

SCHEDULE 14

TESTING AND COMMISSIONING

1.1 Applicable Standards

- (a) Project Co shall plan, schedule, coordinate and execute the testing and commissioning of the Works. The testing and commissioning of the Works shall be in accordance with the Project Agreement and the standards set out in this Schedule 14.
- (b) Project Co Testing and Commissioning includes required work for LEED Certification at the New Walkley Yard. Project Co shall be responsible for achieving all testing and commissioning prerequisites and credits to achieve the LEED Certification of the New Walkley Yard administration building and maintenance building.
- (c) Project Co Testing and Commissioning includes all New Municipal Infrastructure and New Utility Infrastructure in accordance with the Project Agreement. Without limiting the foregoing or any other provision of the Project Agreement, Project Co shall also comply with:
 - (i) all requirements in Appendix A of this Schedule 14 – Testing and Commissioning in respect of, among other things, testing and commissioning of New Municipal Infrastructure; and
 - (ii) all requirements in Appendix B of this Schedule 14 – Testing and Commissioning in respect of, among other things, testing and commissioning of New Utility Infrastructure.
- (d) Project Co shall comply with Good Industry Practice for all Project Co Testing and Commissioning activities. Project Co shall provide all of the documentation to the City in accordance with the requirements of Schedule 10 – Review Procedure.

1.2 Project Co Testing and Commissioning Coordinator

- (a) Project Co shall appoint a testing and commissioning coordinator (the “**Project Co Testing and Commissioning Coordinator**”) to perform the testing and commissioning obligations of Project Co. The Testing and Commissioning Coordinator shall have the qualifications as set out in Schedule 9 – Key Individuals.

1.3 Project Co Testing and Commissioning Parameters

- (a) Project Co shall be responsible for preparing and executing a testing and commissioning plan/strategy required to successfully demonstrate the performance of the System Infrastructure in accordance with the Project Agreement (the “**Testing and Commissioning Plan**”). The scope of the Testing and Commissioning Plan will include all aspects of factory and site testing, static testing, systems integration testing and Trial

Running of the System Infrastructure as a fully integrated system to demonstrate the functional capability and safety of the System Infrastructure.

- (b) The Testing and Commissioning Plan shall include, but not be limited to, the following:
- (i) Relationship to safety and security management and other related System safety and security requirements;
 - (ii) Resumes of key personnel involved detailing years of experience;
 - (iii) Organization chart of the testing and commissioning team and their discipline responsibilities;
 - (iv) Planned resources;
 - (v) Specific requirements for the City interfaces;
 - (vi) Specific requirements for other third party interfaces;
 - (vii) Testing regime and test documentation procedures; and
 - (viii) Testing and Commissioning Schedule.
- (c) The Testing and Commissioning Plan shall demonstrate how Project Co intends to validate and verify that the functional and technical requirements, Trial Running, performance criteria, Maintenance and Rehabilitation Requirements, quality and safety aspects of the Expanded Trillium Line have been met or exceeded to allow the City to operate and Project Co to maintain the Expanded Trillium Line.
- (d) The Testing and Commissioning Plan shall be developed and modified as required to address the evolution of the Project.
- (e) Project Co is solely responsible for all checking and verification activities relating to individual components, sub-systems, Vehicles, communication and train control systems, all associated equipment and facilities required prior to the formal testing and commissioning and acceptance testing programs necessary to demonstrate the fully integrated operation of the System Infrastructure to the satisfaction of Independent Certifier. Project Co is responsible for providing all test procedures and test reports for all subsystems including FAI, FAT, SAT, SIT, and System Integration testing. The City shall be responsible for the checking and verification activities relating to the communication system components, subsystems and equipment installed by the City at the TOCC and BCC.
- (f) Project Co shall prepare and formally submit the PFD Testing and Commissioning Plan within six months of Financial Close in accordance with Schedule 12 – Works Scheduling Requirements. The Testing and Commissioning Plan shall be subject to review and acceptance by the City, in accordance with Schedule 10 - Review Procedure.

The Testing and Commissioning Plan shall undergo review and modification as the project progresses as agreed by the City and Project Co. The IFC Testing and Commissioning Plan shall be submitted no less than 300 days prior to testing

- (g) The Testing and Commissioning Plan shall permit the oversight and monitoring of Project Co Testing and Commissioning activities for the duration of the Project.
- (h) With the exception of the testing and commissioning of communication system components, subsystems and equipment installed by the City at the TOCC and BCC and the obligation to supply operators and controllers for Project Co Testing and Commissioning activities, the City accepts no responsibility for Project Co Testing and Commissioning of other System Infrastructure. Each sub-system of the System Infrastructure shall be, wherever possible, thoroughly tested and commissioned as standalone subsystems operating in simulated worst case environments prior to being placed into service. This shall be demonstrated at FAI, FAT or SAT, whichever is applicable.
- (i) [Intentionally Deleted].
- (j) In addition to the Commissioning Tests specified in Schedule 15-2, the City (and its representatives) shall have the right, when acting reasonably, to identify specific Commissioning testing requirements that will require validation.
- (k) Project Co shall prepare individual Commissioning Test plans for each Commissioning Test, and provide advance notice to the City 60 days prior to such testing in accordance with Schedule 12 – Works Scheduling Requirements. Individual test plans shall be subject to review and acceptance by the City, in accordance with Schedule 10 - Review Procedure.
- (l) The Project Co Testing and Commissioning Coordinator shall convene a meeting of the Testing and Commissioning Team to review the Project Co Testing and Commissioning Plan, set testing and commissioning parameters, designate the responsibilities of the various parties and establish the documentation requirements for each stage of the Works and the Project Co Testing and Commissioning.
- (m) Project Co shall create a schedule of testing and commissioning activities (the “**Testing and Commissioning Schedule**”) and shall incorporate the Testing and Commissioning Schedule into the Works Schedule.
- (n) The Project Co Testing and Commissioning Coordinator shall submit monthly reports to the City in regards to progress of Project Co Testing and Commissioning.
- (o) Project Co is responsible for the supply, installation, start-up, testing, adjustment and cleaning of each item of the System Infrastructure provided as part of the Works with the exception of the communication system components, subsystems and equipment installed by the City at the TOCC and BCC, at Bayview Confederation Line station, and along the

