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**SCHEDULE 15-1**  
**TECHNICAL DEFINITIONS AND REFERENCE DOCUMENTS**

**ARTICLE 1            DEFINITIONS**

The Parties acknowledge that in so far as Schedule 15-3 – Maintenance Specification makes reference to standards or requirements within the Expanded Design and Construction Specifications in respect of the Stage 2 System and/or the Belfast MSF Expansion Works, any defined terms used within such specifications shall be understood by reference to the meanings defined therein, notwithstanding that such definitions may be different to the defined terms set out below.

**Access Points (AP)** means radio transceivers connected to the CBTC Network that allow network communications between trains and wayside CBTC equipment.

**Action Levels** means an instrumentation monitoring level unique to specific geotechnical instruments which, upon reaching, requires an action.

**Advisory Temporary Signing Plan** is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7.

**Alignment Envelope** is as defined in Schedule 15-2, Part 1, Section 1.7.

**Ancillary Facilities** means those facilities, buildings, or structures adjacent to or directly linked to OLRT stations. They can also be standalone facilities or structures located within or adjacent to the OLRT right of way. They include the following elements:

- (a) Pedestrian overpass or underpass structures;
- (b) Passenger shelter structures;
- (c) Structures containing mechanical, electrical, communications or other service equipment;
- (d) TPSS Buildings;
- (e) Signal equipment enclosures;
- (f) Parking areas;
- (g) Entrances;
- (h) PPUDO;
- (i) Bus terminals;
- (j) Bus layby areas; and
- (k) Bus Operations support building.

**Annual Preventive Maintenance Plan** means at any time during the Maintenance Term, that component of the Maintenance and Rehabilitation Plan describing the Preventive Maintenance for the then current or immediately following Contract Year, as the context requires.

**Applicable Codes** means all federal, provincial, and municipal statutes, regulations, acts, by-laws.

**Asset Management Plan** means a plan which identifies the replacement schedule for the OLRT System components based on their expected Design Life, which plan forms part of the Maintenance and Rehabilitation Plan.

**Authorities Having Jurisdiction** has the meaning given in NFPA 130.

**Automatic Train Control (ATC)** means a vital system for controlling train movement.

**Automatic Train Control Zone Controller** means a microprocessor based system which tracks train location, signal and switch positions and which provide Movement Authority limits to trains.

**Automatic Train Operation** means a non-vital overlay for controlling train speed and operation within the limits allowed by the ATP system. Automatic Train Operation provides automatic station stopping, door opening and closing and automatic operation between stations.

**Automatic Train Operation Mode** means an LRV Train operation mode in which CBTC Automatic Train Operation capabilities are enabled on top of Automatic Train Protection.

**Automatic Train Protection** means a vital system for enforcing safe train movement and speeds.

**Automatic Train Protection Only Mode** means a mode of LRV train operation in which only CBTC ATP functions are enabled.

**Automatic Train Supervision** means a non-vital system providing supervisory commands to adjust train speeds and station dwell times and to request interlocking systems to set up and cancel routes.

**Backup Control Centre (BCC)** means an emergency control center facility providing a remote location complete with the basic functioning systems to dispatch, monitor, and control operations of the OLRT in case the TOCC at 875 Belfast is unavailable.

**Barrier-Free** means a feature of a building and its related facilities whereby it can be approached entered and accessed by persons who are physically, mentally or sensory challenged.

**Base Kilometres** has the meaning given to it in Schedule 15-3.

**Baseline Vehicle Kilometers** means the scheduled annual Revenue Service Vehicle Kilometers set out for each Service Level in the Operations Service Plan as of Financial Close.

**Booking** means the schedule of work assignments for Drivers established by the City, several times a year (beginning of January, end of April, end of June, beginning of September) in accordance with the Operations Service Plan.

**Bridge** means a structure that provides a Roadway or walkway for the passage of vehicles, pedestrians or cyclists (or other similar forms of transportation) across an obstruction, gap or facility that is greater than 6 metres in span.

**Bus Rapid Transit Service Management Plan** has the meaning provided in Schedule 10 – Review Procedure.

**Central Instrument House** means a wayside control room housing all the controls for an interlocking or group of interlockings.

**Change** means:

- (a) a request by the City for a Non Maintenance Repair;
- (b) a request by the City or Project Co for a variation, whether by addition, amendment, substitution, omission or otherwise, to any of the Maintenance and Rehabilitation Requirements; and
- (c) does not include a request by the City relating to any matter arising out of a Maintenance Emergency.

**City** means the bus and light rail transit system run by the City of Ottawa.

**City Central Area** is as defined in the City of Ottawa Transportation Master Plan

**City Change** means a Change requested by the City in accordance with Schedule 15-3.

**City Change Certificate** has the meaning given to it in Schedule 15-3.

**City Direction** has the meaning given to it in Schedule 15-3.

**Closed Circuit Television** means a video transmission system monitoring a location, recording images and presenting the images to a central location.

**Communication Based Train Control** means a system of tracking train movement and safely controlling that movement based upon communications between trains and wayside controllers.

**Communications System** is as defined in Schedule 15-2 Part 4 Article 1 – Introduction.

**Comparable LRT Safety Standards** means operating rules, standard operating procedures and standard Safety practices based on best practices for such rules, procedures and practices used under similar operating conditions in comparable LRT systems.

**Compensating Construction** has the meaning given to that term in the OBC.



**Constant Failure Rate** means the constant failure rate specified by Project Co.

**Construction Monitoring Zone** has the meaning given in Part 1 Article 20 – Protection of Existing Adjacent Structures.

**Corrective Maintenance** means the repair of failed E&M and/or Vehicles or the repair of any portion of the Fixed Facilities to restore normal operating condition to a state in accordance with the Standard and includes the repair or replacement of a failed system or subsystem through actions such as:

- (a) investigation, localization and isolation of faults (troubleshooting);
- (b) disassembly, reassembly, repair or replacement of the affected part or parts;
- (c) retesting of the repaired system or subsystem; and
- (d) correcting Defects.

**Corrective Maintenance Plan** means the plan establishing the general policies, procedures and methodology which Project Co shall apply to perform Corrective Maintenance, including without limitation to identify and analyze existing and anticipated Deficiencies, including inspection and testing, and which shall be employed by Project Co to affect the Repairs and Correction of Deficiencies when they occur during the Maintenance Term.

**Cost Recovery** means total actual net cost to Project Co based on an open book system.

**Coupling Mode** means a mode of LRV train operation in which the CBTC system allows a Train or LRV to close in on another LRV or Train to couple the two together.

**Culvert** means a drainage structure designed to allow the passage of surface water, livestock or pedestrians under a Roadway, railway or roadside entrance.

**Current Level of Service** means the level of service operated by OC Transpo and STO, as of September 4, 2011.

**Custodial Maintenance** means all forms of custodial maintenance and all activities, standards and obligations related to custodial maintenance for the System which are set out in Schedule 15-3, but excluding City Custodial Maintenance with respect to City Custodial Maintenance Areas.

**Custodial Maintenance Areas** means those areas and elements of the System included in Schedule 15-3 and identified therein as the responsibility of Project Co with respect to Custodial Maintenance, and for further certainty, includes Vehicles, the Maintenance and Storage Facilities, the Alignment, the Tracks and, to the extent identified in Schedule 15-3, the Stations.

**Cycling Traffic Planning Study** has the meaning given in Schedule 10 – Review Procedure.

**Daily Maintenance Report** has the meaning given to it in Schedule 15-3.

**Defect** means the condition of any part of the work which does not meet the contract document requirements; cause a train or a portion of the Work to cease operating or operate in a degraded mode; or inflicts damage or harm on any other portion of a train or the Work.

**Deficiency** means any condition which exists with respect to any aspect of the System and which requires Maintenance, including without limitation any failure of the System to meet the Standard, other than a Non Maintenance Repair.

**Design Criteria** means established parameters used during design.

**Design Life** is defined as either of the following:

- (a) In Schedule 15-2, Design Life has the meaning given to that term in CAN/CSA-S6-06; or
- (b) In Schedule 15-3, Design Life means the interval during which a Constant Failure Rate will occur with respect to a component, subsystem or system.

**Developer's Guide** has the meaning given in Part 1 Article 19 – Future Adjacent Construction Requirements.

**Disposed, Disposed of or Disposal** means disposal as identified in the “Waste and Excess Materials Management for Maintenance (MTO)” operational specification.

**Ditch** means an open drainage facility constructed to carry water to an outlet.

**Drained Structure (Tunnel)** means a Structure (or Tunnel) partly or fully below the groundwater table where a drainage system is provided to permanently prevent the build-up of hydrostatic pressure around the Structure (or Tunnel).

**Driver** means a City employee who has been trained and certified by an OLRT Trainer to operate on the OLRT.

**Driver Training** means a program of Driver Training a City employee must attend prior to becoming a certified OLRT Driver. The program is provided by an OLRT Trainer.

**Dwell Time** means the amount of time a Train resides at a Station.

**Epidemic Defect** shall be deemed to have occurred at any time during the Maintenance Term when the Failure Rate within a Population of a component, subsystem or system exceeds the Constant Failure Rate by 10% measured over the time period in which the constant Failure rate is expressed but, for the avoidance of doubt, an Epidemic Defect shall exclude any Defect which arises:

- (c) as a result of the failure by the Operator to operate the System in accordance with the Operation Requirements;
- (d) out of the replacement or repair of any component, subsystem or system where such replacement or repair is the responsibility of the Operator or the City;

- (e) out of the replacement or repair of any component, subsystem or system by the Maintenance Contractor where such replacement or repair is a product of the Design Life and Constant Failure Rate of the applicable component, subsystem or system; and/or
- (f) any Defect which occurs after the expiration of the Design Life of such component, subsystem or system.

For the purposes hereof, the “**Population**” of a component, subsystem or system means the total number of identical line replaceable units (as identified in the Response) of a distinct type and function, whether the line replaceable unit consists of individual components, subassemblies or unit assemblies, incorporated in the fleet of vehicles provided as part of the Project.

**Electromagnetic Compatibility and Test Plan** has the meaning given in Schedule 10 – Review Procedure.

**Electromagnetic Compatibility Control Plan** has the meaning given in Schedule 10 – Review Procedure.

**Emergency Costs** has the meaning given to it in Schedule 15-3.

**Emergency Response Plan** has the meaning given in Schedule 10 – Review Procedure.

**Emergency Response Standard Operating Procedures** means the mandatory standard operating procedures for response to an Emergency, being part of the Standard Operating Procedures established for the System.

**Emergency Traffic Plan** has the meaning given in Schedule 15-2, Part 7.

**Employee Security Standard** means the security clearance and identification procedures and requirements mandated by the hiring policies, practices and standards of the City’s Human Resources Department, as may be amended from time to time

**Entry and Exit Points** means the point where the VIA Rail corridor intersects with the tracks which lead to and from the Belfast MSF, and where Moodie Drive intersects with the tracks which lead to the Moodie MSF.

**Erosion and Sediment Control Plan** has the meaning given in Schedule 10 – Review Procedure.

**Essential Services Code** is as defined in the OBC and in addition shall include all components and elements, including but not limited to the building envelope, mechanical systems, communication systems, and electrical systems to maintain uninterrupted function during and after an event.

**Existing Adjacent Structures** means Adjacent Structures and other structures that are susceptible to ground movements caused by construction activities.

**Failure** means an event primarily due to Design inadequacy for the duty cycle or stress level, a quality defect, or an inability to survive the operational environment. A Constant Failure Rate is therefore an indication that the Design criteria are consistent with the Operation Requirements and Specifications and that the quality standard as provided in the Response is appropriate to the required Design Life.

**Failure Rate** means the probability of Failure in a given time interval.

**Federal Lands** mean all lands owned and managed by all federal government departments.

**Federally Mandated Stations** means those stations within the project that are subject to Federal Land Use Agreement letters.

**Foundation** means a structure that transfers loads to the earth.

**Ground Movement** means the movement of ground directly or indirectly caused by construction activities. Ground Movement may manifest itself in such ways as surface settlement, ground settlement, the movement of retained excavation systems, the movement of slopes, and the ground vibrations arising from construction activities.

**Handover Maintenance** means the testing, disassembly, refurbishment, rebuilding and/or repair of any components of the System to be completed by Project Co within the last sixty (60) months of the Maintenance Term and prior to the expiry of the Maintenance Term in accordance with the requirements contained in Schedule 15-3.

**Handover Maintenance Period** means the last 60 calendar months of the Maintenance Term.

**Handover Maintenance Plan** means the documented plan for the performance of the Handover Maintenance in compliance with the requirements of Schedule 15-3.

**Handover Maintenance Work Plan** has the meaning given to it in Schedule 15-3.

**Immediate** or **Immediately** means the initiation of an activity as soon as possible after Detection or being Made Aware and no later than 2 hours from the time of Detection or being Made Aware, save in respect of Schedule 15-3 Appendix A Attachments 3 to 10 (inclusive), where “Immediate” or “Immediately” has the meaning given to it in Article 7.0 of Appendix A to Schedule 15-3. If more than one activity requires immediate action at the same time, Project Co shall give priority to the highest degree of Hazard.

**Implementation Plan** is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7.

**Incident Management Plan** is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7.

**Initiating Notice** has the meaning given to it in Schedule 15-3.



**Inter-modal Transfer Facility** means the movement, or transfer, of passengers from one mode of transportation such as bus transit to another mode of transportation such as the OLRT.

**Interruption Period** has the meaning given to it in Schedule 15-3.

**ISO 9001:2008** means the quality management system so designated and established by the International Organization for Standardization.

**Landscape Plan** means a plan that specifies the hard and soft landscape material.

**Light Rail Vehicles** means a form of urban rail public transportation that generally has a lower capacity and lower speed than heavy rail and metro systems, but higher capacity and higher speed than traditional street-running tram systems. The term is typically used to refer to rail systems with rapid transit-style features that usually use electric rail cars operating mostly in private rights-of-way. LRVs are typically powered by a pantograph collecting power from an overhead catenary.

