh). The Fence shall be installed in accordance with the following specifications:

   a) The finer mesh fence will be installed on the outside of the fence (facing away from the Highway pavement) to a height of no less than 1.8 m above the ground.
   b) This fence will be buried 20-40cm below the ground surface and backfilled.
   c) The top of the finer meshed fence will incorporate a 15cm wide lip which is angled away from the road at a 45 to keep animals from climbing over this fence.
   d) This finer meshed fence will be continuous with no gaps

6. Steel Posts shall be spaced 5 m apart measured horizontally unless specified otherwise in the contract.

7. Posts shall be installed plumb going across slopes and should be installed 3 deg off vertical angle away from the highway.

8. Brace posts shall be installed at fence ends and at other stress points where required. The spacing between adjacent intermediate brace panels and between intermediate brace panels and end post panels, will not be more than 54 metres.

Wildlife Jump Outs Installation

1. Jump outs must be maintained clear of vegetation (i.e., trees and shrubs)

2. Jump outs be 1.5 to 1.8 m high

5.0 MAINTENANCE

The Fence shall be maintained in an effective, functioning, stable condition, without holes, tears, and punctures or sagging for a minimum of two years after initial installation or duration of contract whichever is longer. The Contractor shall inspect and repair all fences between April 1 and June 30 of each year following construction. Any major concerns with the integrity of the fence should be communicated to the Contract Administrator immediately.

6.0 MEASUREMENT FOR PAYMENT

Measurement will be by Plan Quantity Payment and may be revised by Adjusted Plan Quantity Payment in metres of fence supplied, installed and maintained.

7.0 BASIS OF PAYMENT

Payment at the contract price for the above tender item shall be full compensation for all labour, equipment and material required to do the work, including brace panels and wildlife fencing gates. Partial payments will be made on the following basis:

a. 75% for initial installation
b. 25% for maintenance paid at substantial completion

RELOCATION OF TELEPHONE UTILITIES - Item No. 78

Special Provision

1.0 SCOPE

This Special Provision covers all work associated with the reconstruction of Bell ducts at the location of the proposed retaining wall along the QEW south and North of the CP/ CN rail.

2.0 DESIGN AND SUBMISSION REQUIREMENTS

The General Contractor shall utilize the tender form / quantity summary sheet provided in *"2019-2003 - Bell Canada Work"* to document the bid prices and shall include all overhead, markup and profit of the General Contractor into the unit prices used to establish the Lump Sum bid price for the above tender item.

3.0 CONSTRUCTION

3.1 General Information

The General Contractor is to hire a Bell Approved Contractor to work under his control to perform the following minor shift and adjustment work shown plan 401. Arb 1 to Arb 2 - expose 71.0 m of 2 existing PVCD-2 occupied ducts.
Note: There may be a fiber cable in each duct or 2 fiber cables in one duct with one duct empty. This needs to be verified in the field. Caution - both the fiber cables are High Priority Trunk/Toll cables.

Shift these ducts away from the proposed retaining wall construction area to allow for the safe installation of the required footings.

The total length of minor shift and adjustment may vary as well as the lateral relocation distance. This is to be determined in the field by the General Contractor and by the slack made available for relocation.

There may be a need for additional adjustments along the entire route of the proposed retaining wall. See plan 402 for reference, these will be determined in the field by the General Contractor as construction proceeds.

The Bell Approved Contractor will be re-engaged to return and complete the necessary adjustments.
In all cases final restoration is to be handled by the Bell Approved Contractor.

He will perform any and all duct repairs or replacements required to ensure the final integrity of the Bell ducts.

3.2 Drawings

The following drawings are Issued for Tender. After awarding the work to the winning contractor, Chris Gill from Bell Canada will issue the plans for construction, and send them to the selected contractor.
The work form part of this contract:

Bell Canada Drawing No.'s: 401- (402 for reference) and 701 to 702. Network No. J33602
Planview Reference: 18-4-0179

The contractor shall refer and adhere to *"2019-2003 - Bell Canada Work*" provided for this contract containing the above documents.

3.3 Bell Canada Inspection

All Bell Canada plant related work shall be inspected by Bell Canada. The Contractor shall provide of 30 days advance notice to Bell Canada for the inspection. Any extra work shall be approved by Bell inspector prior to being carried out.

The Bell Canada contact is:

Chris Gill
(chris.gill@bell.ca)
Implementation Manager - Access Network / Structures
20 Hunter Street West- Floor 6
Hamilton, Ontario- L8N 3H2
C: 289 260 3934

Unless advised otherwise by Bell Canada, a Bell Canada Representative must be present when work on or adjacent to Bell Canada ducts and cables is carried out.

3.4 Bell Canada Approved Construction Contractors

All work on or affecting the Bell Canada plant must be performed by a qualified subcontractor approved by Bell Canada. This work shall be carried out in accordance with the latest versions of the "Bell Canada Contract Work Manual", and the "Bell Canada Master Specific Contract" (form BC3961), to which each of the approved subcontractors is a signatory. All conditions noted in the Bell Canada "Master Specific Contract" apply and must be conformed to, except as modified here in this Specification. In the case of conflict, the more stringent requirement as determined by Bell Canada, will govern.

Approved subcontractors for the Bell Canada work for this project are named as follows:

R.B Somerville
Chris Dekoning
Email: cdekoning@rbsomerville.com
Steve Fifield
Email: Sfifield@rbsomerville.com
13176 Dufferin Street, King City, Ontario L7B 1K5

Phone: 905.833.2100 Fax: 905.833.3111

Avertex
Rick Hyatt
Phone: 647.929.1305
Email: rhyatt@avertex.ca
Andrew VanSpronsen
Phone: 905.746.9635
Email: avansporonsen@avertex.ca
205235 County Road 109, Amaranth, Ontario L9W 0T8
Phone: 519.942.3030 Toll Free: 888.837.3030 Fax: 519.942.2383

GUCI
Jeff Brown
Phone: 905.945.8878
Email: jbrown@guci.ca
211 Roberts Road, Grimsby, Ontario L3M 4E8

Black and McDonald
Frank Plastina
Phone: 416.298.9977
Email: fplastina@blackandmcdonald.com
Suite 2100 – 2 Bloor Street East, Toronto, Ontario, M4W 1A8
Phone: 416.920.5100 Fax: 416.922.8768

JCH Contracting
Jeff Snyder
Phone: 519.787.3814
Email: jchcontracting@xplornet.com
31534 9th Line, Fergus, ON N0B 1J0

Pacheco Contractors
George Teves
Phone: 519.652.5041
Email: pachecos@bellnet.ca
4192 Perkins Rd, London, ON N6L 1C2

Picard
Maurice Pickard
Cell Phone: 519.372.0905 Office: 519.637.7500
Email: owensound@pickardconstruction.com
170 Thom Drive, Owen Sound, Ontario N4K 5N7

Weinmann Electric Ltd
Dan Toppazzini
Phone: 905.651.6900
Email: dan.toppazzini@weuil.com, info@weinmannelectric.com
211 Courtwright Street, Fort Erie, Ontario L2A 2R9

Aecon
Tony Sinopoli, G.S.C.
Office: 416.297.2600 Ext. 3715 Fax: 416.940.2283 Cell: 416.433.5175
Email: tsinopoli@aecon.com
20 Carlson Court, Suite 800 Toronto, ON M9W 7K6

Clearway Utilities
Blair Mullin – General Manager – Utilities, Fleet & IT
Office: 905.761.6955 Fax: 905.761.9770 Cell: 647.229.9244
Email: blairmullin@clearwaygroup.com
379 Bowes Road, Concord, ON L4K 1J1

Expercom
Zoya Misbah
Email: zoya.misbah@expercom.ca
Jason Garner
Office: 613.836.0044 Cell: 613.447.0743
Email: jason.garner@expercom.ca
171 Walgreen Road, RR#3, Carp (Ontario) K0A 1L0

Please note that there can be other Bell approved contractors not on this list as the list does and can change from time to time.

For verification of a contractor not on this list, please contact Bell Canada directly. Only Bell can authorize its contractors; this approval cannot be transferred from one company to another or assumed by any company without proper verification from Bell Canada.

1st Example – A Bell approved hires a non Bell approved sub because they are busy, the sub will not be Bell approved by default.

2nd Example – A contractor advises the Region or project driver that they are Bell approved and have worked for Bell in the past.

This does not mean that the contract is Bell approved for Civil. Without verification from Bell, this contractor should not be considered Bell approved.

3.5 Protection of Existing Bell Canada Plant

The General Contractor shall be responsible for the protection of the existing Bell Canada ducts and cables for the duration of the Contract. No extra payment will be made for the required protection works. The General Contractor shall obtain approval from the Bell Canada Site Representative for the proposed protection schemes of the existing plant prior to commencing work within the vicinity of the Bell Canada plant. **Any damage incurred to the existing cables will be repaired immediately by Bell Canada at the contractor's expense. Upon completion of all work the contractor at his expense and Bell Canada's discretion shall replace any cables that have been damaged / repaired.**

4.0 MEASUREMENT FOR PAYMENT – NOT USED

5.0 BASIS FOR PAYMENT

Relocation of Telephone Utilities – Item

Payment at the Contract price for the above tender item shall be full compensation for all labour, equipment and materials required to do the work.

2400 MM X 1500 MM PRECAST CONCRETE BOX CULVERT - Item No. 79

Special Provision

1.0 SCOPE

The contractor shall note that item includes the abandonment of a 1.8m x 0.93m x 56m cast in-place concrete open footing rigid frame culvert.

The Contractor shall thoroughly clean out debris from all culverts to be abandoned prior to filling the culverts with grout or concrete. The cleaning shall be included in the contractor's price under this item.

2.0 BASIS OF PAYMENT

Payment at the contract price for the above tender item shall include all necessary labour, materials and equipment required to do the work.

WORKING SLAB - Item No. 83

Special Provision

1.0 SCOPE

This Special Provision covers the requirements for the supply and placement of a concrete working slab for the base of the excavations associated with the construction of the non-structural box culvert replacement beneath the QEW at Station 14+273.

2.0 REFERENCES

This Special Provision refers to the following standards, specifications or publications:

Ontario Provincial Standard Specifications, Construction
OPSS 902 Excavating and Backfilling - Structures

3.0 DEFINITIONS – NOT USED

4.0 DESIGN AND SUBMISSION REQUIREMENTS – NOT USED

5.0 MATERIALS

Concrete for working slabs shall have a minimum 28 day strength of 20 MPa.

6.0 EQUIPMENT – NOT USED

7.0 CONSTRUCTION

7.01 Excavation

Excavation for the working slab shall be according to OPSS 902.

7.02 Protection of Subgrade

The native subgrade for the retaining wall structure will be susceptible to disturbance and softening/ loosening from construction traffic and ponded water. Following inspection and approval of the prepared subgrade, a concrete working slab with a minimum thickness of 100 mm shall be placed on the foundation subgrade within four hours.
The concrete shall have a compressive strength of at least 20 MPa, and be placed in accordance with OPSS.PROV 904.

7.03 Dewatering

Dewatering shall be carried out according to OPSS 902.

8.0 QUALITY ASSURANCE – NOT USED

9.0 MEASUREMENT FOR PAYMENT – NOT USED

10.0 BASIS OF PAYMENT

10.01 Working Slab - Item

Payment at the Contract price for the above tender item shall be full compensation for all labour, Equipment and Material to do the work.

CONTROLLER CABINETS - Item No. 98

Special Provision No. 682S16M June 2017

Amendment to OPSS 622, April 2017

622.01 SCOPE

Section 622.01 of OPSS 622 is deleted and replaced by the following:

This scope of work under this tender item covers the requirements for the installation of the controller cabinet and installation of salvaged equipment under this Contract.

622.05 MATERIALS

Section 622.05 of OPSS 622 is amended by the addition of the following subsections:

622.05.09 Components

Cabinets shall meet the requirements of the current version of the Ontario Traffic Signal Control Equipment Specifications (OTSCES) except as noted below.

The Specifications section of Chapter 13 of the OTSCES for the digital thermostat panels is amended as follows:

Function	Description	Preset Value
Ht	Heater turn on temperature	+10.0
Ht.HS	Heater Hysteresis value	+5.5
Fn	Fan turn on temperature	+25.0
Fn.HS	Fan hysteresis value	+5.5
HI.Ct	High cut-off temperature of critical equipment	+55.0
HI.HS	High cut-off hysteresis	+2.0
LO.Ct	Low cut-off temperature of critical equipment	-10.0
LO.HS	Low cut-off hysteresis	+2.0
HI.FL	High cut-off count; the number of times the temperature has exceeded HI.Ct to a maximum of 999	0
LO.FL	Low cut-off count; the number of times the temperature has exceeded LO.Ct to a maximum of 999	0
HI.t	Highest temperature since last reset	+99.99
LO.t	Lowest temperature since last reset	-99.99

622.05.10 Service Light

Lamps shall be 50W energy efficient rated for rough service.

The lamp shall be installed after the cabinet is mounted in the field.

622.05.11 External Cable Access Enclosure

The external cable access enclosure shall be made of 3.175 mm thick aluminum with a polyester powder coat matching the cabinet colour. The enclosure dimension shall not exceed 305 mm W x 200 mm H x 100 mm D.

The enclosure shall have three 19 mm holes to provide access for cables of 10 mm in diameter and be able to accommodate one cable with a 12.5 mm connector. Space around the access holes shall allow for the installation of liquid-tight connectors. The enclosure shall be shipped from the factory with all access holes securely plugged with rubber type fittings designed for cable entry.

The door to the enclosure shall have a stainless steel hinge on one side and be configured with an internal catch that provides access from inside the cabinet only. An external locking mechanism for the enclosure shall not be provided.

The enclosure door shall not interfere with liquid tight connectors when closed. The enclosure shall be sealed to provide a NEMA 4 rating.

622.05.12 Antenna Mount

The cabinet shall be supplied with an external antenna mount bracket suitable for mounting antennas with up to 16 mm diameter threaded bolt. The mounting bracket shall be “L” shaped with two holes and a cable slot on the top portion for the antenna and two holes on the side to secure the bracket to the cabinet. The bracket is to be stainless steel or aluminum with polyester powder coat matching the cabinet colour.

622.07 CONSTRUCTION

622.07.03 Timing of Work

Subsection 622.07.03 of OPSS 622 is amended by the addition of the following:

The controller cabinet shall be energized immediately following installation and all environmental equipment shall be operational.

622.07.04.05 Equipment Ground

Clause 622.07.04.05 of OPSS 622 is deleted and replaced with the following:

The controller cabinet ground shall be connected to the system ground at the power supply cabinet ground bus in accordance with the requirements of OPSS 609 or, the neutral cable shall be connected to the cabinet AC - terminal and kept independent of the grounding facilities.

622.07.04.06 Installation of External Cable Access Enclosure

The external cable access enclosure shall be mounted as specified in the Contract Documents

The enclosure shall be installed such that opening of the door is not obstructed by the adjacent power supply cabinet.

No additional holes are to be drilled on the enclosure.

622.07.05 Installation of Controller Equipment

Section 622.07.05 of OPSS 622 is amended with the addition of the following:

The Contractor shall install the salvaged controller equipment and accessories for the QWS and the VMS to the controller cabinet. All wiring and interconnection of the equipment shall be performed to render a complete system.

622.07.05.04 Identification of Equipment

Clause 622.07.05.04 of OPSS 622 is deleted in its entirety and replaced with the following:

622.07.05.04 Cabinet Identification

A laminated phenolic plastic nameplate shall be installed on the side of each cabinet facing traffic such that it can be easily seen from the highway. Nameplates shall be 450 mm x 70 mm with 50 mm high white lettering, 8 mm letter stroke width and 6 mm spacing between letters, on a black background. Letters shall be generated by an engraving machine.

In cases where cabinets are installed behind noise barriers, the nameplate shall be installed over or on the front door of the cabinet and an additional nameplate shall be installed on the highway side of the noise barrier, over the access door. Nameplates shall be fastened with four stainless steel self-tapping screws, with 'Robertson' No. 2 (red) heads. The nameplate information shall be confirmed with the Contract Administrator prior to manufacturing the nameplates.

The name plate shall contain the full 12 characters of the Universal Identifier including the highway name (Example: 401CE0420DEC).

622.07.06 Quality Control

Subsection 622.07.06 of OPSS 622 is deleted and replaced with the following:

The framework of the approval process shall be as specified elsewhere in the Contract Documents.

622.07.06.01 Pre-Installation Testing

The Contractor is required to perform quality control testing on 10% of cabinets and 100% of digital thermostats prior to delivering the cabinets and thermostats. The Contractor shall test each cabinet and thermostat to confirm that it meets the requirements of the Ontario Traffic Signal Control Equipment Specifications (OTSCES).

The quality control testing and test procedures shall include, but not be limited to the following:

Visual Inspection

The Contractor shall perform detailed visual inspection to confirm that the following aspects of the cabinet are in compliance with the requirements of the Ontario Traffic Signal Control Equipment Specifications (OTSCES) as applicable for the appropriate cabinet type:

General Appearance
Cabinet Dimensions
Finish
Locks
Door Handles
Door Frames
Latching Mechanism
Door Hinges, Pin and Bolts
Catches
Louvred Vents and Filters
Gaskets
Heater Bracket
Storage for Drawings
Front Face Plate
Fan Ventilation Area
Cabinet Pedestal
Output Files
Equipment Racks
Lifting Eyes
Trouble Lamp
Insulation
Ventilation Requirements
Heating Requirements
Side Panel
Input Panel
Service Panel
Labelling
Cabinet Wiring Diagram
Power Distribution Assembly
Conductors
Colour Coding
Terminal Blocks
24 Volt DC Power Supply
Power Supply Front Panel
Input Files
Digital Thermostat
Connectors and Harness
Screws

Functional Testing

The Contractor shall measure the following cabinet attributes:

Paint Thickness

The Contractor shall perform functional tests of the following components:

Trouble Lamp
Input Files Wiring
24 Volt DC Power Supply
Power Distribution Assembly
Fan
Heater
Main Power Disconnect
Digital Thermostat
Output Files Wiring

622.07.06.02 Proof of Performance Testing

The Contractor shall energize each cabinet and confirm proper operation of 24 VDC power supply, heaters, fans, thermostats and service lights.

622.07.06.03 System Integration Testing

The Contractor shall carry out System Integration Testing to ensure that the cabinets perform to the specified standards when operated as follows:

a) In operation with controller units, detector sensor units and actuation devices installed under the Contract.
b) In operation with existing control and actuation devices.
c) In operation with the existing Fort Erie bound QWS, message sign and flasher.

622.09 MEASUREMENT FOR PAYMENT

622.09.01.01 Actual Measurement

Clause 622.09.01.01 of OPSS 622 is amended by the addition of the following:

For measurement purposes, a count shall be of the number of controller cabinets installed.

622.10 BASIS OF PAYMENT

Clause 622.10.02 of OPSS 622 is amended by the addition of the following:

622.10.02.03 Controller Cabinets - Item

Payment at the Contract price for the above tender item shall be full compensation for all labour, Equipment and Materials required to do the work, except System Integration Testing which is paid for under a separate item.

REMOVAL OF ADVANCED TRAFFIC MANAGEMENT SYSTEM EQUIPMENT - Item No. 101

Special Provision No. 682F22 November 2016

Amendment to OPSS 610, November 2016

610.07 CONSTRUCTION

Section 610.07 of OPSS 610 is amended by the addition of the following subsection:

610.07.13 Advanced Traffic Management System Equipment

A detailed equipment removal plan with detailed schedule and procedures shall be submitted for review and approval to the Contract Administrator 2 weeks prior to commencing any removal work.

Prior to removal operations, all equipment to be salvaged shall be inspected and tested. The Contract Administrator will witness all tests and inspections. Twenty-four hours advance notice shall be provided to the Contract Administrator prior to commencing any removal work.

The following test and/or inspections shall be performed for equipment to be salvaged under this Contract:

Equipment	Test / Inspection Details
QWS VMS Controller	Testing to be performed by qualified Technician from the Controller manufacturer.

The following equipment shall be removed and salvaged for delivery/storage as indicated:

Description	Quantity	Delivery / Storage Location
QWS VMS controller	1	Ledstar Inc. 131 Westcreek Dr. Woodbridge, Ontario L4L 9N6

The following equipment shall be removed and salvaged for re-installation under this Contract. A temporary storage location with regulated environmental controls to meet the manufacturers storage requirements shall be utilized when equipment cannot be re-installed and re-energized during the same working day as removal. ***Each equipment shall be labelled with the Contract number and the cabinet/enclosure number prior to delivery to the storage location.***

Description	Quantity	Temporary Storage Location
ATC in QEWCS0900SES	1	1200 South Service Road, Winona ON
Fibre optic modem in QEWCS0900SES	1	1200 South Service Road, Winona ON

The above equipment shall be delivered to and from the Working Area if temporary storage is required.

All remaining equipment identified for removal shall become the property of the Contractor and shall be managed as specified in the Contract Documents.

Where the Owner's premises are required for delivery and/or storage, 72 hours notice shall be provided to the Contract Administrator prior to delivery and/or pickup. The delivery and/or pickup from Owner's premises shall be made between 7:00 am and 3:00 pm Monday through Friday.

610.10 BASIS OF PAYMENT

Section 610.10 of OPSS 610 is amended by the addition of the following subsection:

610.10.02 Removal of Advanced Traffic Management System Equipment - Item

Payment at the Contract price for the above tender item shall be full compensation for all labour, Equipment, and Material to do the work.

FIBRE OPTIC COMMUNICATION CABLES, IN DUCTS - Item No. 103

Special Provision No. 683S01M December 2017

1. SCOPE

This Special Provision covers the requirements for the installation, splicing and testing of the fibre optic communication cables to be placed in ducts. The requirements apply to various types of fibre optic cables as defined within this Special Provision.

2. REFERENCES

This Special Provision refers to the following standards, specifications or publications:

Electronic Industries Alliance / Telecommunications Industry Association:

EIA/TIA-455-B	Standard Test Procedure for Fibre Optic Fibres, Cables, Transducers, Sensors, Connecting and Terminating Devices, and Other Fibre Optic Components
TIA/EIA-598-B	Optical Fibre Cable Color Coding

3. DEFINITIONS

For the purpose of this Special Provision, the following definitions apply:

Branch Cable means fibre optic cable interconnecting the trunk cable with communication equipment adjacent to pedestals through which the trunk cable does not pass.