- Confederation Line alignment. Where applicable, Project Co Testing and Commissioning shall be completed in accordance with the equipment vendor's guidance.
- (p) Project Co, in implementing the Project Co Testing and Commissioning Plan, shall verify that:
- (i) the System Infrastructure installed by Project Co has been installed and is operating in accordance with the requirements of this Project Agreement;
 - (ii) the Existing Trillium Line Assets have been rehabilitated, maintained and are operating, each in accordance with the requirements of this Project Agreement;
 - (iii) the System Infrastructure performance meets or exceeds the requirements of the Output Specifications and this Project Agreement;
 - (iv) training has been provided and meets or exceeds the requirements of this Project Agreement;
 - (v) Record Drawings and operating and maintenance manuals have been provided in accordance with this Project Agreement;
 - (vi) LEED testing and commissioning documentation required for achieving the LEED Certification has been prepared and copied to the City;
 - (vii) LEED testing and commissioning documentation for achieving the LEED Certification has been submitted per the requirements of LEED;
 - (viii) New Municipal Infrastructure meets or exceeds the requirements of the Project Agreement;
 - (ix) New Utility Infrastructure meets or exceeds the requirements of the Project Agreement; and
 - (x) Maintenance & Rehabilitation Compliance Verification & Validation Matrix has been completed pursuant to Schedule 10 – Review Procedure, Part “B”.
- (q) Project Co shall provide System Infrastructure orientation to the Ottawa Emergency Services, including; the Fire Departments, Paramedics, and Police pursuant to Schedule 15-2, Part 1, Article 26.
- (r) The City shall appoint an arm's length independent third party expert (the “**Systems Integration Verifier**”) to:
- (i) provide a fast track dispute process for Project Co and any City Party as it related to the integration and function of the communications systems as outlined in Schedule 26 – Dispute Resolution Procedure; and

- (ii) during the installation, testing, and commissioning phases, review and comment for compliance and clarity on all Submittals related to communications and Train Control System and will be provided upon request any documents that pertain to: (A) integration, testing and commissioning plans, (B) traceability documents, and (C) test and commissioning procedures.

1.4 Testing and Commissioning Team

- (a) The **Testing and Commissioning Team** shall be comprised of:
 - (i) a representative of Project Co including, where applicable, subcontractors;
 - (ii) a representative of the City;
 - (iii) the Project Co Testing and Commissioning Coordinator;
 - (iv) the Independent Certifier; and
 - (v) where applicable, representatives of the relevant Vehicle manufacturers and equipment manufacturers.
- (b) Project Co and each of its Subcontractors shall assign, where applicable, individuals from each relevant trade to the Testing and Commissioning Team and shall ensure that representatives of the relevant equipment manufacturers and testing agencies are present during the relevant Project Co Testing and Commissioning meetings.
- (c) Project Co shall provide all necessary labour, materials, equipment, testing apparatus and incidentals necessary to completely start-up, verify, performance test and commission each item of the System Infrastructure provided as part of the Works.
- (d) After Financial Close, the Project Co Testing and Commissioning Coordinator shall establish a schedule for regular meetings of the Testing and Commissioning Team to review the progress of the Project Co Testing and Commissioning.

1.5 Project Co Testing and Commissioning Procedures

- (a) Project Co shall ensure that all regulation and code references in the Reference Documents, in addition to the provisions of Part 1 of Schedule 15-2 – Design and Construction, have been fully complied with.
- (b) Project Co and the Project Co Testing and Commissioning Coordinator shall plan, prepare documentation and execute the Project Co Testing and Commissioning Plan, process and procedures.
- (c) Project Co shall ensure that each of the requirements set out in this Schedule 14 and those identified in Schedule 15 – Output Specifications are completed.