**LRT Rules** means the documented rules which Project Co shall establish in consultation with the City, taking into account Comparable LRT Safety Standards and implement to govern (i) the movement of Trains and other non-passenger vehicles within the System and (ii) the conduct and coordination of Maintenance work and other activities on the Tracks, signalling systems within the System, and electrical equipment and systems forming part of the E&M, as approved and amended from time to time by the City, identifying the mandatory rules to be followed by the City and Project Co (including personnel employed in the performance of Operations and Maintenance), including in response to conditions, events, or Deficiencies which cause interruption to or interference with the Operation of the System.

**LRT Systems** means communications, Traction Power and distribution, stray current, EMI, intrusion detection, and all other required and necessary elements, components and appurtenances to ensure the safe operation of the OLRT System.

**Maintain** means to perform the Maintenance, as required in accordance with the Project Agreement including the Maintenance and Rehabilitation Requirements, and “**Maintained**” shall have a corresponding meaning.

**Maintenance** means Preventive Maintenance, Corrective Maintenance, Custodial Maintenance and Handover Maintenance.

**Maintenance and Rehabilitation Plan** means the documented plan for the performance of the Maintenance Services, provided to the City and with respect to which the City has no material objection at the time of the Final Design Submittal as contemplated in the RFP, which shall thereupon be attached as Appendix A Attachment 1, as revised from time to time in accordance with the Project Agreement.

**Maintenance and Rehabilitation Services** means Maintenance to be provided by Project Co to the City in accordance with Schedule 15-3 and the other terms of the Project Agreement and shall also include the supply, operation and maintenance of any vehicle and or equipment used to provide Maintenance.

**Maintenance and Storage Facility** means each of the maintenance, operation and storage facilities for the Vehicles and System and includes the Maintenance Buildings, Operations Crew Facilities, Storage Yards and Vehicle Storage facilities.

**Maintenance Change Instruction** has the meaning given to it in Schedule 15-3.

**Maintenance Change Report** has the meaning given to it in Schedule 15-3.

**Maintenance Dispute** has the meaning given to it in Schedule 15-3.

**Maintenance Dispute Resolution Procedure** has the meaning given to it in Schedule 15-3.

**Maintenance Emergency** means any Emergency which is caused by, or which arises as a result of:

- (a) Project Co's performance of, or failure to perform, the Maintenance Services;
- (b) a Defect or Deficiency of the Fixed Equipment, Vehicles or Fixed Facilities;
- (c) any act or omission of Project Co or any Employee or officer, agent or contractor of Project Co; or
- (d) except to the extent that such Emergency is not caused by or does not arise as a result of any of subparagraphs (a), (b) and (c) above, and except to the extent that such Emergency is caused by or arises as a result of a Force Majeure.

**Maintenance Spare Vehicle(s)** means the number of Vehicles, as determined by Project Co, required to provide the necessary spare Vehicle capacity to allow Project Co to conduct Maintenance Services on the Vehicle Fleet such that the Vehicle Maintenance Service Standards, as identified in Schedule 15-3 are met.

**Maintenance Management System** has the meaning given to it in Schedule 15-3.

**Maintenance Responsibility Table** means the table set out in Schedule 15-3.

**Major Maintenance Works** means any Preventive, Corrective, and Handover Maintenance, including rehabilitation or life cycle replacement of components of the System and based upon the work being completed in accordance with the applicable sub plans of the Maintenance and Rehabilitation Plan, Handover Maintenance Plan, and Good Industry Practice, that cannot be completed while meeting the standards as provided in Schedule 15-3 Appendix A, Article 2.1 – Maintenance and Performance Standards, in whole or in part, within the time available during Off Peak Periods or outside of Revenue Service Hours.

**Major Service Change** means any Service Level Increase, Service Level Decrease, or other modification to the Operations Service Plan which requires Project Co to increase or decrease the size of its peak in-service vehicle fleet.



**Manual Release Mode** means a latched mode of train operation for moving trains at restricted speeds when communications with the wayside CBTC systems has failed.

**Major Maintenance Shutdown Period** means any period of time during the Maintenance Term during which Project Co is permitted to partially or fully shut down the System during Revenue Service Hours without deductions under the Payment Mechanism, compliance with Section 1.5 of Schedule 15-3, in order to carry out major maintenance works.

**Major Municipal Roads** means a City freeway, Arterial Roadway or Major Collector Road as defined in the City of Ottawa Transportation Master Plan (2008). For the purposes of the OLRT Project, Queen Street shall be considered a Major Municipal Roadway.

**Medium Service Change** means any modification or set of modifications to the Operations Service Plan which is not a Major Service Change, but results in Revenue Service Vehicle Kilometers in any Contract Year exceeding the Baseline Vehicle Kilometers for that Service Level by greater than 120%.

**Minor Municipal Roads** means a Collector Road or Local Road as defined in the City of Ottawa Master Transportation Plan (2008).

**Minor Service Change** means any modification or set of modifications to the Operating Service Plan which is not a Major Service Change or a Medium Service Change.

**Monthly Activity Report** has the meaning given to it in Schedule 15-3.

**Movement Authority** means the limit of train movement allowed to a train by the ATC Zone Controller.

**New Municipal Infrastructure** at any time means Infrastructure constructed by Project Co on the Municipal Reconveyed Lands as part of the carrying out of the Initial Works and includes any Municipal Infrastructure that has been altered, upgrade or augmented at that time by the carrying out of Initial Works, but excluding Infrastructure and other property of Railway Companies and Utility Companies, the limits whereof relative to the Lands as set forth in the Design and Construction Specifications.

**Noise Control Plan** has the meaning given in Schedule 10 – Review Procedure.

**Non Maintenance Emergency** means an Emergency that is not a Maintenance Emergency.

**Non-Revenue Vehicles** means vehicles that are used by staff in the performance of maintenance and operational duties on the OLRT and its related facilities.

**Off Peak Period** means any period of time during Revenue Service Hours which is not a Peak Period.

**OLRT Controller** means a City employee that will be assigned to the TOCC and will be responsible for all dispatching functions for the OLRT.

**OLRT Controller Training** means a program of OLRT Controller Training a City employee must attend prior to becoming a certified OLRT Controller. The program is provided by a Project Co Trainer.

**OLRT Trainer** means a City employee or contractor who has been trained and certified to instruct OC Transpo employees in certain classifications who are assigned to or have any duties and responsibilities on the OLRT. These classifications include but are not limited to Driver, Station Attendant, Fare Collectors, Public Information, and security personnel.

**Onboard Computer** means a Communications Based Train Control computer located on a rail vehicle that calculates train location and enforces Movement Authorities and Speed Restrictions based on communication with wayside CBTC systems and its own Track Database.

**Open Data** is defined in Schedule 15-2 Part 4 Article 6.

**Operating Scenario** means the ridership service scenarios to be used by Project Co to design and construct the System as outlined in Schedule 15-2 Part 1.

**Operations Crew Facility** means the spaces within each MSF occupied and used by the City for purposes of the operation of the System, including dispatching of Drivers and Trains, lunch rooms and locker rooms, training centre, and reception area for Drivers and supervisors.

**Operations Service Plan** means the operations schedule as outlined in Schedule 15-3, and includes Train movements in support of Revenue Service.

**Out-of-Service Vehicle(s)** means a Vehicle or Vehicles which are unavailable for Revenue Service for reasons unrelated to the Maintenance Services and beyond Project Co's control; for example a Vehicle removed from service due to a collision beyond Project Co's control.

**Overhead Catenary or Overhead Catenary System** means a system that distributes DC power from the Traction Power System to the Vehicle via a pantograph on the Vehicle. The OCS consists of a conductive messenger wire suspending a contact wire between poles and/or attachments along the OLRT to provide the DC propulsion power requirements of the Vehicle to the train consist maintaining continuous contact between the pantograph and the contact wire.

**Passenger Pick Up and Drop-off** means a designated pick-up and drop-off area for passengers from private vehicles adjacent to an OLRT Station or a Transit Centre.

**Pavement** means all structural elements or layers above the subgrade of a road, including granular driving surfaces and shoulders.

**Peak Period** means the AM and PM periods each weekday as defined in the Operations Service Plan or otherwise determined by the City in its Discretion by written notice to Project Co.

**Pedestrian Access Plan** means a plan that outlines and shows the pedestrian flow, directions, route, volumes to and from and around all facilities, Guideway and Stations.

**Pedestrian and Cyclist Movement Study** means a study that addresses all the elements for pedestrian and cyclist requirements.

**Performance Improvement Notice** has the meaning given to it in Schedule 15-3.

**Permanent Lining** has the meaning given to that term in Part 3 Article 2.

**Permit to Take Water** required for any taking of more than a total of 50,000 litres of water in a day under the *Ontario Water Resources Act*.

**Platform** means that portion of the Station directly adjacent to the tracks where trains stop to load and unload passengers. There are two basic types of platform configuration: centre loading which has the platform located between each set of tracks, and side loading, which has the platforms located on the outside of each set of tracks. Both platform types are in use on the OLRT system.

**Pre Handover Inspections** has the meaning given to it in Schedule 15-3.

**Preventive Maintenance** means any action that is performed at scheduled intervals in accordance with the Maintenance and Rehabilitation Plan or as otherwise required to maintain the System at a constant level of performance to comply with the Maintenance and Rehabilitation Requirements and ensuring that the Maintenance of the System is sufficient to permit the Operation of the System in accordance with the Operation Requirements and Specifications (and, for further certainty, to meet or exceed the Maintenance Service Requirements), including the detection and correction of deviations from normal operation before a major system or subsystem failure occurs, periodic inspections and testing, condition monitoring, critical item replacement, lubrication, adjustment, cleaning and calibration.

**Preventive Maintenance Plan** means the plan establishing the Preventive Maintenance which Project Co is required to perform, which plan forms part of the Maintenance and Rehabilitation Plan.

**Project Co Driver** means a Project Co employee or contractor who is trained and certified to operate a revenue service vehicle without passengers on the OLRT.

**Project Co Driver Training** means a program of Driver Training a Project Co employee or contractor must attend prior to being allowed to operate an out of service revenue vehicle anywhere on the alignment or the MSF. The program is provided by a Project Co Trainer.

**Project Co Trainer** means a Project Co employee or contractor who is assigned the task of instructing and certifying a Project Co employee, Contractor or an OLRT employee in a specific classification.

**Quality Performance Criteria** means the qualitative standards of service and the performance criteria set out in Schedule 15-3.

**Radio System Supplier** means the City corporate radio nominated manufacturer determined by an external radio contract issued by the City. The radio supplier shall have the responsibility for

citywide supply, maintenance, installation, testing and licensing for all public services radio systems specified and procured by Project Co. The radio supplier shall enter into third party agreements with Project Co to ensure OLRT radio performance is in accordance with the PSOS requirements for the concession period.

**Record Drawings** means the final completed as constructed drawings in electronic (CADD) and hard copy format of all structures that was built.

**Reference Concept** means the plans, drawings, reports and other information prepared during the preliminary design for the OLRT Project and which reside in the Project Data Room.

**Reference Documents** means the references, codes, standards, specifications, guidelines, policies, reports, publications, manuals, bulletins and other such documents listed throughout the Output Specifications and summarized in Schedule 15-1.

**Reliability Acceptance Test** means the requirements (as defined and described in the RFP) to be satisfied following the expiry of the second anniversary of the Revenue Service Availability Date provided for in the Project Scope and the Design and Construction Performance Requirements.

**Remedial Action Notice** has the meaning given to it in Schedule 15-3.

**Replacement Parts** has the meaning given to it in Schedule 15-3.

**Retaining Wall** means a structure that holds back soils and is not a wingwall connected to a Bridge or Culvert.

**Revenue Service** means the carriage of paying Passengers on the System.

**Revenue Service Fleet** means, at any given time, the System Vehicle Fleet excluding the Maintenance Spare Vehicles.

**Revenue Service Hours** means the hours during which Revenue Service is provided on the System as set out in Schedule 15-3.

**Revenue Service Vehicle Kilometres** means the distance travelled by Vehicles while in Revenue Service, measured in kilometres.

**Revision Notice Period** has the meaning given to it in Schedule 15-3.

**Risk Assessment Plan** is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7.

**Roadway** means the driving surfaces of the highway, including the travelled lanes, shoulders and shoulder rounding.

**Safety and Security Certification** means the process of verifying compliance with a set of formal safety and security requirements. The requirements are defined by the OLRT Safety and Security Certification Plan, OLRT Design Criteria and Technical Specifications and applicable



codes and industry standards. Specifically, certifiable elements need to be identified, verification activities need to be performed and documented, and Certificates of Conformance need to be signed and issued by the responsible parties.

**Safety Audit** means an inspection by the City of the System, the books and records and/or procedures of Project Co relating to the Safety Standards, and includes an inspection of the Safety Management System and the Safety Case.

**Safety Case** means the documented demonstration by Project Co, as approved and audited by the General Manager of the City and filed with the General Manager of the City, that the System complies with the Safety Standards, in accordance with the Safety Standards to be established by Project Co for the Maintenance Term.

**Safety Management System** means the Safety protocol (including without limitation the activities, resources, procedures, methodologies, responsibilities and organizational structure) which Project Co shall establish in consultation with the City, taking into account the Design and Construction Specifications and is implemented to ensure the Safety of the System and compliance with the Safety Standards, and which is authorized by the General Manager of the City and filed with the General Manager of the City, adherence to which Safety protocol shall be mandatory in all Operations and Maintenance activities, and which shall without limitation include the LRT Rules and the Standard Operating Procedures.

**Safety Standards** means all mandatory Safety standards for the System, being the requirements of Law relating to health and Safety matters respecting the Design, Construction, Maintenance and Operation of the System, including all such Safety standards established by Project Co, in conjunction with the City, taking into account Comparable LRT Safety Standards, the Safety Case, and all Safety standards established by the Design and Construction Performance Requirements.