Drop Cable means fibre optic cable interconnecting the trunk cable or the branch cable with the pre-terminated fibre connection module in cabinets.

Patch Cord Cable means fibre optic cable interconnecting the fibre connection module with the communication equipment in cabinets.

Trunk Cable means fibre optic cable interconnecting the Traffic Operation Centre (TOC) communication equipment with the roadside communication equipment.

The number prior to the designator SM means the number of single mode fibres in the cable.

4. DESIGN AND SUBMISSION REQUIREMENTS

4.1 Submission Requirements

The Contractor shall supply the specification sheets for the fibre optic communication cables including colour coding and position of fibres and buffer tubes within the trunk, branch and drop cables, connectors and terminating blocks to the Contract Administrator for review prior to ordering.

5. MATERIALS

The Contractor shall be allowed to supply different combinations of fibre optic cables to meet the requirements as specified in the Contract Documents; however, the Contractor will not be compensated for any additional lengths of cable or surplus fibres resulting from such substitutions.

5.1 Trunk Cable, Branch Cable

5.1.1 The trunk and branch cables shall consist of the required optical SM fibres divided into buffer tubes and housed within a protective armoured jacket suitable for installation in outdoor underground ducts.

5.1.2 All fibre optic trunk and branch cable shall include at least one twisted pair within the space allocated for one buffer tube for cable locating purposes. The twisted pair included in the fibre optic cables shall be 22 AWG copper, PVC insulated, twisted and unshielded, with a nominal conductor resistance no more than 57 ohms/km at 20 °C.

5.1.3 The cables shall be rated for operation over a temperature range of -30 to +60 °C.

5.1.4 The cables shall provide mechanical support and protection for the specified number of fibres.

5.1.5 The cables shall be able to withstand a maximum pulling tension of 2500 N during installation without any resulting damage.

5.1.6 The minimum static bending radius for the cables under no tension shall be 200 mm. The minimum bending radius during installation and under tension shall be 300 mm.

5.1.7 All interstices within the cable's outer jacket shall be filled with a compound to prevent the ingress and migration of water. The compound shall be nontoxic and dermatologically safe. Some leakage of the compound is permitted; however, there shall be no bulk flow of compound out of the cable over the specified operating temperature range which could impact on the waterproofness of the cable.

5.1.8 Materials used in the cables shall not produce hydrogen in a concentration large enough to cause any degradation in the transmission performance of the optical fibres.

5.1.9 Materials used in the cables shall not support galvanic action.

5.1.10 Fibres shall be bundled in buffer tubes. Each buffer tube shall contain 12 fibres.

5.1.11 Each individual fibre in the cables shall be identified by means of colour coding or a combination of colour and positional coding as specified in TIA/EIA-598-B.

5.2 Drop Cable

5.2.1 The drop cable shall consist of the required optical SM or MM fibres housed in a protective armoured jacket rated for outdoor installation in underground conduits. Each drop cable shall include a pre-terminated fibre connection module complete with integrated connectors and factory terminated onto the armoured drop cable.

5.2.2 The attenuation of the drop cable for MM fibre after installation, not including the connector loss, shall not exceed 3.5 dB/km measured at 850 nm and 1.0 dB/km measured at 1300 nm. The

attenuation of the drop cable for SM fibres shall not exceed 0.4 dB/km measured at 1310 nm and 0.3 dB/km measured at 1550 nm.

5.2.3 The drop cable shall be suitable for operation over the temperature range of -30 to +60 °C.

5.2.4 The exact number of connected drop cables at each pedestal and at the TOC shall be as specified in the Contract Documents. Each drop cable shall contain a minimum of eight (8) fibres or the quantity of fibres equal to the terminations on the pre-terminated connection module.

5.2.5 The length of drop cable in the pedestal shall be equal to that of the trunk and branch cable stored in the pedestal. Sufficient slack shall be provided in the cabinet to allow mounting the fibre connection module at the top of the cabinet with at least 1.0 m of spare cable in the cabinet.

5.2.6 Each pre-terminated fibre connection module shall have a minimum capacity of eight (8) connectors. The connectors shall be grouped in pairs, and arranged in a step formation and supplied with protective caps or plugs for protection when not in use.

5.2.7 Each pre-terminated fibre connection module shall be compatible for connection to the LC style connectors of the fibre optic patch cord cables.

5.2.8 The pre-terminated fibre connection module shall be epoxy filled to provide a watertight unit and provide rodent protection.

5.2.9 Each fibre connection module shall be equipped with a mounting bracket for installation on EIA rack requiring no special tools. The fibre connection module shall be installed in the cabinet as shown on the Contract Drawings.

5.3 Fibre Optic Patch Cord Cable

5.3.1 The fibre optic patch cord cables shall consist of optical SM or MM fibres housed individually in protective armoured jackets. Both ends of the cable shall be connectorized.

5.3.2 The attenuation of a fibre optic patch cord cable after installation, not including the connector loss, shall not exceed 0.1 dB measured at 850 nm and 1300 nm.

5.3.3 The fibre optic patch cord cable shall be suitable for operation over the temperature range of -30 to +60 °C.

5.3.4 Fibre optic patch cord cables in cabinets shall be 2.0 m in length.

5.4 Single Mode (SM) Cabled Fibre

5.4.1 The optical attenuation at 1310 nm shall not be greater than 0.4 dB/km for any fibre.

5.4.2 The optical attenuation at 1550 nm shall not be greater than 0.3 dB/km for any fibre.

5.4.3 The fibre attenuation shall not vary more than 0.2 dB/km over the specified cable operational temperature range.

5.4.4 The SM fibre shall be coated with a protective polymer to preserve the strength of the fibre. The coating shall be removable by mechanical or chemical means. The coating shall retain its colour when subject to the manufacturer's recommended fibre cleaning and splicing preparation methods.

5.4.5 The SM fibre shall have attenuation and bandwidth specified at two wavelength windows.

5.4.6 The first wavelength window shall be at and around 1310 nm.

5.4.7 The second wavelength window shall be at and around 1550 nm.

5.4.8 The zero dispersion wavelength shall be at a wavelength of 1310 ± 10 nm.

5.5 Multimode (MM) Cabled Fibres

5.5.1 The mean optical attenuation for cables at 850 nm shall be not greater than 3.2 dB/km.

5.5.2 The mean optical attenuation for cables at 1300 nm shall not be greater than 1.0 dB/ km.

5.5.3 The fibre attenuation shall not vary more than ± 0.2 dB/km over the specified cable operational temperature range.

5.5.4 MM fibres shall have a graded refractive index profile.

5.5.5 The MM fibre shall consist of a glass core surrounded by a glass cladding surrounded by a polymer coating. If tight buffering of the MM fibre is used, the buffering material may be considered to be the polymer coating.

5.5.6 The MM fibre core shall have a diameter of 62.5 µm with a tolerance of ± 3 µm.

5.5.7 The MM fibre cladding shall have an outer diameter of 125 µm with a tolerance of ± 3 µm.

5.5.8 The MM fibre core shall have a theoretical numerical aperture of 0.275.

5.5.9 The core eccentricity shall not exceed 7.5%. The typical eccentricity shall be not greater than 2%.

5.5.10 The core non-circularity shall be less than 2%.

5.5.11 The MM fibre shall be coated with a protective polymer to preserve the strength of the fibre. The coating shall be removable by mechanical or chemical means. The coating shall retain its colour when subjected to the manufacturer's recommended fibre cleaning and splicing preparation methods.

5.5.12 The polymer coating shall have an outer diameter of at least 230 µm.

5.5.13 The MM fibre shall have attenuation and bandwidth specified at two wavelength windows.

5.5.14 The short wavelength window shall be at and around 850 nm.

5.5.15 The long wavelength window shall be at and around 1300 nm.

5.5.16 The fibre optical bandwidth at 850 nm shall be equal to or greater than 200 MHzkm.

5.5.17 The fibre optical bandwidth at 1310 nm shall be equal to or greater than 600 MHzkm.

5.6 Twisted Pair Cable

5.6.1 A separate twisted pair cable shall be provided for use between the splice enclosure and the terminal block in the pedestal and the pedestal terminal block and the terminal block in the cabinet. For each end of the trunk or branch cable coming into the pedestal, one twisted pair shall be provided. One twisted pair cable shall be provided between the terminal block in the pedestal and the terminal block in the cabinet. The conductors of the cable shall be 22 AWG copper, PVC insulated, twisted and unshielded.

5.6.2 The cable shall meet the environmental requirements of the fibre optic cable.

5.6.3 Each conductor of the cable shall be identified by means of colour coding.

5.6.4 Nominal conductor resistance in any length of completed cable shall not exceed 57 ohms/km at 20 °C.

5.6.5 The cable shall be designed for use in underground environments, and shall include outdoor rated cable sheath and filled cores.

5.7 Connectors

5.7.1 Connectors shall all be LC style unless otherwise specified in the Contract Documents.

5.7.2 The connector mean loss shall not be greater than 0.5 dB with a standard deviation of not greater than 0.2 dB. The connector loss shall not vary more than 0.2 dB over the operating temperature range.

5.7.3 Index matching fluids or gels shall not be used.

5.7.4 The connector loss shall not vary more than 0.2 dB after 1000 repeated matings.

5.7.5 The connector shall withstand an axial load of 135 N.

5.7.6 The connectors shall be compatible with the optical fibre surrounding jacket and shall be installed on one end of the optical fibre according to the manufacturer's recommended materials, equipment and practices.

5.7.7 The connector shall be suitable for the intended environment and shall meet the following environmental conditions.

5.7.8 Operating temperature: -30 to +60 °C.

5.7.9 Connectors shall be protected by a suitably installed waterproof protection cap.

5.8 Number of Fibres

The number of SM fibre specified for each cable shall be the guaranteed number of SM and MM fibres, (i.e. fibres in the cable shall comply with the specification after installation).

5.9 Fish Line

Fish line shall be nylon or polypropylene material with a minimum test strength of 400 N.

5.10 Packing and Shipment

The cable shall be supplied on reels. Each reel shall have the following information clearly labelled on it in:

a) Customer
b) Customer order number
c) Reel number
d) Destination
e) Ship date
f) Manufactured date
g) Manufacturer's name
h) Cable code
i) Length of cable

6. EQUIPMENT

6.1 Where mechanical pulling means is required, a fibre optic cable puller and suitable cable routing accessories shall be used to ensure that the minimum bending radius of the cable is not exceeded.

6.2 The connection between the mechanical puller and the fibre optic cable shall be through a break-away link, designed to disconnect the winch cable from the fibre cable when the maximum pulling tension of the cable is exceeded.

7. CONSTRUCTION

7.1 General

7.1.1 Care shall be taken at all times to avoid scraping, denting, or otherwise damaging the cable before, during or after installation. Damaged cable shall be replaced by the Contractor at no additional cost to the Owner.

7.1.2 The manufacturer's recommended safe pulling tension and minimum bending radius shall not be exceeded at any time.

7.1.3 Twisted pairs shall be terminated at the termination block in each pedestal and the cabinet. The termination blocks shall be installed in pedestals external to the splice enclosures as specified in the Contract Drawings and as approved by the Contract Administrator. All connections shall be clearly identified.

7.1.4 All cable ends shall be protected from moisture ingress by using properly sealed caps.

7.2 Installation in Ducts

7.2.1 Cables shall be installed in duct in the field as specified in the Contract Drawings.

7.2.2 All duct ends shall be smoothed prior to installation of the cables to prevent scraping the cable.

7.2.3 A stiff bristle brush shall be pulled through each section of duct before pulling cable.

7.2.4 A manufacturer recommended lubricant shall be applied to the cable to reduce friction between the cable and the duct.

7.2.5 Plastic inner ducts shall be installed inside ducts when specified.

7.2.6 Drop cables shall be manually pulled from the cabinet to the pedestal to prevent the connectors from being damaged. Cable ties shall be installed to fasten all drop cables in the cabinet, and to bundle the drop cable with the trunk or branch cables entering a splice enclosure.

7.2.7 Where fibre optic cables (trunk, branch or drop) are required to be installed in inner duct, each section of inner duct shall be secured to prevent it from being pulled with the cables.

7.2.8 A cable grip ("pulling eye") shall be attached to the strength members of the cables so that no direct force is applied to the optical fibre. The cable grip shall have a swivel to prevent the cable from twisting during pulling.

7.2.9 Cable rollers and feeders and winch cable blocks shall be used to guide the cable freely into the duct and at electrical chamber locations.

7.2.10 Mechanical aids and pulling cable or ropes shall be used as required.

7.2.11 Personnel equipped with two-way communication equipment shall be stationed at appropriate locations through which the cable is to be pulled to observe and lubricate the cable.

7.2.12 Cable pulls shall be continuous and steady between pull points and shall not be interrupted until the entire run of cable has been pulled.

7.2.13 At no point shall the pulling tension exceed the maximum pulling tension or minimum bend radius of the cable as specified by the cable manufacturer.

7.2.14 During all mechanical pulling operations, a break-away link shall be used to limit pulling tension to the maximum pulling tension of the cable as defined by the cable manufacturer.

7.2.15 Cable passing through all electrical chambers and communication chambers shall be marked with a plastic cable tag with permanent printing indicating that this is a fibre optic cable.

7.2.16 Cable passing through electrical chambers shall be installed in 90 mm PVC split duct and shall have sufficient slack for expansion and contraction. The split duct shall be installed on the electrical chamber wall opposite the power cables and ladder rungs using galvanized steel conduit straps. The split duct shall clearly identify the contents to be fibre optic cable.

7.2.17 The cable shall be securely fastened in place within electrical chambers, pedestals and cabinets. For vertical conduit runs, the cable installation shall include installation of strain relief mechanism.

7.2.18 The cable shall be of sufficient length to allow for connection as shown on the Contract Drawings, including provision for slack, vertical runs, cable necessary for splicing, wastage and cable to allow for the removal of the splice enclosure for future splicing.

7.2.19 The unconnectorized end of the drop cable shall be spliced to the trunk or branch cable fibres as specified in the Contract Documents.

7.2.20 Immediately following installation, each trunk or branch cable entering a pedestal shall be labelled with the cable identification and direction as specified in this Special Provision.

7.2.21 Following installation of the cable in the ducts, all duct entrances at pedestals and cabinets shall be sealed with duct plugs to prevent the ingress of moisture, foreign materials, and rodents.

7.2.22 Conduit containing cables shall be sealed using a duct plug with an opening approximately the size of the cable. The duct plug may be split in the factory or the field to allow placing around the cable, and the remaining openings in the plug, as well as any spaces between the conduits, cable or plug shall be sealed with duct sealing compound. Expandable foam shall not be used to seal ducts.

7.2.23 At least 12 m of trunk cable, 6m on each side of the splice enclosure, and at least 6 m of branch cable shall be coiled at each pedestal.

7.2.24 10 m of each cable going to and coming from each pedestal shall be coiled in the first ATMS chamber on either side of the pedestal. In addition, 25 m of cable shall be left coiled in the first ATMS chamber on each side of all surface mounted conduit systems.

7.2.25 Where trunk cable terminations are left “dead ended”, 25 m of cable shall be left coiled.

7.2.26 All coiled cables shall be securely fastened in place with a minimum of four galvanized steel conduit straps.

7.2.27 Fish line shall be installed in all communications ducts or conduits along with fibre optic communication cables. A 2.0 m length of fish line shall be left coiled, tied and accessible in each cabinet, pedestal, electrical chamber and junction box.

7.2.28 At intermediate pulling points, to prevent over-tension on the cable, the cable shall be either taken up with an intermediate cable take up device as approved by the Contract Administrator, or all excess cable shall be laid out on the ground in a “figure eight” configuration before subsequent installation.

7.2.29 Pedestals may be removed to assist in the installation. If this option is exercised, all removed pedestals shall be reinstalled to their original condition.

7.2.30 Unless otherwise specified in the Contract Documents, the temporary fibre cable and associated drop cables shall be removed and delivered to the Owner at the location specified by the Contract Administrator.

7.3 Installation in the Communication Head End

At the communication head end locations, cables shall be installed from the indoor splice enclosures to the communications equipment as specified in the Contract Drawings.

7.4 Splicing

7.4.1 Only the splices specified in the Contract Drawings shall be allowed.

7.4.2 All pedestal splices shall be housed in a splice enclosure as specified in the Contract Documents. All splices in the head end buildings shall be housed in indoor splice enclosures.

7.4.3 The splices shall be performed by high quality fusion type splicing equipment.

7.4.4 The maximum loss introduced by any single mode splice shall not exceed 0.25 dB at 1310 nm and 1550 nm.

7.4.5 The average single mode splice loss shall not exceed 0.1 dB for any given span, with a standard deviation not greater than 0.07 dB.

7.4.6 Only the fibres required to be spliced to drop cables specified in the Contract Documents shall be severed and spliced. Where required, the buffer tube splitting tool recommended by the manufacturer shall be used to open the correct buffer tube. Unsevered fibres in an open buffer tube shall be coiled in the splice tray. When buffer tubes do not need to be opened, at least 3.0 m of unopened buffer tubes shall be coiled at the slack basket in the fibre optic splice enclosure and labeled with the fibre count, highway and direction.

7.4.7 The designated fibres of the cable for splicing to the drop cables shall be prepared following manufacturer recommended procedures. All splices shall be arranged neatly in splice trays, supported and protected with a suitable splice protector. At least 1.0 m of each fibre shall be stored in the splice tray.

7.4.8 Fibres that do not require splicing shall be contained within buffer tubes and the buffer tubes shall be fastened to the tray.

7.4.9 All opened buffer tubes routed to splice trays shall be protected with protective tubing provided with the splice enclosure or spiral wrap to protect the buffer tube.

7.4.10 Fibres routing between trays shall be enclosed in tubing designed for this purpose to ensure that the minimum bending radius is not exceeded, both for the completed splice, and during access to any of the splice trays.

7.4.11 Splicing shall be completed using a fusion splicer that tests the tensile strength of the completed splice by applying a force of not less than 200 grams.

7.4.12 Drop cable entrances to the splice enclosures shall adhere to the outdoor splice enclosure manufacturer’s recommendations.

7.4.13 To reduce the overall number of splices required, the cable shall be installed in continuous lengths with a minimum average of 2 km. Runs of cable beyond the minimum requirements shall be maximized if possible. Locations for trunk cable splicing shall be approved by the Contract Administrator and documented as part of as-constructed documentation.

7.5 Twisted Pair Cable

7.5.1 The twisted pair in the trunk or branch cable shall be spliced to the twisted pair cable leaving the splice enclosure, such that one pair in the twisted pair cable is spliced to the end of each trunk or branch cable. The other end of each twisted pair shall be separately terminated on the pedestal termination block and labelled providing the cable identification as specified in this Special Provision.

7.5.2 The ends of the twisted pair cable between the pedestal and the controller cabinet shall be terminated at the termination blocks in the pedestal and in the cabinet and labelled providing cable identification

7.6 Fibre Connection Module

7.6.1 The pre-terminated fibre connection module shall be used as a fibre optic 'Patch Panel'.

7.6.2 Patch cord cables shall be used between the fibre connection module and communication equipment.

7.6.3 The unused ports of the fibre connection module shall be provided with protective caps or plugs to protect dust or unwanted material from degrading the connectors.

7.7 Labeling

7.7.1 The trunk, branch and twisted pair cables in the pedestal shall be labelled with permanent indelible ink on a heavy duty marking tape to indicate the following information as specified in the Contract Drawings:

(a) Cable type, i.e. a Trunk, Branch or a Drop Cable,

(b) Direction the cable is coming from or the cabinet number for the Drop Cable

7.7.2 Each buffer tube entering the splice tray shall be labeled with vinyl tags directly on the splice tray with the direction of the cable, and with the cable identification (Trunk, Branch or Drop).

7.7.3 The interface connector in the pre-terminated fibre connection module shall be labelled. The labelling scheme shall, at a minimum, include the following:

a) Fibre Type;

b) Fibre Number and Direction from the cable it comes from;

c) Function (Rx or Tx);

d) The adjacent cabinet number from where the cable comes from.

Example:

SMF 34W Tx 401CW0420SWC

7.7.4 Both ends of the fibre patch cords from the fibre connection module to the communication equipment, e.g. switch shall be labelled. The labelling scheme shall be as follows:

a) At the switch end, the label shall indicate to which adjacent cabinet the connection is from;

b) At the fibre connection module end, the label shall indicate Fibre Type, Fibre Number and Function.

7.8 Grounding

7.8.1 All metallic components in the fibre optic cables shall be bonded together with a connection to the ground lug of the splice enclosures.

7.8.2 If the fibre cable has metallic components, the ground lug of the splice enclosure shall bonded to the communications pedestal ground.

7.9 Quality Control

The Contractor is responsible for all testing and documentation required to establish approval and acceptance of installation and operation of this equipment. The framework of the approval process shall be as specified elsewhere in the Contract Documents.

The following table details the clauses within this Special Provision, which are to be validated through the PIT, POP, and SIT processes as specified. All measurements shall be performed according to EIA/TIA-455-B.

CLAUSE	PIT	POP	SIT
5.2.2	√	√	
5.3.2	√	√	
5.4.1	√ [1]	√ [2]	
5.4.2	√ [1]	√ [2]	
5.4.3	√ [1]	√ [2]	
5.5.1	√ [1]	√ [2]	
5.5.2	√ [1]	√ [2]	
5.5.3	√ [1]	√ [2]	
5.6.2		√	
7.4.4		√ [3]	
7.4.5		√ [3]	
7.4.6		√ [3]	
7.7.1		√	
7.7.2		√	
7.7.3		√	
7.7.4		√	

Testing Footnotes:

[1] Each reel shall be tested prior to installation in ducts. PIT shall include a minimum of 10% of the total fibre optic communication cable. Where 10% equates to more than one fibre, the fibres to be tested shall be located in different buffer tubes.