- (d) Training:
- (i) Project Co shall provide a training schedule and agenda for each training session to the City for acceptance in accordance with Schedule 10 - Review Procedure and Schedule 12 – Works Scheduling Requirements. Operational and maintenance training shall be provided for all System Infrastructure. Operations and maintenance training manuals shall be submitted in accordance with Schedule 10 - Review Procedure and Schedule 12 – Works Scheduling Requirements. A complete listing of all training programs that Project Co is responsible for is located in Schedule 15-2, Part 1, Article 12.
 - (ii) The Project Co Testing and Commissioning Coordinator or designated delegate shall attend a sample of every training session to ensure the agenda is maintained and that quality training is provided. One training session for each category shall be video recorded in digital format. The video shall be submitted to the City and labelled accordingly.
 - (iii) Project Co’s design consultants shall provide an overview of the System Infrastructure, including an explanation as to why the solutions and equipment were selected, identification of the design intent and discussion of the operating procedures required to maintain the design intent. These sessions shall be video recorded in digital format.
 - (iv) Training sessions for equipment shall be conducted at the location of the equipment or such Project Co supplied equipment.
 - (v) A portion of the training sessions for the System Infrastructure shall be conducted at the operating stations (workstations).
 - (vi) All training sessions shall be logged and personnel shall be recorded as receiving training. Further refreshers shall be scheduled in line with safety, quality and training requirements.
- (e) Trial Running:
- (i) Trial Running Objectives
 - (A) Project Co shall conduct Trial Running when:
 - (I) the integrated System Infrastructure has been tested;
 - (II) the complete fleet is fully tested and ready for passenger service;
 - (III) the complete signalling and train control system and associated TOCC equipment is fully tested and ready for passenger service;

- (IV) there are no outstanding defects (major or minor) affecting rail systems functionality, including track, signals and communications;
 - (V) there are no major defects, safety defects, or incomplete vehicle modification programs;
 - (VI) all Stations are substantially complete with only Minor Deficiencies remaining;
 - (VII) Project Co is fully mobilized and ready to commence maintenance services in accordance with Schedule 15-3 – Maintenance and Rehabilitation Requirements, including availability of required maintenance staff, parts, maintenance equipment, CMMS, and completion of training;
 - (VIII) Project Co has submitted the Maintenance & Rehabilitation Compliance Verification & Validation Matrix pursuant to Schedule 10 – Review Procedure, Part “B”; and
 - (IX) the City is fully mobilized, trained and ready to operate the System.
- (B) Trial Running will be the final step in confirming Readiness for Revenue Service.
- (C) The fundamental objective of Trial Running is to exercise the complete integrated System Infrastructure, including all subsystems, operating personnel and operating procedures, to confirm Readiness for Revenue Service. This can be subdivided into the following key objectives:
- (I) to validate the performance of the System Infrastructure with operating and maintenance staff who are trained on the operation of the System Infrastructure and Standard Operating Procedures;
 - (II) to exercise and validate the operating schedules and operational performance requirements; and
 - (III) to exercise and confirm the operating reliability of the subsystems simulated under various operating conditions (normal and emergency). The basic design requirements and safety and security requirements will have been verified through the testing and commissioning phase prior to this stage of Trial Running.
- (ii) Performance Criteria for Trial Running Acceptance

- (A) Project Co shall conduct the Trial Running for final acceptance which will be conducted for a period of 21 consecutive days following successful completion of the Commissioning Tests and verification by Project Co that there are no deficiencies to prevent safe running of the System Infrastructure, verification that they have an adequate number of trained staff and resources to maintain the System Infrastructure and verification from the City that they have an adequate number of trained staff available to support Trial Running operating requirements. When all of the requirements in this Schedule 14 have been satisfactorily completed and are in place, the System Infrastructure will be ready for Revenue Service (“**Readiness for Revenue Service**”).
- (B) Trial Running shall be reviewed on a day to day basis by the Testing and Commissioning Team.
- (C) Project Co shall communicate with the City Representative to review daily performance, resolve service availability and delay issues and coordinate all Maintenance and Rehabilitation Services on the System that could potentially affect System operation, public safety or concerns and all other related issues.
- (D) Trial Running shall operate a full regular scheduled service on the full line for a 14 day period. Passengers will not be carried. Additional tests during the 21 day period referred to in (A) above shall include a variety of failure management scenarios that could reasonably be expected to occur in regular Revenue Service. The City shall have the opportunity to review and approve the failure management scenarios that will be tested during Trial Running.
- (E) Project Co shall achieve the Service Reliability Standard outlined in Schedule 15-2, Part 1, Article 3.5 wherein the 98.5% on-time performance must be achieved over a 14-day period within the 21 day Trial Running period.
- (F) Project Co shall use the Trial Running period to collect operating data and evaluate system reliability, availability, and maintainability performance and to demonstrate that the process to collect, evaluate, and validate the operating data has been properly established. Using prescribed procedures, data on service deviations will be collected and assigned against the Vehicles and specific subsystems down to the Line Replaceable Unit (LRU) level. The database shall provide verification of system reliability to the LRU level. If the cumulative failure of any LRU exceeds 10% of the total LRU population, up to and including the completion of Trial Running, Project Co shall redesign and replace the defective LRU’s.

- (G) Project Co shall demonstrate that the integrated System (vehicles, stations, and infrastructure) perform reliably through the Trial Running period such that the Performance Criteria for Trial Running are achieved and that would otherwise lead to zero performance deductions during the Maintenance Period.
- (H) Validation of the Trial Running acceptance shall be performed by the Independent Certifier.
- (I) The Trial Running of the System Infrastructure will demonstrate to the satisfaction of the Independent Certifier that the specified travel times, headways and operational performance requirements can be achieved.