**Security** means surveillance and protection of persons and property by direct or remote means.

**Security Management System** means the Security protocol (including without limitation the activities, resources, procedures, methodologies, responsibilities and organizational structure) which Project Co shall establish in consultation with the City, taking into account the Design and Construction Specifications and the initial Threat and Vulnerability Assessment, and implement to ensure the Security of the System and compliance with the Safety Standards, and which is authorized by the General Manager of the City and filed with the General Manager of the City, adherence to which Security protocol shall be mandatory in all Operations and Maintenance activities, and which shall without limitation include the LRT Rules and the Standard Operating Procedures.

**Security Standard** means all mandatory Security standards for the System, being the requirements of Law relating to Public and System Security matters respecting the Design, Construction, Maintenance and Operation of the System, including all such Security standards established by Project Co, in consultation with the City, taking into account all Security standards established by the Design and Construction Specifications and the initial Threat and Vulnerability Assessment (TVA), as approved and amended from time to time by the City,

identifying the mandatory Security Standards to be followed by the City and Project Co (including personnel employed in the performance of Operations and Maintenance), including in response to conditions, events, or Deficiencies which cause interruption to or interference with the Operation of the System.

**Service Level** means the sets of operational parameters set out by the City in the Operations Service Plan and labeled as Service Levels 1 to 9, describing the system capacity (PPHPD), headways, consist sizes, hours of operation, and other key parameters to be attained by the System in each case, which Project Co's provision of the Maintenance Services must accommodate, and the term also includes any additional or modified operational parameters which may be developed and agreed by the City and Project Co from time to time.

**Service Level Decrease** means a requirement by the City for Project Co to provide a Service Level with a lesser system capacity (PPHPD) as compared to the then-prevailing Service Level.

**Service Level Increase** means a requirement by the City for Project Co to provide a Service Level with a greater system capacity (PPHPD) as compared to the then-prevailing Service Level.

**Service Proven Control System** means a Control System that is compliant with the following characteristics:

- (a) The major control system equipment and associated sub systems (including, but not limited to, Train Control, CTS, TOCC, YCC, BCC, PIDS, PA, SCADA, PBX, CCTV and fire life safety have been integrated and used in a comparable LRT system currently in Revenue Service, and
- (b) The system has been operating in Revenue Service for a minimum of one year, and
- (c) has been operated in similar climatic conditions and service conditions to those specified for the OLRT project, and
- (d) Authority data is available confirming that the system and sub-systems have attained an availability of 99.99%.

**Service Proven Vehicle** means a Vehicle that is substantially compliant with the following characteristics:

- (a) the major vehicle sub systems (including trucks, braking systems, propulsion systems, articulation joints), have been integrated in a comparable LRV currently in revenue service; and
- (b) a minimum of 10 of these vehicles have been in Revenue Service for a minimum of two years; and
- (c) have been operated in similar climatic conditions and service conditions to those specified for the OLRT project; and



- (d) have authority data confirming that the Vehicle has attained a minimum “in-service” MDBF of 50,000 km. Failures are defined as malfunctions that cause Revenue Service delays of 4 minutes or more.

**Shell** means the roof slab, exterior walls and invert slab of an underground box structure, including any beams integral with the slabs and walls.

**the Standard** means a standard of Maintenance which complies with all of the standards and terms set out in Article 2 – Maintenance and Performance Standards.

**Standard Operating Procedures** means the standard operating procedures which Project Co shall establish in consultation with the City, taking into account the Design and Construction Specifications, Maintenance Services, Operation of the System, and Best Industry Practice, as approved and amended from time to time by the City, identifying the mandatory procedures to be followed by the City and Project Co (including personnel employed in the performance of Operations and Maintenance), including in response to conditions, events, or Deficiencies which cause interruption to or interference with the Operation of the System. The Standard Operating Procedures shall incorporate as required the provisions of the Safety Management System, Security Management System, LRT Rules, and regulations governing the Operation and Maintenance of the System.

**Station** means a Facility where Trains and or buses stop to pick up or drop off customers. The Station primarily consists of Platform areas for Passenger loading/unloading, fare control equipment, and Passenger information. Other related components include; service rooms, stairs, ramps, escalators, elevators, advertising, public art, and Train and bus Operator support Facilities, customer amenities, etc. On the Ottawa system, Confederation Line stations are classified, and are not mutually exclusive as follows:

- (e) **At Grade Station:** A Station at which the platform is at grade, above grade, below grade, and meets the criteria for an open station as defined in NFPA 130
- (f) **Transfer Station:** Station with the incorporation of Facilities to support the transfer of Passengers between modes of transportation or between the O-Train Lines within a Fare Paid Zone.
- (g) **Underground Station:** An enclosed Station as defined by NFPA 130 in which the platform is constructed fully underground or enclosed within a building.
- (h) **Terminal Station:** A Station that is located at the terminus of a line.
- (i) **Line Station:** Station that is located along the alignment providing service in both directions of the line.

**Storage Yard** means the outdoor areas located within a Maintenance and Storage Facility, not including the Maintenance Buildings or the Operations Crew Facilities, but including the open space, parking areas, Track area, storage of Maintenance of Right-of-Way equipment and

supplies (unless incorporated within Maintenance Building), outdoor storage (ties, Track, poles, etc.) and Vehicle Storage.

**Stormwater Management** means the management of the quantity and quality of that portion of rain and snowmelt that does not soak into the ground or is intercepted by vegetation (surface runoff).

**Stormwater Management Plan** means the means through which the management of surface runoff from developed areas is addressed.

**Structure** means any building, Bridge, Tunnel, structural Culvert, Retaining Wall.

**Subsystem Reliability Criteria** means the subsystem reliability criteria set out in Part 4 of Schedule 15-3 (Design and Construction Requirements) to the Project Agreement.

**Surplus Vehicle Fleet** means, following a Service Level Decrease, any vehicles which are in excess of:

- (a) the fleet size required to provide Peak Period service;
- (a) the number of vehicle required to maintain Project Co's spare vehicle ratio; and
- (b) the quantity of Non-Revenue Vehicles called for by Project Co's maintenance plans.

**Sustainability Plan** has the meaning given in Schedule 17 – Environmental Obligations.

**System Vehicle Fleet** means the Total Vehicle Fleet plus any additional Vehicles acquired by the City in accordance with the Vehicle Option.

**Total Vehicle Fleet** means the total number of Vehicles that Project Co is required to provide under the Project Agreement, and includes the number of Scheduled Revenue Service Vehicles, and Maintenance Spare Vehicle(s)

**Total Vehicle Kilometers** means the total distance travelled by Vehicles outside of the Entry and Exit Points, after having crossed from the MSFs over the Entry and Exit Points and prior to crossing back over the Entry and Exit Points when returning to the MSFs, measured in kilometres. For clarity, this distance includes Revenue Service Vehicle Kilometres, as well as additional distance travelled by vehicles for purposes of entering into or exiting from service, or training of operators.

**Track Database** means a database containing all station, switch, curve and end of track locations, all grades, and all civil and temporary speed restriction zones, and all work zones and all speed limits through these zones and over all switches in either position. The Track Database is used by the Onboard Computer to calculate a safe speed profile and station stopping braking profiles.

**Track Protections** means a verbal protection provided by a Project Co employee or an OLRT Controller assigned to the TOCC. Track protections are issued to employees or contractors who will be on the right of way.

**Traction Power** or **Traction Power System** means an electrical network of power conversion substations receiving MV electrical power from the Utility, transforming the power to a lower usable voltage, and converting the power from AC to DC power to supply the Train consists operating along the OLRT.

**Traffic and Transit Management Communications Plan** is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7.

**Traffic and Transit Management Plan** or **TTMP** means the manner that transit and traffic will be managed during construction activities and the method traffic management model used to for determining the magnitude of the impacts to traffic and mobility of associated with lane and/or intersection reconfigurations or closures, and the measures applied to address them.

**Traffic Control Device(s)** is a term used to describe any person, sign, signal, marking or device placed upon, over or adjacent to a roadway by or at the direction of a Relevant Authority or their designate, for the purpose of regulating, warning, guiding or informing a vehicle operator or pedestrian of an existing condition or hazard.

**Traffic Control Persons** means a person duly trained and authorized to direct traffic at a Work zone through the use of the Traffic Control Sign (STOP/SLOW Paddle).

**Traffic Control Plan** is a detailed plan for the control of traffic, including vehicular, cycling and pedestrian movements, required to allow Project Co to fulfill all conditions of the contract, taking into account the organized, systematic safe conduct of the Project, which includes detours, staging sequences, Work, public and emergency vehicle access and egress, public access and separation from hazardous areas, temporary barriers, removal of old pavement markings and signage, modification to curbside use, and the selection of appropriate traffic operation layouts and devices necessary for traffic control.

**Traffic Protection Plan** is a plan required by the OHS/A and its regulations for the protection of workers in a Work zone.

**Train** means a 2-car consist of Vehicles.

**Train Control** or **Train Control System** means a safety critical computer based control system for Vehicle identification, Vehicle location control and monitoring, maintaining safe headway between vehicles, Vehicle speed control, maintaining safe brake rates, Vehicle route selection and fleet management, interlocking control and power consumption optimization.

**Train Structures** means any structures (excluding Tunnels) that support any form of Train loading including but not limited to grade-supported slabs, elevated Train supports, foundations supporting Train loads, retaining walls supporting Train surcharges and other similar Structures.

**Train The Trainer** means the training program conducted by a Project Co employee(s) or contractor(s) that trains and certifies a City employee to serve as an OLRT Trainer.

**Transit Centre** means a facility and a stopping point for buses and other types of transit service where passengers using one type of transit service can transfer to another. For example, bus passengers can transfer to the OLRT at this location if the Transit Centre is combined with an OLRT Station.

**Transit Management Plan** is a sub-plan of the TTMP and has the meaning given in Schedule 15-2, Part 7.

**Transit Operations Control Centre or TOCC is the communications control center responsible for all dispatching, supervision, and monitoring of all functions within the OLRT System.**

**Transit Priority Lanes** is as defined by the City of Ottawa.

**Tree Mitigation Plan** means a plan to audit, monitor, protect, and preserve trees to comply with City regulations.

**Trial Running** means a twelve (12) consecutive day period that may commence upon the successful completion of testing and commissioning. Upon successful completion of trial running, the integrated system will be ready for revenue service.

**Trigger Level** means an instrumentation monitoring level unique to specific geotechnical instruments which, upon reaching, requires a review and verification of the instrumentation data.

**Tunnel** has the meaning given in Schedule 15-2, Part 3 Article 1 – Introduction.

**Undrained Structure (Tunnel)** means a Structure, or Tunnel, partly or fully below the groundwater table that is designed and constructed to allow the groundwater level to return to normal levels after construction.

**Urban Design Elements** means the elements of items covered in the Landscape Plan.

**Vehicle Location System** means an Onboard CBTC system to read tachometer pulses and wayside passive transponders for the purpose of determining vehicle location.

**Vital Microprocessor Interlocking System** means a vital microprocessor based system for controlling switches and signals at an interlocking. This system may also be known as a Computer Based Interlocking (CBI) controller.

**Yard Control Centre** means a facility within an MSF established to monitor and control yard and shop operations of train movements, video observation of maintenance functions, intrusion control, IAC security, and BMS system monitoring from one location.

**Zone of Influence** means the area within the subsurface and surface boundaries where Ground Movement arising from Project Co construction activities is expected to occur.



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**ARTICLE 2            ACRONYMS**

The Parties acknowledge that in so far as Schedule 15-3 – Maintenance Specification makes reference to standards or requirements within the Expanded Design and Construction Specifications in respect of the Stage 2 System and/or the Belfast MSF Expansion Works, any acronyms used within such specifications shall be understood by reference to the acronyms as defined therein, notwithstanding that such definitions may be different to those applicable to the acronyms set out below.