[2] Each length of fibre cable shall be tested after installation in ducts. POP shall include a minimum of 10% of the single mode fibres to be connected to equipment. The Contractor shall not test the same fibres on consecutive lengths. All spare cables shall be tested. The Contractor shall record the reel number from which the cable came, the identification of the fibres measured and the attenuation in dB/km of the fibres measured.

[3] Each optical link (fibre link terminated with optical connectors on each end) shall be tested using light source and power meter. Attenuation and continuity shall be demonstrated at 1310 nm and 1550 nm. Calibration between the light source and power meter shall be performed at the beginning of each day of testing and after every 20 optical link measurements.

Each optical fibre with at least one fibre connector shall be tested using an OTDR at 1310 nm and 1550 nm. Test results shall include the following measurements:

a) Total length of the optical link

b) Total attenuation of the optical link

c) Attenuation of each splice in the optical link under test

d) Attenuation per kilometre of the optical link under test

e) Wavelength of the measurement

f) Index of refraction used for the test

Test results shall include electronic copies of the OTDR attenuation profile in searchable PDF format.

When cable installed in this Contract interconnects with existing cable, the Contractor will be provided with test results for existing adjacent communications cable and shall review the results prior to interconnecting to the existing cable.

A certificate confirming the calibration of the OTDR within the past year prior to undertaking any testing shall be submitted to the Contract Administrator.

8. QUALITY ASSURANCE – Not Used

9. MEASUREMENT FOR PAYMENT

9.1 Fibre Optic Communication Cables, In Ducts

Measurement of cables shall be made horizontally in metres along the longitudinal axis of the duct trench from centre to centre of poles, electrical chambers, concrete pads and to the face of bridge structures and retaining walls.

10. BASIS OF PAYMENT

10.1 Fibre Optic Communication Cables, In Ducts - Item
Fibre Optic Communication Cables, In Ducts (Temporary) - Item

Payment at the Contract price for the above tender items shall be full compensation for all labour, Equipment and Materials required to do the work regardless of the type or number of fibres in the cable (connecting to both new and existing trunk cable), splices, twisted pair cable, termination blocks, coils of cable, mechanical support, delivery, installation, testing and the production of all drawings, text and test results.

Progress payment for temporary fibre optic cables shall be based on the following percentages of the Contract price:

80% for supply and installation

20% for removal

VARIABLE MESSAGE SIGNS - Item No. 104

Special Provision 685S01M February 2016

1. SCOPE

This Special Provision covers the requirements for the design, installation and testing of Variable Message Signs (VMS) and all associated equipment for the Queue Warning Signs (QWS). The QWS sign is a single line variable sign integrated with static message component.

The scope of work under this item includes the refurbishing and reconfiguration of the existing VMS Controller CTL-19 to be re-used and operate with the new VMS.

2. REFERENCES

This Special Provision refers to the following standards, specifications or publications:

Ontario Provincial Standard Specifications, Construction:

OPSS 609	Grounding
OPSS 915	Construction Specification for Sign Support Structures

Ontario Ministry of Transportation Publications:

Designated Sources of Material (DSM)

Canadian Standards Association:

CAN/CSA-S6-00	Canadian Highway Bridge Design Cod
CSA C22.2 No. 65-03	Wire Connectors
CSA C22.2 No.75-M1983	Thermoplastic-Insulated Wires and Cables
CSA C22.2 No. 35-M1987	Extra-Low-Voltage Control Circuit Cables, Low-Energy Control

	Cable, and Extra-Low-Voltage Control Cable
CSA Electrical Bulletin No. 561A	Electrical Insulation Tapes

Electronic Industries Alliance / Telecommunications Industry Association:

EIA/TIA-232-E	Interface Between Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Binary Data Interchange
TIA/EIA-422-B	Electrical Characteristics of Balanced Voltage Digital Interface Circuits
TIA/EIA-568-B	Commercial Building Wiring Standard
EIA-310-D	Cabinets, Racks, Panels and Associated Equipment

Institute of Electrical and Electronics Engineers:

IEEE 518	Guide for the Installation of Electrical Equipment to Minimize Electrical Noise; Inputs to Controllers from External Sources
IEEE 802.3	IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications

International Organisation for Standardization:

ISO/IEC 17025	General Requirements for Competence of Testing and Calibration Laboratories – Standards Council of Canada

National Electrical Manufacturers Association (NEMA):

NEMA 250	Enclosures for Electrical Equipment (1000 Volts Maximum) - NEMA 3R

Others:

Ontario Electrical Safety Code

3. DEFINITIONS

For the purpose of this Special Provision, the following definitions apply:

Display Module: means a matrix of pixels. A matrix of display modules are used to make up the display area of the sign face. A display module is typically 7 rows of pixels vertically by 5 columns of pixels horizontally but it can be any size larger than 7x5 that can be managed by maintenance staff when display modules need to be replaced.

ITS: means Intelligent Transportation Systems

MIBs: means Management Information Base

MTBF: means Mean Time Between Failures.

Pixel: means an assembly of LEDs that collectively form an image-forming unit. All LEDs in a pixel are turned on or off in unison.

QWS: Queue Warning System.

VMS: means Variable Message Sign that includes signcase, display elements, photocell sensor, VMS controller, and all other associated mechanisms and equipment required to form an operational display.

4. DESIGN AND SUBMISSION REQUIREMENTS

4.1 Design Requirements

4.1.1 VMS Design

4.1.1.1 The structural design for the signcase, including the load on the sign face and mounting hardware, shall comply with all relevant requirements of the Canadian Highway Bridge Design Code.

4.1.1.2 Design of the variable message sign with all internal components shall sustain the galloping, vortex shedding, natural wind gust and truck-induced wind gust loading based on the appropriate design standards.

4.1.1.3 Design of the VMS shall meet all appropriate ice loading design standards.

4.1.1.4 The structural design of the sign and the associated mounting, undertaken by the Contractor, shall be compatible with the design of the sign support structure. The signcase shall be designed to be compatible with the mounting truss and footings as shown in the Contract Drawings.

4.1 .1.5 The Contractor shall submit calculations for the estimation of the weight of the sign panel and shall be responsible for redesign of the footing or support structure if the weight exceeds 225kg.

4.1.1.6 All structural design components (including all mass calculations) shall have the design attested to by an Engineer.

4.1.1.7 The sign shall be positioned to meet the viewing distance requirements. The sign shall be adjustable to allow aiming of the sign face to maximize viewing distance.

4.1.2 Software Design

4.1.2.1 The Contractor shall submit a software development plan, schedule and software architecture (high level) design to the Contract Administrator for review.

4.1.2.2 Software documentation, as required, shall be submitted for review and approval to the Contract Administrator in advance of site installation of the VMS.

4.2 Submission Requirements

4.2.1 Shop Drawings

The Contractor shall submit all designs, drawings and details to the Contract Administrator for review. the Contractor shall submit shop drawings for the following:

a) Signcase and sign face;
b) Light emitting assembly;
c) Display matrix including mounting details;

d) Environmental system;
e) Mounting hardware and details;
f) Photosensor system and dimming scheme;
g) Driver electronics;
h) Interconnection method; and
i) Associated cables and wiring.

Shop drawings relating to the VMS controller shall consist of circuit schematics, functional block diagrams, relevant timing diagram s, equipment sizes, catalogue numbers and cut sheets and other relevant material necessary to fully describe the controller.

4.2.2 Pixel

As a minimum, the following design information for the pixel shall be submitted to the Contract Administrator prior to the manufacturing of the sign:

a) Type and characteristics of LEDs and other major components of the pixel, as appropriate.
b) Design of the pixels and associated calculations to verify how the optical performance requirements are achieved.
c) The range of driving parameters of the light emitting elements to attain the required range of design output intensity.
d) The reliability information of the LEDs and pixels including predicted MTBF for the LEDs and pixels for continuous operations under the worst case operating conditions and the associated reliability information from the LED manufacturer to show the LED MTBF with respect to operating temperature.
e) Degradation characteristics of the pixel with respect to light output, colour shift, light propagation and reflective characteristics shall be minimal.
f) Evidence of the LED manufacturer's binning process.

4.2.3 Other Submission Requirements

The following additional design and construction elements shall be submitted prior to the manufacturing of the sign:

4.2.3.1 A sample of the exterior signcase paint finish.

4.2.3.2 The proposed method for replacing modules, wiring and internal components within the signcase. A mock-up of the polycarbonate sheet sections shall be visually demonstrated to the Contract Administrator.

4.2.3.3 The design verification for the control of negative (out-forward) pressure for the sign face shall be carried out as specified by the Canadian Highway Bridge Design Code and certified by an Engineer. Methods to control the negative pressure shall be submitted with the sign documentation.

4.2.3.4 The Contractor shall submit calculations for the estimation of the mass of the signcase and the total mass of the sign (signcase complete with all internal components).

4.2.3.5 The Contractor shall submit the design criteria used and the associated design calculations and drawings to the Contract Administrator prior to the manufacturing of the sign.

4.2.3.6 Calculations for energy consumption to demonstrate that the limits for power consumption are met.

4.2.3.7 Design of the environmental system shall be submitted. The submission shall state the predicted internal environmental conditions during normal operations and under the external environmental extremes. The predicted maximum temperature adjacent to the light source shall be provided. Associated heat analysis calculations shall be attested by an Engineer.

4.2.3.8 Proposed display module driver mounting and maintenance access scheme.

4.2.4 Module Prototype Requirement

4.2.4.1 The Contractor shall construct and test a sign prototype consisting of a minimum of two fully functional modules (including the polycarbonate sheet) prior to fabrication of the sign to demonstrate compliance of the sign design with the requirements included in this Special Provision.

4.2.4.2 The prototype shall be of identical material and design of the sign to be supplied under the Contract.

5. MATERIALS

5.1 Previous Suppliers

The following company has supplied LED VMS for the Queue Warning System to the Owner in the past:

Ledstar Inc.
131 Westcreek Dr.
Woodbridge, Ontario L4L 9N6
Telephone: (905) 265-7800

5.2 Signcase

5.2.1 The signcase shall be constructed of aluminum alloy or other approved non-ferrous, durable materials. The signcase shall provide the required protection and mechanical strength for the application.

5.2.2 The Signcase shall be designed to conform to the requirements of NEMA 3R outdoor enclosures.

5.2.3 The total mass of the sign component, including all internal and external components shall not exceed 225 kg.

5.2.4 The outside dimensions shall be:

- width: 3000 mm
- height: 610 mm
- depth: 475 mm

(excluding minor appurtenances) as specified elsewhere in the Contract Documents.

5.2.5 The sign face shall mount flush with the static sign. The sign shall be designed such that it matches the static sign width of 3000 mm wide. The sign shall be mounted on the static sign such that the gap between the sign and the static sign is less than 10 mm and filled by neoprene or other suitable material.

5.2.6 The perimeter of the signcase shall include wide strip of high intensity retro-reflective fluorescent sign material, matching as closely as possible the colours of the pixels.

5.2.7 All structural hardware components shall be stainless steel unless otherwise specified. Nylon stop nuts shall be used. The hardware components shall prevent galvanic action, corrosion, and loosing under the conditions of the highway environment. All fasteners of less than 3 mm diameter shall use Robertson heads and all larger fasteners shall use hex heads.

5.2.8 The signcase seams shall be continuous welded. Seams shall be welded with gas metal arc (MIG) or gas tungsten arc (TIG) process using bare aluminum welding electrodes. Spot welding shall not be used. Corrosion protection shall be provided between dissimilar metals.

5.2.9 The sign shall be supplied with a minimum of two (2) lifting eyes to facilitate lifting of the sign without damage.

5.2.10 The Signcase shall be designed such that the signcase support is compatible with the sign support structure.

5.2.11 Colour shall be grey on all exterior surfaces except for the front face. The signcase shall be cleaned, treated with chemical conversion coating, or with a paint primer suitable to the signcase material, and finished with two coats of prime quality enamel. Alternatively, anodized aluminum or electrostatically applied powder coats are acceptable. The finish shall be of prime quality substantially free of flow lines, paint washout, streaks, blisters and other defects that would impair serviceability or detract from the general appearance. All visible surfaces on the front face shall be entirely matt black except for the high-intensity retro-reflective fluorescent border strip.

5.2.12 Front maintenance access is to be compatible with the design of the sign support structure and the maximum dimensions of the sign.

5.2.13 The design shall permit easy access of modules, wiring and internal components for maintenance and diagnostic purposes from the front of the signcase. Modules shall be provided with a swing-down assembly such that all equipment can be inspected, removed, and replaced.

5.2.14 A latching mechanism shall secure the front panel for maintenance access.

5.2.15 Safety strips shall be mounted on the interior signcase ceiling and on all interior protruding members.

5.3 Sign Face

5.3.1 The sign face shall be protected by a single weather tight, dust proof, non-glare polycarbonate sheet. The polycarbonate sheeting shall be secured to the signcase as recommended by the manufacturer of the polycarbonate sheet and shall be designed with appropriate methods to withstand all applicable loads as required by the Canadian Highway Bridge Design Code. There shall be no aperture mask in front of the polycarbonate sheets.

5.3.2 The polycarbonate sheet shall be securely mounted to the front face of the sign. The protective screen shall be rigid and shall not deform as a result of wind or temperature.

5.3.3 Suitable mullions shall be installed to allow for the expansion and Contraction of the polycarbonate sheet.

5.3.4 The signcase shall be designed to allow cleaning of the internal surface of the polycarbonate sheets.

5.3.5 The polycarbonate sheets shall exhibit a consistent degree of uniformity across the panel.

5.3.6 While the type and material selected for the polycarbonate sheet shall satisfy the requirements to protect the sign, the design of the polycarbonate sheet shall also be required to meet the overall optical performance of the sign display as stated herein.

5.4 Sign Display Matrix

5.4.1 The display matrix shall consist of a continuous line matrix.

5.4.2 All display elements of the sign shall be of identical material and design to ensure uniformity in characteristics.

5.4.3 The line matrix shall consist of 7 rows and 55 columns of pixels. In the case of a display module that is 7 rows by 5 columns, each line matrix would consist of a horizontal row of 11 display modules.

5.5 Sign Power Requirements

5.5.1 The power consumption shall not exceed 600 VA with all fans, heaters, auxiliary equipment and 50% of the pixels operative in their half output setting or 25% of the pixels operative in their maximum output setting.

5.5.2 The power factor shall be a minimum of 0.90. The Contractor shall provide power factor correction equipment, where necessary, to achieve this minimum power factor.

5.5.3 The sign shall be powered from the PDA receptacles in the controller cabinet.

5.5.4 One duplex 110V receptacles with a ground fault interrupter (GFI) shall be provided inside the signcase for the use by maintenance personnel. The receptacles shall be easily accessible by the maintenance personnel.

5.5.5 Lighting shall be installed inside the signcase to provide lighting during maintenance and repair activities. Control of the lighting shall be through a switch located within the signcase close to at the maintenance access.

5.6 Sign Display

5.6.1 General

5.6.1.1 Failure of a pixel or display module shall not cause failure of any other pixel or module. Failure of a single LED within a pixel shall not cause a failure of the pixel or more than 25% loss of pixel intensity.

5.6.1.2 When pixels are operating in a pulse mode, no noticeable light flicker shall be visible by a human eye. The frequency of the pulse mode shall be minimum 90 Hz.

5.6.1.3 The sign display shall be clearly legible from a distance of between 45 m and 200 m under normal highway operating conditions from any part of the approaching lanes including the shoulders.

5.6.1.4 The sign display shall be visible from a distance of 300 m in all ambient light conditions.

5.6.1.5 The minimum luminance ratio under all external sign illuminances (lx) within 400 to 40,000 lx shall be 10 to 1. The luminance ratio (LR) shall be calculated as follows:

Luminance Ratio = $(l_a - l_b) / l_b$, where

l_a = The measured luminance (cd/m2) of the element in the ON state.

l_b = The measured luminance (cd/m2) of the element in the OFF state.

5.6.1.6 The sign face shall be set at an angle of 0° (degrees) from vertical so that the pixels are aimed downward towards the roadway.

5.6.2 Display Module

5.6.2.1 Each display module shall be sized to be easily handled for maintenance operations and be made up of multiple pixels arranged in regular horizontal rows and vertical columns with pixel centres equivalently spaced.

5.6.2.2 Within the display module, each pixel shall be individually addressable to allow proportional fonts and graphics capability for the line matrix and each pixel for the end matrices shall be individually addressable to allow full graphics capability.

5.6.2.3 The display modules shall allow display of 300 mm (± 25 mm) high characters using 50 mm (± 10 mm) diameter pixels.

5.6.2.4 The spacing between pixels shall be 48 mm as measured from the centre of one pixel to the centre of adjacent pixels both horizontally and vertically. The horizontal and vertical spacing shall be equal.

5.6.2.5 The minimum size for a display module shall be 7 rows vertically by 5 columns horizontally of pixels. The maximum size will be such that maintenance staff can easily remove the display module. All display modules in a single sign shall be the same size.

5.6.3 Pixels

5.6.3.1 Each pixel shall be comprised of a minimum of 7 light emitting diodes (LEDs). When turned on and viewed from 75 m, the pixel shall be visible as a solid dot and not as individual LEDs. The pixel shall not require external or supplementary illumination, and shall have a nominal diameter of 50 mm. Operation of each pixel shall be independent of the other elements such that failure of a pixel will not affect proper operations of the other elements.

5.6.3.2 All pixels of the sign shall be of identical material and design to ensure uniformity in characteristics. Design of the pixels shall meet the harsh environmental requirements of the

intended installation within the component manufacturer's rated temperature range and operating characteristics.

5.6.3.3 The pixels shall be assembled in display modules to facilitate maintenance and replacement. Failure of operation of a pixel shall not require on-site replacement of an entire display module.

5.6.3.4 When activated, pixels shall be amber, light emitting. When not activated, pixels shall be non-light emitting.

5.6.3.5 All pixels shall be securely mounted such that the nominal axis of the light output shall be perpendicular to the sign face. The luminous intensity of the pixel shall not decrease more than 50% when viewed at a minimum angle of 15° (degrees) (7.5° 1/2 angle) centered about the optical axis and perpendicular to the surface of the display.

5.6.3.6 The average luminance output from the highest 12% of the pixels to the lowest 12% shall be less than 3:1. The ratio of the average luminance output from the highest 4% of the pixels to the lowest 4% shall be less than 5:1.

5.6.3.7 The pixels shall be made up of amber LEDs. The luminance of the pixel shall be a minimum of 10,000 cd/m2 at the brightest level and with all the pixels activated within the maximum LED driving characteristics for the maximum design output for the sign operations, at the maximum operating temperature.

5.6.3.8 The pixel design shall be such that it minimizes the effect of heat buildup within the pixel. The LEDs shall operate within the LED manufacturer rated temperature range under the worst case operating conditions.

5.6.3.9 Each pixel shall contain sufficient LEDs, such that the entire sign with the polycarbonate sheet in front of the pixels shall fulfil the optical output, contrast, viewing angle, legibility and reliability requirements as specified elsewhere in this Special Provision.

5.6.3.10 The soldering of the LEDs hall be in accordance with the manufacturer's recommended guidelines.

5.6.4 LEDs

5.6.4.1 All LEDs shall have a nominal wavelength of 590 nanometres (amber colour). The colour of the pixels shall be uniform across the sign.

5.6.4.2 The LEDs shall be of aluminum indium gallium phosphide technology. The LEDs shall be from one of the following manufacturers:

a) Toshiba
b) Avago

5.6.4.3 All LEDs shall be of industrial grade and of identical make and model from the same manufacturer.

5.6.4.4 The LED shall be highly reliable for the intended applications. With a target continuous operating period of five (5) years, the mean time between failure (MTBF) of a single LED shall not be less than 150,000 hours at the brightest level and with all the pixels activated within the maximum

LED driving characteristics for the maximum design output for the sign operations at an outside air temperature of 35° C and a relative humidity range of 5% to 100%. Failure of a pixel is defined as the inability to activate more than 25% of the LEDs in a pixel and/or achieving less than 25% of the intended pixel output intensity.

5.6.5 Display Font

The sign shall display the fonts MTO1 and MTO2. The font requirements will be provided by the Contract Administrator. The Contractor is responsible for configuring the sign to display the fonts.

5.6.6 Display Performance

The time to display a 75 alphanumeric character message generated at the VMS controller shall not exceed 0.5 second from a blank state.

5.7 Sign Photosensor System

The sign shall have photovoltaic sensors. The sensor shall be scaled for a reading of up to 100,000 lux. The sensor shall be mounted on the top of the sign. The aiming angle of the sensor shall be adjustable.

5.8 Sign Environmental System

5.8.1 The sign enclosure and the equipment housed within shall be protected from moisture, rain, snow, sun radiation, dust, dirt and salt corrosion found in a highway environment.

5.8.2 A heating system and thermal insulation shall be provided, if required, to prevent adverse effect on the equipment due to condensation. Condensation may be controlled using thermostatically controlled strip heaters or axial fan heaters inside the sign face.

5.8.3 A force d ventilation system shall be provided, if required, to mitigate the effects of dust ingress and for providing air movement, thermal cooling, and thermal equalization to mitigate the accumulation of condensation and formation of "hot spots". All fans shall be mounted in the top of the sign case. All forced intake air shall be filtered.

5.8.4 The environmental system shall maintain the internal environment of the sign with in the operating range of all internal components, - 40° C to + 65° C, being employed for the design of the sign system for all external conditions encountered in Ontario.

5.8.5 The environmental system shall be designed for proper continuous sign operations at 25% of the pixels with all possible pixel combinations for LED technology, at the brightest level, under the full external environmental range.

5.8.6 An adequate quantity of temperature sensors shall be provided inside the signcase with associated temperature monitoring functions to prevent damage of the components due to build-up of excessive heat.

5.8.7 The use of fans is required to provide comfortable working conditions within the sign during maintenance activities. When not in use, the fan openings shall be shut and turned off.

5.8.8 Liquid coolants shall not be permitted.

5.9 Sign Electronic Components/Electrical Components

5.9.1 All electrical/electronic components shall be of modular, interchangeable, plug-in type fabrication and shall be standard manufacturer's components and CSA certified, where possible. Failure of a single display pixel or module shall not affect operations of the other display pixels or modules. During replacement of defective driver boards or light emitting modules the sign shall remain operational.