1.6 Project Co Testing and Commissioning Submittals

- (a) Project Co shall prepare a design brief describing the System Infrastructure design and performance requirements, including the requirements of the Output Specifications prior to beginning the construction process.
- (b) Project Co shall prepare and submit to the City the Testing and Commissioning Plan identified in this Schedule 14 in accordance with Schedule 10 - Review Procedure and Schedule 12 – Works Scheduling Requirements.
- (c) Project Co shall prepare and submit to the City test forms, verification forms and performance test forms for all equipment, communication systems and train control systems. Test procedures should include but not be limited to the following:
 - (i) Test objectives;
 - (ii) Required Safety methods and prerequisite training required;
 - (iii) Associated tests and pass/fail criteria;
 - (iv) Reference specifications /standards and supporting literature;
 - (v) Staffing required, including requirements from the City;
 - (vi) Test methods;
 - (vii) Test equipment, jigs and supporting systems required;
 - (viii) Test schedule;
 - (ix) Test location;
 - (x) Identification of professional personnel and resumes of those responsible for sign-off;

- (xi) Certified test reports including test results and recommendations; and
- (xii) Compliance matrix to detail contract requirements being tested.
- (d) Project Co shall prepare and submit to the City the performance testing and commissioning progress management forms and the commissioning summary forms to be used for monthly reporting.
- (e) Project Co shall prepare and submit to the City a Testing and Commissioning Schedule of each item of the System Infrastructure, New Municipal Infrastructure and New Utility Infrastructure provided as part of the Works.
- (f) Project Co shall prepare and submit to the City detailed testing and commissioning manuals for each item of the System Infrastructure, New Municipal Infrastructure and New Utility Infrastructure provided as part of the Works (the “**Testing and Commissioning Manuals**”) in accordance with Schedule 10 - Review Procedure and Schedule 12 – Works Scheduling Requirements.
- (g) All Testing and Commissioning Manuals shall include:
 - (i) name and logo as directed by the City;
 - (ii) name of the Project;
 - (iii) project number;
 - (iv) identification of each item of the System Infrastructure tested and commissioned;
 - (v) the date each item of the System Infrastructure was tested and commissioned;
 - (vi) the signature of the Project Co Testing and Commissioning Coordinator;
 - (vii) issue and date;
 - (viii) document version control; and
 - (ix) document amendments table.
- (h) All Testing and Commissioning Manuals shall include:
 - (i) test reports;
 - (ii) configuration control records;
 - (iii) equipment check sheets (start-up, verification and performance) for each item of the System Infrastructure provided as part of the Works; and

- (iv) interim and final acceptance check sheets for each item of the System Infrastructure provided as part of the Works.
- (i) Project Co shall prepare and submit O&M manuals in accordance with Schedule 10 – Review Procedure and Schedule 12 – Works Scheduling Requirements.
- (j) Project Co shall prepare and submit a re-commissioning manual in accordance with the requirements of Schedule 10 – Review Procedure.
- (k) Project Co shall prepare and submit configuration control records in accordance with the requirements of Schedule 10 – Review Procedure and Schedule 12 – Works Scheduling Requirements.

1.7 Coordination with the City, Systems Integration Verifier and the Independent Certifier

- (a) The Project Co Testing and Commissioning Coordinator shall co-ordinate with the City, Systems Integration Verifier, CNR, Via Rail, the NRC and the Airport Authority, as applicable, and the Independent Certifier, throughout the Project Co Testing and Commissioning process.
- (b) This co-ordination shall include:
 - (i) review of test, verification and performance test forms;
 - (ii) review of testing and commissioning progress management forms and performance testing;
 - (iii) review of the Testing and Commissioning Plan;
 - (iv) review of the Testing and Commissioning Schedule;
 - (v) sample witnessing of tests and performance testing;
 - (vi) review of the training curriculum and materials as outlined in Part 1 Article 12 of Schedule 15-2 and scheduling;
 - (vii) review of the O&M manuals;
 - (viii) sample witnessing of seasonal performance testing;
 - (ix) review of the testing and commissioning reports;
 - (x) attend Testing and Commissioning Team meetings; and
 - (xi) report to the City and third parties as applicable regarding the progress of testing and commissioning.

1.8 Systems and Vehicles to be Commissioned

- (a) The Project Co Testing and Commissioning shall include the testing and commissioning of all Systems and Vehicle items of the System Infrastructure provided as part of the Works including, but not limited to, the following:
 - (i) Revenue Vehicles;
 - (ii) Maintenance Vehicles;
 - (iii) Signalling and Train Control System;
 - (iv) Communications System up to the demarcation point at Bayview Station; and
 - (v) Tracks.

1.9 Guideway and Building Systems to be Commissioned

- (a) The Project Co Testing and Commissioning shall include the testing and commissioning of all Guideway and building system items of the System Infrastructure provided as part of the Works including, but not limited to, the following:
 - (i) SCADA system (field devices and equipment);
 - (ii) Maintenance equipment systems;
 - (iii) Building envelope;
 - (iv) Elevators;
 - (v) Fire protection systems;
 - (vi) TVS
 - (vii) Plumbing systems;
 - (viii) HVAC systems;
 - (ix) Building automation systems;
 - (x) Electrical systems;
 - (xi) Security and safety systems;
 - (xii) Communications System up to the demarcation point at Bayview Station;
 - (xiii) CCTV;

- (xiv) Interfaces with OLRT and BRT stations and systems;
 - (xv) Passenger information systems; and
 - (xvi) Intrusion detection systems.
- (b) For further certainty, the City will be responsible for communication system, subsystems and equipment testing and commissioning activities relating to the headend equipment at the TOCC and BCC. Project Co shall be responsible for coordinating this work, and reflecting it in the SIMP and the overall Testing and Commissioning Plan.