**AABC** means Associated Air Balance.

**AAMA** means American Architectural Manufacturers Association.

**AAR** means Association of American Railroads.

**AASHTO** means American Association of State Highway and Transportation Officials.

**ABS** means Acrylonitrile Butadiene Styrene.

**ACGIH** means American Conference of Governmental Industrial Hygienists.

**ACI** means American Concrete Institute.

**ADA** means *Americans with Disabilities Act*.

**AER** means Approval Exemption Regulation.

**AESS** means Architecturally Exposed Structural Steel.

**AFBMA** means Anti Friction Bearing Manufacturer's Association.

**AGMA** means American Gear Manufacturers Association.

**AHU** means Air Handling Unit.

**AIC** means Amp Interrupting Capacity.

**AISC** means American Institute of Steel Construction.

**AISI** means American Iron and Steel Institute.

**ALCTV** means Automotive Lifts – Safety Requirements for Construction, Testing and Validation.

**ALI** means Automotive Lift Institute.

**AMCA** means Air Movement and Control Association.

**AMS** means Aerospace Material Specifications.



**ANSI** means American National Standards Institute.

**AODA** means *Accessibility for Ontarians with Disabilities Act*.

**AP** means Access Point.

**APC** means Automatic Passenger Counting.

**APTA** means American Public Transportation Association.

**AREMA** means American Railway Engineering Maintenance-of-Way Association.

**ARI** means Air-conditioning and Refrigeration Institute.

**ASCE** means American Society of Civil Engineers.

**ASHRAE** means American Society of Heating, Refrigerating and Air-Conditioning Engineers.

**ASJ** means All Service Jacket.

**ASME** means American Society of Mechanical Engineers.

**ASPE** means American Society of Plumbing Engineers.

**ASSE** means American Society of Safety Engineers.

**ASTM** means American Standards for Testing and Materials.

**ATC** means Automatic Train Control.

**ATO** means Automatic Train Operation.

**ATOR** means Above Top of Rail.

**ATP** means Automatic Train Protection.

**ATS** means Automatic Train Supervision or Automatic Transfer Switch.

**AWG** means American Wire Gauge.

**AWI** means Architectural Woodworking Institute.

**AWMAC** means Architectural Woodwork Manufacturers Association of Canada.

**AWS** means American Welding Society.

**AWS BRH** means American Welding Society Brazing Handbook.

**AWS WHB** means American Welding Society Welding Handbook.

**AWWA** means American Water Works Association.

**BAS** means Building Automatic System.

**BCC** means Back-up Control Centre.

**BMS** means Building Management System.

**BRT** means Bus Rapid Transit.

**BSS** means British Standards Society.

**BWA** means Balance Weight Assembly.

**CADD** means computer aided design drafting.

**CBC** means Canadian Broadcasting Corporation.

**CBI** means Computer Based Interlocking.

**CBTC** means Communication Based Train Control.

**CCIP** means Cement and Concrete Industry Publications.

**CCOHS** means Canadian Centre for Occupational Health and Safety.

**CCTV** means Closed Circuit Television System.

**CDED** means Contract Design Estimating and Documentation.

**CEAA** means Canadian Environmental Assessment Agency.

**CEC** means Canadian Electrical Code.

**CFC** means Chlorofluorocarbon.

**CFR** means Code of Federal Regulations.

**CGC** means Canadian Gypsum Company.

**CGSB** means Canadian General Standards Board.

**CGVD** means Canadian Geodetic Vertical Datum.

**CHBDC** means Canadian Highway Bridge Design Code. [(CHBDC) CAN/CSA S6-06.]

**CIAR** means Construction Impact Assessment Report.

**CIH** means Central Instrument Houses.

**CISC** means Canadian Institute of Steel Construction.

**CISCA** means Ceilings and Interior Systems Construction Association.

**CMAA** means Crane Manufacturers Association of America.

**CNC** means Computerized Numeric Control.

**CNLA** means Canadian Nursery Landscape Association.

**COMAP** means City of Ottawa Municipal Accessibility Plan.

**CPCI** means Canadian Precast/Prestressed Concrete Institute.

**CPMA** means Color Pigments Manufacturers Association, Inc.

**CPR** means Cardiopulmonary Resuscitation or Canadian Pacific Railway.

**CPTED** means Crime Prevention through Environmental Design.

**CPVC** means chlorinated polyvinyl chloride.

**CQ** means Commercial Quality.

**CRAC** means Computer Room Air Conditioning.

**CRCA** means Canadian Roofing Contractors Association.

**CRTC** means Canada Radio-Television and Telecommunications Commission Regulations.

**CSA** means Canadian Standards Association.

**CSO** means combined sewer overflow.

**CSRS** means Canadian Spatial Reference System.

**CSSBI** means Canadian Sheet Steel Building Institute.

**CSST** means combined sewage storage tunnel.

**CTS** means Communications Transmission System.

**CWB** means Canadian Welding Bureau.

**CWR** means continuous welded rail.

**DAQ** means Delivered Audio Quality.

**DFF** means Direct Fixation Fastener.

**DFO** means Fisheries and Oceans Canada.

**DOT** means U.S. Department of Transportation.

**DOTT** means Downtown Ottawa Transit Tunnel.

**DOUDS** means Downtown Ottawa Urban Design Strategy.

**DSD** means Decision Sight Distance.

**DWA** means Designated Waiting Area.

**DX** means Direct Expansion.

**E&M** means Electrical and Mechanical.

**EA** means Environmental Assessment.

**EGFP** means equipment ground fault protection.

**EHU** means Electro Hydraulic Unit.

**EIA** means U.S. Energy Information Administration.

**EIFS** means Exterior Insulation Finishing System.

**EMC** means Electromagnetic Compatibility.

**EMI** means electromagnetic interference.

**EMO** means Emergency Management Ontario.

**EMS** means Emergency Medical Services.

**EPDM** means ethylene propylene diene monomer.

**ERP** means Emergency Response Plan.

**ESA** means Electrical Standards Association or Electrical Safety Authority.

**ETL** means extract, transform, load.

**FAI** means First Article Inspection.

**FAT** means Factory Acceptance Testing

**FBCU** means Friction Brake Control Unit.

**FCC** means U.S. Federal Communications Commission.

**FEA** means Finite Element Analysis.

**FHWA** means Federal Highway Administration.

**FIFO** means First In, First Out.

**FLS** means fire life safety.

**FLSSC** means Fire Life Safety and Security Committee.

**FLUA** means Federal Land Use Approval.

**FMEA** means Failure Mode and Effects Analysis.

**FMECA** means Failure Mode, Effect, and Criticality Analysis.

**FMS** means Facility Management System.

**FRA** means Federal Railroad Administration.

**FRP** means fibre reinforced plastic.

**FSK** means Foil-Scrim-Kraft.

**FTA** means Federal Transit Administration.

**FTMS** means Freeway Traffic Management System.

**GANA** means Glass Association of North America.

**GBC** means Green Building Council.

**GFI** means Ground Fault Interrupter.

**GFRP** means glass fibre reinforced polymer.

**GUI** means Graphic User Interface.

**HCFC** means hydrochlorofluorocarbon.

**HCL** means Horizontal Control Line.

**HDMI** means High-Definition Multimedia Interface.

**HFC** means hydrofluorocarbon.

**HMI** means Hoist Manufacturers Institute or Human Machine Interface

**HOL** means Hydro Ottawa Limited.

**HPPL** means High Performance Photo Luminescent.

**HSCB** means High Speed Circuit Breaker.

**HSLA** means High Strength, Low Alloy.

**HTM** means Hazard Tracking Matrix.

**HVAC** means Heating, Ventilation and Air Conditioning.

**IAC** means Intrusion Access Control.

**IAQ** means Indoor Air Quality.

**IBC** means International Building Code.

**ICEA** means Insulated Cable Engineers Association.

**IEC** means International Electrotechnical Commission.

**IEEE** means Institute of Electrical and Electronics Engineers.

**IESNA** means Illuminating Engineering Society of North America.

**IGBT** means insulated gate bipolar transistor.

**IGMAC** means Insulating Glass Manufacturer's Association of Canada.

**ILI** means Indiana Limestone Institute of America, Inc.

**IP** means internet protocol.

**ISD** means Intersection Sight Distance.

**ISFP** means City of Ottawa Integrated Street Furniture Policy and Design Guidelines.

**ISO** means International Standards Organization.

**ITA** means International Tunnelling Association.

**LAN** means Local Area Network.

**LED** means light emitting diode.

**LEED** means Leadership in Energy and Environmental Design.

**LKI** means Landmark Kilometre Inventory.

**LLEPM** means Low Location [or level – in vehicles] Exit Path Marking.



**LOS** means Level of Service.

**LRT** means Light Rail Transit.

**LRU** means Line Replaceable Unit

**LRV** means Light Rail Vehicle.

**LV** means low voltage.

**LVC** means length of vertical curve.

**LVPS** means Low Voltage Power Supply.

**M&R** means maintenance and rehabilitation.

**MCBCF** means Mean Cycles Between Component Failure.

**MCC** means Motor Control Centre.

**MCR** means Main Communications Room.

**MDE** means Maximum Design Earthquake.

**MERV** means Minimum Efficiency Reporting Value.

**MHIA** means Materials Handling Industry of America.

**MIL** means U.S Military Standard.

**MNECB** means Model National Energy Code for Buildings.

**MNR** means Ontario Ministry of Natural Resources.

**MOE** means Ontario Ministry of the Environment.

**MOL** means Ministry of Labour.

**MPA** means mid-point anchor.

**MPI** means Magnetic Particle Inspection.

**MSE** means Mechanically Stabilized Earth.

**MSF** means Maintenance and Storage Facility.

**MSHA** means Mine Safety and Health Administration.

**MTBF** means Mean Time Between Failures.

**MTM** means Modified Transverse Mercator.

**MTO** means Ontario Ministry of Transportation.

**MTTR** means Mean Time To Repair.

**MUP** means Multi-Use Pathway.

**MUTCD** means Manual for Uniform Traffic Control Device.

**MV** means medium voltage

**MVB** means Multifunctional Vehicle Bus.

**NAC** means National Arts Centre.

**NAD** means North American Datum.

**NB** means northbound.

**NBC** means National Building Code of Canada.

**NC** means Noise Level Criteria.

**NCC** means National Capital Commission.

**NCMA** means National Concrete Masonry Association.

**NEBB** means National Environmental Balancing Bureau.

**NEC** means National Electrical Code.

**NECA** means National Electrical Contractors Association.

**NEMA** means National Electrical Manufacturer's Association.

**NESC** means National Electrical and Safety Code.

**NETA** means InterNational Electrical Testing Association.

**NFC** means National Fire Code.

**NFCC** means National Fire Code of Canada.

**NFPA** means National Fire Protection Association.

**NFRC** means National Fenestration Rating Council.

**NGD** means negative grounding device.

**NHI** means National Highway Institute.

**NMS** means Network Management System.

**NPA** means National Particleboard Association.

**NPCC** means National Plumbing Code of Canada.

**NPS** means nominal pipe size.

**NRCA** means National Roofing Contractors Association.

**NRCan** means National Resources Canada.

**NSF** means National Sanitation Foundation.

**NVR** means Network Video Recorder.

**OBC** means Ontario Building Code.

**OBCN** means On Board Communications Network.

**OCDR** means Overhead Coiling Door.

**OCP** means Ottawa Cycling Plan.

**OCS** means Overhead Catenary System.

**ODE** means Operating Design Earthquake.

**OEC** means Ontario Electrical Code.

**OESC** means Ontario Electrical Safety Code.

**OFC** means Ontario Fire Code.

**OHSA** means the *Occupational Health and Safety Act* (Ontario).

**OLRT** means Ottawa Light Rail Transit.

**OM&R** means Operation, Maintenance and Repair.

**OMNR** means Ontario Ministry of Natural Resources.

**ONVIF** means Open Network Video Interface Forum.

**OP** means Ottawa Official Plan.

**OPCA** means Ontario Painting Contractors Association.

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**OPP** means Ontario Provincial Police.