5.9.2 Electronic components shall not be socket or jack mounted, except for LSICs (Large Scale Integrated Circuits) having more than 16 or more leads. If IC sockets are used, they shall have high grade, industrial quality, machined pin contacts and dual spring, gold plated type sockets.

5.9.3 All components and PCBs (Printed Circuit Boards) shall be conformal coated. PCBs shall use either a wire connector or edge connector. PCBs with edge connectors shall have bifurcated gold plated contacts.

5.9.4 All components shall be capable of withstanding the extreme environmental conditions as specified without degrading their design life. The design shall be inherently temperature compensated to prevent abnormal operation. Circuit designs shall include compensation as is necessary to overcome adverse effects due to temperature in the specified environmental range.

5.9.5 The design life of all individual components shall be not less than 10 years operating 24 hours per day in their circuit application.

5.9.6 All components including the LEDs shall be de-rated by 20% with regard to applied voltage and power dissipation unless otherwise specified such that material shortening of life or shift in values is minimized.

5.10 Sign Cables and Wiring

5.10.1 The Contractor shall provide low voltage (power) and extra low voltage (internal sign control) cables necessary to operate the variable message signs.

5.10.2 Properly supported cable trays shall be provided for routing all wiring within the sign.

5.10.3 Low voltage (power) cables shall be stranded copper type TWH meeting the requirements of the latest CSA Standard C22.2 No. 75.

5.10.4 Extra low voltage (internal sign control) cables shall be type ELC meeting the requirements of the latest CSA standards C22.2 No. 35.

5.10.5 All cables shall be protected against lightning or over-voltage conditions with appropriate surge protectors. The low voltage circuits shall be protected by MOVs rated at 20 kA with a peak voltage of 350 volts.

5.11 Sign Connectors

5.11.1 Wire connectors shall be of the fork tongue compression type for terminal connections or the to-wire connections and shall meet the insulated wing nut vibration proof spring type for wire-requirements of the latest CSA standard C22.2 No. 65.

5.11.2 The signcase shall include a connector suitable for terminating the interconnecting cable to the VMS controller.

5.11.3 All connectors shall have suitable strain relief and positive retention.

5.12 Sign Grounding Materials

Grounding wire and connectors shall meet the requirements of section 609.05 of OPSS 609.

5.13 Sign Soldering

All circuit board soldering shall be 63/37 tin/lead mix resin core type.

5.14 Sign Driving Circuitry

5.14.1 Driver boards shall be mounted to the back of each display module.

5.14.2 Each driver board shall be uniquely addressable.

5.15 Sign Mounting Hardware

5.15.1 All assemblies within the signcase shall be mounted using shock, vibration and weather resistant hardware.

5.15.2 The sign structure shall be secured to the sign support structure as shown in the Contract Drawings.

5.16 VMS Controller

5.16.1 General

5.16.1.1 The VMS controller shall be a microprocessor based unit.

5.16.1.2 A watchdog timer for detecting controller failure and resetting the microprocessor shall be provided.

5.16.1.3 The VMS controller's front panel shall include a keypad and LCD. The device shall be used to perform the following functions with the sign controller and VMS:

a) Monitor the current status of the sign controller, including the status and representation of the message visible on the display face;
b) Per form diagnostics testing of various system components, including pixels, power systems, sensors, and more;
c) Activate messages stored in memory;
d) Configure display parameters, including display size and colors;
e) Configure communications port settings and NTCIP options.

5.16.1.4 The front panel interface shall also include the following:

a) Power switch to turn the controller on and off;
b) LED power "on" indicator;
c) "Local/remote" switch that places the controller in local mode such that it can be controlled from the front panel interface;

d) LED to indicate state of the “local/remote” mode switch;
e) Reset switch to quickly restart the controller.

5.16.1.5 All indicators shall have a +/- 45° cone of visibility with the axis perpendicular to the front panel. All indicators shall be readily visible at a radius of up to 1.22 metres within the cone of visibility.

5.16.1.6 The VMS controller shall be capable of communicating with a local field test computer and centrally located ATC.

5.16.1.7 The VMS controller unit shall support two forms of communication interface: Serial and Ethernet.

5.16.1.8 The controller communications shall be user selectable.

5.16.1.9 The controller shall have a unique address for communication with the VMS master controller. The VMS Master controller shall be an ATC controller unit with the Ministry Queue Warning software. This address shall be stored in non-volatile memory /solid state disk.

5.16.2 Environmental

The controller s hall be capable of operating over the temperature range of - 30° C to + 65° C.

5.16.3 Electrical Requirements

5.16.3.1 The VMS controller shall operate from a line voltage of 106 to 126 Volts AC and frequency of 60 +/- 0.5 Hertz.

5.16.3.2 The power consumption of the VMS controller, power supply, and permanently connected equipment shall not exceed 250 watts total.

5.16.3.3 All components, when housed in the ATC chassis, shall be unaffected by transient voltages normally experienced on commercial power lines.

5.16.3.4 All equipment shall be capable of normal operation following opening and closing of contacts in series with the applied voltage to the cabinet at a rate of 30 openings and closings per minute for a period of 2 minutes in duration.

5.16.3.5 All electrical modules within the controller assembly shall fully comply with local governmental requirements concerning the suppression of unintended radio frequency emissions.

5.16.3.6 All circuits shall be sufficiently protected against stray static electricity so as not to be damaged during normal shipping, handling and operation.

5.16.3.7 The controller shall include appropriately sized lightning protection and surge protection. The protective devices shall be encapsulated hybrid suppressors and shall be bayonet mounted such that replacement can be done without removal of the housing or other equipment. The suppressors shall be EDCO Cat. # PC-642 or approved equal.

5.16.3.8 The general principles of minimizing the effects of voltage surges shall conform to the requirements of IEEE Standard 518-1982.

5.16.3.9 All fuses shall be easily accessible on the front panel unless otherwise specified and shall be replaceable without the use of any tools.

5.16.3.10 Test points shall be provided for monitoring all power supply voltages. All test points shall be readily accessible when equipment is opened in service position and the voltage level to be verified shall be clearly labelled beside the test point.

5.16.3.11 The power supply, if separate from the controller enclosure, shall be EIA rack mountable.

5.16.3.12 The power cable shall be easily detached from the controller for quick removal.

5.16.4 Communications

5.16.4.1 Serial

5.16.4.1.1 The controller shall be provided with two EIA/TIA-232-E serial communications ports for use with a plug-in field computer and for communications with the data modem.

5.16.4.1.2 The serial ports shall use a 9-pin socket connector; ITT DB-9S. The field test computer port shall be on the front face of the enclosure.

5.16.4.1.3 Communications through the serial ports shall be asynchronous in a half-duplex mode.

5.16.4.1.4 The standard baud rate shall be 9600 while allowing the selection of 9600 or 19200.

5.16.4.1.5 It shall be possible to easily switch from full-duplex to half- duplex and vice versa.

5.16.4.2 Ethernet

5.16.4.2.1 The controller shall be provided with one IEEE 802.3u 10/100Base-TX Ethernet port.

5.16.4.2.2 The Ethernet port shall have a RJ-45 female connector. The port shall meet Category 5 specifications and shall be compliant with EIA/TIA-568-B standard pin out.

5.16.4.3 Sign Head to Controller Interconnect

The controller shall provide a suitable interface for connecting the controller to the VMS signcase over the maximum distance required under the contract. The Contractor has the option of providing external line drivers, if required.

5.16.5 Storage

5.16.5.1 The controller shall have non-volatile electronically changeable memory. This memory shall be formed by flash or battery-backed static RAM integrated circuits that retain the data in memory for a minimum of 30 days following a power loss. This changeable memory shall be used to store messages and schedules.

5.16.5.2 The controller memory shall be capable of storing a minimum of 100 two page messages in non-volatile RAM.

5.16.5.3 The controller shall store a minimum of 100 graphic symbols in non-volatile RAM.

5.16.5.4 The controller shall support a minimum of four fonts and 255 characters shall be burned in the non-volatile memory.

5.16.6 Control of Display

5.16.6.1 The controller shall be able to display messages of up to 75 alphanumeric characters and graphic symbols on the variable message sign as commanded by the VMS controller or from the plug -in terminal.

5.16.6.2 The controller shall have the capability of detecting display on/off state element failures. As a minimum, the following failure modes shall be reported:

a) A complete module fails;
b) A complete column of pixels fails;
c) A complete row of pixels fails;
d) More than 8% of all pixels fail; or
e) One or more of the photosensors fail.

5.16.6.3 The controller, in the worst case, shall be able to display a mixed text and graphics message or a full graphics within four (4) seconds of the receipt of the complete command transmission at its communications port.

5.16.7 Control of Sign Luminance

5.16.7.1 The controller shall provide means to change the brightness of the display matrix manually or automatically.

5.16.7.2 The manual intensity control will allow the user to select one of at least 15 intensity levels. The brightness shall remain at that level until the user changes the level or sets the controller to automatic mode.

5.16.7.3 The automatic intensity control mode shall monitor the ambient light sensors on the VMS and will use a mathematical algorithm to automatically select one of the 15 or more intensity levels.

5.16.7.4 The 15 automatic intensity control levels shall have five (5) ranges controlled by the prevailing outdoor illumination levels and software, and a minimum of three (3) levels within each of the five (5) ranges selected on the basis of message importance.

5.16.7.5 Sensing of ambient light levels shall be through the three VMS photosensors connected through an analogue to digital converter card using separate channels. The analogue-to-digital converter shall have a minimum resolution of eight bits and a multiplexer of four channels.

5.16.7.6 The controller shall be equipped with pulse width modulation (PWM) circuitry with the peak current not exceeding the typical forward current specified by the LED manufacturer for the specified LED cluster.

5.16.7.7 In the case of a critical photosensor system failure, the light output of the sign display elements shall be defaulted to the night range setting. Failure notification of photosensor failure, both locally and at central, shall, if the sensor is not a single unit, indicate which photosensor has failed.

5.16.8 Controller Software

The software for the VMS controller shall meet all of the functional requirements specified elsewhere in this Contract.

5.16.9 Physical and Mechanical Requirements

5.16.9.1 The dimensions of the complete controller, including the power supply and all connectors, shall not exceed 775 mm high, 480 mm wide, and 530 mm deep.

5.16.9.2 The controller shall be EIA 480 mm rack mountable.

5.16.9. 3 There shall be no serviceable parts within the controller.

5.16.9.4 All connectors shall be keyed to prevent accidental insertion of the wrong connector;

5.16.9.5 The design life of the controller and its components, under 24 hours a day operating conditions in their circuit application, shall not be less than ten years.

5.16.9.6 No internal item, component or subassembly shall emit a noise level exceeding the specification outlined by CSA C108.8-M1983.

5.16.9.7 All circuit board soldering shall be 63/37 tin/lead mix resin core type.

5.16.9.8 All aluminum components shall be anodized. The anodic coating shall have a minimum thickness of 0.178 mm and a minimum coating weight of 42 grams per square metre. Prior to the anodic coating, the component shall be cleaned and etched.

5.16.9.9 The manufacturer's name or logo, model number, serial number, and circuit issue or revision number shall appear and be readily visible on all items supplied. All serial numbers shall be at least 3 mm in height and shall be either etched or engraved on all items supplied.

5.16.9.10 Different components of the controller equipment including all the wires, connectors, control LEDs, switches, etc. shall be identified with labels of engraved lamacoid or with permanent transfers. The identifiers shall correspond to the labels used in the equipment documentation and maintenance material.

5.17 Sign to Controller Interconnect Wiring

5.17.1 All interconnecting cables between the controller and the sign shall be outdoor rated for installation in underground ducts. The cable shall include the number of conductors required for communication between VMS and the VMS controller.

5.17.2 The connectors shall match the interface requirements.

6. EQUIPMENT – Not Used

7. CONSTRUCTION

7.1 Timing Of Work

7.1.1 The Contractor shall ensure that sign controller units are installed, tested and ready for operation before installing the variable message signs.

7.1.2 All installation work shall be carried during permitted times for lane closures as specified elsewhere in the Contract.

7.1.3 The Contractor shall coordinate communication and central software configurations with the Owner.

7.2 Sign Installation

7.2.1 The requirements of OPSS 915 shall apply to this work.

7.2.2 All mechanical hardware for initial attachment shall be attached and secured prior to the reopening of lanes to traffic. Attachment of all hardware shall be completed prior to the release of crane cables.

7.3 Controller Installation

7.3.1 The controller shall be installed in the designated space in the field cabinet in locations as indicated in the Contract Drawings.

7.3.2 Only Robertson head or combination of Robertson and slot head screws shall be used for mounting assemblies on the controller cabinet rack. Slotted thumbscrews may also be used for assembly mounting. All screw type fasteners shall utilize locking devices or locking compounds. All screws, nuts, and washers accessible to the maintenance staff shall be made of stain less steel.

7.3.3 All protective devices such as lightning arresters and surge protectors shall be mounted external to the VMS controller enclosure but within the cabinet.

7.3.4 All mounting hardware and wire connections shall be easily accessible and removable with hand tools.

7.3.5 The front panel and chassis shall be connected to the cabinet ground bus from a single point only.

7.4 Installation of Sign to Controller Interconnect Cables

7.4.1 The Contractor shall complete all wiring between the VMS signcase and VMS controller. The interconnect power and communications cables shall be installed in liquid tight conduit in inconspicuous locations, between the nipples on the sign support and the signcase. The interconnecting cables shall use the sign support beams and legs as raceways and shall be installed in continuous, unspliced lengths between the signcase and the controller cabinet. Sufficient slack shall be left to ensure that the connection to the power source will be possible without the need to add or splice any cables. Cables and connectors shall not be stressed during or after installation.

7.4.2 All communication/control cables shall be properly terminated on industry standard termination panels within the signcase and field cabinet.

7.4.3 All interconnection cables shall not exceed the minimum bending radius specified by the manufacturer.

7.4.4 All interconnection cables shall be installed inside the ducts connecting the cabinet pad and the sign footing (see Contract Drawings).

7.4.5 Low-voltage cables and communication/control cables installed in the cabinet shall be routed on opposite sides of the cabinet and shall not be routed parallel to other low-voltage cables.

7.4.6 All electrical installations shall meet the requirements of Ontario Electrical Safety Code.

7.5 Pre-delivery Repair

The procedures listed below shall be followed in the repair of equipment before shipment:

7.5.1 Any defects or deficiencies found by the inspection system involving mechanical structure or wiring shall be fed back through the manufacturing process or special repair process for correction.

7.5.2 Defects in printed circuit boards or electronic circuit components shall be specially treated as follows:

a) A printed circuit board may be flow soldered a second time if copper runs and joints are not satisfactorily coated on the first run;
b) Under no circumstances shall a printed circuit board be flow soldered more than twice;
c) Hand soldering may be used for printed circuit repair;
d) A printed circuit board may be factory repaired not more than two times during the warranty period. A third failure shall result in replacement of the printed circuit board. A circuit board whose components or printed conductor become damaged during factory repair shall also be replaced by a new board; and
e) All factory repairs shall be described in detail on a form to be furnished by the Contract Administrator. The completed form shall be returned together with the repaired unit.

7.6 Quality Control

The Contractor is responsible for all testing and documentation required to establish approval and acceptance of installation and operation of this equipment. The framework of the approval process shall be as specified elsewhere in the Contract Documents.

The following table details the clauses within this Special Provision, which are to be validated through the PIT, POP, and SIT processes as indicated:

CLAUSE	PIT	POP	SIT
4.2.3.2	√		
4.2.4.1	√ [1]		
5.2.3	√		
5.2.4	√		
5.2.11	√ [2]		
5.3.5	√ [3]		
5.5.1	√		
5.5.3	√	√	
5.5.4	√	√	
5.6.1.1	√		
5.6.1.3		√ [4]	
5.6.1.4		√ [4]	
5.6.1.5	√		
5.6.1.6		√	
5.6.2.2	√ [5]		
5.6.2.3	√		
5.6.3.1	√		
5.6.3.4	√ [6,7,8]	√ [7.8]	
5.6.3.5	√		
5.6.3.6	√		
5.6.3.7	√ [9]		
5.6.5	√ [10]		
5.6.6	√		
5.8.4	√ [16]		
5.8.5	√ [11]		
5.9.1	√		
5.10.5	√	√	
5.16.1.3	√		
5.16.1.4	√		
5.16.1.6	√ [12]		√ [12]
5.16.1.7	√ [13]	√ [13]	

CLAUSE	PIT	POP	SIT
5.16.1.8	√		
5.16.2	√ [14]		
5.16.3.4	√ [15]		
5.16.4.1.1	√		
5.16.4.1.4	√	√	√
5.16.4.1.5	√		
5.16.4.2.1	√	√	√
5.16.5.1	√		
5.16.5.2	√		
5.16.5.3	√		
5.16.5.4	√		
5.16.6.1	√ [17]	√ [17]	√ [17]
5.16.6.2	√ [16]		
5.16.6.3	√	√	
5.16.7.2	√	√	
5.16.7.3	√	√	
5.16.7.7	√		

Testing Footnotes:

1 i) Each prototype shall exhibit dimming functions as specified for the full size sign.

ii) Each prototype shall be equipped with a polycarbonate sheet cover.

iii) Each prototype shall display the following test patterns:

a) All elements on;
b) Activation of alternate rows;
c) Letters A-to-Z and numerals 0 to 9; and
d) All elements off.

iv) The Contractor shall demonstrate to the Contract Administrator that the legibility distance, viewing angles, pixel intensity, dimming, spacing between pixels, uniformity of pixel intensity and contrast ratios, as defined in this Special Provision, are met.

v) All equipment shall continue normal operation when subjected to the low temperature test: With the item functioning at a line voltage of 106 VAC for all items in its intended operation, the ambient temperature shall be lowered from 20o C to the minimum temperature defined for the signcase and controller at a rate of not more than 18o C per hour. The item shall be

cycled at this temperature for a period of five (5) hours and then returned to 20o C at the same rate. The test shall be repeated with a line voltage of 126 VAC.

vi) All equipment shall continue normal operation when subjected to the high temperature test: With the item functioning at a line voltage of 106 VAC in its intended operation, the ambient temperature shall be raised from 20o C to the maximum temperature defined for the signcase and controller at a rate of no more than 18o C per hour. The item shall be cycled at this temperature for five (5) hours and then returned to 20o C at the same rate. The test shall be repeated with the line voltage of 126 VAC.

2 The Contractor shall demonstrate that the Signcase shall suffer no coating loss by the following method: Two samples of 100 mm x 200 mm, made of the same material and coating as the Signcase supplied, shall be used for the test. Two 225 mm diagonal scratches exposing bare metal will be made on a sample. It will be soaked in de-mineralized water for 192 hours. A 25 mm strip of masking tape shall be tightly affixed to this surface and removed with one quick motion; evidence of blistering, softening or peeling of the paint and/or coating from the base metal shall be cause for rejection.

3 Subjective assessment of colour uniformity.

4 Visibility tests including test drives during day and night conditions to verify the legibility distance. Testing at dawn or sunset will be required depending on site location. Pixel luminance shall vary automatically during the tests and be supplemented with manual input.

5 All the display modules shall be turned on and off several times to demonstrate that all driving circuitry and/or multiplexing circuitry is functional.

6 Demonstration of all pixels activated/deactivated in alternating mode using a checkerboard test pattern for 30 minutes minimum.

7 Demonstration of operation with the VMS controller, including demonstration of the use of all software commands capable of controlling the pixels on/off state.

8 Continuous operation over 168 hours using a message display change every 15 minutes. Any pixel failures during this test will require satisfactory repeat of the complete test. Demonstration of various pixel luminance levels, set and operating in accordance with the specifications, is required. The signcase shall not be covered during this operation.

9 The LED pixels shall be tested to ensure suitability for the application. As a minimum, the LED pixels shall pass the following test:

a) A random sample of not less than 200 pixels shall be activated continuously at the brightest design output level at the predicted maximum temperature adjacent to LED pixels inside the signcase. The duration of the test shall be sufficient to verify satisfactory operation of all pixels to simulate a total pixel operation of not less than 150,000 hours. The test shall be considered as failed upon any single failure of the pixel in the test sample.

b) Prior to the manufacturing of the sign, the Contractor shall provide proof of certified testing by the manufacturer or conduct the above test to the satisfaction of the Contract Administrator. The Contractor is responsible for any re-test or design modification of the pixel to satisfy the above test criteria.

10 Downloading of messages with and without graphic symbols shall be carried out using all variations of attributes or other variables. Recovery of all messages and graphic symbols from the appropriate memory slots shall be demonstrated at least three (3) times.

11 Demonstration of the maximum internal signcase temperature for proper operation of the equipment inside the signcase. Measurements shall be conducted with the sign displaying a test pattern defined by the Contract Administrator. A minimum of 10 test points identified by the Contract Administrator shall be measured. The temperature shall be measured when the internal environment of the signcase reaches a steady state. The maximum internal signcase temperature shall be verified with respect to the specification with necessary adjustment for the worst-case ambient conditions. If the maximum internal signcase temperature as identified in the test exceeds the predicted temperature as identified in the specification, the test for pixels as specified in the specification shall be repeated to verify that the reliability requirements of the pixels are met. The Contractor is responsible for any re-test or design modification to satisfy the test criteria.

12 The Contractor shall demonstrate proper controller operation with the communication subsystem and ATC by downloading and uploading the message library and by demonstrating that all software commands, as embedded in the communications protocol, are functional. The field test computer may be used for master emulation. The Owner shall provide the simulated central software for the purpose of testing. A laptop shall be used to initiate all commands required in the software specifications. The controller must respond correctly within 30 seconds of issuing the command and must transmit the correct reply. All commands shall be held for a minimum of 15 minutes.

13 The controller, when subjected to a loss of communication, shall resume operation with the VMS displaying a blank message.

14 All controller environmental tests to be carried out by the Contractor shall employ the services of an accredited testing laboratory in compliance with ISO/IEC 17025 (general requirements for competence of testing and calibration laboratories) Standards Council of Canada. The controller unit shall be submitted to a low temperature test by cooling t o – 10o C for 24 hours and then demonstrating reaction to commands as in tests above. The controller unit shall then be de-energized for 30 minutes and then re-powered and the tests performed again.