1.10 Civil Engineering Elements Inspection and Testing

- (a) Project Co Testing and Commissioning shall include inspection and testing of the civil engineering elements of System Infrastructure, New Municipal Infrastructure, and New Utility Infrastructure for purposes of establishing readiness for intended use, including the following:
- (i) Structures;
 - (ii) Underground Structures;
 - (iii) Guideway structures and foundations;
 - (iv) Facility structures, foundations, architectural elements and finishes;
 - (v) roadways and roadway related infrastructure;
 - (vi) landscaping and urban design elements; and
 - (vii) wayfinding, signage and visual displays.

APPENDIX A

NEW MUNICIPAL INFRASTRUCTURE

For clarity, the obligations of Project Co in this Appendix A are in addition to and not in substitution of any other requirements for Project Co Testing and Commissioning of the Works and/or any other requirements in respect of New Municipal Infrastructure contained in the Project Agreement or this Schedule 14, including, for clarity, the process and requirements set out in Section 25.13 of the Project Agreement. The obligations in this Appendix A are in respect of New Municipal Infrastructure only.

1. DEFINITIONS

1.1 The following terms shall have the following meanings for purposes of this Appendix A:

- (a) **“Operations Data and Maintenance Manuals”** means the operations data and maintenance manuals Project Co is required to deliver pursuant to Section 2.3 of Attachment 1 of this Appendix A.
- (b) **“Special Infrastructure”** means, for purposes of this Appendix A, the assets described in the Ontario Water Wellness Report under the headings of “Underground Storage Tanks/Superpipes”, “Oil Grit Separators” and “Wet or Dry Pond or Other Stormwater Management Facilities”.
- (c) **“Witness and Hold Points”** has the meaning given in Schedule 11 – Integrated Management System Requirements.

2. INSPECTION, TESTING, COMMISSIONING, AND HANDOVER

2.1 Interim Inspection of New Municipal Infrastructure

- (a) Project Co shall comply with all requirements set out in this Schedule 14- Testing and Commissioning (including, for clarity, this Appendix A) as well as all requirements set out in Section 25.13 of the Project Agreement in connection with interim inspections of New Municipal Infrastructure.
- (b) Project Co shall notify the City of achievement of all milestones set out in the Inspection and Test Plan in respect of New Municipal Infrastructure as well as all Witness and Hold Points in respect of New Municipal Infrastructure.

2.2 Final Inspection of New Municipal Infrastructure

- (a) Project Co shall comply with all requirements set out in this Schedule 14 – Testing and Commissioning (including, for clarity, this Appendix A) as well as all requirements set out in Section 25.13 of the Project Agreement in connection with final inspections of New Municipal Infrastructure.
- (b) Prior to final inspection of New Municipal Infrastructure, Project Co shall, in addition to all other requirements set out in Section 25.13 of the Project Agreement:
 - (i) remove all Temporary Works no longer required from the site subject to final inspection, including but not limited to fencing, sign board, samples, and any other items

not considered to be part of System Infrastructure or New Municipal Infrastructure, except for those items required for ongoing Works; and

- (ii) clean all New Municipal Infrastructure prior to Handover following final inspection of such New Municipal Infrastructure including:
 - (A) sweeping/spraying of roads, boulevards and sidewalks;
 - (B) flushing of sewers; and
 - (C) cleaning out of catch basins, maintenance holes, and valve chambers,all taking into account ongoing Works.
- (c) Prior to final inspection of New Municipal Infrastructure, Project Co shall, in addition to all other requirements set out in Section 25.13 of the Project Agreement, prepare a record of the following, and submit it to the City for review in accordance with Schedule 10 – Review Procedure at least 20 Business Days before the final inspection:
 - (i) a list of any required Operations Data and Maintenance Manuals, as required for New Municipal Infrastructure that is Special Infrastructure and highways, as set forth in Attachment 1 of this Appendix A.

2.3 Pre-Conditions to Handover of New Municipal Infrastructure

In addition to any other requirements in the Project Agreement, Project Co shall satisfy the requirements of this Appendix A, including, for clarity, those set out in Attachment 1 of this Appendix A, prior to, and as a condition of, Handover of New Municipal Infrastructure.

ATTACHMENT 1

NEW MUNICIPAL INFRASTRUCTURE

3. REQUIREMENTS FOR TESTING, COMMISSIONING, HANDOVER, AND ACCEPTANCE

3.1 Applicable to all New Municipal Infrastructure

- (a) Project Co shall, prior to and as a pre-condition of achievement of Handover of New Municipal Infrastructure, submit the following to the City in accordance with Section 2.1 of this Attachment 1 for review in accordance with Schedule 10 – Review Procedure:
- (i) certification of the New Municipal Infrastructure in accordance with Section 3 of this Attachment 1; and
 - (ii) Final Record Drawings in accordance with Sections 2.1 and 2.2 of this Attachment 1, unless final Record Drawings are not reasonably available at the time of Project Co Testing and Commissioning of the New Municipal Infrastructure, in which case Project Co shall:
 - (A) provide red-lined as-built drawings within ten Business Days after final inspection of the New Municipal Infrastructure; and
 - (B) provide final Record Drawings in accordance with Sections 2.1 and 2.2 of this Attachment 1 within three (3) months of Handover of such New Municipal Infrastructure.