**OPS** means Ontario Provincial Standard.

**OPSD** means Ontario Provincial Standard Drawings.

**OPSS** means Ontario Provincial Standard Specifications.

**OR** means Ottawa Road.

**OSIM** means Ontario Structure Inspection Manual.

**OSIMS** means Ontario Structure Inspection Management Systems.

**OSTC** means Ottawa Seniors Transportation Committee.

**OTM** means Ontario Traffic Manual.

**OWS** means Operation Work Station or oil water separator.

**PA** means Public Address.

**PBX** means Private Branch Exchange.

**PC** means personal computer.

**PCB** means polychlorinated biphenyl.

**PCC** means Precast Concrete.

**PDI** means Plumbing and Drainage Institute.

**PEI** means Passenger Emergency Intercom.

**PEO** means Professional Engineers of Ontario.

**PERP** means Ontario Provincial Emergency Response Plan.

**PGFP** means personal ground fault protection.

**PHA** means Preliminary Hazard Analysis.

**PHL** means Preliminary Hazard List.

**PIDS** means Passenger Information Display Systems.

**PIN** means Property Identification Number.

**PIV** means Peak Inverse Voltage.

**PLC** means Programmable Logic Controller.

**PPHPD** means passenger per hour per direction.

**PPUDO** means passenger pick up and drop off area.

**PRP** means Property Request Plan.

**PSR** means Public Safety Radio.

**PTAC** means Pedestrian and Transit Advisory Committee.

**PTI** means Post-Tensioning Institute.

**PTTW** means Permit to Take Water.

**PTU** means Portable Test Unit.

**PTZ** means Pan Tilt Zoom.

**PVB** means polyvinyl butyral.

**PVC** means polyvinyl chloride.

**PVDF** means polyvinylidene fluoride.

**PVMS** means Portable Variable Message Sign.

**PWGSC** means Public Works and Government Services Canada.

**QC** means Quality Control.

**QMP** means Quality Management Plan.

**RAM** means reliability, availability and maintainability.

**RAMS** means reliability, availability, maintainability and safety.

**RCAC** means Roads and Cycling Advisory Committee.

**RETC** means Rapid Excavation and Tunneling Conference.

**RFID** means Radio Frequency Identification.

**RH** means relative humidity.

**RMS** means root mean square.

**ROW** means right-of-way.



**RP** means Regional Priority.

**RSA** means Rideau Street Alignment.

**RSS** means Retained Soil System.

**RTU** means remote terminal units.

**RVCA** means Rideau Valley Conservation Authority.

**RWIG** means Retaining Wall Inspection Guidelines.

**SAT** means Site Acceptance Testing

**SAE** means Society of Automotive Engineers.

**SB** means southbound.

**SCADA** means Supervisory Control and Data Acquisition.

**SCAT** means Simple Catenary Auto Tension System.

**SCFT** means Simple Catenary Fixed Termination System.

**SCIL** means Safety Critical Items List.

**SCR** means Silicon Controlled Rectifier.

**SEM** means Sequential Excavation Method.

**SHL** means System Hazard List.

**SIA** means Security Industry Association.

**SINAD** means Signal to Noise and Distortion ratio.

**SLS** means Serviceability Limit State.

**SMACNA** means Sheet Metal and Air-conditioning Contractors' National Association.

**SMP** means Safety Management Plan.

**SOP** means standard operating practice.

**SPCC** means Spill Prevention Control and Countermeasures.

**SRA** means Safety Risk Assessment

**SSCP** means Safety and Security Certification Plan.

**SSCRT** means Safety and Security Certification Review Team.

**SSD** means Stopping Sight Distance.

**SSHL** means Subsystem Hazard List.

**SSPC** means Society for Protective Coatings.

**STO** means Société de transport de l'Outaouais.

**SWGR** means switch gear.

**SWM** means stormwater management.

**SWMP** means Stormwater Management Practice.

**T&DI** means Transportation and Development Institute.

**TAC** means Transportation Association of Canada.

**TBM** means Tunnel Boring Machine.

**TC** means Transport Canada.

**TCD** means Traffic Control Device.

**TCP** means Traffic Control Plan or Traffic Control Person or Transmission Control Protocol.

**TCRP** means Transit Cooperative Research Program.

**TCU** means Traction Control Unit.

**TDS** means Train Display Screen.

**TFT** means Trolley Fixed Termination System or thin-filmed transistor.

**TIAC** means Thermal Insulation Association of Canada.

**TLV** means Threshold Limit Value.

**TOCC** means Transit Operations Control Centre.

**TOD** means Ottawa Transit-Oriented Development Guidelines.

**TOR** means Top of Rail.

**TPRU** means Traction Power Rectifier Unit.

**TPSS** means Traction Power Substation.

**TSS** means total suspended solids.

**TTMP** means Traffic and Transit Management Plan.

**TVA** means Threat and Vulnerability Analysis.

**UAD** means Urban Arterial Divided.

**UAU** means Urban Arterial Undivided.

**UCC means Utility Coordinating Committee**

**UCU** means Urban Collector Undivided.

**UHF** means Ultra High Frequency.

**UL** means Underwriter's Laboratories, Inc.

**ULC** means Underwriter's Laboratories of Canada.

**ULS** means Ultimate Limit State

**ULU** means Urban Local Undivided.

**UNESCO** means United Nations Educational, Scientific and Cultural Organization.

**UPS** means uninterruptible power supply.

**UTS** means Ultimate Tensile Strength.

**UVA** means Ultraviolet Light Absorbers.

**VAV** means Variable Air Volume.

**VCU** means Vehicle Control Unit.

**VFD** means Variable-Frequency Drive.

**VLS** means Vehicle Location System.

**VMIS** means Vital Microprocessor Interlocking System.

**VMS** means Vehicle Monitoring System or variable message sign.

**VMU** means Vehicle Monitoring Unit.

**VOC** means volatile organic compound.

**VoIP** means Voice over Internet Protocol.

**WAN** means Wide Area Network.

**WSD** means Working Stress Design.

**WTB** means Wire Train Bus.

**YCC** means Yard Control Centre.

**ARTICLE 3 REFERENCE DOCUMENTS**

The Parties acknowledge that in so far as Schedule 15-3 – Maintenance Specification makes reference to standards or requirements within the Expanded Design and Construction Specifications in respect of the Stage 2 System and/or the Belfast MSF Expansion Works, any reference documents specified within such specifications shall be understood by reference to the reference documents referred to therein, notwithstanding that such reference documents may be different to the reference documents set out below.

| <b>Reference Documents in Schedule 15</b>                   | <b>Description of Reference Documents</b>  |
|---|--|
| 14 CFR 25.853   | Code of Federal Regulations, Title 14: Aeronautics and Space; Part 25.853 – Compartment Interiors                                    |
| 29 CFR 1910.19  | Code of Federal Regulations, Title 29: Labor; Part 1910.19 – Special Provisions for Air Contaminants                                 |
| 40 CFR 82   | Code of Federal Regulations, Title 40: Protection of Environment; Part 82 – Protection of Stratosphere Ozone                         |
| 49 CFR 223  | Code of Federal Regulations, Title 49: Transportation; Part 223 – Safety Glazing Standards - Locomotives, Passenger Cars and Caboose |
| 49 CFR Part 238   | Code of Federal Regulations, Title 49: Transportation; Part 238 – Passenger Equipment Safety Standards                               |
| AAMA 611  | AAMA 611 Voluntary Specification for Anodized Architectural Aluminum   |
| AAMA 620  | AAMA 620 Voluntary Specification for High Performance Organic Coatings on Coil Coated Architectural Aluminum                         |
| AAMA Aluminum Curtain Wall Design Guide Manual (CW-DG-1-96) | American Architectural Manufacturers Association (AAMA)  |
| AAR M-101   | AAR M-101 Carbon Steel Axles   |
| AAR Manual of Standards and Recommended Practices           | Association of American Railroads (AAR)  |
| AAR RP-585  | AAR RP-585 Wiring and Cable Specification  |
| AAR S-501   | AAR S-501 Specification for Wire and Cables  |
| AASHTO Guide for the Design of Pavement                     | American Association of State Highway and  |



| Reference Documents in Schedule 15   | Description of Reference Documents   |
|--|--|
| Structures   | Transportation Officials (AASHTO), 1993  |
| AASHTO Guide Specifications for Design and Construction of Segmental Concrete Bridges      |  |
| AASHTO Guide Specifications for Horizontally Curved Highway Bridges                        |  |
| AASHTO Guide Specifications for Strength Evaluation of Existing Steel and Concrete Bridges |  |
| AASHTO Guide Specifications for Structural Design of Sound Barriers                        |  |
| AASHTO Guide Specifications – Thermal Effects in Concrete Bridge Structures                |  |
| AASHTO Manual for Condition Evaluation of Bridges  |  |
| ACI 201.2R   | ACI 201.2R Guide to Durable Concrete   |
| ACI 358.1  | ACI 358.1 Analysis and Design of Reinforced and Prestressed – Concrete Guideway Structures |
| ACI 360R   | ACI 360R Design of Slabs on Grade  |
| ACI 365  | ACI 365 Service Life Prediction  |
| ACI Publication 201.2R   | ACI Publication 201.2R Guide to Durable Concrete   |
| ACI Publication 222R   | ACI Publication 222R Protection of Metals in Concrete Against Corrosion                    |
| ACI Publication 506.2  | ACI Publication 506.2 Below Grade Shotcrete Used as Permanent Support                      |
| ACI Publication SP-77  | ACI Publication SP-77 Sulphate Resistance of Concrete                                      |
| <i>Accessibility for Ontarians with Disabilities Act (AODA)</i>                            |  |
| AESS Supplement  | Modern Steel Construction, May 2003  |
| AISC Code of Standard Practice for Steel Buildings and Bridges                             | American Institute of Steel Construction (AISC), March 2005                                |
| AISC Design Guide Series 9   | AISC Design Guide Series 9 – Torsional Analysis of Structural Steel Members                |
| AISI/ASTM A167   | AISI/ASTM A167 Stainless and Heat-Resisting  |

| Reference Documents in Schedule 15                    | Description of Reference Documents   |
|---|--|
| Alberta Transportation Highway Geometric Design Guide | Chromium-Nickel Steel Plate, Sheet, and Strip  |
| <i>Americans with Disabilities Act (ADA)</i>          | Alberta Transportation Highway Geometric Design Guide, January 2004  |
| AMCA Standard 210                                     | Air Movement and Control Association International (AMCA) Standard 210, "Laboratory Methods of Testing Fans for Rating Purposes" |
| AMCA Standard 300                                     | AMCA Standard 300, "Test Code for Sound Rating Air Moving Devices"   |
| AMCA Standard 301                                     | AMCA Standard 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data"   |
| AMCA Standard 500-L                                   | AMCA Standard 500-L Laboratory Methods of Testing Louvers for Rating   |
| AMS 5050 E  | AMS 5050 E Steel Tubing, Seamless, 0.15 Carbon, Maximum, Annealed  |
| ANSI/ALI ALCTV-2006                                   | ANSI/ALI ALCTV-2006 Safety Requirements for the Installation and Service of Automotive Lifts                                     |
| ANSI/ASCE/T&DI 21                                     | ANSI/ASCE/T&DI 21 Automated People Mover Standards – Parts 1-4   |
| ANSI/ASHRAE 135                                       | ANSI/ASHRAE 135 BACnet A Data Communication Protocol for Building Automation and Control Networks                                |
| ANSI/AWWA C105  | ANSI/AWWA C105 Polyethylene Encasement for Ductile-Iron Pipe Systems   |
| ANSI/IEEE 515.1                                       | ANSI/IEEE 515.1 Testing, Design, Installation, and Maintenance of Electrical Resistance Heat Tracing for Commercial Applications |
| ANSI/IESNA RP-22                                      | ANSI/IESNA RP-22 Tunnel Lighting   |
| ANSI/SIA A92  | ANSI/SIA A92 Elevating and Vehicle Lift Devices  |
| ANSI B1.20.1  | ANSI B1.20.1 Pipe Threads, General Purpose (Inch)  |
| ANSI C34.2  | ANSI C34.2 Semiconductor Power Rectifiers  |
| ANSI C37  | ANSI C37 Low Voltage Power Circuit Breaker   |
| ANSI C57  | ANSI C57 Power Transformers  |

| Reference Documents in Schedule 15  | Description of Reference Documents   |
|---|--|
| ANSI Z26.1  | ANSI Z26.1 Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways  |
| ANSI Z97.1  | ANSI Z97.1 Safety Glazing Materials Used in Buildings  |
| ANSI Z358.1   | ANSI Z358.1 Emergency Eyewash and Shower Equipment   |
| An Urban Design Strategy for Sussex Dr., Rideau St. and Colonel By                    |  |
| APTA Guidelines for the Design of Rapid Transit Facilities                            | American Public Transportation Association, 1981   |
| APTA Heavy Duty Escalator Design Guideline  | American Public Transportation Association (APTA)  |
| APTA Manual for the Development of System Safety Program Plans for Commuter Railroads | American Public Transportation Association; Commuter Rail Safety Management Program, May 2006  |
| APTA RP-E-002   | APTA RP-E-002 Wiring of Passenger Equipment  |
| APTA RP-E-004   | APTA RP-E-004 Gap and Creepage Distance  |
| APTA RP-E-007   | APTA RP-E-007 Storage Batteries and Battery Compartments   |
| APTA RP-E-009   | APTA RP-E-009  |
| APTA RP-M-001   | APTA RP-M-001 Air Connections, Location and Configuration of, for Passenger Cars Equipped with AAR Long Shank Tight Lock or Similar Long Shank Type Couplers |
| APTA RP-M-009   | APTA RP-M-009 New Truck Design   |
| APTA SS-C&S-004   | APTA SS-C&S-004 Austenitic Stainless Steel for Railroad Passenger Equipment  |
| APTA SS-C&S-015   | APTA SS-C&S-015 Aluminum and Aluminum Alloys for Passenger Equipment Car Body Construction   |
| APTA SS-E-005   | APTA SS-E-005 Grounding and Bonding  |
| APTA SS-E-013   | APTA SS-E-013 Emergency Lighting System Design for Passenger Cars  |
| APTA SS-M-015-06  | APTA SS-M-015-06 Wheel Flange Angle for Passenger Equipment  |

| Reference Documents in Schedule 15   | Description of Reference Documents   |
|--|--|
| APTA SS-PS-004   | APTA SS-PS-004 Low-Location Exit Path Marking  |
| AREMA Communications and Signal Manual   | AREMA  |
| AREMA Manual For Railway Engineering, Volume 2, Chapter 28, Temporary Structure for Construction | AREMA  |
| ASCE Guidelines for Tunnel Lining Design,  | ASCE Technical Committee on Tunnel Lining Design, edited by T. O'Rourke, 1984  |
| ASHRAE 52.2  | ASHRAE 52.2 Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size                         |
| ASHRAE 55  | ASHRAE 55 – Thermal Environmental Conditions for Human Occupancy, 2010 Edition.  |
| ASHRAE 62.1  | ASHRAE 62.1 – Ventilation for Acceptable Indoor Air Quality  |
| ASHRAE 90.1  | ASHRAE 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings – permitted for construction after December 31, 2011 |
| ASHRAE 189.1   | ASHRAE 189.1 – Design of High-Performance, Green Buildings   |
| ASHRAE Handbook  | HVAC Applications, Division 13, “Enclosed Vehicular Facilities”, 2007  |
| ASME/ANSI B16.3  | ASME/ANSI B16.3 Malleable Iron Threaded Fittings   |
| ASME/ANSI B16.5  | ASME/ANSI B16.5 Pipe Flanges and Flanged Fittings  |
| ASME/ANSI B16.22   | ASME/ANSI B16.22 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings  |
| ASME A17.1   | ASME A17.1 Safety Code for Elevators and Escalators  |
| ASME A112.19.2 / CSA B45.1   | ASME A112.19.2 / CSA B45.1 Ceramic Plumbing Fixtures   |
| ASME B30.2   | ASME B30.2 Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)                       |

| <b>Reference Documents in Schedule 15</b> | <b>Description of Reference Documents</b>  |
|---|--|
| ASME B30.10                               | ASME B30.10 Hooks  |
| ASME 30.11                                | ASME 30.11 Monorails and Underhung Cranes  |
| ASME B30.16                               | ASME B30.16 Overhead Joists (Underhung)  |
| ASME B31.1                                | ASME B31.1 Power Piping  |
| ASME B31.5                                | ASME B31.5 Refrigeration Piping and Heat Transfer Components   |
| ASME RT-1                                 | ASME RT-1 Safety Standard for Structural Requirements for Light Rail Vehicles  |
| ASSE 1052                                 | ASSE 1052 Performance Requirements for Hose Connection Backflow Preventers   |
| ASTM A1                                   | ASTM A1 Carbon Steel Tee Rails   |
| ASTM A6                                   | ASTM A6 General Requirements for Rolled Structural Steel Bars, Plates, Shapes and Sheet Piling   |
| ASTM A53                                  | ASTM A53 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless   |
| ASTM A82 / A82M                           | ASTM A82 / A82M Steel Wire, Plain for Concrete Reinforcement   |
| ASTM A105                                 | ASTM A105 Carbon Steel Forgings for Piping Applications  |
| ASTM A106                                 | ASTM A106 Seamless Carbon Steel Pipe for High-Temperature Service  |
| ASTM A123                                 | ASTM A123 Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products  |
| ASTM A153M-03c                            | ASTM A153M-00 Zinc Coating (Hot Dip) on Iron and Steel Hardware  |
| ASTM A167                                 | ASTM A167 Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip   |
| ASTM A185                                 | ASTM A185 Steel Welded Wire Reinforcement, Plain, for Concrete   |
| ASTM A193                                 | ASTM A193 Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications |
| ASTM A197                                 | ASTM A197 Cupola Malleable Iron  |
| ASTM A234                                 | ASTM A234 Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High  |