15 The controller, when subjected to a loss of power, shall resume operation with the VMS displaying a blank message.

16 All subassemblies (including all electronic components mounted in the sign) shall be environmentally tested for a minimum of 24 hours by cycling over the full operating temperature range of the equipment prior to installation in the signs.

17 The Contractor shall demonstrate that the controller unit turns all sign display modules on and off by calling up test patterns from t he local field test computer and the ATC.

8. QUALI TY ASSURANCE

The Owner or Contract Administrator shall be provided the opportunity to perform quality assurance testing including, but not be limited to, the following:

a) Tests of sign display visibility under various ambient conditions;
b) Measurement of pixel luminance;
c) Testing of maintenance accessibility features;

d) Testing of redundancy features;
e) Testing of trial messages by transmission from the ATC (QWS software on ATC);
f) Systems integration test s with the ATC controller subsystem;
g) Quality inspection of all fabricated items;
h) Testing on site with a field test computer (locally).

9. MEASUREMENT FOR PAYMENT

Measurement for payment of the number of variable message signs is by Plan Quantity as may be revised by Adjusted Plan Quantity.

The unit of measurement is each.

10. BASIS OF PAYMENT

Payment at the Contract price for the above tender item shall be full compensation for all labour, Equipment and Materials required to do the work including manufacturing, delivery, installation, testing and the production of all drawings, text and test results, except for SIT which is paid for under a separate item.

REMOVAL OF ELECTRICAL EQUIPMENT - Item No. 114

Special Provision No. 610F01 November 2016

Amendment to OPSS 610, November 2016

610.07.09.03 Shipping of Salvaged Electrical Equipment and Materials

Clause 610.07.09.03 of OPSS 610 is amended by the addition of the following:

Transformers designated for removal shall be removed, salvaged and transported to the site(s) specified in Table 1. All wiring and conduit systems shall be disconnected and the transformer salvaged complete with all fittings and hardware.

TABLE 1
Salvaged Equipment and Unloading Site(s)

Equipment	Site
3 x Poles complete with luminaires and bracket assemblies	**On site for reinstallation**

2 x Poles, complete with luminaires and bracket assemblies	MTO Winona Yard Contact Jim Kozina 905-643-4046 1200 South Service Road, PO Box 10021 Winona, ON L8E 5K0
All temporary traffic signal equipment including the traffic signal controller and any contents of the cabinet, and the non-intrusive detection system.	MTO Winona Yard Contact Jim Kozina 905-643-4046 1200 South Service Road, PO Box 10021 Winona, ON L8E 5K0

REMOTE NON-INTRUSIVE TRAFFIC SENSORS (RNITS) SYSTEM - Item No. 120

Special Provision

1. SCOPE

This Special Provision covers the requirements for the installation, calibration, integration and testing of a Remote Non-Intrusive Traffic Sensors (RNITS) System. As a condition of approval of this item, the Contractor shall ensure that the RNITS System pre-installation and the proof of performance test results are received, reviewed, and approved by the Ministry.

2. REFERENCES

This Special Provision refers to the following standards, specifications and publications:
Ontario Provincial Standard Specifications, Construction:

OPSS 604 Installation of Cable
OPSS 609 Grounding

CSA Standards:

C22.2 No. 65-93 Wire Connectors

Electronic Industries Alliance/Telecommunication Industry Association:

TIA/EIA-195C Electrical and Mechanical Characteristics for Terrestrial Microwave Relay System Antennae and Passive Reflector

EIA/TIA-232-E Interface between Data Terminal Equipment and Data Circuit Terminating Equipment Employing Serial Binary Data Interchange

EIA/TIA-485-A A standard defining the electrical characteristics of drivers and receivers for use in serial communications systems.

National Electrical Manufacturers Association (NEMA):

NEMA 250-1997	Enclosures for Electrical Equipment (1000 Volts Maximum)

Industry Canada:

IC RSS 210	Industry Canada Radio Standards Specification Low-power Licence Exempt Radio Communication Devices
ICES-003	Interference-Causing Equipment Standard for Digital Apparatus, Issue 4

Other

Ontario Electrical Safety Code
MIL-DTL-26482H General Specifications for Electrical Connectors, Receptacles and Plugs

3. DEFINITIONS

For the purpose of this Special Provision, the following definitions shall apply:

Remote Non-Intrusive Traffic Sensors (RNITS) Unit – an aerial sensor unit used to detect to register the presence of a vehicle;
Remote Non-Intrusive Traffic Sensors (RNITS) System – a system comprised of a RNITS unit, hardware components, cables and connectors required for its full operation;
Ethernet Converter – a device used to convert communication signals to Ethernet and vice a versa; and
Lump Sum Item – a tender item indicating a portion of the work for which payment will be made at a single tendered price. Payment is not based on a measured quantity, although a quantity may be given in the Contract Documents.

4. DESIGN AND SUBMISSION REQUIREMENTS

The Contractor shall supply, install, calibrate, integrate, and test, as per manufacturer's specification, one of the following RNITS Units:

SmartSensor HD WX-SS-126, made by Wavetronix; and
Houston Radar

The Contractor shall contact each manufacturer during the bidding process. The Contractor shall receive and provide written consent from each manufacturer regarding their awareness of the Contractor's submission, and a letter from the manufacturer regarding their understanding of the submission requirements or the work herein. These documents shall be provided as part of the required submission items.

The Contractor shall identify pertinent technical as well as contractual issues that will affect the successful delivery of this work in a timely and cost-effective manner.

4.1 Submission Requirements

4.1.1 The Contractor shall submit a proposal for each RNITS System configuration for each installation site for a review and approval by the Contract Administrator. The RNITS System configuration shall include the following:

RNITS Unit;
Hardware components;
Connectors and/or terminals; and
Voltage supply to the RNITS Unit.

The proposal shall demonstrate that the Contractor is familiar with the specific requirements of this assignment, conversant with traffic data collection and data reporting processes, and contractual practices in addressing them.

The submission shall include specification sheets for the RNITS Unit, the proposed hardware components, cables and connectors and/or terminals. The Contractor shall provide the submission to the Contract Administrator within 15 working days after the award of the Contract.

5. MATERIALS

For each RNITS System, the Contractor shall design appropriate configuration to provide full operation including remote monitoring without solar power for a duration minimum of nine (9) consecutive days without charging. Each RNITS System shall be able to be powered by both solar power and battery power.

5.1 Remote Non-Intrusive Traffic Sensors (RNITS) Unit

5.1.1 Each RNITS Unit shall be approved for licence free operation in Canada. The RNITS Unit shall not cause interference or be susceptible to interference from any radiating system. The RNITS Unit shall meet Industry Canada ICES-003 (Issue 4) Interference-Causing Equipment Standard for Digital Apparatus rule for electromagnetic interference.

5.1.2 Each RNITS Unit shall be housed in a NEMA-4X enclosure suitable for outdoor year-round installation and operation in the Ontario climate. The operating temperature shall be in the range of -30°C to +50°C and up to 95% relative humidity. The enclosure shall include a connector that meets the MIL-DTL-26482 specification.

5.2 Pad Mounted Environmental Enclosure:
The Contractor shall supply the environmental pole mounted enclosure for the proposed hardware components, as dictated by the RNITS System installation site specifics. All electrical terminations shall be compliant with the local Electrical Code and shall require an ESA approval. The enclosure shall be of steel material with a minimum of NEMA 3R rating. The size of each cabinet and the mounting height on each pole shall be detailed in the layout drawings.

6. EQUIPMENT – NOT USED

7. CONSTRUCTION

7.1 Remote Non-Intrusive Traffic Sensors (RNITS) System

The Contractor shall design the RNITS System configuration as per RNITS Unit manufacturer's recommendations and requirements, and accounting for system's installation site specifics.

7.1.1 RNITS System Wireless Connectivity

The RNITS System shall support Ethernet connectivity.

When the RNITS System connects to the remote monitoring through the Ethernet converter/Modem installed in the enclosure, the configuration and integration of the RNITS System shall be carried out in the following chronological order:
The Contractor shall set up all IP addresses, user names, and passwords for the RNITS Unit and hardware components supplied with the RNITS System's configuration.
Each RNITS Unit shall be configured according to the manufacturer supplied calibration software.
The software generated results shall be verified through comparison to the results of manually collected traffic data (traffic volume, vehicle classification and speed) performed in parallel with the RNITS System data collection. The speed data verification shall be performed using a radar gun. As a minimum, each RNITS System shall be manually verified over two periods of 15 minutes. One of the two observation periods shall be chosen during free flow traffic conditions and the other during traffic AM/PM peak hours. The manual observations shall be performed in the presence of a Ministry's representative and the Contract Administrator, and compared with the RNITS Unit software generated data.
The Ministry's representative shall verify with the Contract Administrator that the Contractor has configured the RNITS System with the remote monitoring devices.
The Contractor shall connect each RNITS Unit to the Ethernet converter in the enclosure and verify with the Contract Administrator that data from the RNITS System is correctly received at the remote monitoring location.

7.1.2 Software

The Contractor shall provide all material needed to install monitoring software on at least five (5) devices at no additional cost to the Ministry. Lifetime free upgrades of the software shall be included with this installation.

7.1.3 Contractor Provided Support Services

The Contractor shall provide an on-going technical support between the hours of 9 a.m. – 5 p.m. from Monday to Friday on the RNITS System, including troubleshooting, maintenance and Ethernet connectivity of the RNITS System, for the duration of the warranty period.

7.1.4 Contractor Provided Documentation

The following documentation shall be submitted to the Ministry upon completion of the two RNITS System installations:
Comprehensive user guide for the two RNITS Units and the two RNITS Systems, including the associated software;
Installer quick-reference guide for the two RNITS Units and the two RNITS Systems;
User quick-reference guide for the two RNITS Units and the two RNITS Systems; and
Training, maintenance and operational guidelines for the two RNITS Systems.

8. QUALITY CONTROL

The Contractor shall be responsible for all required testing and documentation, and also for establishing a process for approval of the two RNITS Systems' installation and operation. The framework of the approval process shall be as specified elsewhere in the Contract Documents.

The Contractor shall validate proof of performance of each RNITS System by demonstrating that the RNITS system software generated results of traffic volume, vehicle classification and speed are successfully received via remote monitoring system at the Ministry's Office in Downsview, Ontario.

9. FINAL INSPECTION OF INSTALLED REMOTE NON-INTRUSIVE TRAFFIC SENSORS (RNITS) SYSTEM

All installed RNITS Systems shall be inspected, tested and approved by a manufacturer's representative and a Ministry's representative. The contact information for the Ministry's representative is as follows:

MTO CR Traffic Field Office
1927 Kipling Avenue, Unit 10
Etobicoke, ON M9W 4J4
Tel: 416-325-6233 (Office)
Tel: 416-347-1868 (Cell)

Each new RNITS System shall be switched on for operation according to the following requirements:

The Contract Administrator, the manufacturer's representative and the Ministry's representative shall be given a minimum of a three (3) working day notice from when a RNITS System will be inspected.
The Contractor shall provide training by the manufacturer to the Ministry's staff of up to a maximum of six (6) persons, on the following topics:

i. Overview of each RNITS System;
ii. Hardware and software operation;
iii. Field setup procedures (detection zones setup);
iv. Configuration procedures and techniques; and
v. Operation and maintenance of each RNITS System.

Training shall also include handouts and reference materials for each participant.
Training must be completed on or before each RNITS System becomes operational.
Training for each RNITS System shall be completed at the respective installation site along Highway 7/12. Any additional training shall be completed within the Greater Toronto Area.
All repairs or replacement of defective components shall be complete prior to activation.
Each RNITS System installation shall be inspected and approved in writing by an ESA Inspector.

10. WARRANTY

The warranty for all hardware components, supplied and installed by the Contractor for each RNITS System shall extend to three years (36 months) from the date of the complete Contract completion and shall cover any defects in material and workmanship. Each entire RNITS System shall be warranted and the Contractor shall highlight their comprehensive warranties available at no additional costs to the Ministry.

11. MEASUREMENT FOR PAYMENT

Each RNITS System item is paid by the lump sum method and there shall be no measurement for payment for such tender item.

12. BASIS OF PAYMENT

12.1 Remote Non-Intrusive Traffic Sensor System - Item

Payment at the Contract price for the above tender item shall be full compensation for all the labour, equipment and materials required to complete the work. Also, it shall include, but shall not be limited to delivery, fabrication, warranties, and insurance, required for the supply and delivery of a fully-functional RNITS System, all associated operational and maintenance services, communications equipment, and all other associated components as specified.

Progress payments shall be based on the following percentages of the Contract price for milestones accepted by the Contract Administrator:

a) 80% for construction completion and acceptance of this item by the Ministry; and
b) 20% at the end of the warranty period.

Final payment for this Contract item shall occur at the end of the warranty period, provided each entire RNITS System is in complete working condition as outlined in the document.

The replacement of hardware that fails to meet the approval criteria shall be at no additional cost to the Owner.

PROTECTION SYSTEM - Item No. 123, 155, 170

Special Provision

Amendment to OPSS 539, November 2014

539.07.02 Removal of Protection Systems

Subsection 539.07.02 of OPSS 539 is deleted in its entirety and replaced with the following:

Protection systems may be left in place.

Where protection systems are left in place, the top shall be removed to at least 1.2 m below the finished grade/ground level.

The method and sequence of removal shall be such that there shall be no damage to the new work, existing work and facility being protected.

All disturbed areas shall be restored to an equivalent or better condition than existing prior to the commencement of construction.

Special Provision

Amendment to OPSS 539, November 2014

593.07.02 Removal of Protection Systems

Subsection 539.07.02 of OPSS 539 is deleted in its entirety and replaced with the following:

Protection systems shall be removed from the right-of-way unless it is specified in the Contract Documents that the protection system may be left in place.

Where piles are left in place, the top shall be removed to at least 1.2 m below the finished grade or ground level or at least 0.6 m below the streambed.

The method and sequence of removal shall be such that there shall be no damage to the new work, existing work, and facility being protected.

All disturbed areas shall be restored to an equivalent or better condition than existed prior to the commencement of construction.

RETAINED SOIL SYSTEM WITH FINISHING CAP, WALL/SLOPE, HIGH PERFORMANCE - Item No. 124, 185, 188, 191

Special Provision

Amendment to SP 599S22 (March 2018), Section 4.0 Design and Submission Requirements

The following Section 4.01.06 is to be added:

Section 4.01.06 Two-Stage RSS Walls

Two-stage Retained Soil System (RSS) wall types are currently not listed on the Ministry of Transportation, Ontario (MTO) Designated Sources of Material (DSM). For the two-stage RSS wall sections along the QEW, the Contractor shall submit the proposed RSS wall system design to the Contract Administrator who will provide the MTO RSS Committee for review and approval. The Contractor shall allow for a minimum of eight (8) weeks of review time by the MTO RSS Committee.

The proposed wall system shall be suitable for anticipated settlements due to the realignment of the QEW.

The submission shall include working drawings, supporting design documentation and commentary which specifically address the proposed design.

CONCRETE IN SUBSTRUCTURE AND RETAINING WALLS - Item No. 134, 159, 174

Special Provision

Amendment to OPSS PROV.904

904.01 SCOPE

Section 904.01 of OPSS PROV.904 is amended by the addition of the following:

The work of the above tender item(s) shall include the following:

QEW CNR/CPR Overheads, SBL and NBL, Site Nos. 34X-0129/B1/B2
a). EVA foam joint fillers between the abutment and barrier wall footing on RSS wall;
b). EVA foam joint fillers between the abutment and RSS wall;
c). EVA zote rope between the abutment and RSS wall;
d). Geotextile at the abutments;
e). HL-4 asphalt in front of the abutment, between abutment stem and RSS wall cap;
f). Rigid extruded grade 'A' polystyrene (as required) in front of the abutment; and
g). Construction of concrete protection walls at abutments.

QEW Ramp W-W & Ramp E-E/W at Frenchman's Creek Culvert, Site No. 34-454/C
Also as part of the work, the Contractor shall supply and install the steel reinforcement for the reconstruction of retaining walls.

QEW at Frenchman's Creek Culvert, Site No. 34-455/C
Also as part of the work, the Contractor shall supply and install the steel reinforcement for the reconstruction of retaining walls.

All of the above shall be as shown on the Contract Drawings and/or as directed by the Contract Administrator on site.

CONCRETE IN BARRIER WALLS - Item No. 136

Special Provision

Amendment to OPSS PROV.904

904.01 SCOPE

Section 904.01 of OPSS PROV.904 is amended by the addition of the following:

The work of the above tender item(s) shall include the supply and placement of the WABO joint seal and Dow Corning Silicone sealant at barrier wall expansion joints.

All of the above shall be as shown on the Contract Drawings and/or as directed by the Contract Administrator on site.

CONCRETE IN APPROACH SLABS - Item No. 137

Special Provision

Amendment to OPSS PROV.904

904.01 SCOPE

Section 904.01 of OPSS PROV.904 is amended by the addition of the following:

The work of the above tender item(s) shall include the construction of new approach slabs and sleeper slabs, including the supply and placement of the following:

a). Approach slab seat elastomers;
b). Joint fillers between approach slabs and barrier wall footings on RSS;
c). PVC sheets at the bottom of the approach slabs;
d). Bond breaker waterproofing protection board between approach slabs and sleeper slabs;
e). Weep tubes at the end of approach slabs and sleeper slaps; and
f). 150 mm dia. Perforated subdrain with 19mm crushed stone wrapped in class II non-woven geotextile at the end of approach slabs and sleeper slabs.

All of the above shall be as shown on the Contract Drawings.

COATING NEW STRUCTURAL STEEL - Item No. 145

Special Provision

Amendment to OPSS 911

911.01 SCOPE

Section 911.01 of OPSS 911 is amended by the addition of the following:

The work under this item shall include:

a). Coating all structural steel surfaces at the end of girders.
b). Coating all structural steel surfaces at field splices of exterior girders.

All as indicated on the Contract Drawings.

911.07 CONSTRUCTION

911.07.03 Surface Preparation and Surface Profile

911.07.03.02 New Structural Steel

Clause 911.07.03.02 is amended by the addition of the following:

The faying surface of a splice plate shall only be blast-cleaned to SSPC-SP6 but not coated.

The primed faying surfaces of the girder and the primed exposed surfaces of splice plates shall be solvent cleaned and power-tool cleaned to SSPC-SP3 immediately prior to connection. Coatings damaged by the bolting operations shall be repaired as specified elsewhere in this specification.

Special Provision No. 911F10 May 2016

Supplemental Instructions to Bidders

Bidders may conduct trial blasting methods as required but subject to the same requirements as specified in the Contract Documents to ascertain effectiveness and rate of production of equipment and abrasive material intended to be employed.

Bidders may select, subject to Owner approval, any area of structural steelwork within the identified contract limits.

Bidders must inform the Regional Manager of Operations of their testing intentions and obtain approval for a specific time framework.

All materials, labour and equipment deemed necessary for the trial operation, shall be supplied at the bidder's expense.

The site shall be cleaned after the trial period so that it is returned to a state equivalent to the original state.

Amendment to OPSS 911, November 2014

911.07 CONSTRUCTION

911.07.01 General

Subsection 911.07.01 of OPSS 911 is amended by addition of the following:

The surfaces of existing structural steel to be cleaned and coated are as follows:

N/A

The coatings previously applied to the existing structural steel are:

N/A

The coatings previously applied to the existing steel railing system are:

N/A

911.07.03.07 Surface Preparation of Areas Difficult to Access

Clause 911.07.03.07 of OPSS 911 is amended by the addition of the following:

Areas that are difficult to access during surface preparation are described below:

N/A

911.07.04 Application of Coating

911.07.04.02 Paint Coating Systems

911.07.04.02.03 Existing Structural Steel

Clause 911.07.04.02.03 of OPSS 911 is amended by the addition of the following at the end of the second paragraph:

The coating system to be used is:

N/A

911.07.04.04 Coating of Areas Difficult to Access

Clause 911.07.04.04 of OPSS 911 is amended by the addition of the following:

Areas that are difficult to access for coating application are described below:

N/A

BRIDGE DECK WATERPROOFING - Item No. 147

Special Provision

Amendment to OPSS PROV.914

914.01 SCOPE

Section 914.01 of OPSS PROV.914 is amended by the addition of the following:

The work of the above tender item(s) shall include the supply and placement of the waterproofing system on deck and 1000mm on approach slabs.

All of the above shall be as shown on the Contract Drawings and/or as directed by the Contract Administrator on site.

Special Provision No. 914F02 December 2014

Amendment to OPSS 914, November 2014

914.07.02.03 Existing Deck Surface Preparation

Clause 914.07.02.03 of OPSS 914 is amended by the addition of the following:

The surface of the concrete deck is as follows:

Name of Structure: N/A

Textured surface ☐ yes ☐ no
Sawcut grooves ☐ yes ☐ no

DECK JOINT ASSEMBLIES, INSTALLATION - Item No. 149

Special Provision No. 920F03 May 2018

Amendment to OPSS 920, November 2016

920.07.02.04 Placing

Clause 920.07.02.04 of OPSS 920 is deleted in its entirety and replaced with the following:

920.07.02.04.01 General Requirements

The deck joint assemblies shall be placed according to Table 1.

TABLE 1
Method of Expansion Joint Installation on Bridges

Name of Structure	Method of Joint Installation
QEW CNR/CPR Overheads, Site No. 34X-0129/B1&B2	After Asphalt Paving

920.07.02.04.02 Joint Installation After Asphalt Paving

When specified in the Contract Documents, concrete shall be removed to prepare the blockout. Where new barrier or parapet walls are to be constructed, bulkheads shall be used to form blockouts. Steel reinforcement shall be placed in the blockout, as specified in the Contract Documents.