3.2 Applicable to Sanitary, Storm and Combined Sewers

- (a) For New Municipal Infrastructure comprised of sanitary sewers, storm sewers, and combined sewers, and for maintenance holes and catchbasins in addition to the documents and other items required to be delivered and/or performed by Project Co pursuant to Section 1.1 of this Attachment 1 and other documents, actions or deliverables otherwise required to be delivered or performed pursuant to the Project Agreement, Project Co shall, prior to and as a pre-condition of Handover of such New Municipal Infrastructure, complete and perform the following:
- (i) complete all tasks listed under the headings ‘Sanitary, Storm and Combined Sewers’, ‘Maintenance Hole’, and ‘Catchbasins’ in the Ontario Water Wellness Report in accordance with the Project Agreement (if a Notice of Delegation has been issued under the Project Agreement in respect of such New Municipal Infrastructure); and
 - (ii) Project Co shall submit the following to the City in accordance with Section 2.1 of this Attachment 1, for review in accordance with Schedule 10 – Review Procedure:
 - (A) a copy of the Ontario Water Wellness Report prepared, stamped, signed and dated by a professional engineer licensed in the Province of Ontario for all applicable items under the headings ‘Sanitary, Storm and Combined Sewers’, ‘Maintenance Hole’, and ‘Catchbasins’ in the Ontario Water Wellness Report;

- (B) material testing results;
- (C) performance test results;
- (D) manufacturer's manuals and instructions;
- (E) compaction testing results for backfilling and paving;
- (F) video report and detailed written report and electronic files containing chainage-specific defect codes from a CCTV inspection. Where deficiencies have been identified by the CCTV inspection, The City shall arrange for additional examinations as required to demonstrate that all deficiencies have been rectified in accordance with the Project Agreement (if a Notice of Delegation has been issued under the Project Agreement in respect of such New Municipal Infrastructure);
- (G) design documents, including design sheets, reports, and technical studies; and
- (H) service connection cards prepared on the standard form supplied by the City.

3.3 Applicable to Watermains

- (a) For New Municipal Infrastructure comprised of watermains, in addition to the documents and other items required to be delivered and/or performed by Project Co pursuant to Section 3.1 of this Attachment 1 and other documents, actions or deliverables otherwise required to be delivered or performed pursuant to the Project Agreement, Project Co shall, prior to and as a pre-condition of Handover of such New Municipal Infrastructure, complete and perform the following:
 - (i) complete all tasks listed under the headings 'Watermain', 'Fire Hydrants', 'Tracer Wires', and 'Water Service Connections' in the Ontario Water Wellness Report in accordance with the Project Agreement (if a Notice of Delegation has been issued under the Project Agreement in respect of such New Municipal Infrastructure); and
 - (ii) submit the following to the City in accordance with Section 2.1 of this Attachment 1, for review in accordance with Schedule 10 – Review Procedure:
 - (A) a copy of the Ontario Water Wellness Report prepared, stamped, signed and dated by a professional engineer licensed in the Province of Ontario for all applicable items under the headings 'Watermain', 'Fire Hydrants', 'Tracer Wires', and 'Water Service Connections';
 - (B) material testing results;
 - (C) performance test results;
 - (D) manufacturer's manuals and instructions;
 - (E) compaction testing results for backfilling and paving;

- (F) documentation related to the applicable hydrostatic pressure testing, disinfection/chlorination and bacteriological test results, and tracer-wire reports;
- (G) design documents, including design reports, and technical studies; and
- (H) service connection cards prepared on the standard form supplied by the City

3.4 Applicable to Special Infrastructure

- (a) For New Municipal Infrastructure comprised of Special Infrastructure, in addition to the documents and other items required to be delivered and/or performed by Project Co pursuant to Section 3.1 of this Attachment 1 and other documents, actions or deliverables otherwise required to be delivered or performed pursuant to the Project Agreement, Project Co shall, prior to and as a pre-condition of Handover of such New Municipal Infrastructure, complete and perform the following:
 - (i) complete all tasks listed under the headings ‘Underground Storage Tanks/Superpipes’, ‘Oil Grit Separators’, and ‘Wet or Dry Pond or Other Stormwater Management Facilities’ in the Ontario Water Wellness Report in accordance with the Project Agreement (if a Notice of Delegation has been issued under the Project Agreement in respect of such New Municipal Infrastructure);
 - (ii) submit the following to the City in accordance with Section 2.1 of this Attachment 1, for review in accordance with Schedule 10 – Review Procedure:
 - (A) a copy of the Ontario Water Wellness Report prepared, stamped, signed and dated by a professional engineer licensed in the Province of Ontario for all applicable items under the headings ‘Underground Storage Tanks/Superpipes’, ‘Oil Grit Separators’, and ‘Wet or Dry Pond or Other Stormwater Management Facilities’;
 - (B) material testing results;
 - (C) performance test results;
 - (D) manufacturer's manuals and instructions;
 - (E) compaction testing results for backfilling and paving;
 - (F) video report and detailed written report and electronic files containing chainage-specific defect codes from a CCTV inspection. Where deficiencies have been identified by the CCTV inspection, Project Co shall arrange for additional examinations as reasonably required to demonstrate that all deficiencies have been rectified in accordance with the terms of the Project Agreement;
 - (G) design documents, including design sheets, reports, and technical studies; and
 - (H) Operations Data and Maintenance Manuals in accordance with the requirements set out in Section 2.3 of this Attachment 1.