| Reference Documents in Schedule 15 | Description of Reference Documents   |
|------------------------------------|--|
| ASTM A240                          | Temperature Service<br>ASTM A240 Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications |
| ASTM A269                          | ASTM A269 Seamless and Welded Austenitic Stainless steel Tubing for General Service  |
| ASTM A276-04                       | ASTM A276-04 Stainless Steel Bars and Shapes   |
| ASTM A307                          | ASTM A307 Carbon Steel Bolts and Studs   |
| ASTM A325M                         | ASTM A325M Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength   |
| ASTM A416/416M-06                  | ASTM A416/416M-06 Steel Strand, Uncoated Seven-Wire for Prestressed Concrete   |
| ASTM A421/421M-05                  | ASTM A421/421M-05 Uncoated Stress-Relieved Steel Wire for Prestressed Concrete   |
| ASTM A496/A496M                    | ASTM A496/A496M Steel Wire, Deformed for Concrete Reinforcement  |
| ASTM A497/A497M                    | ASTM A497/A497M Steel Welded Wire Reinforcement, Deformed, for Concrete  |
| ASTM A515                          | ASTM A515 Pressure Vessel Plates, Carbon Steel, for Intermediate- and Higher-Temperature Service   |
| ASTM A516                          | ASTM A516 Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower Temperature Service  |
| ASTM A563                          | ASTM A563 Carbon and Alloy Steel Nuts  |
| ASTM A568                          | ASTM A568 General Requirements for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled                          |
| ASTM A588                          | ASTM A588 High-Strength Low-Alloy Structural Steel   |
| ASTM A606                          | ASTM A606 Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance                 |
| ASTM A653/A653M                    | ASTM A653/A653M Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process                                  |

| Reference Documents in Schedule 15 | Description of Reference Documents   |
|------------------------------------|--|
| ASTM A666                          | ASTM A666 Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar  |
| ASTM A775/A775M                    | ASTM A775/A775M Epoxy Coated Reinforcing Steel Bars  |
| ASTM B33                           | ASTM B33 Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes                       |
| ASTM B209                          | ASTM B209 Aluminum and Aluminum Alloy Sheet and Plate  |
| ASTM B221                          | ASTM B221 Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wires, Profiles and Tubes           |
| ASTM B280                          | ASTM B280 Seamless Copper Tube for Air Conditioning and Refrigeration Field Service            |
| ASTM B584                          | ASTM B584 Copper Alloy Sand Castings for General Applications                                  |
| ASTM C67                           | ASTM C67 Sampling and Testing Brick and Structural Clay Tile                                   |
| ASTM C260                          | ASTM C260 Air-Entraining Admixtures for Concrete   |
| ASTM C452-75                       | ASTM C452-75 Potential Expansion of Portland-Cement Mortars Exposed to Sulfate                 |
| ASTM C494/C494M                    | ASTM C494/C494M Standard Specification for Chemical Admixtures for Concrete                    |
| ASTM C507-95a                      | ASTM C507-95a Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe               |
| ASTM C534                          | ASTM C534 Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form |
| ASTM C542                          | ASTM C542 Lock-Strip Gaskets   |
| ASTM C547                          | ASTM C547 Mineral Fiber Pipe Insulation  |
| ASTM C553                          | ASTM C553 Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications  |
| ASTM C568                          | ASTM C568 Limestone Dimension Stone  |
| ASTM C612                          | ASTM C612 Mineral Fiber Block and Board Thermal Insulation                                     |
| ASTM C615                          | ASTM C615 Granite Dimension Stone  |

| Reference Documents in Schedule 15 | Description of Reference Documents  |
|------------------------------------|---|
| ASTM C716                          | ASTM C716 Installing Lock-Strip Gaskets and Infill Glazing Materials                                      |
| ASTM C864                          | ASTM C864 Dense Elastomeric Compression Seal Gaskets, Setting Blocks and Spacers                          |
| ASTM C881/C881M                    | ASTM C881/C881M Epoxy-Resin-Base Bonding Systems for Concrete   |
| ASTM C936                          | ASTM C936 Solid Concrete Interlocking Paving Units  |
| ASTM C1017/C1017M                  | ASTM C1017/C1017M Chemical Admixtures for Use in Producing Flowing Concrete                               |
| ASTM C1026                         | ASTM C1026 Measuring the Resistance of Ceramic Tile to Freeze-Thaw Cycling                                |
| ASTM C1036                         | ASTM C1036 Flat Glass   |
| ASTM C1048                         | ASTM C1048 Heat-Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated Glass                             |
| ASTM C1059/C1059M                  | ASTM C1059/C1059M Latex Agents for Bonding Fresh to Hardened Concrete                                     |
| ASTM C1166                         | ASTM C1166 Lock-Strip Gaskets   |
| ASTM C1172                         | ASTM C1172 Laminated Architectural Flat Glass   |
| ASTM C1184                         | ASTM C1184 Structural Silicone Sealants   |
| ASTM C1242                         | ASTM C1242 Selection, Design and Installation of Dimension Stone Attachment Systems                       |
| ASTM D395                          | ASTM D395 Rubber Property – Compression Set   |
| ASTM D422-63                       | ASTM D422-63 Particle-Size Analysis of Soils  |
| ASTM D516                          | ASTM D516 Sulfate Ion in Water  |
| ASTM D695                          | ASTM D695 Compressive Properties of Rigid Plastics  |
| ASTM D790                          | ASTM D790 Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials |
| ASTM D2240                         | ASTM D2240 Rubber Property – Durometer Hardness   |
| ASTM D2850-95                      | ASTM D2850-95 Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils                        |

| Reference Documents in Schedule 15 | Description of Reference Documents   |
|------------------------------------|--|
| ASTM D2922                         | ASTM D2922 Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)  |
| ASTM D3222                         | ASTM D3222 Unmodified Poly(Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials   |
| ASTM D3675                         | ASTM D3675 Surface Flammability of Flexible Cellular Materials Using a Radiant Heat Energy Source  |
| ASTM D4976                         | ASTM D4976 Polyethylene Plastics Molding and Extrusion Materials   |
| ASTM D5856-95                      | ASTM D5856-95 Water in Petroleum Products and Bituminous Materials by Distillation   |
| ASTM E84                           | ASTM E84 Surface Burning Characteristics of Building Materials   |
| ASTM E90                           | ASTM E90 Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements  |
| ASTM E119                          | ASTM E119 Fire Tests of Building Construction and Materials  |
| ASTM E162                          | ASTM E162 Surface Flammability of Materials Using a Radiant Heat Energy Source   |
| ASTM E283-04                       | ASTM E283-04 Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen |
| ASTM E330                          | ASTM E330 Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls   |
| ASTM E331                          | ASTM E331 Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference                            |
| ASTM E648                          | ASTM E648 Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source   |
| ASTM E662                          | ASTM E662 Specific Optical Density of Smoke Generated by Solid Material  |
| ASTM E1332                         | ASTM E1332 Rating Outdoor-Indoor Sound Attenuation   |

| <b>Reference Documents in Schedule 15</b> | <b>Description of Reference Documents</b>  |
|---|--|
| ASTM F436                                 | ASTM F436 Standard Specification for Hardened Steel Washers  |
| ASTM F519                                 | ASTM F519 Mechanical Hydrogen Embrittlement Evaluation of Plating/Coating Processes and Service Environments |
| ASTM F593                                 | ASTM F593 Stainless Steel Bolts, Hex Cap Screws and Studs  |
| ASTM F738M                                | ASTM F738M Stainless Steel Metric Bolts, Screws, and Studs   |
| ASTM F836M                                | ASTM F836M Style 1 Stainless Steel Metric Nuts   |
| ASTM G51                                  | ASTM G51 Measuring pH of Soil for Use in Corrosion Testing   |
| ASTM G57                                  | ASTM G57 Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method                        |
| AWMAC                                     | Quality Standards for Architectural Woodwork   |
| AWS A5.0                                  | AWS A5.0 Filter Metal Procurement Guidelines   |
| AWS BRH                                   | AWS BRH American Welding Society Brazing Handbook  |
| AWS C1.1                                  | AWS C1.1 Resistance Welding  |
| AWS D1.1                                  | AWS D1.1 Structural Welding Code – Steel   |
| AWS D1.2                                  | AWS D1.2 Structural Welding Code – Aluminum  |
| AWS D1.3                                  | AWS D1.3 Structural Welding Code – Sheet Steel   |
| AWS D1.6                                  | AWS D1.6 Structural Welding Code – Stainless Steel   |
| AWS D14.1                                 | AWS D14.1 Welding of Industrial and Mill Cranes and Other Material Handling Equipment                        |
| AWS D15.1                                 | AWS D15.1 Railroad Welding Specification – Cars and Locomotives  |
| AWS WHB                                   | AWS WHB American Welding Society Welding Handbook  |
| Bayview/Somerset Area Secondary Plan      |  |
| BSS-7239                                  | BSS-7239 Test Method for Toxic Gas   |



| Reference Documents in Schedule 15               | Description of Reference Documents   |
|--|--|
| Canada's Capital Core Area Sector Plan           | Generation by Materials on Combustion  |
| Canadian Transportation Agency                   | Code of Practice, Passenger Terminal Accessibility   |
| Canadian Transportation Agency                   | Code of Practice, Passenger Rail Car Accessibility and Terms and Conditions of Carriage by Rail of Persons with Disabilities |
| Canadian Transportation Agency                   | Code of Practice, Removing Communication Barriers for Travelers with Disabilities  |
| Canadian Transportation Agency<br>CAN/CGSB 1.181 | Code of Practice, Intercity Bus<br>CAN/CGSB 1.181 Ready-Mixed Organic Zinc-Rich Coating                                      |
| CAN/CGSB 12.1-M                                  | CAN/CGSB 12.1-M, Tempered or Laminated Safety Glass  |
| CAN/CGSB 12.11-M                                 | CAN/CGSB 12.11-M Wired Safety Glass  |
| CAN/CGSB 12.20-M                                 | CAN/CGSB 12.20-M Structural Design of Glass for Buildings  |
| CAN/CGSB 12.3-M                                  | CAN/CGSB 12.3-M Flat, Clear Float Glass  |
| CAN/CGSB 12.8-M                                  | CAN/CGSB 12.8-M Insulating Glass Units   |
| CAN/CGSB 75.1-M                                  | CAN/CGSB 75.1-M Tile, Ceramic  |
| CAN/CGSB 85.100                                  | CAN/CGSB 85.100 Painting   |
| CAN/CGSB-109.4                                   | CAN/CGSB-109.4-2000, Passenger Information Symbols Standard  |
| CAN/CSA A5                                       | CAN/CSA A5 Portland Cement   |
| CAN/CSA A16                                      | CAN/CSA A16 Design of Steel Structures   |
| CAN/CSA A23.1                                    | CAN/CSA A23.1 Concrete Materials and Methods of Concrete Construction  |
| CAN/CSA A23.2                                    | CAN/CSA A23.2 Methods of Testing for Concrete  |
| CAN/CSA A23.3                                    | CAN/CSA A23.3 Design of Concrete Structures  |
| CAN/CSA A23.4                                    | CAN/CSA A23.4 Precast Concrete - Materials and Construction  |
| CAN/CSA A23.5                                    | CAN/CSA A23.5 Supplementary Cementing Materials  |

| Reference Documents in Schedule 15 | Description of Reference Documents   |
|------------------------------------|--|
| CAN/CSA A165                       | CAN/CSA A165 Concrete Masonry Units  |
| CAN/CSA A179                       | CAN/CSA A179 Mortar and Grout for Unit Masonry   |
| CAN/CSA A251                       | CAN/CSA A251 Qualification Code for Architectural and Structural Precast Concrete                            |
| CAN/CSA A370                       | CAN/CSA A370 Connectors for Masonry  |
| CAN/CSA A371                       | CAN/CSA A371 Masonry Construction for Buildings  |
| CAN/CSA A440                       | CAN/CSA A440 Window, Door, and Skylight Installation   |
| CAN/CSA A3000                      | CAN/CSA A3000 Cementitious Materials Compendium  |
| CAN/CSA B44                        | CAN/CSA B44 Safety Code for Elevators  |
| CAN/CSA B45                        | CAN/CSA B45 Plumbing Fixtures  |
| CAN/CSA B52                        | CAN/CSA B52 Mechanical Refrigeration Code  |
| CAN/CSA B139                       | CAN/CSA B139 Installation Code for Oil Burning Equipment   |
| CAN/CSA B167-96                    | CAN/CSA B167-96 Maintenance and Inspection of Overhead Cranes, Gantry Cranes, Monorails, Hoists and Trolleys |
| CAN/CSA B651-04                    | CAN/CSA B651-04 Accessible Design for the Built Environment  |
| CAN/CSA C22.1-09                   | CAN/CSA C22.1-09 Canadian Electrical Code, Part I – Safety Standard for Electrical Installations             |
| CAN/CSA C22.2-09                   | CAN/CSA C22.2-09 Canadian Electrical Code, Part II – General Requirements                                    |
| CAN/CSA C22.2 No. 94               | CAN/CSA C22.2 No. 94 Electrical Enclosures   |
| CAN/CSA C22.3 No. 1 & 8            | CAN/CSA C22.3 No. 1 & 8 Overhead Systems   |
| CAN/CSA C22.3 No. 4                | CAN/CSA C22.3 No. 4-1974(R1995) Control of Electromechanical Corrosion of Underground Metallic Structures    |
| CAN/CSA C390-10                    | CAN/CSA C390-10 Energy Efficiency Test Methods for Three-Phase Induction Motors                              |
| CAN/CSA G30.5                      | CAN/CSA G30.5 Welded Steel Wire Fabric for Concrete Reinforcement  |