Prior to filling the blockout, the expansion joint gap shall be plugged to support the material placed in the blockout. The method used to plug the gap shall accommodate the anticipated movement of the structure and retain the blockout material until the joint is to be placed. Granular A shall be used to fill the blockout and then be compacted to 100% of the maximum dry density according to OPSS 501. Granular A shall be placed as follows:

a) When only construction vehicles and equipment are going to use the bridge and cross over the blockout prior to asphalt paving, the Granular A shall be placed from the top of the plug up to a height that is level with the top of the adjacent concrete.

b) When traffic is to be maintained on the bridge and cross over the blockout prior to asphalt paving, the Granular A shall be capped with 50 mm of cold mix or hot mix asphalt placed level with the top of the

adjacent concrete. The top surface of the asphalt shall be maintained smooth and level with adjacent concrete and shall not ravel.

Prior to asphalt paving, the limits of the blockout shall be accurately marked and the markings shall be visible after paving so that the joint limits may be accurately identified.

The deck shall be waterproofed according to OPSS 914.

The paving operation, shall be continuous over the area from 20 m beyond the approach slab, across the bridge to 20 m beyond the end of approach slab of the opposite end. The asphalt pavement at the limits of blockout shall be sawcut full depth and the asphalt above the blockout shall be removed.

The saw-cut asphalt edges shall be adequately protected for the full depth of asphalt. Wood angles with a minimum thickness of 19mm shall be considered a minimum requirement.

All the material used to fill the blockout and to plug the expansion gap, including any supports or bracing, shall be removed to the depth of the bearing seat. Asphalt residue shall be cleaned from the steel reinforcement.

Concrete faces of the blockout shall be abrasive blast cleaned according to OPSS 929.

Reinforcing steel in the blockout shall be checked to ensure that it is not damaged. Damaged reinforcing steel shall be removed from the blockout and replaced with new reinforcing steel.

The deck joint assembly shall be placed in the blockout 3 mm below the elevation of asphalt pavement and in the position specified in the deck joint assembly Working Drawings.

Immediately prior to placing concrete, top setting devices shall be adjusted to give the setting width as specified in the Working Drawings.

Setting devices shall be tightened and the deck joint assembly secured at the correct width, line and grade by welding the loop anchors and stud anchors to the steel reinforcement. The location of these welds shall be not less than 100 mm below the top of the end dams and the spacing shall be approximately 500 mm on centre.

Concrete shall be placed in the in the blockout, no later than 48 hours after the blockout surfaces have been abrasive blast cleaned. All concrete surfaces to receive concrete shall be maintained in a wet condition for a period of 1 hour prior to placing any new concrete. Immediately prior to wetting the concrete surface, all dust and loose material shall be removed from the prepared surface by using compressed air. Prior to placing concrete, excess water shall be removed from the surface using compressed air.

Concrete shall be placed and consolidated to minimize voids under the deck joint assembly and shall be hand-finished with a wooden float. All steel surfaces that are going to be in contact with the preformed seal shall be protected during concrete placement.

Exposed faces of the structural steel shapes shall be cleaned to remove any concrete and deleterious material.

The setting devices shall be flame cut at the gap between 2 to 4 hours after concrete placement. The setting device boltholes for all nosing angles, as well as for the armouring angles, of the joints shall be drilled to a depth of 20 mm, air blast cleaned, and filled with epoxy. All dust, debris, water, and any other foreign materials must be removed from boltholes immediately prior to filling it with epoxy.

After installation of the deck joint assemblies, a 20 mm wide groove shall be saw cut for the full depth of asphalt adjacent to each steel-nosing angle. If the previously saw cut face is undamaged and within 5 mm of the specified location, the Contractor may elect to form the groove. The grooves shall be cleaned, dried, and filled with hot poured rubberized joint sealing compound according to OPSS 914.

920.07.02.04.03 Joint Installation Prior to Asphalt Paving

Concrete shall be removed to prepare the blockout, as required. The blockout shall be formed to the lines and grades specified in the Contract Documents. Where new barrier or parapet walls are to be constructed, bulkheads shall be used to form blockouts. The dimensions of the blockout in the barrier or parapet wall shall not be greater than those of the blockout in the deck and ballast wall, except for the modular joints in structures. Steel reinforcement shall be placed as specified in the Contract Documents.

The top of formwork shall be set such that the top of the deck joint assembly is placed at the proposed top-of-asphalt elevations.

Concrete faces of the blockout shall be abrasive blast cleaned according to OPSS 929.

The joint assembly shall be placed in the blockout at the correct elevation and location.

Immediately prior to placing concrete, top setting devices shall be adjusted to give the setting width as specified in the Contract Documents.

Setting devices shall be tightened and the deck joint assembly secured at the correct width, line and grade by welding the loop anchors and stud anchors to the steel reinforcement. The location of these welds shall be not less than 100 mm below the top of the end dams and the spacing shall be approximately 500 mm on centre.

When an expansion joint system with an approved elastomeric concrete is specified, the mixing, placing and curing requirements shall be according to the manufacturer's specifications.

Concrete shall be placed in the blockout, no later than 48 hours after the adjacent concrete surfaces have been abrasive blast cleaned. All concrete surfaces to receive concrete shall be maintained in a wet condition for a period of 1 hour prior to placing any new concrete. Immediately prior to wetting the concrete surface, all dust and loose material shall be removed from the prepared surface by using compressed air. Prior to placing concrete, excess water shall be removed from the surface using compressed air.

Concrete shall be placed and consolidated to minimize voids under the deck joint assembly and shall be hand-finished with a wooden float. All steel surfaces that are going to be in contact with the preformed seal shall be protected during concrete placement.

Exposed faces of the structural steel shapes shall be cleaned to remove any concrete and deleterious material.

The setting devices shall be flame cut at the gap between 2 to 4 hours after concrete placement. The setting device boltholes for all nosing angles, as well as for the armouring angles, of the joints shall be drilled to a depth of 20 mm, air blast cleaned, and filled with epoxy. All dust, debris, water, and any other foreign materials must be removed from boltholes immediately prior to filling it with epoxy.

The deck shall be waterproofed according to OPSS 914. Waterproofing membrane shall extend 50 mm up the vertical face of the nosing angle of the deck joint assembly.

The final top of asphalt elevation immediately adjacent to the deck joint assemblies shall be 5 mm higher than the assembly, and shall taper to 0 mm over a distance of 1.0 m.

BEARINGS - Item No. 150

Special Provision No. 922F01 November 2016

Amendment to OPSS 922, November 2016

922.07.11 Sampling for Quality Assurance Testing

922.07.11.01 Sampling of Bearings

Clause 922.07.11.01 of OPSS 922 is amended by the addition of the following:

The following elastomeric bearings shall be provided as test samples for destructive testing purposes, as noted in Table 1. These bearings are in addition to those required for installation on the Contract.

TABLE 1
Elastomeric Bearing Test Samples for Destructive Testing

Number of Samples to be Tested	Dimensions	Plain or Laminated	Number of Bearings Represented by Sample	Structure Identification	Bearings Location Represented by Test Sample
1	500x400x20	Plain	24	QEW CNR/CPR Overheads, Site No. 37X-0129/B1&B2	East and West Abut.

922.10 BASIS OF PAYMENT

922.10.02.01 Elastomeric Bearings with Steel Laminates

Clause 922.10.02.01 of OPSS 922 is amended by the addition of the following to the third paragraph.

For the purpose of administering this payment adjustment, where rotational bearings are included in this tender item Bearings, the total value of all elastomeric laminated bearings shall be considered to be one half of the total value of this tender item. Where only elastomeric bearings are included in this tender item, the total value of all elastomeric laminated bearings shall be considered the total value of this tender item.

ACCESS TO WORK AREA, WORK PLATFORM AND SCAFFOLDING - Item No. 151

Special Provision

Amendment to OPSS 928, April 2012

928.01 SCOPE

Clause 928.01 of OPSS 928 is amended by the addition of the following:

Under this item, the Contractor shall provide necessary debris platforms and other containment measures during construction to collect falling concrete and construction debris and ensure that no debris, or materials resulting from the removal work, fall on railways and other areas below the bridges.

The Contractor shall be responsible for the supply/installation/maintenance of any associated fencing and warning signs prior to commencement of work and removal after completion of the work

Excess material resulting from performing the work required under this item shall be removed and managed as specified elsewhere in the contract.

The Contractor shall provide access and equipment necessary for Engineer and Construction Administrator to carry out the inspections.

928.04 DESIGN AND SUBMISSION REQUIREMENTS

928.04.02 Design Requirements

Clause 928.04.02 of OPSS 928 is amended by the addition of the following:

The contractor shall be solely responsible for the structural adequacy, stability and integrity of the work platforms and for safe access by the construction personnel to the work areas for the entire duration of the work.

Subsection 928.04.02 of OPSS 928 is amended by the addition of the following clause:

928.04.02.01 Debris Platforms

Debris platform design shall be according to CAN/CSA S6. The debris platform shall satisfy all OHSA requirements.

The debris platform shall be capable of sustaining all loads arising from workers, Materials, Equipment, concrete debris, and impact forces.

The debris platform shall extend a minimum of 3 metres beyond the edge of tracks.

A minimum vertical clearance beneath the structure of 7.01m shall be provided above tracks at all times.

928.04.03 Submission Requirements

928.04.03.01 Access to Work Areas, Platforms, and Scaffolding

Clause 928.04.03.01 of OPSS 928 is amended by the addition of the following:

The Contractor shall submit 3 sets of debris platform Working Drawings to the Contract Administrator at least 7 Days prior to the commencement of concrete removal, for information purposes only. Prior to making

a submission, the seals and signatures of a design Engineer and a design-checking Engineer shall be affixed on the Working Drawings verifying that the drawings are consistent with the Contract Documents.

The Contractor shall have a copy of the Working Drawings at the site during debris platforms and containment systems installation.

Debris platform Working Drawings shall include at least the following:

a). Platform support details.
b). Method of erection.
c). Connection Details.
d). Material specifications and grades.
e). Containment system details.
f). Design loads.
g). Capacity of proprietary products.

928.07 CONSTRUCTION

928.07.02 Access to Work Area, Work Platform, and Scaffolding

Subsection 928.07.02 of OPSS 928 is amended by the addition of the following:

Prior to the commencement of concrete removals, the Contractor shall install debris platforms and collection systems to ensure that concrete, dust, debris, and effluent from sawcutting, is prevented from falling onto areas below the bridge.

Where removals are undertaken by sawcutting and lifting, removals shall be divided into predetermined, manageable pieces. Before cutting loose the pieces to be removed, the pieces of concrete shall be supported at all times by a cable attached to a crane. The crane shall readily lift the concrete pieces off the bridge deck once the pieces are cut free. Use of excessive force to pull the concrete away from the structure shall be prevented.

At the conclusion of the work, the debris platforms and collections systems shall be removed from the right-of-way.

928.07.09 Certificate of Conformance

Subsection 928.07.09 of OPSS 928 is deleted in its entirety and replaced with the following:

928.07.09.01 Concrete Removal for Each Structural Component and Complete Deck

A Certificate of Conformance shall be submitted by the Contractor upon completion of the designated concrete removal for each structural component and complete deck. The certificate shall be sealed, signed, and dated by the Quality Verification Engineer. The certificate shall state that the Work has been carried out in general conformance with the Working Drawings and the Contract Documents.

928.07.09.02 Debris Platforms

Certificates of Conformance shall be submitted for all debris platforms and collections systems for which Working Drawings are submitted.

A complete Certificate of Conformance shall be submitted to the Contract Administrator upon the installation of the debris platforms and collection systems. The Quality Verifications Engineer's seal and signature shall be affixed on the completed Certificate of Conformance confirming that the installation of the debris platforms and collection system has been installed in general conformance with the Working Drawings and Contract Documents.

928.10 BASIS OF PAYMENT

Subsection 928.10.02 of OPSS 928 is amended by the addition of the following:

No additional payment shall be made for interim removal and subsequent re-installation of the debris platforms and collection systems to accommodate construction sequences.

CSP FOR INTEGRAL ABUTMENT - Item No. 152

Special Provision

1.0 SCOPE

This specification covers the requirements for the installation of the corrugated steel pipes (CSPs) at the integral abutments.

All as shown on the Contract drawings and/or as directed by the Contract Administrator on site.

2.0 REFERENCES – Not Used

3.0 DEFINITIONS – Not Used

4.0 DESIGN AND SUBMISSION REQUIREMENTS

All submissions shall bear the seal and signature of an Engineer.

At least two weeks prior to commencement of installation of the abutment piles, the Contractor shall submit to the Contract Administrator, for information purposes only, three (3) sets of the working drawings.

The Contractor shall have a copy of the submitted working drawings on site at all times. Working drawings shall include at least the following:

1. Layout and elevations of the CSPs;
2. Location of reference points, and location of the centroid of each pile with respect to the reference points;
3. Construction sequence and details;
4. Source of the sand fill, and description of placing methods and equipment;

5. Location and details of all temporary bracing and spacers for the piles and CSPs;
6. Method for preventing water and debris from entering the CSP prior to placing sand; and
7. Method for preventing concrete from abutment pours from entering the CSPs during placement.

The Contractor shall be responsible for the complete detailed design of all temporary bracing, including spacers required to maintain the piles, CSP spacing and abutment stems in their specified positions through all stages of construction until the CSPs have been backfilled. All temporary bracing shall be removed.

5.0 MATERIALS

5.0.1 Corrugated steel pipe

CSP shall be in accordance with OPSS 1801, and shall be from a supplier listed under DSM#4.60.80. The CSP shall be of the diameter and wall thickness specified on the Contract drawings, and shall be galvanized in accordance with CSA G164-M.

CSPs shall be supplied in the lengths and with the end treatments, either square or skew, as specified on the Contract drawings; field cutting and splicing of CSPs will not be permitted. Cut ends shall be neat and free of burrs. The planes defined by the end treatments of each CSP shall be parallel to each other.
Handling and storage of CSPs shall be in accordance with the manufacturer's recommendations. Damaged CSPs shall be rejected. Localized areas of damaged galvanizing on otherwise acceptable CSPs shall be repaired with two coats of zinc-rich paint.

5.0.2 Sand Fill

The sand fill for backfilling the CSP shall meet the gradation requirements of Table 1 below:

Table 1 – Sand Fill Gradation Requirements

MTO Sieve Designation		Percentage Passing
2 mm	#10	100%
600 μm	#30	80% - 100%
425 μm	#40	40% - 80%
250 μm	#60	5% - 25%
150 μm	#100	0% - 6%

6.0 EQUIPMENT – Not Used

7.0 CONSTRUCTION

The sequence of construction shall be in accordance with the working drawings and as follows, unless otherwise approved:

1. Construct levelling pad and place CSPs and spacers.
2. Install piles by driving to design criteria.
3. Place loose sand into 600 diameter CSP.
4. Remove temporary spacers.
5. Place 19mm plywood on top of filled CSP pipes to separate top of CSPs from the abutment wet concrete prior to concrete pouring. Plywood shall be cut to fit steel piles.

The CSP shall be positioned such that the piles are centrally positioned within the CSP. Temporary blocking and bracing shall be used to hold the CSP in position.

The Contractor shall ensure the full perimeters of the tops of all CSPs at each abutment are at the elevation and orientation shown on the working drawings.

The CSP at each pile shall be constructed to the following tolerances:

Criteria	**Tolerance**
Maximum deviation of CSP from pile centroid	+/- 50 mm
Maximum deviation of any point on the top perimeter of the CSP from the specified elevation	+/- 10 mm

The sand fill shall be placed dry of optimum and free-flowing, completely filling the volume between the CSP and pile. No additional compaction effort other than the action of placing the sand itself shall be applied to the sand fill.

The placing of the sand fill shall be carried out in a manner such as to not damage and displace the CSP.

8.0 QUALITY ASSURANCE – Not Used

9.0 MEASUREMENT FOR PAYMENT – Not Used

10.0 BASIS OF PAYMENT

Payment at the Contract price of the above tender item shall include all necessary labour, material and equipment required to do the work.

H-PILES - HP 310X132 - Item No. 153

Special Provision

Amendment to OPSS 903, April 2016

903.01 SCOPE

Section 903.01 of OPSS 903 is amended by the addition of the following:

Under the above tender items, the Contractor shall supply and install H-Piles and provide 19mm plywood sheet to cover CSP.

All as shown on the Contract Drawings.

VIBRATION MONITORING - Item No. 154

Special Provision

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10.0 BASIS OF PAYMENT

1.0 SCOPE

This special provision describes requirements for vibration monitoring during deep foundation installation for the construction of the CN/CP overhead structures and temporary protection system installation associated with the CN/CP overhead structures, embankment construction for the realignment of the QEW, culvert replacement, extensions and rehabilitation, as required, related to the realignment of the QEW from 1.4 km North of Bowen Road Interchange Southerly to Gilmore Road Interchange.

2.0 REFERENCES

The subsurface conditions at the site are described in the following Foundation Investigation Reports entitled:

Replacement of Twin Structure over CN and CP Rails, Site Nos. 34-129-1 and 34-192-2
QEW from 1.4 km North of Bowen Road Interchange Southerly to Gilmore Road Interchange
Town of Erie, Niagara Region, Ontario
G.W.P. No. 2116-16-00
GEOCRES No.:

High Fill Embankments and Retaining Walls
QEW from 1.4 km North of Bowen Road Interchange Southerly to Gilmore Road Interchange
Town of Erie, Niagara Region, Ontario
G.W.P. No. 2116-16-00

GEOCRES No.:

Culvert Replacement and Extensions and Temporary Protection Systems
QEW from 1.4 km North of Bowen Road Interchange Southerly to Gilmore Road Interchange
Town of Erie, Niagara Region, Ontario
G.W.P. No. 2116-16-00
GEOCRES No.:

3.0 DEFINITIONS

For the purpose of this specification, the following definitions apply:

Contractor's Engineer means an Engineer with a minimum of five (5) years' experience in the field of installation of piling and vibration monitoring or, alternatively, with expertise demonstrated by providing satisfactory quality verification services for a minimum of two (2) projects of similar scope to the Contract. The Contractor's Engineer shall be retained by the Contractor to ensure general conformance with the Contract Documents and issue certificates of conformance.

Peak Particle Velocity (PPV) means the maximum component velocity in millimeters per second that ground particles move as a result of energy released from vibratory construction operations.

Pre-Construction Condition Survey means a detailed record, accompanied by film or video, as necessary, of the condition of private or public property, prior to the commencement of vibratory construction operations.

Post-Construction Condition Survey means a detailed record, accompanied by film or video, as necessary, of the condition of private or public property, after completion of vibratory construction operations.

4.0 DESIGN AND SUBMISSION REQUIREMENTS

4.1 Submission Requirements

The Contractor/Contractor's Engineer shall submit details of the vibration monitoring plan to the Contract Administrator for information purposes at least two (2) weeks prior to any work related to deep foundations (driven piles or caissons) and temporary protection system installation. The submittals shall satisfy the specifications and at a minimum contain the following specific information:

Equipment and methods used by the Contractor to perform the work, that may cause undue vibration.
Qualifications of vibration monitoring specialist.
Details regarding proposed instrumentation.
Proposed location of instruments on the CN Rail tracks and adjacent to the residences, utilities, wells, or other potentially vibration-sensitive structures within a 100 m radius from the overhead structures (deep foundations and protection systems) and other protection system locations, as applicable.
Proposed frequency of readings.
Action plan to be taken to adjust deep foundation and protection system installation methods if readings show vibrations exceeding tolerable levels.

6.0 EQUIPMENT

6.1 Vibration Monitoring Equipment

All vibration monitoring equipment shall be capable of measuring and recording ground vibration PPV up to 200 mm/s in the vertical, transverse, and radial directions. The equipment shall have been calibrated within the last 12 months either by the manufacturer or other qualified agent. Proof of calibration shall be submitted to the Contract Administrator prior to commencement of any monitoring operations.

7.0 CONSTRUCTION

7.1 Pre- and Post-Construction Condition Surveys

A Pre-Construction Condition Survey and Post-Construction Condition Survey shall be prepared for all buildings, utilities, structures, water wells, and facilities within 100 m of each abutment, pier and/or protection system location.

7.1.1 Pre-Construction Condition Surveys

The standard inspection procedure shall include the provision of an explanatory letter to the owner or occupant and owner with a formal request for permission to carry out an inspection.

The Pre-Construction Condition Survey, at each structure/well within a 100 m radius of the overhead structures and/or protection system location, shall be completed a minimum of two (2) weeks prior to commencement of installation of deep foundations and temporary protection systems. Only one Pre-Construction Condition Survey per structure or facility is required to be carried out in advance of deep foundation or temporary protection system installation, unless more than six (6) months will elapse between these operations, in which case an interim inspection will be required.

The Pre-Construction Condition Survey shall include, as a minimum, the following information:

Type of structure, including type of construction and if possible, the date when built.
Identification and description of existing differential settlements, including visible cracks in walls, floors, and ceilings, including a diagram, if applicable, room-by-room. All other apparent structural and cosmetic damage or defects shall also be noted. Defects shall be described, including dimensions, wherever possible.
Digital photographs or digital video or both, as necessary, to record areas of significant concern.

Photographs and videos shall be clear and shall accurately represent the condition of the property. Each photograph or video shall be clearly labelled with the location and date taken.

A copy of the Pre-Construction Construction Survey limited to a single residence or property, including copies of any photographs or videos that may form part of the report, shall be provided to the owner of that residence or property, upon request.

7.1.2 Post-Construction Condition Surveys

The standard inspection procedure shall include the provision of an explanatory letter to the owner or occupant and owner with a formal request for permission to carry out an inspection.

A Post-Construction Condition Survey at each structure within a 100 m radius of the overhead structures and/or protection system location, is required within two (2) months of completion of the installation of deep foundations and temporary protection systems at the CN/CP overhead structures.

The Post-Construction Condition Survey shall include, as a minimum, the following information:

Identification and description of existing differential settlements, including visible cracks in walls, floors, and ceilings, including a diagram, if applicable, room-by-room. All other apparent structural and cosmetic damage or defects shall also be noted. Defects shall be described, including dimensions, wherever possible.
Digital photographs or digital video or both, as necessary, to record areas of significant concern.
Comparison between pre-condition survey documented concerns and post-condition concerns.

Photographs and videos shall be clear and shall accurately represent the condition of the property. Each photograph or video shall be clearly labelled with the location and date taken.

A copy of the Post-Construction Condition Survey limited to a single residence or property, including copies of any photographs or videos that may form part of the report, shall be provided to the owner of that residence or property, upon request. The report shall confirm that there have been no changes to the property between the Pre-Construction Condition Survey and the Post-Construction Condition Survey as a result of the installation of deep foundations and temporary protection systems.

7.2 Monitoring

The vibration monitoring equipment shall be placed on the ground surface in the vicinity of each foundation element or protection system, and on the ground surface at radial distances of 25 m, 50 m, and 100 m from the deep foundation element or protection system locations at the CN/CP overhead structures, and from protection system locations elsewhere on the contract as applicable. The Contractor shall take readings continuously during deep foundation installation and during installation of temporary protection systems, and shall immediately notify the Contract Administrator if the vibrations exceed the limits specified herein.

The vibrations measured shall not exceed the following peak particle velocities (as applicable):
Rail tracks – 25 mm/s
Private structures, wells, etc. – 25 mm/s
Utilities – 10 mm/s
Existing bridge(s) – 100 mm/s

If the readings are not within the limits stated above, the Contractor must alter the installation procedures until the vibrations at the various locations are within acceptable levels.

7.3 Records

The Contractor/Contractor's Engineer shall submit details of the vibration monitoring to the Contract Administrator as follows:

The time/duration of each reading.
Construction operations (i.e. installation of sheet piling) and timing of such relative to the readings.
Details of exceedances and modifications to operations.
Final report containing all relevant data including vibration monitoring and Pre- and Post-Construction Condition Surveys.

10.0 BASIS OF PAYMENT

Payment at the Contract price for the above tender item shall be full compensation for all labour, Equipment and Material required to do the work.

EARTH EXCAVATION FOR STRUCTURE - Item No. 156, 171

Special Provision

Amendment to OPSS PROV 902

902.01 SCOPE

Section 902.01 of OPSS 902 is amended by the addition of the following:

The work of the above tender item(s) shall include the restoration of the earth slope in front of culvert and retaining walls with native fill and top seeding the restored embankment. Also included as part of the work under these items, the Contractor shall excavate and restore the existing rock protection at the culvert ends.

All of the above shall be as shown on the Contract Drawings.

CONCRETE IN CULVERTS - Item No. 158, 173

Special Provision

Amendment to OPSS PROV 904

904.01 SCOPE

Section 904.01 of OPSS PROV.904 is amended by the addition of the following:

The work of the above tender item(s) shall construct the top slabs, walls, haunches, refacing and headwalls at the ends of the culverts.

Also as part of the work, the Contractor shall supply and install the steel reinforcement for the rehabilitation/reconstruction works.

All of the above shall be as shown on the Contract Drawings and/or as directed by the Contract Administrator on site.

CONCRETE REMOVAL - PARTIAL DEPTH - TYPE B - Item No. 161, 176

Special Provision

Amendment to OPSS PROV 928

928.01 SCOPE

Section 928.01 of OPSS PROV.928 is amended by the addition of the following:

The work of the above tender item(s) shall include the removal of delaminated and deteriorated concrete on culvert soffit.

All of the above shall be as shown on the Contract Drawings and/or as directed by the Contract Administrator on site.

CONCRETE REMOVAL - PARTIAL DEPTH - TYPE C - Item No. 162, 177

Special Provision

Amendment to OPSS PROV 928

928.01 SCOPE

Section 928.01 of OPSS PROV.928 is amended by the addition of the following:

The work of the above tender item(s) shall include the removal of delaminated and deteriorated concrete from vertical surfaces of culvert walls, haunches between top slab and walls and retaining walls.

All of the above shall be as shown on the Contract Drawings and/or as directed by the Contract Administrator on site.

CONCRETE REMOVAL - FULL DEPTH - Item No. 163, 178

Special Provision

Amendment to OPSS PROV 928

928.01 SCOPE

Section 928.01 of OPSS PROV.928 is amended by the addition of the following:

The work of the above tender item(s) shall include the removal of the following:

a). Culvert top slab, walls, and headwalls at ends; and
b). Portion of retaining walls.

All of the above shall be as shown on the Contract Drawings and/or as directed by the Contract Administrator on site.

CRACK INJECTION - Item No. 167, 182

Special Provision

Amendment to OPSS 932

932.01 SCOPE

Section 932.01 of OPSS 932 is amended by the addition of the following:

The work of the above tender item(s) shall include the injection with epoxy resin to leaking and dry cracks equal and wider than 0.3 mm in any concrete surfaces.

All of the above shall be as shown on the Contract Drawings and/or as directed by the Contract Administrator on site.

DOWELS INTO CONCRETE - Item No. 168, 183

Special Provision No. 999F29 March 2018

REQUIREMENTS FOR INSTALLATION OF METALLIC DOWELS INTO CONCRETE

1.0 SCOPE

This Special Provision covers the performance requirements for the installation of metallic dowels in concrete.

2.0 REFERENCES

This Special Provision refers to the following standards, specifications or publications:

Ontario Provincial Standard Specifications, Construction

OPSS 905 Steel Reinforcement for Concrete

Ontario Provincial Standard Specifications, Materials

OPSS 1440 Steel Reinforcement for Concrete

Ontario Ministry of Transportation Publications

Pull Test Guide for Testing of Metallic Dowels, of Uncoated, Coated or Stainless Steel

Designated Sources for Materials (DSM) Manual

3.0 DEFINITIONS

For the purpose of this Special Provision the following definitions apply:

Dowel Adhesive means an adhesive used to secure the dowel in concrete.

Dowel means deformed reinforcing steel bar, or stainless steel reinforcing bar, placed into a hole of specified dimensions drilled into a concrete structure and bonded to the concrete by dowel adhesive.

Dowel Type means a dowel differentiated by bar size, orientation of embedment (horizontal, vertical or other), and embedment length.

Pull Test means a test consisting of the application of a specified tensile axial load for a specified time period to installed dowels selected for testing.

4.0 DESIGN AND SUBMISSION REQUIREMENTS

Submission requirements for the certification of the manufacturer of metallic dowels shall be according to OPSS 905.

5.0 MATERIALS

5.01 Dowels

Dowels specified in the Contract Documents shall be according to OPSS 1440.

Dowels shall be new, clean, and free of deleterious material.

5.02 Dowel Adhesive

Dowel adhesive shall be a material listed in the MTO Designated Source for Materials suitable for the application.

6.0 EQUIPMENT - Not Used

7.0 CONSTRUCTION

7.01 Dowels in Concrete

Dowel holes shall be drilled to the required dimensions and depth as specified in the Contract Documents. Core drilling of the dowel holes shall not be permitted.

Holes that are started but not completed shall be cleaned and filled with a proprietary patching material from the Owner's pre-qualified products list.

The installation and removal operations shall not cause spalling, cracking, or other damage to the surrounding concrete. Any damage shall be repaired in a manner acceptable to the Contract Administrator.

Steel reinforcement and other existing embedments shall not be cut or damaged by the drilling process. Existing steel reinforcement, utility ducts, post tensioning hardware, and any unsound concrete in the vicinity

of the dowel locations shall be located prior to the drilling of any holes. If any of the above is encountered during drilling operations, the Contract Administrator shall be notified immediately.

Prior to dowel installation, drill holes shall be thoroughly cleaned with compressed air. Dowels shall be positioned as specified in the Contract Documents. The dowel adhesive shall be placed according to the manufacturer's recommendations and shall completely fill the drill hole once the dowel is installed. All excess adhesive shall be struck-off flush with the concrete surface and removed from the surrounding concrete surface area.

Dowels shall be maintained in the proper position and protected from being disturbed during the setting of the dowel adhesive and loss of dowel adhesive from the holes shall be prevented.

The Contract Administrator shall be notified in writing when a lot, as defined in the Lot Size clause, or the proof of process installation, is ready for testing. Five Business Days shall be allowed for the Contract Administrator to carry out the testing.

Access to the dowels for testing shall be provided to the Contract Administrator. The Contractor shall not install formwork or attach anything to the dowels (such as steel reinforcement or utility ducts) until the pull tests have been completed and the dowel lots are accepted into the work.

7.02 Inspection for Dowel Installation

A Request to Proceed shall be submitted to the Contract Administrator after the installation of all metallic dowels in a stage and prior to placement of concrete.

The next operation shall not proceed until the Contract Administrator has issued to the Contractor a Notice to Proceed.

8.0 QUALITY ASSURANCE

8.01 General

Installed dowels shall be accepted based on conformance to the visual acceptance criteria and pull testing criteria.

Dowels tested in-situ will be accepted on a lot basis.

All dowels, with the exception of dowels installed in the following applications, shall be subjected to in-situ pull testing for acceptance purposes:

a) Concrete box culvert extensions;

b) Re-facing of all structural elements (e.g. abutments, columns, wing walls) less than 2 m in height;

c) Widening of footings;

d) Concrete patches;

e) Concrete pavement repairs; and

f) Slip-formed barrier walls.

When the Contract Administrator determines that in-situ pull testing is not possible due to insufficient clearance for proper positioning of the testing device or dowels too short to fit the testing device grips, a proof of process installation and pull testing shall be carried out in lieu of in-situ pull testing. The purpose of proof of process installation and pull testing is to demonstrate to the Contract Administrator that the dowel installation material and methods used in the work are capable of meeting the pull test requirements of the Contract Documents. The proof of process installation shall be installed at another location in the work subject to the approval of the Contract Administrator. The proof of process installation shall be carried out using the same personnel, equipment, materials and methods intended for use in the work, and shall be in the same orientation (vertical or horizontal) required for the work.

8.02 Visual Acceptance Criteria

Completed dowel installations shall be properly positioned as specified elsewhere in the Contract Documents and free of damage to the dowel or dowel coating. Excess dowel adhesive shall have been struck off flush with the concrete surface and removed from the surrounding area.

8.03 Pull Testing Criteria

8.03.01 General

Pull testing shall be carried out by the Contract Administrator according to the Pull Test Guide for Testing of Metallic Dowels, of Uncoated, Coated or Stainless Steel available from Materials Engineering and Research Office, Concrete Section.

The Contractor may be present during the testing procedure. When requested by the Contractor, the Contract Administrator shall provide documentation of equipment calibration.

An individual dowel shall not be subjected to more than one pull test.

Any spalling, cracking, or other damage to the surrounding concrete caused by the Contractor's installation or removal of dowels shall be repaired at no additional cost to the Owner and in a manner acceptable to the Contract Administrator.

8.03.02 Dowel Load Duration Time

8.03.02.01 Dowels Embedded Less than or Equal to 200 mm

Dowels with embedment depth less than or equal to 200 mm, shall be considered acceptable when they can hold the load specified in Table 1 without any change in the load for 15 seconds.

8.03.02.02 Dowels Embedded Greater Than 200 mm

Dowels with embedment depth greater than 200 mm shall be considered acceptable when they can hold the load specified in Table 1 without any change in the load for 15 seconds.

8.03.03 Lot Size - In-Situ Testing Only

A lot shall consist of no more than 200 dowels of the same type in a single stage. Where a single stage is less than 200 dowels of the same type the lot shall be the single stage.

8.03.04 In-Situ Pull Test Requirements

The Contract Administrator shall randomly select 10 dowels in each lot for testing.

Any damage to the dowel coating shall be repaired in a manner acceptable to the Contract Administrator.

If 2 or more dowels fail, the Contract Administrator shall conduct additional pull testing on 20 dowels in the lot. If 2 or more dowels fail, the lot shall be deemed unacceptable and the lot shall be removed and replaced at no additional cost to the Owner.

Replacement dowels shall be accepted by pull testing, proof of process installation, or other means, as directed by the Contract Administrator.

Additional pull testing shall be as detailed elsewhere in this Special Provision at no additional cost to the Owner.

All testing shall be completed before concrete is placed.

8.03.04.01 Replacement of Failed Dowels

Any installed dowels that fail the pull test shall be removed and replaced by the Contractor at no additional cost to the Owner. In lieu of removal, dowels can be cut off flush with the concrete surface.

The Contractor shall install the new dowel in a location approved by the Contract Administrator.

8.03.05 Proof of Process Installation

Where proof of process installation is carried out, the Contract Administrator shall select the location for proof of process installation in another area of the same structural element, or in another comparable structural element.

Dowels shall not be installed into the work until the Contract Administrator has accepted the proof of process installation procedure.

An approved proof of process installation procedure for dowel types shall be valid for the Contract for 120 days from the date of acceptance. After 120 days, proof of process installation shall be repeated using the same labour, materials, dowel type, and process to re-qualify the proof of process installation procedure.

The Contract Administrator may at any time require re-qualification of the proof of process installation procedure. When re-qualification process is required, and it has been deemed acceptable by the Contract Administrator, it shall be valid for 120 days from the date of re-qualification.

The number of dowels required for each proof of process installation shall be 5 dowels for each dowel type to be installed in the work.

Straight bars may be installed for proof of process installation.

If any dowel fails, the proof of process installation shall be considered unacceptable. The Contractor shall not be permitted to install any of the dowel types in the work until a successful proof of process installation procedure for the dowel type has been completed and accepted by the Contract Administrator.

Any installed dowels used for proof of process installation that fail the pull test shall be removed by the Contractor at no additional cost to the Owner. If directed by the Contract Administrator, remaining dowels shall be removed by the Contractor at no additional cost to the Owner. Cutting off dowels flush with the concrete surface is permitted.

Upon the successful completion of a proof of process installation procedure, the Contractor shall be permitted to install dowel types at locations specified elsewhere in the Contract Documents using the accepted installation procedure.

If the Contractor changes the accepted procedure for any dowel type from that used for the proof of process installation, the Contractor shall repeat the proof of process installation according to the changed procedures prior to incorporating any dowel types into the work.

9.0 MEASUREMENT FOR PAYMENT

For measurement purposes, a count shall be made of the number of dowels installed.

10.0 BASIS OF PAYMENT

10.01 Dowels Into Concrete - Item

Payment at the Contract price for the above tender item shall be full compensation for all labour, Equipment, and Material to do the work, except that payment for the reinforcing steel bars or stainless steel reinforcing bars used as the dowels shall be according to OPSS 905.

No payment shall be made for dowels that fail the pull test.

The cost of additional pull testing shall be at no additional cost to the Owner and shall be a lump sum of $1,000 per mobilization to the contract with an additional cost of $50 per dowel.

TABLE 1
Pull Test Loads

Dowel Size	Test Loads kN	
	Embedment Depth Less Than or Equal to 200 mm	Embedment Depth Greater Than 200 mm
10M	20	35
15M	40	70
20M	60	110
25M	100	180
30M	140	250
35M	190	340

CULVERT WATERPROOFING - Item No. 169, 184

Special Provision

1.0 SCOPE

This special provision covers the requirements for the surface preparation and installation of waterproofing. The waterproofing systems are separated into two distinct systems:

a) Type 1 for the exposed concrete culvert waterproofing system; and
b) Type 2 for the buried culvert waterproofing system

Type 1 waterproofing system is required to protect the exposed concrete areas and extend onto a portion of the buried surfaces. Waterproofing shall be applied to the limits shown on the Contract Drawings on the top slab (horizontal) with a minimum 300 mm down the walls (vertical) from the top of the culvert for the following culverts:

- Frenchman's Creek Culvert at QEW Ramp W-W & Ramp E-E/W, Site No. 34-454/C
- Frenchman's Creek Culvert at QEW, Site No. 34-455/C

The horizontal surface shall have an abrasive traffic layer (Heavy Duty). A smooth surface shall be used on the walls and on the 600 mm joint where it is overlain by the Type 2 waterproofing system.

Type 2 waterproofing system is required to protect the buried concrete areas and shall be applied to the limits shown on the Contract Drawings on the top slab (horizontal) with a minimum 300 mm down the walls (vertical) from the top of the culvert for the following culverts:

- Frenchman's Creek Culvert at QEW Ramp W-W & Ramp E-E/W, Site No. 34-454/C
- Frenchman's Creek Culvert at QEW, Site No. 34-455/C

2.0 REFERENCES

This Special Provision refers to the following standards, specifications, or publications:

Ontario Provincial Standards Specification, Construction

OPSS 929 Abrasive Blast Cleaning – Concrete Construction

3.0 DEFINITIONS - Not Used

4.0 DESIGN AND SUBMISSION REQUIREMENTS - Not Used

5.0 MATERIALS

5.01 Type 1 Waterproofing

The Type 1 waterproofing systems to be placed on the exposed concrete surfaces shall be selected from the systems listed below or be an approved equal. The colour of the system shall a light grey matching the concrete culvert.

a) Vulkem 350/351 Pedestrian Deck Coating System

Manufactured by:
Tremco Commercial Sealants and Waterproofing,
220 Wicksteed Avenue,
Toronto, Ontario
M4H 1G7
Telephone: (416) 421-3300 or (800) 363-3213

b) Sikalastic Resoflex System

Manufactured by:
Sika Canada Inc.,
6915 Davand Drive,
Mississauga, Ontario,
L5T 1L5
Telephone: (905) 795-3177 or (800) 933-7452

5.01.01 Joint Sealants

Joints in the sides and top of the culvert that will be exposed to air (will not have backfill material placed against them) shall be sealed prior to Type 1 waterproofing application. Joint seals exposed to air as detailed in the Contract Documents shall be installed using one of the following three modulus silicone joint sealants:

a) Dow Corning 888 Silicone Joint Sealant by Dow Corning
b) Crafco Roadsavers Silicone by Crafco Inc.
c) Spectrem 800 Low Modulus Silicone Highway and Parking Structure Sealant by Tremco

The application of the low modulus silicone joint sealants, including substrate (existing concrete surface) preparation, backer rod material/size/installation, masking of joints, depth and width of sealant for given gap dimension, installation of sealant and tooling/recessing of sealant in complete joint as required to provide protection to the sealant and the presentation of workmanlike appearance, shall be in accordance with the sealant manufacturer's recommendations.

5.02 Type 2 Waterproofing

The Type 2 waterproofing system, including the joint sealants for the buried concrete surfaces, shall be selected from the systems listed below:

Table 1 – Waterproofing Treatment Systems for Joints Where Backfill Will Be Placed

Manufacturer	**Joint Sealant**	**Self-Adhesive Waterproofing Membrane**	**Waterproofing Membrane Protection System**
WR Meadows	Pointing mastic	MEL-ROL with MEL-PRIME primer	PROTECTION COURSE (PC-3 Heavy Duty)
BAKOR	570-05	Blueskin WP200 with Blueskin	Recover Board (6mm

	POLYBITUME®	Primer	thickness)
Grace Construction Products	Bituthene Liquid Membrane	Bituthene System 4000 with Bituthene System 4000 surface Conditioner	25mm expanded polystyrene

The joint sealant, self-adhesive waterproofing membrane, and waterproofing membrane protection system products used shall all be obtained from a single manufacturer as indicated in Table 1 and be compatible with each other.

Application of joint sealant (including backer rod material/ size/installation, and depth and width of sealant for given gap dimension) shall be according with the sealant manufacturer's specifications.

Waterproofing membrane protection materials shall be a minimum 6 mm thick and shall be secured to the culvert as per the manufacturer's specifications.

6.0 EQUIPMENT - Not Used

7.0 CONSTRUCTION

The Contractor shall field verify all dimensions. The Contractor shall coordinate installation of the system with all other construction operations. The waterproofing system shall be installed on the top surface of the culverts and a minimum 300 mm down each side of the culverts, and additionally as shown on the Contract Drawings. The areas requiring waterproofing shall be prepared and the waterproofing installed in accordance with the manufacturer's instructions.

The exterior face of the box culvert units to receive any of the waterproofing joint treatments noted above shall be abrasive blast cleaned to remove all contaminants and laitance in accordance with OPSS 929. Any spent abrasive, dust and debris shall be removed from the joint gap and surrounding concrete surfaces using compressed air prior to applying any sealant or waterproofing treatments.

The concrete in the culverts shall be cured a minimum of 14 Days prior to waterproofing.

The surface of the concrete shall be dry at the time of waterproofing. Work shall not be scheduled following recent rainfalls.

The application limits for the Type 1 system shall be masked.

A non-slip surface shall be provided for the horizontal portions of the Type 1 system. Silica sand shall be broadcast immediately into the wet topcoat and backrolled to distribute the aggregate.

A lap joint shall be constructed at the junction between the Type 1 and Type 2 systems, as shown on the plans. The Type 1 system shall be allowed to cure a minimum of 48 hours prior to application of the Type 2 overlap.

7.01 Management of Excess Materials

Management of excess materials shall be according to the Contract Documents.

8.0 QUALITY ASSURANCE - Not Used

9.0 MEASUREMENT FOR PAYMENT

9.01 Plan Quantity Measurement

Measurement of culvert waterproofing shall be by Plan Quantity of the waterproofed area with no deductions for overlaps. The unit of measure is square metres.

10.0 BASIS OF PAYMENT

10.01 Culvert Waterproofing - Item

Payment at the Contract price for the above tender item shall be full compensation for all labour, Equipment and Material to do the work.

SCHEDULE OF MATERIALS TO BE SUPPLIED BY THE OWNER

Pursuant to Subsection GC 5.01, Supply of Material, this Special Provision lists all the Materials to be supplied by the Owner:

(A) The Owner supplies the following Materials F.O.B. haulage vehicles at a point within the Working Area. Deliveries to the Working Area shall be as requested by the Contractor but subject to the approval of the Contract Administrator:

Nil

The Contractor shall complete Owner's Standard Form PH-CC-765 "Contract Material Delivery Schedule", detailing the Contractor's required delivery date for each item of Material to be supplied by the Owner.

The form shall be completed in triplicate and returned to the Team Lead, Contract Tendering Section within the time limit specified by the Owner in a letter to the Contractor.

At any time following the required delivery date which the Contractor enters in Form PH-CC-765 for each item of Material, the Contractor shall either accept delivery of that Material when required by the supplier or shall make alternative arrangements satisfactory to the supplier which do not result in any additional cost to the Owner.

(B) The Owner supplies the following Materials as indicated below:

Material	Quantity	Supply Point
Build-On Signs	6 each	MTO Provincial Sign Shop - 1927 Kipling Avenue, Rexdale, ON M9W 4J4
Controller Cabinet, Type 401D	1 each	1200 South Service Road, Winona, ON
Static Sign 1200x3000 "WATCH FOR SLOW TRAFFIC"	1 each	MTO Provincial Sign Shop - 1927 Kipling Avenue, Rexdale, ON M9W 4J4
Padlocks for Base Mounted Pedestal	1 each	1200 South Service Road, Winona, ON
Small Signs	53 each	MTO Provincial Sign Shop - 1927 Kipling Avenue, Rexdale, ON M9W 4J4

This Special Provision shall take precedence over all other Special Provisions with respect to the supply of the above materials.

THE CONTRACTOR SHALL SUPPLY **ALL** OTHER MATERIALS FOR THIS CONTRACT.

SECTION B
FAIR WAGE PROGRAM

Labour Conditions for Road Building Contracts
(Classifications and wage rates listed in attached schedules)

DEFINITIONS

1. In these Labour conditions,

(1) "Contract" means a Contract between _____(Owner) Ministry/Crown Corporation/agent

and the Contractor for the Work at _____(location).

(2) "Contractor" refers to

_____
(name of business)

_____
(business address)

_____
(business phone no./fax no.)

(3) "Employee" means a person in the employ of the Contractor a Sub-Contractor or any other person doing or contracting to do the whole or any part of the Work contemplated by this Contract.

(4) "Employer" means the Contractor, and/or any of the Contractor's Sub-Contractors, who has control or direction of, or is directly or indirectly responsible for, the employment of a person therein.

(5) "Fair Wage" or "Fair Wage Rates" means the respective wage rates listed in the attached Schedule(s), or any revisions from time to time, for each classification of labour.

(6) "Owner" refers to the ministry, crown corporation or agent named in subsection (1) as one of the contracting parties of the Contract.

(7) "Provincial Zone" means a geographic area in the Province of Ontario which is designated by the Ontario Ministry of Labour from time to time as non-urban, for the purpose of establishing the Fair Wage Rates.

(8) "Regular rate" means

(a) the hourly rate paid to an Employee for her/his normal non-overtime work week; or

(b) in the case of an Employee to whom clause (a) does not apply, the amount obtained by dividing her/his total earnings for the week by the number of hours he or she worked in the week;

(9) "Sub-Contractor" means any person, firm or corporation having a Contract for the execution of a part or parts of the Work included in the Contract, or a person, firm or corporation furnishing material called for in the Contract and worked to a special design according to the Contract but does not include one who merely furnishes material not so worked.

(10) "Urban Zone" means a geographic area in the Province of Ontario which is designated by the Ontario Ministry of Labour from time to time as urban, for the purpose of establishing the Fair Wage Rates.

(11) "Work on roads" means the preparation, construction, finishing and construction maintenance of roads, streets, highways and parking lots and includes all work incidental thereto other than work on structures.

"Work on structures' means the construction, reconstruction, repair, alteration, remodelling, renovation or demolition of any bridge, tunnel or retaining wall and includes the preparation for and the laying of the foundation of any bridge, tunnel or retaining wall and installation of equipment and appurtenances incidental thereto.

The Ontario Minister of Labour may at his or her sole discretion determine whether any particular work is to be classified as work on roads or as work on structures and such decision may be made notwithstanding the definitions in subsection (11).

GENERAL

2. (1) These Labour Conditions are subject to the Employment Standards Act and the regulations made thereunder.

(2) These Labour Conditions are intended for application primarily to work on the Contract site. Work that is carried out at sites that are not in the immediate vicinity of the Contract site or that are not used exclusively for the purposes of Contracts including municipal contracts containing similar Labour Conditions will not be subject to these Labour Conditions.

HOURS OF WORK -- GENERAL

3. (1) Subject to section 4, the regular work week for a person employed on work on roads being done under this Contract or any other Contract subject to these or similar Labour Conditions shall not exceed fifty-five hours and all time worked by such person in excess of fifty-five hours a week shall be overtime.

(2) Subject to section 4, the regular work week for a person employed on work on structures being done under this Contract or any other Contract subject to these or similar Labour Conditions shall not exceed forty-four hours and all time worked by such person in excess of forty-four hours a week shall be overtime.

HOURS OF WORK -- PROVINCIAL ZONE

4. (1) The regular work week for a person employed on work on roads being done in the provincial zone under this Contract or any other Contract subject to these or similar Labour Conditions shall not exceed fifty-five hours and all time worked by such person in excess of fifty-five hours a week shall be overtime, except that part of the hours of work in excess of fifty-five hours a week which, together with the hours worked in the preceding week, do not exceed fifty-five hours in that preceding week, but in no case shall the number of hours that can be included in the hours of work for that preceding week exceed twenty-two hours.

(2) The regular work week for a person employed on work on structures being done in the provincial zone under this Contract or any other Contract subject to these or similar Labour Conditions shall not exceed fifty hours and all time worked by such person in excess of fifty hours a week shall be overtime, except that part of the hours of work in excess of fifty hours a week which, together with the hours worked in the preceding week, do not exceed fifty hours in that preceding week, but in no case shall the number of hours that can be included in the hours of work for that preceding week exceed twenty-two hours.

WAGES AND OVERTIME PAY

5. (1) Every person employed by the Contractor or a Sub-Contractor or other person to do any part of the work contemplated by this Contract shall be paid while employed on such work not less than the wage rate set out in the Roads and Structures Fair Wage Schedule for the appropriate classification of such work or not less than such other wage rates as, during the continuance of the work, are fixed by the Ontario Minister of Labour for hours of work that are not overtime.

(2) The Fair Wage rates apply to work performed under a Contract let by a ministry of the Ontario government, a corporation established under the Capital Investment Planning Act, 1993, a third party acting on behalf of the Ontario government as its agent, or a municipality receiving funding from the Ontario government for work performed in this Contract.

(3) The wage rates set out in the Roads and Structures Fair Wage Schedule are subject to change periodically.

(4) Any increase in costs incurred by a change in the wage rates referred to in subsection (3) shall be borne by the Contractor.

6. (1) For Urban Zones only, Fair Wage Rates represent 85% of the union rate established in the specific zone for the respective classification, as determined by the Ontario Ministry of Labour from time to time, plus 15% in lieu of non-statutory benefits.

(2) In Urban Zones, employers may pay a portion of the Fair Wage Rates, up to a maximum of 15% of the applicable Fair Wage Rate, to their Employees in non-statutory benefits, and the remainder of not less than 85% of the Fair Wage Rate shall be paid to these Employees in wages.

(3) In the Provincial Zone, employers shall pay their Employees the full amount (100%) of the Fair Wage Rates in wages, exclusive of non-statutory benefits.

(4) In the event that an Employer is performing Work in an Urban Zone and it chooses to pay a portion of the Fair Wage Rates to its Employees in non-statutory benefits, the Contractor must inform the Owner, prior to commencing the Contract or the relevant sub-contract, as to the total cost of such non-statutory benefits to the Contractor, and/or its Sub-Contractor where a Sub-Contractor has elected to provide these non-statutory benefits. The cost of any non-statutory benefit paid to Employees shall be calculated in accordance with subsection (6).

(5) Upon informing the Owner as to its selection in accordance with subsection (2), the Contractor shall provide documentation to the Owner, prior to commencing the Contract or relevant sub-Contract, to sufficiently substantiate, in the Owner's opinion, the total cost of the all non-statutory benefits to the Contractor and/or respective Sub-Contractor.

(6) The cost to the Contractor, and/or a Sub-Contractor, of any non-statutory benefit shall be calculated on the basis of the total weekly cost to the Contractor/Sub-Contractor of each non-statutory benefit provided to Employees divided by forty-eight (48). The total cost of all non-statutory benefits equals the sum of the costs of each non-statutory benefit provided to Employees.

(7) Where the documentation is not provided to the Owner in accordance with subsections (5) and (6), the Contractor and/or relevant Sub-Contractor is responsible for paying its Employees the full amount (100%) of the Fair Wage Rates in wages, exclusive of non-statutory benefits.

(8) Notwithstanding subsection (7), where the Contractor fails to inform and/or provide such documentary proof to the Owner as required by subsections (4) (5) and (6) and the Contractor or any of its Sub-Contractors proceeds to pay a portion, up to a maximum of 15%, of the Fair Wage Rates in non-statutory benefits, the Owner may withhold payments under the Contract until such time as the Owner is satisfied that the Employees have received their Fair Wages.

(9) Once an Employer has made its selection pursuant to subsection (2), it shall continue to pay its Employees in accordance with its initial selection for the entire duration of the Contract and/or relevant sub-contract.

7. (1) Every person employed by the Contractor or a Sub-Contractor or other person to do any part of the work contemplated by this Contract shall be paid while employed on such work one and one-half times his or her regular rate for all hours of work that are overtime.

(2) Notwithstanding that a Contractor, Sub-Contractor, or other person pays wages in excess of the wage rates set out in the Roads and Structures Fair Wage Schedule, the Contractor, Sub-Contractor or other person shall not, in computing overtime wages payable to an Employee, set off against such overtime wages any part of the wages earned by the Employee in respect of their regular work period.

(3) Where a person is working on more than one Contract that is subject to these conditions, including any municipal Contract that contains similar labour conditions, the regular work week and the entitlement to overtime for that person shall be based upon the total hours worked on all such Contracts and if, on this basis, overtime is worked on this Contract the Contractor shall pay such person at the overtime rate and no waiver by that person of this entitlement to overtime wages and no interposition of a third party by way of an employment agency or as the nominal employer of that person shall relieve the Contractor of the obligation to pay that person the overtime wages.

8. Travelling time will not be subject to the Fair Wage Schedule. The hours and wages or moneys paid for travelling time are to be deleted from the wage record of an Employee in computing his or her wage entitlement.

9. The amount of room and board allowance will be negotiated between the employer and Employee, but in no case shall the amount of wages paid to an Employee net of the allowance be less than the amount the Employee would be entitled to receive if he or she was paid the minimum wage set out in the regulations under the Employment Standards Act less the amount of room and board allowance prescribed in those regulations.

CLASSIFICATION OF WAGE RATES

10. For the purpose of this Contract, the following interpretations apply:

(1) (a) Employees, other than students, learning to operate equipment are classified as "apprentice equipment operators" during their first three months operating equipment which does not require a licensed operator or during their first eighteen months operating equipment which requires a licensed operator.

(b) The wages for apprentice equipment operators are as follows:
(i) Windsor Zone - wage rate for Cement Improver;
(ii) Hamilton Zone - wage rate for Asphalt Raker;
(iii) Toronto Zone - wage rate for Asphalt Raker;
(iv) Ottawa Zone - wage rate for Skilled Labourer;
(v) Provincial Zone - wage rate for Skilled Labourer.

(2) Employees other than an operator are to be classified as "Pile Driver Operators" and shall be entitled to the wage rate for "Labourer - Structure Section".

(3) Employees engaged as Gravel and Chip Spreaders shall be paid the wage rate of Equipment and Maintenance Operator, Group "B".

(4) The attachment for a farm or industrial tractor must be power operated and be an integral part of the tractor.

(5) (a) Students employed as flagpersons or watchpersons shall be entitled to the wage rate for those classifications.

(b) Students performing work in positions that are classified in the Fair Wage Schedule, other than flagpersons or watchpersons, shall be entitled to receive the student rate, notwithstanding the rate set out in Schedule for the classification applicable to the work.

(c) Students employed for more than three months in a classified position shall then be entitled to the wage rate for that classification.

(d) Students performing work in positions that are not classified in the Fair Wage Schedule shall be entitled to receive the student rate, regardless of the location of the Contract.

DISCRETION OF THE MINISTER OF LABOUR

11. (1) The Ontario Minister of Labour may decide that special circumstances exist which make it expedient for him/her to decide:

(a) what the current or fair and reasonable wage rates for overtime are; and/or

(b) the proper classification of any Work for the purposes of wages and hours.

(2) The Contractor and Sub-Contractor(s), upon receipt of notice of any decision of the Ontario Minister of Labour, shall adjust accordingly the wage rates, hours, classification of Work so as to give effect to such decision.

CONTRACTOR'S OBLIGATIONS

12. The Contractor must comply with the requirements set out in these Labour Conditions.

13. (1) The Contractor shall post and keep posted these Labour Conditions, and the applicable Road and Structure Fair Wage Schedule, and any revisions thereto, in a conspicuous place on the Site.

(2) The Contractor shall ensure that the posted applicable Schedule includes a breakdown of the wages and non-statutory benefits paid to the Employees of the Contractor and each Sub-Contractor electing to pay the Fair Wage Rates in accordance with Section 6(2).

14. (1) The Contractor shall keep proper records showing the names, trades and addresses of all of the Contractor's Employees who perform any part of the work contemplated by this Contract and the wages paid to and time worked by them, as well as the Contractor's costs for all non-statutory benefits where the Contractor chooses to pay its Employees Fair Wages in accordance with Section 6(2).

(2) The records referred to in subsection (1) shall be kept separate from any records concerning Employees of the Contractor who do not perform any part of the work contemplated by this Contract.

(3) The records referred to in subsection (1) shall be kept in the Province of Ontario and made available for inspection by the Owner's Representative upon request, whether or not any Employee has complained that he or she is not being paid in accordance with section 6.

15. The Contractor shall deliver to the Owner's representative an affidavit or declaration attesting to the Contractor's compliance with these labour conditions accompanying the final invoice to be delivered under this Contract.

CONTRACTOR'S OBLIGATION WITH RESPECT TO SUB-CONTRACTORS

16. (1) The Contractor is responsible for ensuring that Sub-Contractors under the Contractor and any other persons doing or contracting to do the whole or any part of the work contemplated by this Contract under the Contractor comply with these Labour Conditions.

(2) The Contractor must provide all Sub-Contractors with a copy of these Labour Conditions and the applicable Schedule before any work is performed by the Sub-Contractor.

17. Without restricting the generality of Section 16(1), if any Sub-Contractor under the Contractor or any other person doing or Contracting to do the whole or any part of the work contemplated by this Contract under the Contractor fails to pay wages to an Employee of the Sub-Contractor or other person in accordance with section 6, the Contractor shall pay directly to the Employee, regardless of whether or not monies are still owed by the Contractor to the Sub-Contractor, the difference between the amount of wages that the Employee was paid by the Sub-Contractor or other person and the amount of wages that he or she would have been paid had the Sub-Contractor or other person paid wages in accordance with section 6.

18. The Contractor shall, in any Contract with a Sub-Contractor or other person doing or contracting to do the whole or any part of the work contemplated by this Contract who employs an Employee, require the sub-Contractor or other person,

    (a) to pay the Employee in accordance with section 6 of these labour conditions;

    (b) to keep proper records showing the names, trades and addresses of all Employees who perform any part of the work contemplated by this Contract and the wages paid to and time worked by them, as well as the Sub-Contractors's costs for all non-statutory benefits where the Sub-Contractor chooses to pay its Employees Fair Wages in accordance with Section 6(2);

    (c) to keep the records referred to in clause (b) separate from any records concerning Employees who do not perform any part of the work contemplated by this Contract;

    (d) to keep the records referred to in clause (b) in the Province of Ontario and to make them available for inspection by the Contractor and/or the Owner's representative upon request, whether or not any Employee has complained that he or she is not being paid in accordance with section 6; and

    (e) in any Contract with any other person doing or Contracting to do the whole or any part of the work contemplated by this Contract who employs an Employee, to require that other person to assume the same obligations in relation to his, her or its Employees as the Contractor is required by this section to require parties with whom the Contractor Contracts to assume in relation to their Employees.

CLAIM PROCEDURE

19. (1) Wage claims with respect to Contracts issued by the Owner should be made directly to the Owner's Representative.

    (2) An Employee employed by the Contractor shall file his/her completed form regarding a Fair Wage complaint with the Owner's Representative at the earliest time but no later than forty-five (45) days following total completion of the Contract, as defined in the Construction Lien Act.

    (3) An Employee employed by a Sub-Contractor shall file his/her completed form regarding a Fair Wage complaint with the Owner's Representative at the earliest time but no later than forty-five (45) days following total completion of the relevant sub-contract, as defined in the Construction Lien Act.

(4) Third parties may assert a Fair Wage complaint on the Owner's prescribed form on behalf of an Employee where it is based on specific information.

20. In addition to, or alternately to Section 19, an Employee may file a lien claim for wages, in respect of a failure to comply with any requirements under Section 6, under the Construction Lien Act. These lien claims must be filed directly with the Owner.

21. Claims made with respect to Contracts issued by municipalities should be made directly to them under the provisions of the Construction Lien Act.

OWNER'S RIGHT TO HOLD BACK

22. (1) If the Owner receives a complaint that an Employee is not being paid in accordance with section 6 or if Owner finds that an Employee is not being paid in accordance with section 6, the Ministry may withhold from any money that it owes to the Contractor an amount equal to the amount that the complainant alleges is owing or that the Owner has found to be owing to the Employee.

(2) Subsection (1) applies even though the Employee is not the Employee of the Contractor.

(3) The Owner is not required to disclose the identity of a complaining Employee unless the Owner finds that the Employee has not been paid by his or her employer in accordance with section 6 and that Employee is the only Employee of the employer who has not been so paid.

(4) An amount withheld under subsection (1) because the Owner received a complaint that an Employee was not being paid in accordance with section 6 will be paid to the Contractor if,

(i) the Owner finds that the Employee was in fact being paid in-accordance with section 6; or

(ii) the Owner finds that although the Employee was not being paid in accordance with section 6, the Employee has subsequently been paid the difference between the amount of wages that he or she had been paid and the amount of wages that he or she would have been paid had he or she been paid in accordance with section 6.

(5) If the Owner has found that an amount is owing to an Employee, and that amount has not been paid within 105 days of the completion of the work to be performed under this Contract, the amount withheld may be forfeited to the Crown at the discretion of the Owner in which case the entitlement of the Contractor under this Contract is reduced by the amount forfeited.

FAIR WAGE SCHEDULE
ROADS AND STRUCTURES CONSTRUCTION, ONTARIO
PROVINCIAL ZONE

ROAD BUILDING SECTION

CLASSIFICATION OF LABOUR	**Fair Wage Rate Per Hour not less than:**
	Effective Date: April 1, 1995
LICENSED OPERATORS	$13.83
LICENSED MECHANICS AND WELDERS, CLASS "A"	12.99
EQUIPMENT AND MAINTENANCE OPERATORS, GROUP "A"	12.85
EQUIPMENT AND MAINTENANCE OPERATORS, GROUP "B"	12.20
SKILLED LABOURERS	11.69
TRUCK DRIVERS - Tow Tractor Operators - Rollermen (Grade)	11.48
LABOURERS	11.19
FLAGPERSON	9.40
WATCHPERSON	9.40
STUDENTS (registered in day school)	9.04

STRUCTURE SECTION

CARPENTERS, FORM BUILDERS	13.83
RODMEN, CONCRETE FINISHERS, PAINTERS	12.69
STRUCTURE LABOUR OPERATIONS	11.34
STRUCTURAL TRAINEES	11.48

CLASSIFICATION DEFINITIONS:

Licensed Operators: Includes Shovel, Clam, Gradall, Backhoe, Dragline, Piledriver Operator.

Equipment and Maintenance Operators, Group A: Includes Mechanic and Welder, Class B, Rollerman - Asphalt, Burnerman, Powerman, Boiler Engineer (with papers). Float Driver (over 25 tons), Concrete Paver (over 1 cu. yd.), Bulldozer (75 Drawbar HP and over), Grader, Class A (Finished Grading), Front End Loader (1-1/2 yds. and over), Scraper, Crusher, Asphalt Spreader Operator.

Equipment and Maintenance Operators, Group B: Includes Boiler Fireman, Mixerman, Float Driver (25 tons and under), Front End Loader (under 1-1/2 yds.) Grader, Class B (Gravel and other Grading), Farm and Industrial Tractor with Power Attachments, Driller (Air Track), Bulldozer (under 75 Drawbar HP) Operator.

Skilled Labourers: Includes Air Tool Operator, Asphalt Raker, Form Setter, Pipe Layer, Screedman.

Structure Labour Operations: Includes Labourers on Structures.

Structural Trainee: Means an Employee who is enrolled in the Ontario Road Builders Association Pilot Training Programme.

SECTION C
LIQUIDATED DAMAGES

Fixed Completion Date and Charges

1. Time

Time shall be of the essence for carrying out and completing the Work.

2. Progress of the Work and Time for Completion

The Contractor shall complete this Contract in its entirety by **26 Nov 2021**.

If the time limit specified above is not sufficient to permit completion of the Work by the Contractor working a normal number of hours each Day or week on a single daylight/night shift basis, it is expected that additional and/or augmented daylight and night shifts will be required throughout the life of the Contract to the extent deemed necessary by the Contractor to ensure that the Work will be completed within the time limit specified. Any additional costs occasioned by compliance with these provisions will be considered to be included in the prices bid for the various items of work and no additional compensation will be allowed therefore.

3. Liquidated Damages

It is agreed by the parties to the Contract that in case all the Work called for under the Contract is not finished or completed within the date of completion specified aforementioned or as extended according to subsection GC3.06, Extension of Contract Time or Interim Completion Dates, of MTO General Conditions of Contract, November 2016, a loss or damage will be sustained by the Owner. Since it is and will be impracticable and extremely difficult to ascertain and determine the actual loss or damage which the Owner will suffer in the event of and by reason of such delay, the parties hereto agree that the Contractor will pay to the Owner the sum of **$2,500.00** as liquidated damages for each and every Day's delay in finishing the Work beyond the date of completion prescribed. It is agreed that this amount is an estimate of the actual loss or damage to the Owner which will accrue during the period in excess of the prescribed date of completion.

The Contractor shall incur interest on Liquidated Damages and pay such interest in accordance with GC 7.19. For greater certainty, the Owner may also retain interest charges from monies owing to the Contractor under GC 8.02.04.11 (Owner's Set-Off).

ASSISTANT DEPUTY MINISTER,
PROVINCIAL HIGHWAYS MANAGEMENT DIVISION
MINISTRY OF TRANSPORTATION, ONTARIO