- (iii) Project Co shall have provided system demonstration and training to the City for all Special Infrastructure, which training shall include hands-on instruction of City personnel in the operation, adjustment and maintenance of the Special Infrastructure. At the time of the instruction, Project Co shall provide an operations and maintenance manual (in form and content to satisfy the requirements of Section 2.3 of this Attachment 1), which shall be used by Project Co to assist in the instructions; and
- (iv) Project Co shall complete all other requirements for testing, commissioning and acceptance that are conditions to approvals and permits obtained for Special Infrastructure.

3.5 Applicable to Highways

- (a) For New Municipal Infrastructure comprised of highways as defined in the City of Ontario Act, 2006, in addition to the documents and other items required to be delivered and/or performed by Project Co pursuant to Section 3.1 of this Attachment 1 and other documents, actions or deliverables otherwise required to be delivered or performed pursuant to the Project Agreement, Project Co shall, prior to and as a pre-condition of Handover of such New Municipal Infrastructure, complete and perform, as applicable, the following:
 - (i) rectify and repair of all damages, settlements and depressions to the above ground road subgrade;
 - (ii) submit the following to the City in accordance with Section 2.1 of this Attachment 1, for review in accordance with Schedule 10 – Review Procedure:
 - (A) Electrical Safety Authority (ESA) certificate for any traffic signal plant including red light cameras; and
 - (B) inspection and testing reports for all traffic plant including traffic control signals, Red Light Cameras, and arterial cameras; and
 - (iii) For any special equipment associated with traffic management, Project Co shall provide:
 - (A) system demonstration and training to the City for all highways, which training shall include hands-on instruction of City personnel in the operation, adjustment and maintenance of the highways. At the time of the instruction, Project Co shall also provide an operations and maintenance manual (in form and content to satisfy the requirements of Section 2.3 of this Attachment 1), which shall be used by Project Co to assist in the instructions; and
 - (B) an Operations Data and Maintenance Manual, in form and content shall satisfy the requirements in Section 4.3 of this Attachment 1.

3.6 Applicable to Street Trees

- (a) For New Municipal Infrastructure comprised of street trees, in addition to the documents and other items required to be delivered and/or performed by Project Co pursuant to Section 3.1 of this Attachment 1 and other documents, actions or deliverables otherwise required to be delivered or performed pursuant to the Project Agreement, Project Co shall, prior to and as a pre-condition

of Handover of such New Municipal Infrastructure, submit the following in accordance with Section 2.1 of this Attachment 1:

- (i) A full list of trees planted by Project Co on public lands, including on City Road Allowance.

4. DOCUMENTATION

4.1 Submittals

- (a) Project Co shall submit to the City all documentation (including drawings) required to be delivered under this Attachment 1 as follows:
 - (i) to the City for review in accordance with Schedule 10 – Review Procedure; and
 - (ii) in the following formats and quantities in respect of all Record Drawings required to be delivered to the City pursuant to this Attachment 1.
 - (A) for Record Drawings, four CDs/DVDs, one (1) full size hard copy set, and one (1) reduced size hard copy set unless specified otherwise by the City;
 - (B) for Special Infrastructure, five (5) CDs/DVDs and two (2) hard copy sets, unless specified otherwise by the City; and
 - (C) for all other documents (other than documents referenced in (A) and (B), four CDs/DVDs and one (1) hard copy set, unless otherwise specified by The City; and
 - (D) each of the foregoing shall be in PDF format generated from the source electronic document and not scanned from hard copies.

4.2 Record Drawings

- (i) Project Co shall provide Record Drawings for the New Municipal Infrastructure in compliance with the City Standards, or such other standards as are agreed to by Project Co and The City.
- (ii) Project Co shall provide Record Drawings for New Municipal Infrastructure for review in accordance with Schedule 10 – Review Procedure, as follows:
 - (A) Record Drawings shall be in Microstation and PDF format showing the final plan and profile locations of the New Municipal Infrastructure, including service connections;
 - (B) Only the plan and profile drawings shall be updated and submitted as the Record Drawings;
 - (C) Profile drawings shall not be required if profile drawings are not required by the City during the approval and permitting stage; and

- (D) Record Drawings shall accurately record deviations from the original drawings accepted by the City, including changes caused by site conditions.