| Reference Documents in Schedule 15 | Description of Reference Documents   |
|------------------------------------|--|
| CAN/CSA G30.18                     | CAN/CSA G30.18 Grade 400W, Billet-steel Bars, Deformed   |
| CAN/CSA G40.20                     | CAN/CSA G40.20 General Requirements for Rolled or Welded Structural Quality Steel                  |
| CAN/CSA G40.21                     | CAN/CSA G40.21 Structural Quality Steels   |
| CAN/CSA-G164-M                     | CAN/CSA-G164-M Hot Dip Galvanizing of Irregularly Shaped Articles                                  |
| CAN/CSA O86                        | CAN/CSA O86 Engineering Design in Wood   |
| CAN/CSA Q396                       | CAN/CSA Q396 Software Quality Assurance Standards  |
| CAN/CSA Q632-90                    | CAN/CSA Q632-90 Reliability and Maintainability Management Guidelines                              |
| CAN/CSA S6                         | CAN/CSA S6 Canadian Highway Bridge Design Code (CHBDC)   |
| CAN/CSA S16                        | CAN/CSA S16 Limit States Design of Steel Structures  |
| CAN/CSA S136-M                     | CAN/CSA S136-M Design of Cold-Formed Steel Structural Members                                      |
| CAN/CSA S304.1                     | CAN/CSA S304.1 Design of Masonry Structures  |
| CAN/CSA S413                       | CAN/CSA S413 Parking Structures  |
| CAN/CSA S478                       | CAN/CSA S478 Guideline on Durability in Buildings  |
| CAN/CSA S448.1                     | CAN/CSA S448.1 Repair of Reinforced Concrete in Buildings and Parking Structures                   |
| CAN/CSA W47.1                      | CAN/CSA W47.1 Certification for Companies for Fusion Welding of Steel Structures                   |
| CAN/CSA W59                        | CAN/CSA W59 Welded Steel Construction (Metal Arc Welding)  |
| CAN/CSA W186-M                     | CAN/CSA W186-M Welding of Reinforcing Bars in Reinforced Concrete Construction                     |
| CAN/CSA Z259.1                     | CAN/CSA Z259.1 Fall-Arresting Safety Belts and Lanyards for the Construction and Mining Industries |
| CAN/CSA Z259.2-M                   | CAN/CSA Z259.2-M Fall-Arresting Devices, Personal Lowering Devices and Life Lines                  |
| CAN/CSA Z259.3-M                   | CAN/CSA Z259.3-M Lineman's Body Belt and   |

| Reference Documents in Schedule 15   | Description of Reference Documents   |
|--|--|
|  | Lineman's Safety Strap   |
| CAN/CSA Z462   | CAN/CSA Z462 Workplace Electrical Safety   |
| CAN/ULC-S701   | CAN/ULC-S701 Thermal Insulation, Polystyrene, Boards and Pipe Covering   |
| CAN3 S157-M  | CAN3 S157-M Strength Design in Aluminum  |
| Canadian Electrical Code   | Canadian Electrical Code (CEC), 21 <sup>st</sup> Edition   |
| Canadian Foundation Engineering Manual   | Canadian Foundation Engineering Manual, 3 <sup>rd</sup> & 4 <sup>th</sup> Editions   |
| Canadian Motor Vehicle Safety Regulations, Technical Standard 108  |  |
| Canadian Portland Cement Association's Simplified Design Procedure   |  |
| Canadian Standards for Nursery Stock   | Most recent addition   |
| CGC Steel Framed Drywall Systems, 09250-1 E  | CGC Steel Framed Drywall Systems, 09250-1 E  |
| CISC Guide for the Design of Crane-Supporting Steel Structures   | Canadian Institute of Steel Construction (CISC)  |
| City of Ottawa Area Traffic Management Principles and Guidelines   |  |
| City of Ottawa Data Handbook   |  |
| City of Ottawa Emergency Management Plan   |  |
| City of Ottawa Green Space Master Plan   |  |
| City of Ottawa Integrated Street Furniture Policy and Design Guidelines  | City of Ottawa Integrated Street Furniture Policy and Design Guidelines, August 2009 (ISFP)  |
| City of Ottawa Interior Planning Standards   | City of Ottawa, Real Property and Assets Management, July 2002   |
| City of Ottawa Municipal Accessibility Plan (COMAP) Accessibility and Design Guidelines for the Visually Impaired    | City of Ottawa Municipal Accessibility Plan (COMAP) Accessibility and Design Guidelines for the Visually Impaired                  |
| City of Ottawa Operational Policy, Procedures and Guidelines   |  |
| City of Ottawa Right of Way Lighting Policy  |  |
| City of Ottawa Road Corridor Planning & Design Guidelines, Urban & Village Collectors / Rural Arterials & Collectors | City of Ottawa Road Corridor Planning & Design Guidelines, Urban & Village Collectors / Rural Arterials & Collectors, October 2008 |

| Reference Documents in Schedule 15   | Description of Reference Documents   |
|--|--|
| City of Ottawa Sewer Design Guidelines   | City of Ottawa Sewer Design Guidelines<br>(November 2004)  |
| City of Ottawa Sewer Use By-law<br>No. 2003-514                                      |  |
| City of Ottawa Slope Stability Guidelines for<br>Development Applications            |  |
| City of Ottawa Standard Tender Documents<br>for Unit Price Contracts, Volume 1 and 2 |  |
| City of Ottawa Traffic and Parking By-Laws   |  |
| City of Ottawa Transit Technology Choice<br>Report                                   |  |
| City of Ottawa Urban and Rural Truck<br>Routes                                       |  |
| City of Ottawa Water Design Guidelines   |  |
| CMAA No. 70  | CMAA No. 70 Top Running Bridge and Gantry<br>Type Multiple Girder Electric Overhead<br>Traveling Cranes                      |
| CMAA No.74   | CMAA No.74 Top Running and Under Running<br>Single Girder Electric Traveling Cranes Utilizing<br>Under Running Trolley Hoist |
| CN Guidelines for Design of Railway<br>Structures                                    | CN, 2006   |
| CPCI Design Manual Precast Prestressed<br>Concrete                                   |  |
| CRCA Specifications Manual   | Canadian Roofing Contractors Association<br>(CRCA)   |
| CSSBI 101 M  | CSSBI 101 M Zinc Coated Structural Quality<br>Steel Sheet for Steel  |
| DOT-FTA-MA-26-5005-00-01 Hazard<br>Analysis Guidelines for Transit Projects          | U.S. Department of Transportation, Federal<br>Transit Administration (January 2000)  |
| DOT, "Recommended Emergency<br>Preparedness Guidelines for Rail Transit<br>Systems"  | Department of Transportation (DOT),<br>"Recommended Emergency Preparedness<br>Guidelines for Rail Transit Systems"           |
| Downtown Ottawa Urban Design Strategy  | Downtown Ottawa Urban Design Strategy<br>(DOUDS)   |
| <i>Drainage Act</i>  | <i>Drainage Act, 1990 (Ontario)</i>  |



**Reference Documents in Schedule 15****Description of Reference Documents***Electricity Act**Electricity Act, 1998**Elevating Devices Act* and Ontario  
Regulation 229/81

Elevators and Fixed Conveyance Act

EN 13272

EN 13272 Railway applications – Electrical  
Lighting for Rolling Stock in Public Transport  
Systems

EN 50121-1

EN 50121-1 Railway Applications –  
Electromagnetic Compatibility – Part 1: General

EN 50121-2

EN 50121-2 Railway Applications –  
Electromagnetic Compatibility – Part 2:  
Emissions of the Whole Railway System to the  
Outside World

EN 50121-3-1

EN 50121-3-1 Railway Applications, EMC –  
Rolling Stock – Train and Complete Vehicle

EN 50121-3-2

EN 50121-3-2 Railway Applications, EMC –  
Rolling Stock – Apparatus

EN 50121-4

EN 50121-4 Railway Applications, EMC –  
Emission and Immunity of the Signaling and  
Telecommunications Apparatus

EN 50121-5

EN 50121-5 Railway Applications, EMC –  
Emissions and Immunity of Fixed Power Supply  
Installations and Apparatus

EN 50126

EN 50126 Railway Applications – The  
Specification and Demonstration of Reliability,  
Availability, Maintainability and Safety (RAMS)

EN 50128

EN 50128 Railway Applications –  
Communication, Signalling, and Processing  
Systems - Software for Railway Control and  
Protection Systems

EN 50129

EN 50129 Railway Applications –  
Communication, Signalling and Processing  
Systems - Safety Related Electronic for  
Signalling

EN 50155

EN 50155 Railway Applications – Electronic  
Equipment Used on Rolling Stock

| Reference Documents in Schedule 15   | Description of Reference Documents   |
|--|--|
| EN 50159-2   | EN 50159-2 Railway Applications – Communication, Signalling and Processing Systems – Part 2: Safety Related Communication in Open Transmission Systems   |
| EN 50162   | EN 50162 Protection Against Corrosion By DC Track Stray Currents   |
| Federal Highway Administration (FHWA)<br>FHWA-NHI-00-043   | Federal Highway Administration (FHWA)<br>FHWA-NHI-00-043 Mechanically stabilized earth walls and reinforced soil slopes design & construction guidelines |
| Federal Highway Administration (FHWA)<br>Post Tensioning Tendon Installation and Grouting Manual                                       |  |
| <i>Fisheries Act</i>   | <i>Fisheries Act, 1985</i>   |
| FM 1-28  | FM 1-28 Design Wind Loads  |
| FM 4450  | FM 4450 Approval Standards for Class 1 Insulated Steel Roof Decks  |
| FM 4470  | FM 4470 Approval Standard for Class 1 Roof Covers  |
| GANA Glazing Manual  | Glass Association of North America (GANA)  |
| GANA Laminated Glazing Reference Manual  | GANA   |
| Geometric Design Guide for Canadian Roads  | Geometric Design Guide for Canadian Roads (TAC, 1999)  |
| Geometric Design Standards for Ontario Highways  | Geometric Design Standards for Ontario Highways (MTO)  |
| <i>Green Energy Act, 2009</i>  |  |
| Guideline for Professional Engineers Providing Geotechnical Engineering Services, published by Professional Engineers of Ontario (PEO) | GUIDELINE, Professional Engineers Providing Geotechnical Engineering Services, Revised 11/15/98  |
| HMI 100  | HMI 100 Electrical Wire Rope Hoists  |
| IEC/ISO 27000  | IEC/ISO 27000 Information Security Management Systems Standards  |
| IEC 1000-5-2   | IEC 1000-5-2 EMC Cabling Guidelines  |
| IEC 15288  | IEC 15288 Systems Engineering  |
| IEC 60077-1  | IEC 60077-1 Railway Applications – Electric  |

| Reference Documents in Schedule 15 | Description of Reference Documents  |
|------------------------------------|---|
| IEC 60077-3                        | Equipment for Rolling Stock - Part 1: General Service Conditions and General Rules<br>IEC 60077-3 Railway Applications – Electric Equipment for Rolling Stock. Electrotechnical Components. Rules for D.C. Circuit-Breakers |
| IEC 60322                          | IEC 60322 Railway Applications – Electric Equipment for Rolling Stock – Rules for Power Resistors of Open Construction  |
| IEC 60349-2                        | IEC 60349-2 Electric Traction – Rotating Electrical Machines for rail and Road Vehicles – Part 2: Electronic Converter-fed Alternating Current Motors   |
| IEC 60529                          | IEC 60529 Degrees of Protection Provided by Enclosures (IP Code)  |
| IEC 60623                          | IEC 60623 Secondary Cells and Batteries Containing Alkaline or Other Non-acid Electrolytes – Vented Nickel-cadmium Prismatic Rechargeable Single Cells  |
| IEC 61000-2008                     | IEC 61000-2008 Electromagnetic Compatibility (EMC), Testing and Measurement Techniques  |
| IEC 61071                          | IEC 61071 Capacitors for Power Electronics  |
| IEC 61133                          | IEC 61133 Railway Applications – Rolling Stock – Testing of Rolling Stock on Completion of Construction and Before Entry Into Service   |
| IEC 61287-1                        | IEC 61287-1 Railway Applications – Power Convertors Installed on Board Rolling Stock – Part 1: Characteristics and Test Methods   |
| IEC 61508                          | IEC 61508 Functional Safety of Electrical/ Electronic/Programmable Electronic Safety-related Systems  |
| IEEE 11                            | IEEE 11 Rotating Electric Machinery for Rail and Road Vehicles  |
| IEEE 16                            | IEEE 16 Electrical and Electronic Control Apparatus on Rail Vehicles  |
| IEEE 80                            | IEEE 80 Safety in AC Substation Grounding   |
| IEEE 383                           | IEEE 383 Qualifying Class 1E Electric Cables and Field Splices for Nuclear Power Generating Stations  |

| Reference Documents in Schedule 15 | Description of Reference Documents   |
|------------------------------------|--|
| IEEE 497                           | IEEE 497 Accident Monitoring Instrumentation for Nuclear Power Generating Stations   |
| IEEE 519                           | IEEE 519 Harmonic Limits   |
| IEEE 1473                          | IEEE 1473 Communications Protocol Aboard Passenger Trains  |
| IEEE 1474.1                        | IEEE 1474.1 Communications-Based Train Control (CBTC) Performance and Functional Requirements  |
| IEEE 1474.2                        | IEEE 1474.2 Functioning of and Interfaces Among Propulsion, Friction Brake and Train-borne Master Control on Rail Rapid Transit Vehicles |
| IEEE 1474.3                        | IEEE 1474.3 Recommended Practice for Communications-Based Train Control (CBTC) System Design and Functional Allocations                  |
| IEEE 1477                          | IEEE 1477 Passenger Information System for Rail Transit Vehicles   |
| IEEE 1482                          | IEEE 1482 Rail Transit Vehicle Event Recorders   |
| IEEE 1483                          | IEEE 1483 Verification of Vital Functions in Processor-Based Systems Used in Rail Transit Control  |
| IEEE 1584                          | IEEE 1584 Guide for Performing Arc-Flash Hazard Calculations   |
| IEEE 1635.2                        | IEEE 1635.2 Draft Guide for the Ventilation and Thermal Management of Batteries for Stationary Applications                              |
| IEEE C37-13                        | IEEE C37-13 Low-Voltage AC Power Circuit Breakers Used in Enclosures   |
| IEEE C37-14                        | IEEE C37-14 Low-Voltage DC Power Circuit Breakers Used in Enclosures   |
| IEEE C95.1                         | IEEE C95.1 Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 3 to 300 GHz  |
| IEEE C95.6                         | IEEE C95.6 Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0 to 3 kHz  |
| IESNA Lighting Handbook            | Illuminating Engineering Society of North America (IESNA), Lighting Handbook   |

| <b>Reference Documents in Schedule 15</b>   | <b>Description of Reference Documents</b>   |
|---|---|
| IESNA TM-11-2006  | IESNA TM-11-2006 Technical Memorandum on Light Trespass   |
| ISO 2631  | ISO 2631 Mechanical Vibration and Shock   |
| ISO 9000 Series   | ISO 9000 Series – Quality Management  |
| ISO 14224   | ISO 14224 Petroleum, Petrochemical and Natural Gas Industries – Collection and Exchange of Reliability and Maintenance Data for Equipment |
| ITA Fire Guidelines   |   |
| Lebreton Flats South Development  |   |
| MHIA: MH 30.1   | MHIA: MH 30.1 Specification for Dock Leveling Devices   |
| MIL-STD-882   | MIL-STD-882 System Safety   |
| Model National Energy Code for Buildings  | Model National Energy Code for Buildings (MNECB), 1997  |
| MOE Design Guidelines for Drinking-Water Systems  | Ontario Ministry of the Environment (MOE), 2008   |
| MOE Design Guidelines for Sewage Works  | MOE, 2008   |
| MOE Stormwater Management Planning and Design Guidelines  | MOE, 2003   |
| MTO/DFO/OMNR Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings                    | MTO/DFO/OMNR  |
| MTO/DFO/OMNR Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings – User Field Guide | MTO/DFO/OMNR  |
| MTO/MOE Memorandum of Understanding on Permits-To-Take-Water  | MTO/MOE, 2007   |
| MTO/MOE Protocol for the Management of Excess Materials in Road Construction and Maintenance                            | MTO/MOE, 1994   |
| MTO Aesthetic Guidelines for Bridges  | MTO, 2004   |
| MTO Bailey Bridge Manual  | MTO, 1990   |
| MTO Cathodic Protection Manual for Concrete Bridges   | MTO, 1993   |



| <b>Reference Documents in Schedule 15</b>   | <b>Description of Reference Documents</b> |
|---|---|
| MTO Class Environmental Assessment for Provincial Transportation Facilities   | MTO, 2000                                 |
| MTO Concrete Culvert Design and Detailing Manual  | MTO, 1988                                 |
| MTO Construction Manual   | MTO                                       |
| MTO Drainage Management Manual  | MTO, 1997                                 |
| MTO Electrical Engineering Manual   | MTO                                       |
| MTO Environmental Guide for Contaminated Property Identification and Management   | MTO, 2006                                 |
| MTO Environmental Guidelines for Structural Steel Coating   | MTO, 1996                                 |
| MTO Environmental Protection Requirements for Transportation Planning and Highway Design, Construction, Operation and Maintenance | MTO, 2006                                 |
| MTO Formwork and Falsework Manual   | MTO, 1997                                 |
| MTO Geometric Design Standards for Ontario Highways Manual  | MTO                                       |
| MTO Gravity Pipe Design Guidelines for Circular Culverts and Storm Sewers   | MTO, 2007                                 |
| MTO Guide for Preparing Hydrology Reports for Water Crossings   | MTO                                       |
| MTO Guide to the Design of Post-Tensioned Decks   | MTO, 1997                                 |
| MTO Highway Drainage Design Standards   | MTO, 2008                                 |
| MTO Integral Abutment Bridge  | MTO, 1996                                 |
| MTO King's Highway Guide Signing Policy Manual  | MTO                                       |
| MTO Lab Testing Manual  | MTO, 2006                                 |
| MTO Ontario Heritage Bridge Guidelines for Provincially Owned Bridges   | MTO, 2008                                 |
| MTO Ontario Structure Inspection Manual (OSIM)  | MTO, 2008                                 |
| MTO Ontario Structures Inspection   | MTO                                       |

| Reference Documents in Schedule 15   | Description of Reference Documents  |
|--|---|
| Management Systems (OSIMS) User's Guide  |   |
| MTO Overcoating – Technical Assessment of Existing Coatings of Steel Bridges for Overcoating | MTO   |
| MTO Pavement Design and Rehabilitation Manual (SDO-09-01)                                    | MTO, 1990   |
| MTO Performance of Integral Abutment Bridges Report  | MTO, 2000   |
| MTO Pile Load and Extraction Tests   | MTO   |
| MTO Pre-stressed Concrete Manual for Quality Assurance of Bridges During Construction        | MTO   |
| MTO RSS Guidelines   | MTO, 2007   |
| MTO Seismic Design Guidelines  | MTO   |
| MTO Semi-Integral Abutment Bridges Manual  | MTO   |
| MTO Sign Support Manual  | MTO   |
| MTO Structural Manual  | MTO   |
| MTO Structural Steel Coating Manual  | MTO   |
| MTO Structural Rehabilitation Manual   | MTO, 2004   |
| NACE Standard SP0169   | NACE Standard SP0169 Control of External Corrosion on Underground and Submerged Metallic Piping Systems |
| <i>National Capital Act, 1985</i>  | U.S., 1985  |
| National Electrical and Safety Code (NEC)  |   |
| NBC 2010   | National Building Code of Canada (NBC 2010)   |
| NCC Pathway for Canada's Capital Region Strategic Plan                                       |   |
| NCMA Segmental Retaining Wall Design Manual  |   |
| NFPA 10  | NFPA 10 Portable Fire Extinguishers   |
| NFPA 13  | NFPA 13 Installation of Sprinkler Systems   |
| NFPA 14  | NFPA 14 Installation of Standpipe, Private Hydrants, and Hose Systems                                   |

| Reference Documents in Schedule 15            | Description of Reference Documents  |
|---|---|
| NFPA 20                                       | NFPA 20 Installation of Stationary Pumps  |
| NFPA 24                                       | NFPA 24 Installation of Private Fire Service Mains and Their Appurtenances                              |
| NFPA 70                                       | NFPA 70 National Electrical Code  |
| NFPA 80                                       | NFPA 80 Fire Doors and Other Opening Protectives  |
| NFPA 90A                                      | NFPA 90A Installation of Air-conditioning and Ventilation Systems                                       |
| NFPA 91                                       | NFPA 91 Exhaust System for Air-Conveying of Vapours, Gases, Mist, and Noncombustible Particulate Solids |
| NFPA 92A                                      | NFPA 92A Recommended Practice for Smoke-Control Systems;  |
| NFPA 99                                       | NFPA 99 Health Care Facilities Code   |
| NFPA 101                                      | NFPA 101 Life Safety Code   |
| NFPA 110                                      | NFPA 110 Emergency and Standby Power Systems  |
| NFPA 130                                      | NFPA 130 Fixed Guideway Transit and Passenger Rail Systems  |
| NFPA 204                                      | NFPA 204 Smoke and Heat Venting   |
| NFPA 502                                      | NFPA 502 Road Tunnels, Bridges and Other Limited Access Highways  |
| NFPA 1963                                     | NFPA 1963 Fire Hose Connections   |
| NFPA 2001                                     | NFPA 2001 Clean Agent Fire Extinguishing Systems  |
| NFRC 100                                      | NFRC 100 Procedure for Determining Fenestration Product U-factors                                       |
| NRCA Roofing Manual: Steep-slope Roof Systems | National Roofing Contractors Association (NRCA), 2009   |
| NSF 61  | NSF 61 Drinking Water System Components   |
| <i>Occupational Health and Safety Act</i>     | <i>Occupational Health and Safety Act (OHSA)</i>  |
| OC Transpo Operating Policy and Procedures    |   |
| Old Ottawa East Community Design Plan         |   |
| Ontario Barrier-Free Design Guide             | Ontario Barrier-Free Design Guide – Ontario   |

| <b>Reference Documents in Schedule 15</b>  | <b>Description of Reference Documents</b>   |
|--|---|
|  | Safety Codes Council  |
| Ontario Building Code  | Ontario Building Code (OBC 2006)  |
| Ontario Electrical Safety Code   | Ontario Electrical Safety Code (OESC), 24 <sup>th</sup> Edition   |
| Ontario Fire Code  | Ontario Fire Code (OFC)   |
| <i>Ontario Heritage Act</i>  | <i>Ontario Heritage Act</i>   |
| Ontario Mechanical Code  |   |
| Ontario Pavement and Rehabilitation Manual                                       | 1993  |
| Ontario Traffic Manual   | Ontario (Canada) Ministry of Transportation. Ontario Traffic Manual. Toronto, Ontario, Canada: Ontario Ministry of Transportation, July 2001. |
| Ontario Traffic Manual (MTO)   | Ontario Traffic Manual, MTO, 2005   |
| <i>Ontario Water Resources Act</i>   | R.S.O. 1990   |
| Ottawa Cycling Plan  | Ottawa Cycling Plan (OCP)   |
| Ottawa DOTT Recommended Plan   | Ottawa DOTT Recommended Plan  |
| Ottawa Escarpment Area District Plan   |   |
| Ottawa Integrated Street Furniture Program                                       | Ottawa Integrated Street Furniture Program  |
| Ottawa Official Plan   | Ottawa Official Plan (OP)   |
| Ottawa Pedestrian Plan   | Ottawa Pedestrian Plan  |
| Ottawa Train Yards Site Servicing Report   | David McManus Engineering Ltd., 2001  |
| Ottawa Transit-Oriented Development Guidelines                                   | Ottawa Transit-Oriented Development (TOD) Guidelines  |
| Ottawa Transportation Master Plan  | Ottawa Transportation Master Plan   |
| Ottawa Urban Design, A Reference Guide to Creating Great Places and Great Spaces | Publication #2103   |
| PDI-WH 201   | PDI-WH 201 Water Hammer Arresters   |
| Pinecrest/Centrepointe Stormwater Management Criteria Study                      | J F Sabourin & Associates Inc., June 2009   |
| Policy and Guidelines on Disability and the Duty to Accommodate                  | Ontario Human Rights Commission   |
| Post-Tensioned Box Girder Bridge Manual  | Post-Tensioning Institute (PTI) Post-Tensioned Box Girder Bridge Manual   |
| <i>Professional Engineers Act</i>  | <i>Professional Engineers Act</i> R.S.O. 1990,  |

| Reference Documents in Schedule 15  | Description of Reference Documents   |
|---|--|
|   | CHAPTER P.28   |
| Quality Standards for Architectural Woodwork  | Quality Standards for Architectural Woodwork (AWMAC)   |
| Recommendations for Prestressed Rock and Soil Anchors                               | Post-Tensioning Institute (PTI) Recommendations for Prestressed Rock and Soil Anchors                    |
| Regional Municipality of Ottawa-Carleton Transitway Design Manual                   | Regional Municipality of Ottawa-Carleton Transitway Design Manual, October 1983                          |
| Region of Ottawa-Carleton Regional Road Corridor Design Guidelines                  | Region of Ottawa-Carleton Regional Road Corridor Design Guidelines, July 2000, Region of Ottawa-Carleton |
| Roadside Safety Manual  | MTO  |
| Rock Tunneling with Steel Supports  | Proctor, R.V. and White, T.L., Youngstown, Ohio: Commercial Shearing, Inc., 1988                         |
| SAE J524  | SAE J524 Hydraulic Standards for Industrial Equipment  |
| Secondary Plan for the Central Area   | City of Ottawa   |
| Seismic Design and Analysis of Underground Structures                               | Hashash, Y.M.A. et al., 2001, Tunneling and Underground Space Technology 16, pp. 247-293                 |
| Shotcrete Lining Design: Factors of Influence                                       | John M. and Mattle B. (2003), RETC 2003 Proceedings, 726-734   |
| SMACNA Architectural Sheet Metal Manual   | Sheet Metal and Air-conditioning Contractors' National Association (SMACNA), 2003                        |
| SMACNA HVAC Duct Construction Standards   | SMACNA   |
| Specification for Tunnelling  | British Tunnelling Society and Institution of Civil Engineers (latest edition)                           |
| Specifications Covering Use of Aluminum in Passenger Carrying Railway Vehicles      |  |
| SSPC SP10   | SSPC SP10 Near-White Blast Cleaning  |
| Standard Respecting Pipeline Crossings Under Railways                               |  |
| Subway Environmental Design Handbook  | Subway Environmental Design Handbook (SEDH) (DOT 1976);  |
| Superpave Asphalt Mix Selection   |  |
| TC – RTD 10 Road/Railway Grade Crossing Technical Standards and Inspection, Testing | Transport Canada (TC), October 2002  |



| Reference Documents in Schedule 15<br>and Maintenance Requirements                                       | Description of Reference Documents         |
|--|--|
| Technical Report No. 63, Guidance for the<br>Design of Steel-Fibre-Reinforced Concrete                   | The Concrete Society, CCIP-017, March 2007 |
| <i>Toxics Reduction Act</i>  | S.O. 2009                                  |
| Transit Cooperative Research Program<br>(TCRP) Report 57 Track Design Handbook<br>for Light Rail Transit |  |
| Tunnel Lining Design Guide   |  |
| Tunney's Pasture Master Plan   |  |
| UIC605OR   | UIC605OR Protection from Corrosion         |
| University of Ottawa – Main Campus<br>Strategy   |  |
| User's Guide – NBC: Structural<br>Commentaries (Part 4)  |  |