4.3 Operations Data and Maintenance Manuals

- (a) In respect of New Municipal Infrastructure that is Special Infrastructure or Highways, as contemplated in Sections 3.4 and 3.5 of this Attachment 1, Project Co shall prepare operations data and maintenance manuals for the City in accordance with the following requirements:
 - (i) Vinyl, hard covered, three ring, loose leaf binder for 215 mm X 280 mm sized paper;
 - (ii) Title sheet, labelled 'Operations Data and Maintenance Manual', project name, date, and list of contents;
 - (iii) Contents organized in the respective sections of work with each section marked by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets. The electronic copy shall be bookmarked with the list of contents hyperlinked;
 - (iv) Details of operation and maintenance instructions for equipment and systems, including a complete list of equipment and part lists consisting of make, size, capacity, and serial number;
 - (v) Names, addresses, and phone numbers of subcontractors and suppliers;
 - (vi) Warranties showing the 'Title' of the Project, guarantee periods reflecting the start date, a clear indication on parts and parcels that are covered under guarantee, and due authorization of competent signatories; and
 - (vii) Any additional materials used in the applicable New Municipal Infrastructure showing names of manufacturers and source supplies including manufacturers' literature.
- (b) All PDF documents included within all Operations Data and Maintenance Manuals shall be generated from the source electronic document and not scanned from hard copies

5. CERTIFICATION

- (a) Prior to achievement of Handover of New Municipal Infrastructure, and as a pre-condition of Handover, Project Co shall submit to the City (if a Notice of Delegation has been issued in respect of the New Municipal Infrastructure) written certification of the New Municipal Infrastructure in the form attached as Attachment 2 of this Appendix A. Each certificate shall be stamped, signed and dated by professionals licensed in the Province of Ontario qualified to certify the specific type of work and equipment being certified.

ATTACHMENT 2

FORM OF NEW MUNICIPAL INFRASTRUCTURE CERTIFICATION

Certificate Reference Number [...] *(insert reference number)*

CERTIFICATE OF MUNICIPAL INFRASTRUCTURE

A. General

1. This certificate is in respect of:
 - (a) [...] *(insert details of the New Municipal Infrastructure to be certified)* (the “**Certificate**”); and
 - (b) the Project Agreement between The City and Project Co dated [...] *(insert date of Project Agreement)* (the “**Project Agreement**”) relating to the Project.
2. Defined terms and expressions used in the Project Agreement have the same meanings in this Certificate.
3. This Certificate is used by Project Co for certifying, as applicable:
 - (a) the substantial completion of construction activities in respect of those components of the Works set out in paragraph A1 of this Construction Certificate; or
 - (b) the total completion of construction activities in respect of any Reinstatement Work carried out by the Construction Contractor pursuant to Section 30 of the Project Agreement in accordance with a Reinstatement Plan,

in accordance with the Project Agreement, City Standards, the designs and plans submitted by Project Co and accepted by the City, other standards that have been agreed to in writing by the City and Project Co, and good engineering practices.

B. Construction Contractor’s Statement

1. We certify that the components of the Works set out in paragraph A1 of this Construction Certificate have been designed, constructed, [**substantially completed as set out in paragraph A2(a)**], [**totally completed as set out in paragraph A2(b)**], commissioned and tested in all respects in accordance with: *(Inapplicable language to be deleted)*
 - (a) the relevant Design Data, Design Certificates, and Construction Certificates pursuant to Schedule 10 of the Project Agreement in each case to which there has been no objection under the Review Procedure;
 - (b) the provisions of the Project Agreement, including all applicable Output Specifications, as amended by the following Variation(s):
 - (i) [...] *(List, if any, the change(s) made by the issue of any Variation(s))*; and
 - (c) the requirements of City Standards, the designs and plans submitted by Project Co and accepted by the City, other standards that have been agreed to in writing by the City and Project Co, and good engineering practices.

Signed..... (Construction Contractor’s representative)

Name.....

Date.....

C. Design Team’s Statement

1. We certify that the components of the Works set out in paragraph A1 of this Construction Certificate have been designed, constructed, **[substantially completed as set out in paragraph A2(a)], [totally completed as set out in paragraph A2(b)]**, commissioned and tested in all respects in accordance with: the requirements for examination of the Works contained in the Design Management Plan and the Construction Design Management Plan and utilizing the standards of care, skill and diligence that, in accordance with the standards of our profession, are required of experienced professionals undertaking such examinations. *(Inapplicable language to be deleted)*
2. We further certify that in our professional opinion the components of the Works set out in paragraph A1 of this Construction Certificate have been designed, constructed, **[substantially completed as set out in paragraph A2(a)], [totally completed as set out in paragraph A2(b)]**, commissioned and tested in all respects in accordance with: *(Inapplicable language to be deleted)*
 - (a) the relevant Design Data, Design Certificates, and Construction Certificates pursuant to Schedule 10 of the Project Agreement in each case to which there has been no objection under the Review Procedure;
 - (b) the provisions of the Project Agreement, including all applicable Output Specifications, as amended by the following Variation(s):
 - (i) [...] *(List, if any, the change(s) made by the issue of any Variation(s));* and
 - (c) the requirements of City Standards, the designs and plans submitted by Project Co and accepted by the City, other standards that have been agreed to in writing by the City and Project Co, and good engineering practices.

Signed..... (Design Team’s Principal)

Name.....

Date.....

Professional Registration Number: (Affix Professional Seal)

D. The City Representative

1. This Certificate is:
 - i. reviewed*
 - ii. reviewed as noted as follows*
 - iii. returned marked “rejected” as follows:*

* delete as appropriate

Signed: (The City Representative)

Name:

Date: