

Public Works and Government Services Canada (PWGSC)

Electrification of the Atwater and Charlevoix Areas Atwater Area and Pedestrian Footbridge

PWGSC Ref.: R.072066.001

FOR TENDER

TECHNICAL SPECIFICATIONS Electrical

July 10, 2015

O/Ref.: 248-P-0006525-220-EL-S-0003-00

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Prepared by:

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Important Note: This list of sections is used to enumerate required works, without limitation, and to attribute works to contractors according to the symbols explained hereunder, and it is considered an integral part of the present specification.

E : Applicable section to electrical works performed at site

END OF SECTION

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END OF SECTION

DIVISION 01

General Requirements

PART 1 - GENERAL**1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises carrying and installation of a 400 A-120/240 V, distribution center, its connection, and allied services, supplying and installation of the lighting of the pedestrian bridge and the quay's footbridge, the conduits and cables runs the receptacles and plugs for the feeding of the boat's pedestals.

1.3 SCOPE OF WORK

- .1 Work includes, without limitation:
 - .1 The taking charge, the carrying and installation of a 400 A-120/240 V distribution center including all components such as: switches, fuses, HQ metering, through, private metering and socket, electrical distribution panels, breakers, conduits, cables, receptacles, lighting, ventilation, controls, waterproof boxes and covers for receptacles, hardware, and accessories.
 - .2 Supplying and installation of the breakers heavy duty receptacles and plugs, multiconductors cables, anchors bolts, and hardware.
 - .3 Supplying and installation of electrical connections,
 - .4 Supplying and installation of conduits and cables.
 - .5 The demolition and reconstruction of surfaces and concrete.
 - .6 The drilling.
 - .7 Security measures including cones, fences, and working men panels.
 - .8 Strapping, hardware, and accessories.
 - .9 Field quality control.
 - .10 Shop drawings for all material and equipment, including concrete and pavement formulas.
 - .11 Excavation and backfilling.
 - .12 Coordination with Hydro-Quebec, CN, and all other public utilities, including the HQ Connection demand.

- .13 Protection of archeological remains and objects.
- .14 The installation of ducts by trenchless technology.
- .15 Concrete protection in case of cold or freezing weather.
- .16 The surveying of the limits of Parks Canada and CN lands and the implantation of the interior cabinet inside the land's limit of Parks Canada.
- .17 The taking charge, the transportation and the installation of the pedestrian bridge lighting fixtures.
- .18 The supply and installation of the lighting system and fixtures, the conduits and the wiring of the access footbridge of the quay.
- .19 The supplying of the CEMA 3R exterior cabinet by Parks Canada and the lighting fixtures of the pedestrian bridge.
- .20 Preparation of the CN demands and permits including drawings, sketches and payment of the fees.

1.4 WORK BY OTHERS

- .1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Departmental Representative.
- .2 Co-ordinate Work with that of other Contractors. If any part of Work under this Contract depends for its proper execution or result upon Work of another Contractor, report promptly, in writing, any defects which may interfere with proper execution of Work.

1.5 WORK SEQUENCE

- .1 Construct Work in stages to accommodate Owner's continued intermittent use of premises during construction.
- .2 Construct Work in stages to provide for continuous public usage. Do not close off public usage of facilities until use of one stage of Work will provide alternate usage.

1.6 CONTRACTOR USE OF PREMISES

- .1 Restricted use of site until Substantial Performance.
- .2 Limit use of premises for Work to allow:
 - .1 Owner occupancy.
 - .2 Public usage.

- .3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .4 At completion of operations condition of existing work: Equal to or better than that which existed before new work started.

1.7 OWNER OCCUPANCY

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Establish Work schedule with the Departmental Representative in order to reduce conflicts and to facilitate utilization of the site by the Owner.

1.8 EXISTING SERVICES

- .1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.

1.9 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each document as follows:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed Shop Drawings.
 - .5 List of Outstanding Shop Drawings.
 - .6 Change Orders.
 - .7 Other Modifications to Contract.
 - .8 Field Test Reports.
 - .9 Copy of Approved Work Schedule.
 - .10 Health and Safety Plan and Other Safety Related Documents.
 - .11 Other documents as specified.

1.10 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from projected activities.

- .2 Ensure detailed Project Schedule includes all milestone and activity corresponding to and necessary to complete Work in the delay.
- .3 Departmental Representative will review and return revised schedules within five (5) working days.
- .4 Revise impractical schedule and resubmit within five (5) working days.
- .5 Accepted revised schedule will become Master Plan and be used as baseline for updates.
- .6 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
- .7 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.11 PROJECT MEETINGS

- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Weather related delays with their remedial measures will be discussed and negotiated.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 - GENERAL**1.1 RELATED SECTIONS**

- .1 Division 26 - Electrical.
- .2 Division 31 - Earthwork.

1.2 PAYMENT METHODS

- .1 Construction Signage.
 - .1 Construction signage is paid by lump sum. Price includes supply, installation, moving and removing of traffic signage (working men panels, cones, fences, etc.), supply of labor, equipment, and any necessary incidental expenses to have a safe construction site.
- .2 Demolition and refection of the surfaces.
 - .1 Demolition and refection of the surfaces is paid by lump sum. Price includes supply of labor, equipment, and excavation and backfilling, machinery, the saving, the crushing, the removing, the drilling and boring, the rebar, the concrete, the embankment, the turf, the vegetable earth, disposal of materials, and any necessary incidental expenses.
- .3 Installation of the CEMA 3R Exterior Enclosure and Components.
 - .1 The installation of the CEMA 3R exterior enclosure and components is paid by lump sum. The lump sum includes the carrying and installation of CEMA 3R enclosure and components, distribution and hardware, and all inherent expenses required for a complete and functional installation as described in specifications and on drawings.
 - .2 The price also includes the supplying and installation of the additional breakers.
 - .3 The contractor shall recuperate the CEMA 3R Exterior enclosure and components at Parks Canada's workshops at Lachine Canal situated at 1156 Mill Street, in Montreal (Quebec) (by appointment 48 hours before with Mr. Richard St-Jean at 514-283-8303).
- .4 Conductors.
 - .1 Conductors are paid by linear meter of conductors. The price includes supplying and installation of conductors, manpower, all materials, accessories, hardware, necessary equipment, testing, and quality control.
 - .2 The price includes connection to equipment.

- .5 Conduits.
 - .1 Conduits are paid by linear meter of conduits. The price includes supplying and installation of conduits, manpower, all materials, accessories, hardware, necessary equipment, testing, and quality control.
 - .2 The price includes connection to equipment.
- .6 Second Class Excavation, Trenching, and Backfilling.
 - .1 The price for the 2nd Class excavation, trenching, and backfilling is paid by linear meter of excavation, trenching, and backfilling done. The unit price includes demolition, sawing and removing of the pavement and concrete slab, excavation, backfilling, compaction, pumping and temporary retaining walls for the trench, repairing of the pavement and concrete slab, filling material, manual excavation and man-power, all materials and necessary equipment for the complete realization of the Work.
 - .2 The price also includes costs associated with waiting for inspection of trench.
- .7 450 x 450 x 150 mm NEMA 4X Pull Box.
 - .1 The 450 x 450 x 150 mm NEMA 4X Pull Box is paid by unit price.
 - .2 The price includes supplying and installation of the box, manpower, all materials, accessories, the drilling, the anchors and hardware, and all necessary expenses required for a complete and functional installation as described in specifications and on drawings.
- .8 Exterior CEMA 3R Enclosure Concrete Base.
 - .1 Exterior CEMA 3R enclosure concrete base is paid by unit price. The price includes supplying and installation of concrete, rebar, installation and removal of formworks, anchor bolts, hardware, accessories, rigid insulation, and the rigid PVC conduits, and also the excavation and backfilling, removal and disposal of excavation material, and all necessary expenses for a complete and functional installation.
 - .2 The price also includes backfilling material, restoration of surfaces, pumping and temporary retaining walls of excavation, the surveying of Parks Canada and CN land's limits in the work area.
- .9 Field Quality Control.
 - .1 Field quality control is paid by lump sum. The price includes testing required in specifications done by an independent firm, including equipment, issuing of a report, and supplementary inspections, and all necessary expenses for the complete execution of Work.

- .10 60 A, 600 V heavy-duty receptacle.
 - .1 The 60 A, 600 V heavy-duty receptacle is paid by unit price of receptacle supplied and installed. The price includes, without limitations, the supplying and installation of a receptacle, the back box, the angle box, the anchors, the screwable cover, the drilling, the hardware and the accessories and all necessary expenses for the complete execution of the work.
- .11 60 A, 600 V heavy-duty plug.
 - .1 The 60 A, 600 V heavy-duty plug is paid by unit price of plug supplied and installed. The price includes, without limitations, the supplying and installation of a plug, the screwable cover, the hardware and the accessories and all necessary expenses for the complete execution of the work.
- .12 Multiconductor plug cable.
 - .1 The multiconductor plug cable is paid by meter of cable supplied and installed. The price includes, without limitations, the supplying and installation of the cable, the heavy wall heatshrinkable boot with 4 breakouts, the copper cable pigtail adaptors, the stress relief net, the connection to the plug, the hardware and the accessories and all necessary expenses for the complete execution of the work.
- .13 Conduit installation by trenchless technology.
 - .1 The conduit installation by trenchless technology is paid by meter of conduit supplied and installed by trenchless technology. The price includes, without limitations, the supplying and installation of the conduit, joint, waterproof transition connector, connectors, the equipment, the trenching and backfilling, the pumping, the embankment, disposition of the excavated materials, the cleaning and repairing of the surfaces, the manpower, the hardware and the accessories and all necessary expenses for the complete execution of the work.
 - .2 The price also include the respect of the CN requirements for the works inside the railway track land's limits.
- .14 Pedestrian bridge lighting fixture.
 - .1 The pedestrian bridge lighting fixture is paid by unit price of lighting fixture installed. The price includes, without limitations, the taking charge of the lighting fixtures at Parks Canada service center, the transportation and installation of the lighting fixture, the self-tapping screws, the drilling, the connectors, the manpower, the hardware and the accessories and all necessary expenses for the complete execution of the work.

- .15 20 degree plate for lighting fixture.
 - .1 The 20 degree plate for lighting fixture is paid by unit price of plate supplied and installed. The price includes, without limitations, the supplying and installation of the plate, the factory painting, the drilling, the manpower, the hardware and the accessories and all necessary expenses for the complete execution of the work.
- .16 Connection to the existing circuit.
 - .1 The connection to the existing circuit is paid by lump sum. The lump sum includes, without limitations, the supplying and installation of the fuse-holder, the fuses, the connectors, the hardware and the accessories and all necessary expenses for the complete execution of the work.
- .17 Quay's access footbridge lighting fixture.
 - .1 The pedestrian bridge lighting fixture is paid by lump sum of lighting fixture supplied and installed. The lump sum includes, without limitations, the supplying and installation of the lighting fixture, the control box, the drivers, the dimmer, the conduits, the wiring, the boxes, the strapping, the drilling, the connectors, the manpower, the hardware and the accessories and all necessary expenses for the complete execution of the work.
- .18 300 mm diameter steel conduit installed by trenchless technology.
 - .1 The 300 mm diameter steel conduit installed by trenchless technology is paid by meter of conduit supplied and installed. The price includes, without limitations, the supplying and installation of the conduit, the trenching and backfilling of the departure and arrival pits, the pumping of the pits, disposition of the excavated materials, the cleaning and repairing of the surfaces, the equipment, the manpower, the hardware and the accessories and all necessary expenses for the complete execution of the work.
 - .2 The price also include the taking charge and sending of the CN demands, procedures and permits (permit's appendix D and E) and the CN SCP-1005 form, the production of a geotechnical study, the production and sending of engineer's signed and sealed sketch and drawings and the payment of the fees, loss of time associated to the CN permit's demand, work's delay and others expenses.
- .19 Soil engineering study.
 - .1 The soil engineering study is paid by lump sum. The price include the production of a soil engineering study including the characterization of the soil and the soil bearing capacity according to CN requirements, the wellbores, the permits and permit's demand, the taking care of the CN document's transmission and all necessary expenses for the soil engineering study production.
 - .2 The study shall be sealed and signed by a member in good-standing engineer of the Ordre des Ingénieurs du Québec.

- .20 CN signaller.
 - .1 The CN signaller is paid by CN billing. A budgetary allowance is budgeted at the price schedule and the amount shall be readjusted in more or less according to the submitted CN invoices. No administrative charges or benefit can be charge by the contractor at this item.
- .21 Cable localization.
 - .1 The cable localization is paid by CN billing. A budgetary allowance is budgeted at the price schedule and the amount shall be readjusted in more or less according to the submitted CN invoices. No administrative charges or benefit can be charge by the contractor at this item.
 - .2 The price also include the production of drawings, sketches sealed and signed by a member in good-standing of the Ordre des Ingénieurs du Québec. The drawings and sketches shall be in accordance with CN requirements.
- .22 Vacuum truck.
 - .1 The vacuum truck is paid by hour of utilization. The price include the services of the vacuum truck, his crew, the man-power, the backfilling and compaction, the restauration of the environment, the hardware and the accessories, the permit's demand, and permissions, the transmission of the documents to the CN and all necessary expenses for the complete execution of the works.
- .23 Canal wall drilling.
 - .1 The canal wall drilling is paid unit of hole drilled. The price incudes, without limitations, the supplying, installation and removing of the drilling equipment and the platform, the supplying of the electricity for the equipment and the water for the cooling of the drill bit, the CN permit's demand to execute the works, the cooling water captation and disposal, the man-power, the hardware and accessories and all necessary expenses for the complete execution of the works.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Province of Quebec.
 - .1 An Act Respecting Occupational Health and Safety, R.S.Q., c.S-2.1 (current edition) - Updated 2005.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit site-specific Health and Safety Plan: Within seven (7) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
- .2 Submit three (3) copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative.
- .3 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within fourteen (14) days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within seven (7) days after receipt of comments from Departmental Representative.
- .4 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .5 On-site Contingency and Emergency Response Plan: Address standard operating procedures to be implemented during emergency situations.

1.3 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.
- .2 Contractor shall be responsible and assume the Principal Contractor role for each work zone location and not the entire complex. Contractor shall provide a written acknowledgement of this responsibility with 3 weeks of Contract award. Contractor to submit written acknowledgement to CSST along with "Ouverture de Chantier" Notice.
- .3 Work zone locations include:
 - .1 Atwater area and pedestrian bridge.

- .4 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.4 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.5 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.6 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.7 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Contractor shall be the Principal Contractor as described in the Quebec Act Respecting Health and Safety code for the Construction for only their scope and areas of work as defined and described this project specification.
- .3 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.8 COMPLIANCE REQUIREMENTS

- .1 Comply with R.S.Q., c. S-2.1, an Act respecting Health and Safety, and c. S-2.1, r.4 Safety Code for the Construction Industry.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.9 UNFORSEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.

- .2 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, advise Health and Safety co-ordinator and follow procedures in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.

1.10 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
 - .1 Have site-related working experience specific to activities associated with Work.
 - .2 Have working knowledge of occupational safety and health regulations.
 - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .5 Be on site during execution of Work.

1.11 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.

1.12 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.13 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL**1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 Definitions:
 - .1 Environmental Pollution and Damage: Presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
 - .2 Environmental protection: Prevention/control of pollution and habitat or environment disruption during construction.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.
- .2 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .3 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .4 Include in Environmental Protection Plan:
 - .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
 - .3 Names and qualifications of persons responsible for training site personnel.
 - .4 Descriptions of environmental protection personnel training program.
 - .5 Drawings indicating locations of proposed temporary excavations.
 - .6 Historical, archeological, and cultural plans defining procedures for the protection of these resources.

1.4 FIRES

- .1 Fires and burning of rubbish on site is not permitted.

1.5 DRAINAGE

- .1 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .2 Ensure pumped water into waterways, sewer, or drainage systems is free of suspended materials.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.6 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties.
- .2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m minimum.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
 - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.

1.7 HISTORICAL/ARCHAEOLOGICAL CONTROL

- .1 Provide historical and archaeological resources plan that defines procedures for identifying and protecting historical and archaeological resources known to be on project site and identifies procedures to be followed if historical and archaeological resources not previously known to be onsite or in area are discovered during construction.
- .2 Plan: Include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental Representative.

1.8 ARCHEOLOGY

- .1 The Lachine Canal National Historic site is considered as an archeological site of national importance. Contractor must collaborate with Parks Canada if archeological remains are discovered.

- .2 Archeological Findings:
 - .1 If Contractor thinks to have discovered archeological remains during construction, immediately advise Departmental Representative and wait for written directives before proceeding with construction in area of discovery.
 - .2 Remains, antiquities, and any other element having a historic, archeological, or scientific interest, such as angular stones, commemorative plaques, slates, and other objects (remains or fragment) found on-site or in excavation or demolition areas, remain the property of Parks Canada. Protect objects and obtain directives from Departmental Representative.
- .3 Protection of Remains and Objects:
 - .1 Contractor must take every reasonable precaution during excavation to protect every discovered remains and clear area for archeological examination. Parks Canada will not tolerate any violation. If Contractor negligently deteriorates any type of remains, he will be held responsible and judged accordingly by Parks Canada.
 - .2 During demolition work, take necessary precautions to protect kept existing structures. Progressively demolish elements in a controlled manner. Carefully demolish elements which have sections for future use. If elements are damaged during demolition work, immediately inform Departmental Representative.

1.9 NOTIFICATION

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection Plan.
- .2 Contractor: After receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
 - .1 Take action only after receipt of written approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION**3.1 CLEANING**

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: Upon completion remove surplus materials, rubbish, tools, and equipment.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB 1.189-2000, Exterior Alkyd Primer for Wood.
 - .2 CGSB 1.59-1997, Alkyd Exterior Gloss Enamel.
- .2 Canadian Standards Association (CSA International).
 - .1 CSA-A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CAN/CSA-Z321-96(R2006), Signs and Symbols for the Occupational Environment.

1.2 INSTALLATION AND REMOVAL

- .1 Provide construction facilities in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

1.3 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Maintain and protect traffic on bicycle path during construction period, except as otherwise specifically directed by Departmental Representative. In any case, the bicycle path shall not be obstructed.
- .2 Provide measures for protection of traffic, including erection of barricades, fences, erection and maintenance of adequate warning, danger, direction signs, and traffic cones.
- .3 Protect travelling public from damage to person and property.
- .4 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with traffic.
- .5 Verify adequacy of existing roads and allowable load limit on these roads. Contractor is responsible for repair of damage to roads caused, landscaping, and all other surfaces by construction operations.
- .6 Provide necessary signs, barricades, distinctive markings, and traffic cones for safe movement of traffic.
- .7 Dust Control: Adequate to ensure safe operation at all times.

1.4 CLEAN-UP

- .1 Remove daily construction debris, waste materials, packaging material from work site.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Stack stored new or salvaged material not in construction facilities.

PART 2 - PRODUCTS**2.1 NOT USED**

- .1 Not Used.

PART 3 - EXECUTION**3.1 NOT USED**

- .1 Not Used.

END OF SECTION

PART 1 - GENERAL**1.1 ADMINISTRATIVE REQUIREMENTS**

- .1 Acceptance of Work Procedures:
 - .1 Delay:
 - .1 A maximum delay of seventy (70) working days after Contract granting is provided to proceed to Work Substantial Performance.
 - .2 Inspection:
 - .1 Departmental Representative's Inspection:
 - .1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .2 Completion Tasks: Submit written certificates both in English and French that tasks have been performed as follows:
 - .1 Work: Completed and inspected for compliance with Contract Documents.
 - .2 Defects: Corrected and deficiencies completed.
 - .3 Equipment and systems: Tested and fully operational.
 - .4 Work: Complete and ready for final inspection.
 - .3 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Departmental Representative and Contractor.
 - .2 When Work incomplete according to Departmental Representative, complete outstanding items and request re-inspection.
 - .4 Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

- .5 Commencement of Lien and Warranty Periods: Date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
- .6 Final Payment:
 - .1 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
- .7 Payment of Holdback: After issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.2 FINAL CLEANING

- .1 Clean Work areas and remove surplus materials, excess materials, rubbish, tools, and equipment.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

DIVISION 02

Existing Conditions

PART 1 - GENERAL**1.1 REFERENCES**

- .1 CSA International.
- .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.

PART 2 - PRODUCTS**2.1 NOT USED**

- .1 Not Used.

PART 3 - EXECUTION**3.1 EXAMINATION**

- .1 Inspect site with Departmental Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage, and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.
- .4 Disconnect, cap, plug, or divert, as required, existing public utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.
 - .1 Immediately notify Departmental Representative and utility company concerned in case of damage to any utility or service, designated to remain in place.
 - .2 Immediately notify the Departmental Representative should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

3.2 PREPARATION

- .1 Protection of In-Place Conditions:
 - .1 Prevent movement, settlement, or damage to adjacent structures, utilities, and landscaping features, and parts of building to remain in place. Provide bracing and shoring required.
 - .2 Keep noise, dust, and inconvenience to occupants to minimum.
 - .3 Protect building systems, services, and equipment.
 - .4 Provide temporary dust screens, covers, railings, support, and other protection as required.
- .2 Demolition/Removal:
 - .1 Removal of pavements, curbs, and gutters:
 - .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Departmental Representative.
 - .2 Protect adjacent joints and load transfer devices.
 - .3 Protect underlying and adjacent granular materials.
- .3 Works in the CN land's limits:
 - .1 The contractor shall prepare and transmit permit's demand for working in the CN land's limits, pay all fees and respect all CN requirements.

3.3 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: Upon completion remove surplus materials, rubbish, tools, and equipment.

END OF SECTION

DIVISION 03

Concrete

PART 1 - GENERAL**1.1 REFERENCES**

- .1 Canadian Standards Association (CSA International).
 - .1 CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-O86S1-05, Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood.
 - .3 CSA O121-M1978(R2003), Douglas Fir Plywood.
 - .4 CSA O151-04, Canadian Softwood Plywood.
 - .5 CSA O153-M1980(R2003), Poplar Plywood.
 - .6 CAN/CSA-O325.0-92(R2003), Construction Sheathing.
 - .7 CSA O437 Series-93(R2006), Standards for OSB and Waferboard.
 - .8 CSA S269.1-1975(R2003), Falsework for Construction Purposes.
 - .9 CAN/CSA-S269.3-M92(R2003), Concrete Formwork, National Standard of Canada
- .2 Underwriters' Laboratories of Canada (ULC).
 - .1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit shop drawings for formwork and falsework.
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.

PART 2 - PRODUCTS**2.1 MATERIALS**

- .1 Formwork Materials:
 - .1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121.

- .2 Rigid insulation board: To CAN/ULC-S701.
- .2 Form Ties:
 - .1 For concrete not designated "Architectural", use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.
- .3 Form Liner:
 - .1 Plywood: High density overlay Douglas Fir to CSA O121, Tongue and Groove edge, 20 mm thick.
- .4 Form Release Agent: Non-toxic, biodegradable, low VOC.
- .5 Form Stripping Agent: Colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene, with viscosity between 70 and 110s Saybolt Universal, 15 to 24 mm²/s at 40°C, flashpoint minimum 150°C, open cup.

PART 3 - EXECUTION

3.1 FABRICATION AND ERECTION

- .1 Verify lines, levels, and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Obtain Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.
- .3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .4 Do not place shores and mud sills on frozen ground.
- .5 Provide site drainage to prevent washout of soil supporting mud sills and shores.
- .6 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.
- .7 Align form joints and make watertight.
 - .1 Keep form joints to minimum.
- .8 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
- .9 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.

- .10 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

3.2 REMOVAL AND RESHORING

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
- .1 Remove formwork when concrete has reached 50% of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.

END OF SECTION

PART 1 - GENERAL**1.1 REFERENCES**

- .1 American Concrete Institute (ACI).
 - .1 SP-66-04, ACI Detailing Manual 2004.
- .2 ASTM International.
 - .1 ASTM A82/A82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - .2 ASTM A143/A143M-07, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
 - .3 ASTM A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
 - .4 ASTM A775/A775M-07b, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
- .3 CSA International.
 - .1 CSA-A23.1-09 /A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A23.3-04(R2010), Design of Concrete Structures.
 - .3 CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
 - .4 CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .5 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .6 CSA W186-M1990(R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .4 Reinforcing Steel Institute of Canada (RSIC).
 - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Canada.
 - .1 Indicate placing of reinforcement and:
 - .1 Bar bending details.
 - .2 Lists.
 - .3 Quantities of reinforcement.
 - .4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.
 - .5 Indicate sizes, spacings and locations of chairs, spacers, and hangers.
 - .2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated.
 - .2 When Chromate solution is used as replacement for galvanizing non-prestressed reinforcement, provide product description for review by Departmental Representative prior to its use.

1.3 DELIVERY, STORAGE, AND HANDLING

- .1 Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .2 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Departmental Representative.

- .2 Reinforcing Steel: Billet steel, grade 400, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing Steel: Weldable low alloy steel deformed bars to CSA-G30.18.
- .4 Cold-Drawn Annealed Steel Wire Ties: To ASTM A82/A82M.
- .5 Deformed steel wire for concrete reinforcement: to ASTM A82/A82M.
- .6 Welded Steel Wire Fabric: To ASTM A185/A185M.
 - .1 Provide in flat sheets only.
- .7 Chairs, Bolsters, Bar Supports, Spacers: To CSA-A23.1/A23.2.
- .8 Mechanical Splices: Subject to approval of Departmental Representative.
- .9 Plain Round Bars: To CSA-G40.20/G40.21.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
 - .1 SP-66 unless indicated otherwise.
- .2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.

PART 3 - EXECUTION

3.1 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.
- .2 When field bending is authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on placing drawings in accordance with CSA-A23.1/A23.2.
- .2 Use plain round bars as slip dowels in concrete.
 - .1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.

- .2 When paint is dry, apply thick even film of mineral lubricating grease.
- .3 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.

3.3 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: Upon completion remove surplus materials, rubbish, tools, and equipment.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 ASTM International.
 - .1 ASTM A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
 - .2 ASTM D260-86(2001), Standard Specification for Boiled Linseed Oil.
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-19.24-M90, Multicomponent, Chemical-Curing Sealing Compound.
- .3 CSA International.
 - .1 CSA-A23.1/A23.2-2004, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .3 CAN/CSA-G30.18-M92(R2002), Billet-Steel Bars for Concrete Reinforcement.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Shop Drawings:
 - .1 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and necessary details of reinforcing.
 - .2 Submit drawings showing formwork and falsework design: To CSA A23.1/A23.2.
 - .3 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.

1.3 DELIVERY, STORAGE, AND HANDLING

- .1 Delivery and Acceptance Requirements:
 - .1 Concrete hauling time: Deliver to site of Work and discharged within 120 minutes maximum after batching.
 - .1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2.

- .2 Deviations to be submitted for review by the Departmental Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Cement: To CSA A3001, Type GU.
- .2 Blended Hydraulic Cement: Type GUB to CSA A3001.
- .3 Water: To CSA A23.1/A23.2.
- .4 Reinforcing Bars: To CAN/CSA-G30.18, Grade 400.
- .5 Welded Steel Wire Fabric: To ASTM A185.
- .6 Other Concrete Materials: To CSA A23.1/A23.2.

2.2 MIXES

- .1 Performance Method for specifying concrete: To meet Departmental Representative performance criteria to CSA A23.1/A23.2.
 - .1 Provide concrete mix to meet following hard state requirements:
 - .1 Durability and class of exposure: F-2.
 - .2 Compressive strength at 28 age: 35 MPa minimum.
 - .3 Intended application: Slab and sidewalk.
 - .4 Aggregate size: 19 mm maximum.
 - .5 Entrained air: 5 to 8%.
 - .6 Sagging: 80 mm \pm 30.
 - .2 Concrete supplier's certification.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Provide Departmental Representative 24-hour notice before each concrete pour.
- .2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.

- .3 During Concreting Operations:
 - .1 Development of cold joints not allowed.
 - .2 Ensure concrete delivery and handling facilitates placing with minimum of rehandling, and without damage to existing structure or Work.
- .4 Protect previous Work from staining.
- .5 Clean and remove stains prior to application of concrete finishes.

3.2 INSTALLATION/APPLICATION

- .1 Do cast-in-place concrete work in accordance with CSA A23.1/A23.2.

3.3 FINISHES

- .1 Formed surfaces exposed to view: Sack rubbed finish in accordance with CSA A23.1/A23.2.
- .2 Pavements, walks, curbs and exposed site concrete:
 - .1 Screed to plane surfaces and use wood floats.
 - .2 Provide round edges and joint spacings using standard tools.
 - .3 Trowel smooth to provide lightly brushed non-slip finish.

3.4 CURING

- .1 Use curing compounds compatible with applied finish on concrete surfaces free of bonding agents and to CSA A23.1/A23.2.

3.5 SEALING APPLICATION

- .1 After curing is complete, apply two even coats of linseed oil mixture to clean dry surfaces, each at 8 m²/L. Allow first coat to dry before applying second coat.

3.6 SITE TOLERANCES

- .1 Concrete floor slab finishing tolerance to CSA A23.1/A23.2.

3.7 CLEANING

- .1 Clean at the end of Work.
- .2 Designate cleaning area for tools to limit water use and runoff.

3.8 CONCRETE FREEZING PROTECTION

- .1 The concrete freezing protection consists of building a shelter covering the Work. The shelter shall be realized in order to cover with canvas or tarpaulin the concrete surfaces being done. These covers shall be watertight, strong, and fixed in a manner that they cannot be displaced during the period of protection.
- .2 The shelter shall be sufficiently high and sized to allow, inside, pouring, finishing, and cure of concrete.
- .3 The shelter and the heating method shall be conceived in order to avoid ground from freezing. No concrete pouring on a frozen ground.
- .4 Heating apparatus, such as boilers, heaters, etc., shall be sized and in sufficient quantity to maintain concrete to the specified temperature. A warm air stream shall circulate inside the shelter. Heat shall reach all surfaces, formworked or not. If heating apparatus emit carbonic gases, these gases shall be evacuated outside the shelter.
- .5 Heating shall be maintained during 7 consecutive days.

END OF SECTION

DIVISION 26

Electrical

PART 1 - GENERAL**1.1 REFERENCES**

- .1 Canadian Standards Association (CSA International).
 - .1 CSA C22.10-10, Canadian Electrical Code, Part 1 (21st Edition) and modification of Quebec.
 - .2 CAN/CSA-C22.3 n° 7-10, Underground Systems.
 - .3 CAN3-C235-83 (R2010), Preferred Voltage Levels for AC Systems, 0 to 50,000 V.
- .2 Electrical and Electronic Manufacturer's Association of Canada (EEMAC).
 - .1 EEMAC 2Y-1-1958, Light Gray Colour for Indoor Switch Gear.
- .3 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC).
 - .1 IEEE SP1122-2000, The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.

1.2 DEFINITIONS

- .1 Electrical and Electronic Terms: Unless otherwise specified, terms used in these specifications and on drawings are those defined by IEEE SP1122.

1.3 DESIGN REQUIREMENTS

- .1 Operating Voltages: To CAN3-C235 Standard.
- .2 Motors, electric heating, control, and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.
 - .1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.
- .3 Language Operating Requirements: Provide identification nameplates and labels for control items in English and French.
- .4 Use one nameplate for both official languages.

1.4 SUBMITTALS

- .1 Product Data: Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish, and limitations.
- .2 Shop Drawings:
 - .1 Shop drawings for Work executed at site to be stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
 - .2 Submit wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure co-ordinated installation.
 - .3 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each piece of equipment.
 - .4 Drawing must indicate clearances for operation, maintenance, and replacement of operating equipment devices.
 - .5 Submit electronic version drawings and data sheets.
 - .6 If changes are required, notify Departmental Representative of these changes before they are made.
- .3 Certificates:
 - .1 Provide CSA certified equipment and material.
 - .2 Where CSA certified equipment and material is not available, submit such equipment and material to inspection authorities for special approval prior delivery to site.
 - .3 Submit test results of installed electrical systems and instrumentation.
 - .4 Permits and fees: In accordance with General Conditions of Contract.
- .4 Manufacturer's Field Reports: Submit to Departmental Representative manufacturer's written report, within 3 days of review, verifying compliance of Work and electrical system and instrumentation testing, as described in PART 3 - FIELD QUALITY CONTROL.

1.5 QUALITY ASSURANCE

- .1 Qualifications: Electrical Work to be carried out by qualified, licensed electricians who hold valid Master Electrical Contractor license or apprentices in accordance with authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, and handle materials.
- .2 Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors and in accordance with manufacturer's recommendations in clean, dry, and well-ventilated area.
 - .2 Store and protect materials from nicks, scratches, and blemishes.
- .4 Replace defective or damaged materials with new.

1.7 DEMOLITION

- .1 Remove all existing electrical equipment as indicated. Equipment to be removed at correct timing.
- .2 All equipment to be removed:
 - .1 Shall be removed with all related cabling and mounting;
 - .2 Becomes the property of the Contractor who shall dispose it promptly, or, be delivered to Departmental Representative, as indicated.
 - .1 All existing equipment to be delivered to Departmental Representative shall be cleaned and put in appropriate packaging.

1.8 SYSTEM STARTUP

- .1 Instruct operating personnel in operation, care and maintenance of systems, system equipment, and components.
- .2 Provide one additional visit for one technician on site within the period of twelve months following the date of the substantial completion certificate.
- .3 Date of visit to be coordinated with Departmental Representative.

1.9 OPERATING INSTRUCTIONS

- .1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.

- .2 Operating instructions to include following:
 - .1 Wiring diagrams, control diagrams, and control sequence for each principal system and piece of equipment.
 - .2 Safety precautions.
 - .3 Procedures to be followed in event of equipment failure.
 - .4 Other instructions, as recommended by manufacturer of each system or equipment.
- .3 Post instructions where directed.
- .4 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.
- .5 Ensure operating instructions will not fade when exposed to sunlight.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- .1 Material and equipment to be CSA certified. Where CSA certified material and equipment are not available, obtain special approval from inspection authorities before delivery to site.

2.2 WIRING TERMINATIONS

- .1 Ensure lugs, terminals, and screws used for termination of wiring are suitable for copper conductors as well as aluminum conductors.
- .2 Cable lugs to be compression type for the required size.

2.3 EQUIPMENT IDENTIFICATION

- .1 The enclosure identification terms will be supplied by Departmental Representative.

2.4 WIRING IDENTIFICATION

- .1 Identify wiring with permanent indelible identifying markings, numbered or self-adhesive coloured plastic tapes ("Pan-Quick" type), on both ends of phase conductors of feeders and branch circuit wiring, including neutral.
- .2 Maintain phase sequence and colour coding throughout the installation.
- .3 Colour Coding: To CSA C22.1.

2.5 FINISHES

- .1 Shop finish metal enclosure surfaces by application of rust resistant primer, inside and outside, and at least two coats of finish enamel.

PART 3 - EXECUTION**3.1 INSTALLATION**

- .1 Do complete installation in accordance with CSA C22.1, except where specified otherwise.
- .2 Do overhead and underground systems in accordance with CSA C22.3 No.1, except where specified otherwise.

3.2 NAMEPLATES AND LABELS

- .1 Ensure manufacturer's nameplates, CSA labels, and identification nameplates are visible and legible after equipment is installed.

3.3 FIELD QUALITY CONTROL

- .1 Conduct following:
 - .1 Circuits originating from branch distribution panels;
 - .2 Checking of earth continuity;
 - .3 Insulation resistance testing:
 - .1 Megger circuits, feeders, and equipment up to 350 V with a 500 V instrument.
 - .2 Check resistance to ground before energizing.
- .2 Carry out tests in presence of Departmental Representative.
- .3 Provide instruments, meters, equipment, and personnel required to conduct tests during and at conclusion of project.
- .4 Submit testing results to the Departmental Representative.

3.4 CLEANING

- .1 Clean and touch up surfaces of painted equipment scratched or marred during shipment or installation, to match original paint.

END OF SECTION

PART 1 - GENERAL**1.1 RELATED SECTIONS**

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA)/CSA International.
 - .1 CAN/CSA-C22.2, No. 18-98(R2003), Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware.
 - .2 CSA C22.2, No. 65-03 (R2008), Wire Connectors (Tri-National Standard with UL 486A-486B and NMX-J-543-ANCE-03).
- .2 National Electrical Manufacturers Association (NEMA).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit manufacturer's instructions, printed product literature, and data sheets for wire and box connectors, and include product characteristics, performance criteria, physical size, finish, and limitations.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit required documents.
- .2 Operation and Maintenance Data: Submit operation and maintenance data for wire and box connectors for incorporation into operation and maintenance manual.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

- .2 Store and protect wire and box connectors from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Pressure type wire connectors to: CSA C22.2, No. 65, with current carrying parts of copper sized to fit copper conductors, as required.
- .2 Joint connectors for lighting fixtures, to current carrying copper elements, sized for copper conductors size 10 AWG or less.
- .3 Bushing Stud Connectors: To NEMA to consist of:
 - .1 Connector body and stud clamp for round copper conductors.
 - .2 Clamp for stranded copper conductors.
 - .3 Stud clamp bolts.
 - .4 Bolts for copper conductors.
 - .5 Sized for conductors as indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for wire and box connectors installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

- .1 Remove insulation carefully from ends of conductors and cables, and proceeding as following:
 - .1 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CAN/CSA-C22.2 No. 65.
 - .2 Install fixture type connectors and tighten to CAN/CSA-C22.2 No.65. Replace insulating cap.
 - .3 Install bushing stud connectors in accordance with NEMA.
 - .4 Where required, provide grounding and bonding in accordance with CSA C22.2 No. 41.

3.3 CLEANING

- .1 Perform cleaning during construction.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: Upon completion remove surplus materials, rubbish, tools, and equipment.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 26 05 00 - Common Work Results for Electrical.
- .2 Section 26 05 20 - Wire and Box Connectors (0 - 1,000 V).

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International).
 - .1 CSA C22.2, No. 0.3-09, Test Methods for Electrical Wires and Cables.
- .2 Underwriters Laboratories of Canada (ULC).
 - .1 ULC-S139-00, Method of Fire Test for Evaluation of Integrity of Electrical Cables.

1.3 PRODUCT DATA

- .1 Provide product data.

PART 2 - PRODUCTS

2.1 BUILDING WIRES

- .1 Conductors: Stranded for 10 AWG and larger. Minimum size: 12 AWG.
- .2 Copper Conductors: Size as indicated, with 1,000 V insulation of cross-linked thermosetting polyethylene material rated or RWU90 XLPE.

2.2 MULTICONDUCTOR CABLE FOR PEDESTAL

- .1 4#4 AWG, round W type multiconductor cable with 90°C EPDM insulation. The conductor colour are black, white, red and green. The 90°C "Super Vu-Tron" exterior jacket is good for harsh environments.
- .2 Insulation up to 2,000 V.
- .3 The utilization temperature range is -40 to 90°C.
- .4 The cable is for exterior use and is marked "SUN-RES".

- .5 Withstands exposure to oil, acids, alkalies, heat, moisture and most chemicals.
- .6 Suitable for immersion in water if properly terminated.
- .7 Excellent impact resistant.
- .8 CSA, MSHA and UL type W approved.
- .9 Manufacturer: CAROL Super Vu-Tron type W Round 4#4 AWG (Anixter 5B-0204C or equivalent).

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform required tests using method appropriate to site conditions and to approval of Departmental Representative and local authority having jurisdiction over installation.
- .3 Perform tests before energizing electrical system.

3.2 GENERAL CABLE INSTALLATION

- .1 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors (0-1,000 V).
- .2 Cable Colour Coding: To Section 26 05 00 - Common Work Results for Electrical.

3.3 INSTALLATION OF BUILDING WIRES

- .1 Install wiring as follows:
 - .1 In conduit systems or in underground ducts.

END OF SECTION

PART 1 - GENERAL**1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 CSA Group.
 - .1 CSA C22.1-12, Canadian Electrical Code, Part 1 (22nd Edition), Safety Standard for Electrical Installations.
 - .2 CSA C22.2 No. 41-13, Grounding and Bonding Equipment (Tri-National Standard, with NMX-J-590ANCE and UL 467).
 - .3 CSA C22.2 No. 65-13, Wire connectors (Tri-National Standard, with UL 486A-486B NMX-J-543-ANCE).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for connectors and terminations, and include product characteristics, performance criteria, physical size, finish, and limitations.

PART 2 - PRODUCTS**2.1 CONNECTORS AND TERMINATIONS**

- .1 Copper long barrel compression connectors to CSA C22.2 No. 65 as required sized for conductors.

PART 3 - EXECUTION**3.1 EXAMINATION**

- .1 Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for connectors and terminations installation in accordance with manufacturer's written instructions.

3.2 INSTALLATION

- .1 Splices in accordance with manufacturer's instructions.

3.3 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: Upon completion remove surplus materials, rubbish, tools, and equipment.

END OF SECTION

PART 1 - GENERAL**1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 American National Standards Institute /Institute of Electrical and Electronics Engineers (ANSI/IEEE).
- .1 ANSI/IEEE 837- 02, IEEE Standard for Qualifying Permanent Connections Used in Substation Grounding.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for grounding equipment and include product characteristics, performance criteria, physical size, finish, and limitations.

PART 2 - PRODUCTS**2.1 EQUIPMENT**

- .1 Rod Electrodes: Copper clad steel, 19 mm diameter by minimum 3 m long.
- .2 Plate Electrodes: Copper, surface area 0.2 m², minimum 1.6 mm thick.
- .3 Grounding Conductors: Bare stranded copper, tinned, soft annealed, size as indicated.
- .4 Insulated Grounding Conductors: Green, copper conductors, size as indicated.

PART 3 - EXECUTION**3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for grounding equipment installation in accordance with manufacturer's written instructions.

3.2 INSTALLATION GENERAL

- .1 Install complete permanent, continuous grounding system including, electrodes, conductors, connectors, accessories.

- .2 Install connectors in accordance with manufacturer's instructions.
- .3 Protect exposed grounding conductors from mechanical injury.
- .4 Make buried connections, and connections to electrodes, using copper welding by thermit process.
- .5 Use mechanical connectors for grounding connections to equipment provided with lugs.

3.3 MAINTENANCE HOLES

- .1 Install conveniently located grounding stud, electrode, size as indicated stranded copper conductor in each maintenance hole.

3.4 ELECTRODES

- .1 Install rod, plate electrodes, and make grounding connections as indicated.
- .2 Make special provision for installing electrodes that will give acceptable resistance to ground value where rock or sand terrain prevails. Ground as indicated.

3.5 EQUIPMENT GROUNDING

- .1 Install grounding connections to typical equipment included in, but not necessarily limited to following list: Service equipment, transformers, switchgear, duct systems, distribution panels, and outdoor lighting.

3.6 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform tests before energizing electrical system.

3.7 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: Upon completion remove surplus materials, rubbish, tools, and equipment.

END OF SECTION

PART 1 - GENERAL**1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International).
- .1 CSA C22.1-06, Canadian Electrical Code, Part 1, 20th Edition.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

PART 2 - PRODUCTS**2.1 JUNCTION AND PULL BOXES**

- .1 Interior Boxes:
 - .1 Construction: Welded steel enclosure without knock-out.
 - .2 Cover Surface Mounted: Screw-on flat covers.
- .2 Exterior Boxes:
 - .1 Exterior pull boxes shall be 316L stainless steel, NEMA 4X, 12 AWG gauge with threaded welded couplers for threaded steel rigid conduit.

PART 3 - EXECUTION**3.1 JUNCTION, PULL BOXES AND CABINETS INSTALLATION**

- .1 Install pull boxes in inconspicuous, but accessible locations.
- .2 Unless indicated otherwise, mount cabinet as indicated.

3.2 IDENTIFICATION

- .1 Equipment Identification: To Section 26 05 00 - Common Work Results for Electrical.

- .2 Identification Labels: Size 2 indicating voltage and phase or as indicated.

END OF SECTION

PART 1 - GENERAL**1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International).
 - .1 CAN/CSA C22.2 No. 18-98(R2003), Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware, A National Standard of Canada.
 - .2 CSA C22.2 No. 45-M1981(R2003), Rigid Metal Conduit.
 - .3 CSA C22.2 No. 56-04, Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
 - .4 CSA C22.2 No. 83-M1985(R2003), Electrical Metallic Tubing.
 - .5 CSA C22.2 No. 211.2-M1984(R2003), Rigid PVC (Unplasticized) Conduit.
 - .6 CAN/CSA C22.2 No. 227.3-05, Nonmetallic Mechanical Protection Tubing (NMPT), A National Standard of Canada (February 2006).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data: Submit manufacturer's printed product literature, specifications, and datasheets.

PART 2 - PRODUCTS**2.1 CONDUITS**

- .1 Rigid PVC Conduit: To CSA C22.2 No. 211.2. Use in bottom of trench only.
- .2 Rigid metal conduits to CSA C22.2 No. 45, hot dipped galvanized steel, interior and exterior epoxy painted and exterior PVC coved, color: gray, threaded.

2.2 CONDUIT FASTENINGS

- .1 One-hole steel straps with spacer to secure surface conduits smaller than 50 mm.
 - .1 Two-hole steel straps for conduits 50 mm or larger diameter.
 - .2 Coating: same as conduit.

2.3 CONDUIT FITTINGS

- .1 Fittings: To CAN/CSA C22.2 No. 18, manufactured for use with conduit specified.
Coating: Same as conduit.
- .2 Ensure factory "ells" where 90° bends 20 mm and larger conduits.

2.4 EXPANSION FITTINGS FOR RIGID CONDUIT

- .1 Weatherproof expansion fittings with internal bonding assembly suitable for 200 mm linear expansion.
- .2 Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection.

2.5 FISH CORD

- .1 Polypropylene.

PART 3 - EXECUTION**3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: Comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

- .1 Mount conduits, except as indicated.
- .2 Use rigid PVC conduit underground.
- .3 Bend Conduit Cold:
 - .1 Replace conduit if kinked or flattened more than $\frac{1}{10}$ th of its original diameter.
- .4 Mechanically bend steel conduit over 19 mm diameter.
- .5 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.

- .6 Install fish cord in empty conduits.
- .7 Remove and replace blocked conduit sections.
 - .1 Do not use liquids to clean out conduits.
- .8 Dry out conduits before installing wire.

3.3 SURFACE CONDUITS

- .1 Run parallel or perpendicular to works lines.

3.4 CONDUITS UNDERGROUND

- .1 Slope conduits to provide drainage.
- .2 Waterproof joints (PVC excepted) with heavy coat of bituminous paint.

3.5 CLEANING

- .1 Clean site on a weekly basis.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools, and equipment.

END OF SECTION

PART 1 - GENERAL**1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 Insulated Cable Engineers Association, Inc. (ICEA).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for cables, and include product characteristics, performance criteria, physical size, finish and limitations.

PART 2 - PRODUCTS**2.1 CABLE PROTECTION**

- .1 38 x 140 mm planks pressure treated with clear copper naphthenate or 5% pentachlorophenol solution, water repellent preservative.

PART 3 - EXECUTION**3.1 EXAMINATION**

- .1 Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for cable installation in accordance with manufacturer's written instructions.

3.2 CABLE INSTALLATION IN DUCTS

- .1 Install cables as indicated in ducts.
- .2 Do not pull spliced cables inside ducts.
- .3 Install multiple cables in duct simultaneously.
- .4 Use CSA approved lubricants of type compatible with cable jacket to reduce pulling tension.
- .5 After installation of cables, seal duct ends with duct sealing compound.

3.3 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform tests using qualified personnel.
 - .1 Include necessary instruments and equipment.
- .3 Check phase rotation and identify each phase conductor of each feeder.
- .4 Check each feeder for continuity, short circuits, and grounds.
 - .1 Ensure resistance to ground of circuits is not less than 50 megohms.
- .5 Pre-acceptance Tests:
 - .1 After installing cable but before splicing and terminating, perform insulation resistance test with 1,000 V megger on each phase conductor.
 - .2 Check insulation resistance after each splice and/or termination to ensure that cable system is ready for acceptance testing.
- .6 Acceptance Tests:
 - .1 Ensure that terminations and accessory equipment are disconnected.
 - .2 Ground shields, ground wires, metallic armour and conductors not under test.
 - .3 High Potential (Hipot) Testing.
 - .1 Conduct hipot testing in accordance with manufacturer's recommendations.
 - .4 Leakage Current Testing:
 - .1 Raise voltage in steps from zero to maximum values as specified by manufacturer for type of cable being tested.
 - .2 Record leakage current at each step.
- .7 Provide Departmental Representative with list of test results showing location at which each test was made, circuit tested and result of each test.
- .8 Remove and replace entire length of cable if cable fails to meet any of test criteria.

3.4 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: Upon completion remove surplus materials, rubbish, tools, and equipment.

END OF SECTION

PART 1 - GENERAL**1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 CSA International.
 - .1 CSA C22.2 No. 5-09, Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures (Tri-National Standard with UL 489, and NMX-J-266-ANCE-2010).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for circuit breakers and include product characteristics, performance criteria, physical size, finish, and limitations.
- .2 Include time-current characteristic curves for breakers with interrupting capacity of 22,000 A symmetrical (rms) and over at system voltage with ampacity of 100 A and over.
- .3 Certificates:
 - .1 Prior to installation of circuit breakers in either new or existing installation, Contractor must submit 3 copies of a production certificate of origin from the manufacturer. Production certificate of origin must be duly signed by factory and local manufacturer's representative certifying that circuit breakers come from this manufacturer and are new and meet Standards and Regulations.
 - .1 Production certificate of origin must be submitted to Departmental Representative for approval.
 - .2 Delay in submitting production of certificate of origin will not justify any extension of contract and additional compensation.
 - .3 Any work of manufacturing, assembly or installation to begin only after acceptance of production certificate of origin by Departmental Representative. Unless complying with this requirement, Departmental Representative reserves the right to mandate manufacturer listed on circuit breakers to authenticate new circuit breakers under the contract, and to Contractor's expense.

- .4 Production certificate of origin must contain:
 - .1 Manufacturer's name and address and person responsible for authentication. Person responsible must sign and date certificate.
 - .2 Licensed dealer's name and address and person of distributor responsible for Contractor's account.
 - .3 Contractor's name and address and person responsible for project.
 - .4 Local manufacturer's representative name and address. Local manufacturer's representative must sign and date certificate.
 - .5 Name and address of building where circuit breakers will be installed:
 - .1 Project title;
 - .2 End user's reference number;
 - .3 List of circuit breakers.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .2 Storage and Handling Requirements:
 - .1 Store circuit breakers indoors and in accordance with manufacturer's recommendations in clean, dry, and well-ventilated area.
 - .2 Store and protect circuit breakers from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 BREAKERS GENERAL

- .1 Moulded-case circuit breakers, circuit breakers, ground-fault circuit-interrupters: To CSA C22.2 No. 5.
- .2 Bolt-on Moulded Case Circuit Breaker: Quick-make, quick-break type, for manual and automatic operation with temperature compensation for 40°C ambient.
- .3 Common-Trip Breakers: With single handle for multi-pole applications.
- .4 Circuit breakers to have minimum 22 kA symmetrical rms interrupting capacity rating.

2.2 THERMAL MAGNETIC BREAKERS

- .1 Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short-circuit protection.

2.3 ADDITIONAL FEATURES

- .1 Include:
 - .1 On-off locking device for all breakers.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions.

3.2 INSTALLATION

- .1 Install circuit breakers.

3.3 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: Upon completion remove surplus materials, rubbish, tools, and equipment.

END OF SECTION

PART 1 - GENERAL**1.1 RELATED REQUIREMENTS**

- .1 Section 26 05 00 - Common Work Results for Electrical.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI).
 - .1 ANSI C82.1-04, Lamp Ballasts-Line Frequency Fluorescent Lamp Ballast.
 - .2 ANSI C82.4-02(R2007), Ballasts for High-Intensity-Discharge and Low-Pressure Sodium Lamps Multi Supply Type.
- .2 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE).
 - .1 ANSI/IEEE C62.41-1991, Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.
- .3 ASTM International Inc.
 - .1 ASTM F1137-00(2006), Standard Specification for Phosphate/Oil and Phosphate/Organic Corrosion Protective Coatings for Fasteners.
- .4 Canadian Standards Association (CSA International).
- .5 ICES-005-07, Radio Frequency Lighting Devices.
- .6 Underwriters' Laboratories of Canada (ULC).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide complete photometric data prepared by independent testing laboratory for luminaires where specified, for review by Departmental Representative.
 - .3 Photometric data to include: VCP Table where applicable.

- .2 Quality assurance submittals: provide technical specifications.
- .1 Manufacturer's instructions: provide manufacturer's written installation instructions and special handling criteria, installation sequence, cleaning procedures and maintenance.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

PART 2 - PRODUCTS

2.1 GENERAL

- .1 The lighting fixtures shall be installed in the hand rail of the quay's footbridge.

2.2 LIGHTING FIXTURES

- .1 LED lighting fixtures constituted of a 316 stainless steel frame with a borosilicate lens including stainless steel accessories. The lighting fixture is IP66 classified.
- .2 The lighting fixture has a single 1.55 W LED. The LED produce an output of 125 lumens and the lighting distribution is asymmetrical with a beam light aperture of 90°.
- .3 The lighting's fixture are feed by LED driver , a 0-10 V dimmer, distribution blocks, a fuse-holder block, fuses and a CEMA 4X 316 stainless steel box.
- .4 The splices within the handrail are connected with waterproof gel connectors.
- .5 Manufacturer:
 - .1 Lighting fixtures Planet lighting, modèle HLS vertical down asymmetric beam (90 degrés) minipuck HLS – ST- HW - FF – WW;
 - .2 Driver Planet Lighting PLED – 2X50-450;
 - .3 Waterproof gel connectors Planet Lighting UY 2.

2.3 FINISHES

- .1 Light fixture finish and construction to meet ULC listings and CSA certifications related to intended installation.

2.4 OPTICAL CONTROL DEVICES

- .1 As indicated in specifications and drawings.

2.5 LUMINAIRES

- .1 As indicated in specifications and drawings.

PART 3 - EXECUTION**3.1 INSTALLATION**

- .1 Locate and install luminaires as indicated.

3.2 LIGHTING FIXTURES

- .1 Pull the wiring through the lighting fixture's openings.
- .2 Use the drilling jig to drill in the handrail.
- .3 Splice the conductors with the gel connectors.
- .4 Screw the lighting fixtures in their openings.
- .5 Test the lighting system.
- .6 When the system functions correctly, apply a Loctite 243 adhesive sealant to seal the openings and to lock the lighting fixtures in place.
- .7 Always refer to manufacturer's installation instructions.

3.3 WIRING

- .1 Connect luminaires to lighting circuits:
 - .1 Install flexible or rigid conduit for luminaires as indicated.

3.4 CLEANING

- .1 Clean the site of works.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

DIVISION 31

Earthwork

PART 1 - GENERAL**1.1 REFERENCES**

- .1 American Society for Testing and Materials (ASTM).
 - .1 ASTM C117-13, Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D422-63 (2007)e1, Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D698-12e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³).
 - .5 ASTM D1557-12, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-m/m³).
 - .6 ASTM D4318-10e1, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA).
 - .1 CAN/CSA-A3000-03 (R2005), Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .1 CSA-A3001-03, Cementitious Materials for Use in Concrete.
 - .2 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete

1.2 DEFINITIONS

- .1 Excavation Classes: Two classes of excavation will be recognized; common excavation and rock excavation.
 - .1 Rock: Solid material which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m³ bucket. Frozen material not classified as rock.
 - .2 Common excavation: Excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Unclassified Excavation: Excavation of deposits of whatever character encountered in Work.
- .3 Top soil: Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping, and seeding.
- .4 Waste Material: Excavated material unsuitable for use in Work or surplus to requirements.
- .5 Borrow Material: Material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .6 Unsuitable Materials:
 - .1 Compressive and weak fill materials under the excavated areas.
 - .2 Frost susceptible materials under the excavated areas.
 - .3 Frost susceptible materials:
 - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136 Standards: Sieve sizes to CAN/CGSB-8.1.

- .2 Table:

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80
0.005 mm	0 - 45

- .3 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.

- .7 Unshrinkable Fill: Very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.3 DOCUMENTS TO BE SUBMITTED FOR APPROBATION/INFORMATION

- .1 Submit required documents.
- .2 Quality Control:
 - .1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.
 - .2 Submit for review by Departmental Representative proposed dewatering and heave prevention methods as described in PART 3 of this Section.
 - .3 Submit to Departmental Representative written notice at least seven (7) days prior to excavation work, to ensure cross sections are taken.
 - .4 Submit to Departmental Representative written notice when bottom of excavation is reached.
- .3 Preconstruction Submittals:
 - .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
 - .2 Submit records of underground utility locates, indicating: Location plan of existing utilities as found in field, clearance record from utility authority, location plan of relocated and abandoned services, as required.

1.4 QUALITY ASSURANCE

- .1 Submit design and supporting data at least two (2) weeks prior to beginning Work.
- .2 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Quebec and/or Canada.
- .3 Keep a copy of design and supporting data on the Work site.
- .4 Hire a qualified professional engineer registered or licensed in Province of Quebec and/or Canada, to be in charge of the conception and the inspection of the cofferdams and bracings, during the Work.
- .5 Do not use soil material until written report of soil test results is approved by Departmental Representative.

.6 Health and Safety Requirements.

- .1 Do construction occupational health and safety.

1.5 PROTECTION OF EXISTING STRUCTURES

- .1 Protect existing structures in accordance with local regulations.

.2 Underground structures and utility systems.

- .1 Before commencing Work verify and establish location of buried services on and adjacent to site.
- .2 Details indicated on the drawings regarding the dimensions, location and depth at which underground structures and utilities are buried are only provided for general information purposes and are not necessarily accurate or complete.
- .3 Before starting to dig trenches, notify the Departmental Representative and/or the authorities of the public utility companies involved and determine the location and condition of the underground structures and systems. Clearly identify the locations to prevent any service interruptions while the Work is being performed.
- .4 Confirm the location of the underground systems by carefully performing trial excavations.
- .5 Maintain in operation and protect against any damage all water, sewage, gas, electricity and telephone lines as well as other systems or structures that might be in the areas to be excavated.
- .6 Before moving or disturbing a structure or a public utility system in any way, obtain appropriate directives from the Departmental Representative.
- .7 Obtain appropriate directives from Departmental Representative before removal or detour of existing systems at the excavation site. Assume the costs for this Work.
- .8 Take note of the location of the underground lines that have been retained, diverted or abandoned.
- .9 Confirm the location of excavations recently performed near Work area.

.3 Existing buildings and structures on the property.

- .1 In the presence of the Departmental Representative, check the condition of the buildings, trees and other plants, lawns, fences, service poles, cables, railroad tracks, road surfaces, survey markers and elevation indicators that need to stay in place and which may be damaged during the Work.

- .2 Protect existing buildings and structures on the property likely to sustain damage, against all such damage while the Work is being performed. In the event of damage, immediately restore the affected components to their original state, to the Departmental Representative's satisfaction.
- .3 If roots or branches need to be cut to complete the excavation work, only perform this work after obtaining the Departmental Representative's approval.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Type 1 Fill: Crushed stone 20-0:

- .1 Clean, hard, durable crushed stone or gravel free of shale, clay and friable, organic or deleterious material; the sizing of the material shall remain within the range indicated below, when tested in accordance with the ASTM C136-06 and ASTM C117-04 Standards, and the sizing curve plotted on a semi-logarithmic graph shall be continuous and progressive. The fill shall be certified DB 0-20 fill.

ASTM Sizing; % Throughs

31.5	mm	100
20	mm	90-100
14	mm	68-93
5	mm	35-60
1.25	mm	19-38
315	µm	9-17
80	µm	2-7

- .2 Type 2 Fill: Granular Class A Soils:

- .1 Compactable soils, essentially comprising granular, hard, durable, non-plastic material, such as MG-112 sand, gravel or crushed stone. These soils shall be free of shale, clay, and friable, organic or deleterious material, and of contaminated material. These soils shall not be frost prone. These soils shall not contain rubble greater than 100 mm in diameter.

- .3 Type 3 Fill: Regular Class B Soil:

- .1 All compactable, unfrozen material may be used except organic soils. The soil components must be minerals, free from stones greater than 150 mm in diameter, clinker, ashes, waste, pieces of sod or other harmful material.

- .4 Drainage Fill:
- .1 Crushed stone 19 mm in diameter, clean, hard, and durable, containing no dust or foreign material, organic or plant material, or flat or elongated fragments.
- .5 Stone Dust:
- .1 Screened stone: hard, clean, durable, free of shale, clay and friable, organic or deleterious material; in compliance with the following sizing (ASTM C136-06 and ASTM C117-04):
- ASTM Sizing; % Through**
- | | | |
|-----|----|--------|
| 10 | mm | 100 |
| 5 | mm | 75-100 |
| 160 | µm | 4-25 |
| 80 | µm | 0-10 |
- .6 Dimensionally Stabilized Fill Materials:
- .1 0.4 MPa maximum compression strength at 28 days;
- .2 maximum Portland cement content of 25 kg/m³, comprising 40% fly ash as cement replacement: in accordance with the CAN/CSA-A3000, Type GU Standard;
- .3 0.07 MPa minimum strength at 24 hours;
- .4 Concrete aggregate: In accordance with the CAN/CSA-A23.1/A23.2-04 Standard;
- .5 Portland cement: Type GU;
- .6 Slump: 160 mm.
- .7 Geotextile Membrane: Texel No. 7609 type or approved equivalent.
- .8 Before using, have the Departmental Representative approve all fill materials. After receiving approval, always purchase the same materials from the same sources.
- .9 Before resorting to using borrowed material, the Contractor may use excavated material if it meets the requirements of this section of the specifications and is approved by the Departmental Representative. In-situ soils shall not be used as type 2 fill. They may be considered as type 3 fill if they meet the requirements for this type of fill.
- .10 Provide supplementary fill material suitable for the Work, from an outside supplier.

- .11 Bedding and surround materials for pipes and underground structures: The bedding and surround of underground structures or the anti-contamination layer are produced using MG-20b calibre granular materials complying with the Quebec Department of Transport's 2101 and 2103 Standards shown in the tables appearing in the "Granular Materials" article, and whose petrographic number is 300 max. with M_gSO_4 (NQ2560-450) durability of 35 % max.

ASTM Sizing; % Throughs

31.5	mm	100
20	mm	90-100
14	mm	68-93
5	mm	35-60
1.25	mm	19-38
315	μm	9-17
80	μm	5-11

PART 3 - EXECUTION**3.1 PREPARATORY WORK**

- .1 At the start of the Work, clear away all obstacles, snow and ice from the surfaces of the excavation and backfill area to the extent indicated and/or required to perform Work.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.2 PREPARATION/PROTECTION

- .1 Protect existing features in accordance with applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative's approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .5 Protect buried services that are required to remain undisturbed.

3.3 STRIPPING OF TOP SOIL

- .1 Once the bushes, weeds and sod have been removed from the site, start excavating the top soil in the areas required for completion of the Work.
- .2 Excavate the top soil down to the subsoil. Do not mix the top soil with material from the subsoil.
- .3 Pile the top soil in the areas designated by the Departmental Representative for later use in landscaping operations. Do not pile the earth higher than 2 m.
- .4 Remove the unused top soil from the site.

3.4 PILING

- .1 Pile the backfill material in the areas designated by the Departmental Representative and store the aggregate material to prevent any segregation.
- .2 Protect the fill materials against any contamination.

3.5 COFFERDAMS, BRACING, CROSS BRIDGING, AND UNDERPINNING

- .1 Build temporary falsework as required.
- .2 Perform the following operations during backfilling:
 - .1 Unless otherwise indicated or directed by the Departmental Representative, remove the sheet piles and falsework from the excavation sites.
 - .2 Do not remove the cross bridging before the fill material has been piled to the height at which it stands.
 - .3 Gradually remove the sheet piles, keeping the compacted backfill at least 500 mm above the bottom of the sheet piles.
- .3 When the sheet piles need to remain in place, cut the tops of the sheet piles at the level indicated.
- .4 Perform the following operations once the infrastructure construction is completed.
 - .1 Remove the cofferdams, falsework and cross bridging.
 - .2 Remove the surplus material from the site.

3.6 EXCAVATION DEWATERING AND UPLIFT PREVENTION

- .1 Keep the excavations dry throughout Work.
- .2 If there is a risk of boiling or uplift, do not excavate below the water table. To prevent the conduits or the excavation floor from heaving, lower the water table, cut back the sheet piles or use other appropriate methods.
- .3 Protect open pits against flooding and damage that may result from surface runoff.
- .4 Evacuate the water in a manner that poses no risk to public or private properties, or to any part of the completed Work or Work in progress.
- .5 Provide and install flocculation tanks, settling tanks or other water treatment facilities to remove suspended solids or other undesirable material before discharging the water into a storm sewer, watercourse, or drainage basin.

3.7 EXCAVATION

- .1 Notify the Departmental Representative at least one week before starting the excavations and record the elevations of the natural land in his presence where necessary.
- .2 Perform the excavation work according to the indicated mapping, profiles, levels, cuts and dimensions.
- .3 The excavation work shall in no way alter the load-bearing capacity of adjacent foundations.
- .4 Do not move the earth under the canopy of trees or bushes that are to remain in place. If it is necessary to excavate between the roots, excavate by hand and cut the roots with a well-sharpened axe or saw.
- .5 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave any open trench at end of day's operation.
- .6 Excavation materials and piled materials shall be stored at an adequate distance from the trenches.
- .7 Limit Work performed with construction machinery in the immediate vicinity of unfilled trenches.
- .8 Dispose all excavation surpluses or unsuitable materials away from work site.
- .9 Avoid blocking surface runoff or natural watercourses.

- .10 Excavation bottoms shall be free of loose, soft or organic material.
- .11 If the soil at the bottom of the excavations appears to be unsuitable, notify the Departmental Representative.
- .12 Once the excavations are completed in an area, have them approved by the Departmental Representative.
- .13 Remove all unsuitable material, such as stone, rock fragments, and others, from the excavation site that might slides down into it.
- .14 Contour the excavations by hand, reinforce the walls and remove all loose material and debris from the excavations. If the material at the bottom of the excavation has been disturbed, compact it until it is at least as dense as the undisturbed soil. Clean cracks found in the rock and fill them with concrete grout or mortar to the Departmental Representative's satisfaction.
- .15 Install geotextiles.

3.8 FILL TYPES AND COMPACTION

- .1 Use types of fill as indicated or specified below or as mentioned on the plans. Compaction densities are percentages of maximum densities obtained from ASTM D698, and/or ASTM D1557.
 - .1 Place unshrinkable fill in areas as indicated.

3.9 BEDDING AND SURROUND OF UNDERGROUND SERVICES

- .1 Place and compact granular material for bedding and surround of underground services as indicated.
- .2 Place bedding and surround material in unfrozen condition.

3.10 BACKFILLING

- .1 Perform compaction of backfilling materials with vibrating equipment.
- .2 Do not proceed with backfilling operations until Departmental Representative has inspected and approved the installations.
- .3 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .4 Do not use backfill material which is frozen or contains ice, snow or debris.

- .5 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .6 Backfilling around installations:
 - .1 Place bedding and surround material as specified elsewhere.
 - .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
 - .3 Place layers simultaneously on both sides of installed Work to equalize loading.
 - .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
 - .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Departmental Representative:
 - .2 If approved by Departmental Representative, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Departmental Representative.
- .7 Place unshrinkable fill in areas as indicated.
- .8 Consolidate and level unshrinkable fill with internal vibrators.

3.11 SITE RESTORATION

- .1 Once Work is completed, remove any surplus material and debris, re-grade the slopes and correct any defects.
- .2 Replace top soil as indicated.
- .3 Reinstate lawns to elevation which existed before excavation.
- .4 Restore the surfaces of roads affected during the Work to the condition and level that existed before the excavation began, ensuring that these structures are restored to their original thickness.
- .5 Clean and restore areas damaged during the Work, according to the Departmental Representative's directives.
- .6 During the first 24 hours, use temporary shoring to support the loads exerted by traffic on the dimensionally stabilized backfills.
- .7 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

3.12 DISPOSAL OF WASTE MATERIALS

.1 General.

.1 The Contractor shall load, transport and dispose of all waste material off-site, at the location, which he shall select and which is suited to the disposal of said waste, in compliance with the directives of the MDDEP's Soil Protection and Contaminated Sites Rehabilitation Policy.

.2 Loading, transportation and disposal of waste are at the Contractor's expense.

.2 Dry Materials.

.1 All materials from 2nd class excavation such as crushed or shredded residue, which are non-petruscible and contain no hazardous waste such as scrap wood, rubble, waste plaster, and concrete, masonry and paving refuse, shall be transported and disposed of at a dry materials dump authorized by Quebec's Ministère de l'Environnement (Ministry of the Environment). The Contractor must provide the Departmental Representative with proof that the selected dumpsite meets the requirements of this article as well as receipts issued by the dumpsite upon reception of the material. The cost of sorting, handling, and disposing of these materials shall be assume by the Contractor.

.3 Unusable Materials.

.1 All materials from 2nd class excavation and deemed unusable by the Departmental Representative, such as putrid matter, top soil, loam, etc., shall be transported to a suitable location chosen by the Contractor and approved by the Departmental Representative. Rotting materials from debris will also be loaded into closed truck boxes. The cost of sorting, handling and disposing of these materials shall be assumed by the Contractor.

.2 If deemed necessary by the Departmental Representative, the Contractor shall, for filling trenches, replace unusable materials with acceptable materials.

3.13 DISPOSAL OF EXCAVATION SURPLUS

.1 Excavation surplus refused by the Departmental Representative for the project's backfilling purposes can be disposed of at a site selected by the Contractor and approved by the Departmental Representative, and located at least 75 m (250 ft.) from a road's right-of-way or the shoreline of a water course. Materials must be placed so as not to be visible from a public road or obstruct the flow of water. Once disposal has been completed, the materials must be leveled to the satisfaction of the owner(s) of the land. The Contractor must obtain a letter of authorization from each of the owners of the land covered by these provisions. A copy of this agreement must be provided to the Departmental Representative before material is transported.

- .2 All Work covered by the preceding provisions shall be carried out in compliance with the directives and/or regulations of the MDDEP's *Soil Protection and Contaminated Sites Rehabilitation Policy*, which, in the event of contradiction, take priority over the preceding requirements.
- .3 All expenses related to any use whatsoever of the above-mentioned disposal and/or landfill site, including the obtention of any permit and/or authorization, as well as the loading, transportation and disposal, shall be at the Contractor's expense.
- .4 All sites for the storage and disposal of debris (excavation surplus excluding any refuse) considered within the framework of this contract must first be approved by the Departmental Representative no later than the first worksite meeting. None of these materials can be disposed of until this approval has been obtained.
- .5 Part of the debris is used by the Contractor to carry out Work covered by this contract. If excavation surplus is required by the Departmental Representative, the Contractor shall transport and spread this surplus material at his expenses, at designated locations within an overland radius of 8.0 km, as established by the Departmental Representative.
- .6 All excavation surplus and 1st and 2nd Classes debris not required by the Departmental Representative become the property of the Contractor.
- .7 The Contractor shall ensure that these materials are not disposed of in a flood zone and, prior to the start of Work, shall provide the Departmental Representative with a permit.
- .8 The Contractor is solely responsible for consequences resulting from the filling of one or more properties and possible claims or lawsuits from the property owners concerned, with regards to the leveling, the quality of debris materials, damages to trees, terraces, etc. The disposal of excavation surplus must not impede the natural drainage of the site.

END OF SECTION

APPENDIX A

CN Guidelines Regarding Access to Workplace

CN Guidelines Regarding Access to Workplace

Introduction

Railway facilities and operations can be dangerous places for people who do not have a railroad background. This applies to contractors, sub-contractors, visitors and other non-company personnel.

It is important that proper control measures be taken to ensure that access to CN property is controlled and the safety of all people is assured.

This document outlines the necessary requirements for authorizing access to CN property and CN equipment.

Included is a letter to all employees from CN's Chief of Police & Chief Security Officer outlining CN's requirements for access to CN property and right-of-way. Also included is a table outlining the specific measures and control procedures to access various workplaces, copies of the liability forms, safety instructions, and a letter of introduction.

All CN management employees, are expected to read these guidelines and abide by their contents.

Message to all Employees, Contractors, and Sub-Contractors:

Subject: Access to CN Workplace

CN's "Guidelines Regarding Access to CN Workplace" is applicable when access to company property is sought by persons other than CN employees. This includes yards, shops, railway equipment and all other company locations, such as locomotives, vehicles, etc. This Guideline exists to protect the safety of all people granted access, and also to safeguard CN's interests. **All employees are required to comply with these Guidelines.**

In essence, the major points are as follows:

1. No one, other than CN employees, may enter a CN workplace without proper authorization from the appropriate CN Officer.
2. Every non-CN employee entering the CN workplace is required to be identified in an appropriate way (ex.: visitor must wear protective headwear, I.D. card, pass, etc.).
3. Authorization to board railway equipment and vehicles (i.e., locomotive cabs, hi-rail equipment, other vehicles, etc.) consists of a pass and / or a signed letter of authorization from V.P. (or delegate).
4. If observing a trespasser, do so from a safe distance to determine that it is safe to approach, and warn the trespasser to leave CN's property. In all cases, notify CN Police (1-800-465-9239) and a supervisor. If the trespasser(s) is unwilling to leave, observe the individual(s) until a CN Police officer or supervisor arrives.

While on CN premises non-CN employees, and employees and sub-contractors, must comply with CN rules, policies, standards and procedures. This requires that non-CN employees receive adequate instructions as to what these are. Job briefings must also be conducted by the CN person in charge when arriving on company property or prior to commencing work.

Although the process to apply company policy may vary according to circumstances, all Company rules, policies, standards and procedures must be strictly adhered to. If you are unsure on how to proceed, please check with a supervisor.

Stephen Covey
Chief of Police and Chief Security Officer

ACCESS TO CN WORKPLACE REQUIREMENTS AND MANDATORY DOCUMENTATION

Access to CN Property & Facilities (Shops/RTC Centers/Yards/Operated Right-of-Way)

(Note: HQ and Regional Buildings require sign-in and wearing of pass/badge for all visitors)

TYPE OF ACCESS	REQUIREMENTS	DOCUMENTATION
Any party entering CN's shops, RTC Centers, Yards and Right-of-way (except invitee) Not applicable to delivery persons or persons performing minor building services. Examples: minor photocopy repair, plumbing or electrical work.	<ul style="list-style-type: none"> Must sign the Right of Entry form Must provide insurance as indicated in the Right of Entry form Must be given the document "Safety Guidelines For Contractors And Non-CN Personnel" Must be eRailsafe or Contractor Orientation <u>certified as the case may be</u> Must be fully aware of safety and related requirements and instructions for work on CN Railway Right-of-Way by Non-CN Personnel (if applicable) <p>Note: Contractors accessing CN workplace on a repeat basis must sign the Right of Entry Form on an annual basis, but a process requiring the establishment of a check-in procedure for each visit must be created.</p>	<ul style="list-style-type: none"> Right of Entry Form Provide certificate of insurance Safety Guidelines For Contractors And Non-CN Personnel Certification under eRailsafe or Contractor Orientation
Contractors required by CN for Emergency Work (e.g., local contractors used for derailment clean-up)	<ul style="list-style-type: none"> Must sign Emergency Work Right of Entry Form Must be given a safety briefing Must be under supervision of CN Officer 	<ul style="list-style-type: none"> Emergency Work Right of Entry Form for Contractors
Visitors and Invitees	<ul style="list-style-type: none"> Authorization must be obtained from CN Officer Must be given visitor badge/ID card (or sign-in with senior officer in sites such as derailments) Must be under the supervision of CN employee in charge and comply with all instructions Must be given safety briefing by CN employee in charge Must sign Right of Entry Form for Invitees where the activity conducted on CN property is performed in proximity to railway operations, CN's signals and communications systems or any fiber optic cable system. The Chief Legal Officer or delegate can provide an exemption to this process when appropriate. 	<ul style="list-style-type: none"> Visitor badge/ID card Right of Entry Form for Invitees
Regulators in line of duty (e.g., Transport Canada, Transportation Safety Board, Human Resources Development of Canada (HRDC), Federal Railroad Administration (FRA), National Transportation Safety Board (NTSB))	<ul style="list-style-type: none"> Must present Inspector/ Investigator ID card Must be given Safety Briefing where applicable 	<ul style="list-style-type: none"> Regulatory ID card

Access to Non-Operated CN Property & Facilities

TYPE OF ACCESS	REQUIREMENTS	DOCUMENTATION
Any party hired by CN and entering non-operated CN Right-of-way	<ul style="list-style-type: none"> • Must sign the Right of Entry form • Must provide insurance as indicated in the Right of Entry form • Must be given the document "Safety Guidelines For Contractors And Non-CN Personnel" • Must be <u>eRailsafe certified</u> • Must be fully aware of safety and related requirements and instructions for work on CN Railway Right-of-Way by Non-CN Personnel (if applicable) 	<ul style="list-style-type: none"> • Right of Entry Form • Provide certificate of insurance • Safety Guidelines For Contractors And Non-CN Personnel • Certification under eRailsafe
Any party not hired by CN and entering non-operated CN Right-of-way where that party has an existing agreement/contract with CN which provides for access to the property and includes provisions for Indemnity and Insurance	<ul style="list-style-type: none"> • Must be given the document "Safety Guidelines For Contractors And Non-CN Personnel" • Must be fully aware of safety and related requirements and instructions for work on CN Railway Right-of-Way by Non-CN Personnel (if applicable) • No Right of Entry form required • May be required to be certified under Contractor Orientation depending on the work to be performed. 	<ul style="list-style-type: none"> • Safety Guidelines For Contractors And Non-CN Personnel
Any party not hired by CN and entering non-operated CN Right-of-way where that party does not have an existing agreement/contract with CN which provides for access to the property or such agreement does not include provisions for Indemnity and Insurance	<ul style="list-style-type: none"> • Must sign the Right of Entry form • Must provide insurance as indicated in the Right of Entry form • Must be given the document "Safety Guidelines For Contractors And Non-CN Personnel" • Must be fully aware of safety and related requirements and instructions for work on CN Railway Right-of-Way by Non-CN Personnel (if applicable) • May be required to be certified under Contractor Orientation depending on work to be performed. 	<ul style="list-style-type: none"> • Right of Entry Form • Provide certificate of insurance • Safety Guidelines For Contractors And Non-CN Personnel

Access to Equipment Locomotives

TYPE OF ACCESS	REQUIREMENTS	DOCUMENTATION
Regulators in line of duty (e.g., Transport Canada, Transportation Safety Board, Human Resources Development of Canada (HRDC), Federal Railroad Administration (FRA), National Transportation Safety Board (NTSB))	<ul style="list-style-type: none"> • Must present Inspector/ Investigator ID card • RTC must be informed of all passengers other than on-duty train crew • Must be given Safety Briefing where applicable 	<ul style="list-style-type: none"> • Regulatory ID card
Off-Duty Train Crews	<ul style="list-style-type: none"> • Must contact CMC/Traffic Coord. or RTC (if entraining en-route) to confirm availability of room on locomotives • Must show CN ID card to train crew upon boarding 	<ul style="list-style-type: none"> • CN ID card
CN Employees In Line of Duty (Other than Train Crews)	<ul style="list-style-type: none"> • Must present locomotive pass upon boarding • Letter of Introduction to conductor encouraged where possible for CN employees performing special studies, etc. • RTC must be informed of all passengers other than on-duty train crew 	<ul style="list-style-type: none"> • Locomotive pass • Letter of Introduction

Visitors (Invited Guests, CN Employees not in Line of Duty)	<ul style="list-style-type: none"> • Must present signed Letter of Introduction to conductor indicating V.P. (or delegate) approval. • Must have signed Right of Entry Form for Invitees • Must be given safety briefing • RTC must be informed of all passengers other than on-duty train crew <p>Note: Visitors requiring access for an extended period should be provided with a temporary locomotive pass and sign the Right of Entry Form (instead of Letter of Introduction)</p>	<ul style="list-style-type: none"> • Letter of Introduction or temporary locomotive pass • Right of Entry Form for Invitees
Visitors (Job Shadowing Students)	<ul style="list-style-type: none"> • Not permitted 	
Emergency Situations	<ul style="list-style-type: none"> • RTC to contact train crew to arrange for identification and pickup of passenger(s) • Train crew to confirm pick-up with RTC 	

Note: RTC must maintain a written log of all reported visitors on CN locomotives. Information must include name of visitor, time boarded locomotive, origin, destination, reason for access, and name of person authorizing access.

Test Cars, Work Equipment, HI- Rail Vehicles, Other Vehicles on Track or Right of Way

TYPE OF ACCESS	REQUIREMENTS	DOCUMENTATION
Regulators in line of duty (e.g., Transport Canada, Transportation Safety Board, Human Resources Development of Canada (HRDC), Federal Railroad Administration (FRA), National Transportation Safety Board (NTSB))	<ul style="list-style-type: none"> • Must present Inspector/ Investigator ID Card • Must be given safety briefing where applicable 	<ul style="list-style-type: none"> • Regulatory ID Card
Visitors (guests, invitees, including CN employees not in line-of-duty)	<ul style="list-style-type: none"> • Must present signed Letter of Introduction to Equipment operator indicating V.P. approval (or Delegate) • Must have signed Right of Entry Form for Invitees • Must be given safety briefing by CN Employee in charge 	<ul style="list-style-type: none"> • Letter of Introduction • Right of Entry Form for Invitees
Job Shadowing Students	<ul style="list-style-type: none"> • Not Permitted 	
Emergency Situations	<ul style="list-style-type: none"> • RTC to contact Equipment operator to arrange for identification and pickup of passenger(s) • Equipment operator to confirm pick-up with RTC 	

Railway Business Cars, Passenger Vehicles, Company Automobiles & Other Vehicles Not on Track or Right of Way*

TYPE OF ACCESS	PROCEDURES	DOCUMENTATION
Regulators in line of duty (e.g., Transport Canada, Transportation Safety Board, Human Resources Development of Canada (HRDC), Federal Railroad Administration (FRA), National Transportation Safety Board (NTSB))	<ul style="list-style-type: none"> • Must present Inspector/ Investigator ID card • Must be given safety briefing where applicable 	<ul style="list-style-type: none"> • Regulatory Id Card
Visitors (guests, invitees, including CN employees not in line-of-duty)	<ul style="list-style-type: none"> • Must be authorized by appropriate CN Officer • Must be given safety briefing • Equipment must be operated by the proper CN Employee at all times 	

*** Exemption may apply to certain company vehicles**

Related Documents

Section A: RIGHT OF ENTRY FORM"

- Schedule A
- Schedule B "Plan(s)"
- Schedule C "General Requirements"
- Schedule D "Undertaking by Contractor"
- Schedule E "Employer Information Sheet"

Section B: SAFETY GUIDELINES FOR CONTRACTORS AND NON-CN PERSONNEL

Section C: EMERGENCY WORK RIGHT OF ENTRY FORM FOR CONTRACTORS

Section D: RIGHT OF ENTRY FORM FOR INVITEES

Section E: SAMPLE LETTER OF INTRODUCTION

SECTION A

RIGHT OF ENTRY

General Conditions

1. "Railroad" refers to Canadian National Railway Company or such of its affiliates or associates (within the meaning ascribed to those terms under the *Canada Business Corporations Act*) to whose property this Right of Entry relates.
2. This Agreement is entered into as of this _____ day of _____, 20____ between Railroad, having its registered office at 935 de la Gauchetière West, Montreal, Quebec, H3B 2M9, and [Company Name] _____ ("Company"), having a place of business at [Address] _____.
3. The Railroad, solely to the extent of its right, title and interest, without any warranty, expressed or implied, at law, under contract or otherwise, hereby grants to Company and its authorized employees, servants, agents or contractors, authorization and consent to enter upon the property described under Schedule "A" hereto (the "Railroad property") for the sole purpose described under Schedule "A" hereto. This Right of Entry shall only extend to such actions as are necessary or required to fulfill the purpose described under Schedule "A" hereto.
4. This Right of Entry shall terminate forthwith upon expiration of the term noted in Schedule "A" hereto, it being understood that Railroad shall have entire discretion to revoke this Right of Entry at any time prior to the expiration of the term, upon notice to that effect to the Company, which notice shall be effective forthwith upon receipt by the Company or at such later date indicated by Railroad in the aforesaid notice.
5. The Railroad grants this consent subject to the understanding that Company and its authorized employees, servants, agents or contractors who enter upon Railroad property will:
 - 5.1. See that any activities conducted on said Railroad property are done in a good workmanlike manner, in compliance with applicable laws, statutes, regulations, policies, directives, orders, approvals and other legal requirements and in such manner and at such time as not to obstruct or interfere with Railroad's operation, trains or the functioning of its signal and communications systems or any fiber optic cable system or unduly delay the safe passage of Railroad's trains;
 - 5.2. For the purposes hereof, the following expressions shall have the meanings hereinafter noted:
 - 5.2.1. "Applicable Laws" means the applicable and enforceable statutes, regulations, policies, directives, orders, approvals and other legal requirements of an Authority or of the common law in effect from time to time, including, without limitation, those, together with the guidelines of an Authority, relating to the protection, conservation or restoration of the natural environment;
 - 5.2.2. "Authority" means the federal, provincial, municipal, state, county and, generally local governments, the courts, administrative and quasi-judicial boards and tribunals and any other organizations or entities with the lawful authority to regulate, or having a power or right conferred at law or by or under a statute;
 - 5.3. Observe, abide by and comply with any and all guidelines, directives and policies adopted from time to time by Railroad including, without limitation eRailsafe, Contractor Orientation (as the case may be).
 - 5.4. Take due precautions against injury and damage to persons or property located upon said Railroad property; and
 - 5.5. Unless otherwise agreed to, return said Railroad property to the same condition, reasonable wear and tear excepted, as existed prior to such work, failing which Railroad, after providing written notice to Company, and allowing Company a reasonable amount of time to return the Railroad property to the same condition, may do so at Company's sole cost and expense.

Work

6. Any work carried out by Company shall be carried out at those locations described in Schedule "A" or shown on the Plan attached hereto as Schedule "B" and, as the case may be, in the manner described therein."
7. Company agrees to advise Railroad's representative identified in Schedule "A" hereto (the "Representative") or such other representative designated from time to time by Railroad as to the dates and times when the work will be conducted on Railroad property and to provide him with at least ten (10) working days advance notice before entering upon Railroad property to commence any work or for any other purpose. Unless otherwise agreed to in writing, Company agrees to assume the costs of engineering services, Railroad's Representative's costs and its designee, signal locates, flagman, track labor and all other associated costs incurred by Railroad. Railroad shall, at its option, invoice Company directly for such costs or, if any of those services have been provided by a third party, Railroad may direct such third party to invoice directly Company, in which case Company undertakes and agrees to pay such third party forthwith upon receipt of (i) Railroad's direction to pay such third party; (ii) proper invoice for the relevant services.

8. The Railroad, its employees, agents or representatives shall have the right to view and inspect any activity or work on Railroad's property. If, in the sole opinion of Railroad, any activity or work is undesirable for any safety-related reason, Railroad shall notify Company, its authorized employees, servants, agents or contractors and if appropriate corrective action is not taken, Railroad shall have the right to terminate this Agreement at once.
9. Railroad shall have the right to restrict Company's activity on Railroad's property in any way that Railroad may deem necessary from time to time to assure normal railroad operations or for safety reasons and, after consultation with Company, shall also have the right to require Company, its authorized employees, servants, agents or contractors to comply with Railroad's instructions and take any safety precautions that Railroad may reasonably deem necessary from time to time. No work shall be performed or equipment located within thirty (30) feet of the centerline of the nearest railroad track without flagging protection being provided by Railroad, at the Company's expense or as otherwise agreed to in writing. Said work must be arranged no less than ten (10) business days in advance of starting work.
10. Company shall not suffer or permit any construction lien or similar lien to be filed or registered against Railroad property. If such a lien shall at any time be filed or registered, Company shall forthwith procure its discharge at its sole costs and expenses. Railroad shall have the right, if Company fails to forthwith procure such discharge, to discharge any lien filed or registered at any time against Railroad property, and any amount paid by Railroad in so doing together with all reasonable costs and expenses of Railroad including its legal fees and costs shall be paid to Railroad by Company on demand.

Confidentiality

11. Company covenants and agrees that any information of whatsoever nature (whether such information is written, verbal or otherwise), relating to Railroad, its operations, properties, business, assets, liabilities and financial condition (together with any and all memoranda, notes, reports, documents based upon and relating to such information, all copies and extracts thereof and all studies and data prepared on the basis of such information), is strictly confidential and Company represents and warrants that neither Company nor those for whom it is responsible at law will release the reports or any of the information contained therein (including to any Authority), without the express written consent of Railroad, and Company shall refuse all requests for such reports or information in the absence of Railroad's express written consent, unless compelled to do so by competent judicial or administrative authority and only to the extent that (i) Company gives Railroad timely notice of any proceeding and/or hearing related thereto; and (ii) Company has taken no action that would hinder Railroad from seeking a protective order to prevent such disclosure of its confidential information. Company further undertakes and agrees to share with Railroad, at no cost to Railroad, any and all conclusions, studies, reports or data incorporating, based upon or relying on any such information.

Indemnity

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

Insurance

13. Company, its contractors or any sub-contractors shall each provide and keep in force and effect throughout the term of this Right of Entry such insurance, in amounts and for risks as Railroad may prescribe from time to time including, if applicable, the kinds and minimum amounts of insurance set out under Schedule "C" – "General requirements".
14. If Company, its contractors or any sub-contractors shall perform sub-surface work, Company, its contractors or any sub-contractors shall also provide and keep in force and effect throughout the term of this Right of Entry the additional insurance specified under Schedule "C" – "Sub-Contractor Insurance Coverage".

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

Exceptions

15. Any exception or variation to the terms and conditions of this Right of Entry shall be specifically identified in Schedule "A" hereto. No such exception or variation shall be binding upon Railroad unless Schedule "A" is properly initialed by Railroad's duly authorized representative(s).

Miscellaneous

16. Company shall not have the right to transfer and/or assign this Right of Entry or any of its rights hereunder without Railroad's prior written consent, which consent Railroad shall have entire discretion to withhold or delay.
17. All notices provided for under this Right of Entry shall be in writing and sent by pre-paid registered mail, fax or hand-delivered to the other party at the addresses herein first noted or at such other address as either party may notify the other from time to time.

Such notices, if given by mail, shall be deemed to have been received on the third business day following the postage thereof; if by fax or hand delivery, at the date and time the fax is sent or the hand delivery is made.

18. Either party's exercise or failure to exercise any rights under this Agreement shall not relieve the other party of any responsibility under this Agreement.
19. In the event of conflict between the terms hereof and the terms of any other agreement between Railroad and Company, the most stringent standards and conditions shall govern.
20. This Right of Entry shall be governed by the laws of the jurisdiction where Railroad property accessed under the authority hereof is located, as noted under Schedule "A" hereto.

The parties have executed this Agreement this _____ day of _____ 20____.

RAILROAD

Signed: _____

Print Name: _____

Title: _____

COMPANY

Signed: _____

Print Name: _____

Title: _____

Schedule A

Railroad Property

Limited Access Purpose

For the limited purpose of _____
[insert detailed description].

Term

A term of _____ [number of days /
months / years], beginning on [commencement date] _____ and
terminating on _____ [termination date], unless sooner terminated as
provided hereunder.

Insurance

General Requirements

None required

(Relief from Insurance Requirements requires prior
approval from CN Law Department)

☐

Sub-Contractor Insurance Coverage

Required

☐

Exceptions/ Variations

(Variation in insurance
coverage requires prior
approval from Risk
Management Department)

Representative

(name and address)

Schedule B
Plans
(Appended hereto)

Schedule C

General Requirements

(a) Commercial General Liability insurance in an amount of no less than ten million dollars (\$10,000,000) per occurrence, or such other amounts as Railroad may reasonably require from time to time, combined single limit for bodily/personal injury including death and/or damage to or destruction of property (including loss of use) caused by an accident or an occurrence and also including contingent employers liability, products and completed operations coverage, non-owned automobile liability and contractual liability endorsement specifically granting coverage for all liability assumed under this agreement. This insurance shall name Railroad as additional insured and shall contain cross liability clause and shall specifically include liability for operations within or around railroads and railway tracks; and

[include (b) only for parties performing work]

(b) To the extent Company carries out work on its own behalf or on behalf of Railroad, it shall provide and cause its contractors or its sub-contractors to provide and keep in force and effect throughout the term of this Right of Entry, in addition to the insurance listed above (which, for greater clarity it shall also cause its contractors and sub-contractors to provide and keep in force and effect as aforesaid), the following kinds and minimum amounts of insurance:

- Automobile Liability insurance on all licensed vehicles owned by, hired, leased to or on behalf of the Company's contractor in an amount no less than five million dollars (\$5,000,000) per occurrence.
- Professional Liability insurance to the extent required with limits of not less than \$5,000,000 per claim and a deductible of not more than \$25,000 or for such greater amounts as Railroad may from time to time reasonably require.
- If available in the jurisdiction covered by this Agreement Worker's Compensation insurance in amounts not less than the statutory limits and Employer's Liability in an amount no less than five million dollars (\$5,000,000).
- All Risk Builders Risk Insurance

All risks contractor's equipment insurance covering construction machinery and equipment used by the Sub-Contractor for the performance of the Work, as well as any structures being built or assembled, shall be in a form acceptable to the Contractor and Railroad and shall not allow subrogation claims by the Insurers against the Contractor and Railroad. The policies shall be endorsed to provide the Contractor with not less than thirty (30) days written notice in advance of cancellation, change or amendment restricting coverage.

[include following only if party is performing sub-surface work]

Additional Insurance Requirements for Sub-Surface Work

(a) Expanded Commercial General Liability Insurance:

The policy is to have a minimum limit of liability of \$5,000,000 and is to contain the following coverages and provisions:

- Personal Injury;
- Broad Form Property Damage;
- Occurrence (not claims made) Format;
- Broad Form Contractual Coverage;
- Product and Completed Operations;
- Unlicensed Vehicles on and off premises owned or controlled by the Owner;
- Non-owned Automobile Insurance;
- Cross Liability and Severability of Interest Clause;
- Owners and Contractors Protective Coverage;
- Named Perils Pollution Coverage
- No XCU exclusions; and
 - Hold harmless and waiver of subrogation against the Contracting Authority and Railway;
 - Insurance shall specifically include liability for operations within or around railroads and railway tracks;
- 30 Day Cancellation clause.

(b) Environmental Impairment Liability Insurance

The policy is to have a minimum limit of liability of \$5,000,000 and must contain the following coverage and provisions:

- Third Party Personal and Bodily Injury;
- Property Damage including Third Party Clean-up Costs;
- Defense Costs;
- Covering Gradual Pollution and Sudden and Accidental Events;
- Covering off site Clean-up Costs;
- Extended Discovery Period - up to two years;
- Coverage not "Site-Specific" but rather covers all operations and locations outlined in the Contract Specifications;
- Covering Wastes and Materials to be recycled, stored, reconditioned or decontaminated, on or off premises Owned or Occupied by the Insured;
- Cross Liability and Severability of Interest Clauses;
- Contractual Liability;
- 30 day Notice of Cancellation; and
- Blanket Contractors Pollution Coverage

Schedule D
UNDERTAKING BY CONTRACTOR

I hereby undertake to respect the attached CN Policies and to ensure that they are respected by my workers, subcontractors and suppliers and visitors.

I also hereby acknowledge that I have received a copy of said documents.

WSIB/CSST EMPLOYER NUMBER:

CONTRACTOR'S NAME:

AUTHORIZED REPRESENTATIVE:

TITLE:

Signature: _____

Date: _____

EMPLOYER INFORMATION SHEET

Contractor information

Name: _____

Address:

Telephone (head office):

(Work site) :

(Emergency) :

Fax (head office):

(Work site) :

Person in charge at work site

Name : _____

Title:

Phone :

Safety and health

representative Name :

Title / Association:

Phone :

Union representative

Name :

Title /

Association:

Phone :

Signature: _____

Date: _____

SECTION B



SAFETY GUIDELINES FOR CONTRACTORS AND NON-CN PERSONNEL

Introduction

This document is a condensed version of CN's mandatory safety training for Contractors and non-CN personnel. It should be noted that this document is not a substitute for the mandatory safety training for Contractors and non-CN personnel. For the purposes of this document "*Contractor*" may also apply to individuals on CN property, whether under contract to CN or not.

These guidelines are not to be considered as a substitute for the applicable government regulations. These guidelines are the minimum requirement and must be exceeded where the hazard or government regulations warrant.

It is not possible to deal with every hazard in this one document. These guidelines are to be employed in conjunction with Government Acts, Regulations, local Ordinances, CN Safety Rules and Standards, and good judgment to facilitate the safe completion of the work.

Additional information regarding safe work practices may be included in contract documents and specifications. In the event of a discrepancy between these guidelines and the contract, the contract shall govern.

GENERAL RULES AND INFORMATION

"Expect the movement of a train, engine, rail car or track unit at any time, on any track, in either direction. Protect yourself and others from the movement of trains, engines, railcars and track units and do not expect them to stop."

If any situation arises which affects the safe movement of trains, CN must be contacted immediately at:

1-800-465-9239.

Alternatively, contact CN's Network Operations Centre in Edmonton at:

1-800-661-3963.

Before any digging is performed on CN property, proper clearance and instructions must be obtained through the Information Technology Command Centre (ITCC Network Management Centre) at:

1-800-661-3687 or 1-800-NO1-FOTS.

In an emergency, any object waved violently by anyone on or near the track is a signal for trains to stop.

Violation of CN's *mandatory Contractor Safety training* or contravention of these guidelines may result in the immediate removal of the Contractor or the offending personnel from CN property.

Compliance with Government Regulations

Contractors shall follow all applicable Federal, Provincial, and Municipal Acts, Regulations, Laws and Codes, including but not limited to those related to the licensing of workers, occupational health and safety, transportation or handling of dangerous substances, inspection and certification of equipment. As CN is a federally regulated enterprise, Contractors are advised that work undertaken on CN right-of-way may be governed by Federal regulation.

The Contractor must become familiar with all applicable regulations and must ensure compliance by workers at the job site. Supplementary instructions may be issued by CN representatives from time to time.

Contractor's responsibility

1. Before entering upon CN right-of-way, the Contractor must have all documentation properly executed and available for review by CN personnel at the working site. (i.e. Permits, Licenses, Contract Documents, Contractor Safety Approved identification card and/or Waivers).
2. Daily briefings must be held at every work site to review the contents of these guidelines and any unique conditions at the site relating to safety. A record must be kept of such briefings by the Contractor's responsible person at the work site. Work site briefings must be updated regularly as the job conditions change
3. Unless explicitly permitted by CN, no equipment or vehicle may enter upon the operated right-of-way.
4. Unless explicitly permitted by CN, no work shall take place within thirty (30) feet of the nearest rail except in the presence of a CN Protecting Foreman. The CN Protecting Foreman is concerned only with the safe movement of trains and will not be responsible for the safety of the Contractor, the Contractor's personnel or the Contractor's equipment.
5. Contractor's personnel must not crawl under, climb over or pass through standing railway equipment.
6. Contractor's personnel must not cross a track within thirty (30) feet, of standing railway equipment.
7. CN has many power and/or communication cables buried within the CN right-of-way. The Contractor shall be sure of their location before making any excavation, driving stakes or otherwise penetrating the ground surface. In the event of any excavation work that strikes an underground cable adjacent to CN's track, the contractor must make immediate contact with CN
8. In accordance with CN's safety standards, Contractor's personnel must wear CN required personal protective equipment at all times while on CN right-of-way. Such equipment will include hard hats, safety glasses, reflective apparel, safety footwear (protective footwear shall meet or exceed CSA Z195 and/or ASTM F2413, shall cover and support the ankle and have a defined heel. In Canada, the defined heel must be a minimum of 9 mm (3/8 inch) and shall not exceed 25 mm (1 inch). In the US, the defined heel must be a minimum of 12 mm (1/2 inch and shall not exceed 25mm (1 inch). Boots must be equipped with laces, which must be laced to the top and tied. Hearing and respiratory protection and fall arrest equipment shall be worn where signs are posted or when a potential hazard exists.
9. No CN plant, signal, structure, equipment or property of any kind may be tampered with, modified or removed.
10. *"Hi-rail"* equipment shall only be operated on the track by personnel qualified in the latest version of the *"Canadian Rail Operating Rules"*.
11. Horseplay, practical jokes, fighting or any other activity that may create a hazard will not be tolerated.
12. Contractor's personnel must immediately abide by instructions from CN personnel.

Approaching Train

- 1 On the approach of a train, the Protecting Person will communicate to the Contractor's Responsible Person, either by radio or by personal contact, that a train is approaching.
- 2 After receiving the train information from the Protecting Person, the Contractor's Responsible Person must ensure that all workers, equipment and materials are "Clear Of The Track" (as defined below) then communicate this to the Protecting Person.
- 3 The Protecting Person will not authorize any trains through the working limits nor authorize cancellation of protection before receiving confirmation that all workers have been alerted, stopped working and the track is clear of workers and machinery.
- 4 After the train has passed, no one is to foul or occupy the track until the Protecting Person has given the authorization. Authorization will be communicated to the Contractor's Responsible Person.

Clear Of The Track

To be Clear of the Track shall be defined as:

- 1 All work has been stopped.
- 2 All workers are made aware of the approaching train and route to be followed.
- 3 All workers, equipment and material have been positioned beyond the clearance limits or at any other location deemed safe by CN. (At least 5 meters (15 feet) from the nearest rail of the track on which the train is to pass with additional allowances for curvature and super elevation).
- 4 All off-track equipment by special approval less than 5 (15 feet) meters of the nearest rail has stopped working and operators have left their equipment.
- 5 All off-track equipment more than 5 meters (15 feet) from the nearest rail has stopped working. Operators may remain in their cabs unless directed otherwise by the Contractor's Responsible Person. All equipment must be properly secured against unintentional movement
- 6 All on-track equipment has been moved into the siding or other track as per the Protecting Person's instruction. Operators will leave their equipment unless directed otherwise by the Contractor's Responsible Person. All unattended equipment must be properly secured against unintentional movement
- 7 Booms, cranes or other similar equipment have been immobilized and the boom is parallel to the railway track(s), and clear of the nearest rail be 5 meters (15 feet)
- 8 Provided there is no possible way for the worker to become unintentionally foul of a passing train, and at the discretion of the CN Supervisor, workers may continue working.

POLICY TO PREVENT WORKPLACE ALCOHOL AND DRUG PROBLEMS

Policy standards

- 1 The Contractor, subcontractors, employees, suppliers and visitors must remain free from any adverse effects of alcohol or other drugs and conduct themselves in an appropriate manner while on CN business or premises. The Contractor must ensure that all those having access to the site adhere to the following standards when on CN business or premises, including vehicles and equipment:
 - 1 No use, possession, distribution or sale of illegal drugs or drug paraphernalia.
 - 2 No use, possession, distribution or sale of beverage alcohol or any form of alcohol.

- 3 Responsible use of prescribed and over-the-counter medications.
- 4 No distribution, offering or sale of prescription medications.
- 5 To report for duty and remain during the entire period of duty free of the negative effects of alcohol and other drugs, including the after effects of such use.

Consequences of violation

Failure to meet these standards will be considered a breach of the contract. This may at CN's sole discretion, trigger the suspension or termination of the contract.

Policy violation procedures

Where CN has reasonable grounds to believe any individual in the employ of the Contractor or a supplier is on duty in an unsafe condition or otherwise in violation of the Policy, or where during the preliminary phase of any investigation such an individual has been identified as being directly involved in the chain of acts or omissions leading up to an accident or incident;

- 1 CN will escort the individual(s) to a safe place.
- 2 CN will notify the Contractor or supplier.
- 3 The Contractor will investigate the situation.
- 4 The Contractor must satisfy CN that there has been no policy breach.
- 5 If a policy breach has occurred, the individual will not be allowed to continue providing services to CN without written permission from a CN official, and he/she will be required to adhere to any conditions governing his/her return.

Firearms

Firearms (loaded or empty) are not permitted on CN property, except for CN Police officers and other designated persons performing authorized work and when authorized to do so. In all cases, any firearms must be accompanied with a written authorization from the Chief of CN Police and the person should have in his possession all pertinent government permits.

Explosives

No explosives will be permitted on CN property without written CN approval.

Vehicles

Contractor's vehicles on the site must be in safe operating condition. Operators must observe all site speed limits. Unattended vehicles must not be left running unnecessarily. Where they must be left running, the parking brake must be applied. The operator is responsible for the safety of all passengers and the stability of materials being transported.

All vehicles will be parked in a pre-determined area and where required, a designated Contractor entrance shall be used.

Smoking in the Workplace

Smoking is not permitted in any CN interior workplace or motor vehicle.

Security

Contractor's personnel will proceed directly to the Contractor's work location. Contractor's employees must remain at their designated work site and must not wander about the site.

The Contractor shall not permit persons other than the Contractor's personnel to enter the site without the prior written authority of the CN representative.

Emergency Evacuation Procedures

Prior to commencing work, all Contractor's employees must be familiar with the emergency evacuation plan for that work site. The Contractor shall issue written emergency and rescue procedures to the Contractor's personnel and shall post such procedures on the job site.

Unsafe Conditions or Practices

Contractors shall correct or report any unsafe conditions or practices they observe. All such conditions or practices shall be reported to the CN representative at the work site as soon as practical

Reporting Accidents/Incidents

All accidents/incidents occurring on CN property, that result in or had the potential of causing serious injury, lost work days, vehicle or property damage must be reported to the CN representative within twenty-four (24) hours. All such incidents will be fully investigated by the Contractor.

The Contractor shall subsequently provide a written report to CN (i.e. Company Officer assigned as Liaison to Contractor) within seven (7) days detailing the nature of the incident, the cause(s), regulatory authorities notified, and a specific action plan to prevent recurrence.

Treatment of Injured Personnel (Contractors)

Contractors shall ensure the following is provided for their personnel as required by CN and in accordance with applicable government regulations:

1. Adequate first-aid supplies and equipment.
2. Qualified personnel to render first-aid treatment.

Audio and Visual Recording Equipment

Cameras and audio-visual equipment are not permitted on CN property without prior approval. Use of personal electronic devices such as smart phones for the purpose of recording video, photographic or audio information is prohibited while on CN property.

Summary

In conclusion, CN requires the full cooperation of the Contractor and the Contractor's employees with these guidelines and all other applicable regulations. Should there be any doubt as to the meaning or interpretation of these guidelines, consult with the CN representative responsible for the worksite.

Contractor Acknowledgement

Contractor/Sub-contractor personnel must read and understand CN's *"Safety Guidelines for Contractors and Non-CN Personnel"*. The Contractor/Sub-contractor must follow the appropriate Contractor Safety training.

SECTION C

EMERGENCY WORK RIGHT OF ENTRY FORM FOR CONTRACTORS

1. "Railroad" refers to Canadian National Railway Company or such of its affiliates or associates (within the meaning ascribed to those terms under the *Canada Business Corporations Act*) to whose property this Right of Entry relates.
2. This Agreement is entered into as of this _____ day of _____, 20____ between Railroad, having its registered office at 935 de la Gauchetière West, Montreal, Quebec, H3B 2M9, and _____ ("Company"), having a place of business at _____.
3. The Railroad, solely to the extent of its right, title and interest, without any warranty, expressed or implied, at law, under contract or otherwise, hereby grants to Company and its authorized employees, servants, agents or contractors, consent to enter upon the property located at: _____ (the "Railroad property") for the sole purpose of _____.
4. This Right of Entry shall terminate forthwith upon expiration on _____, it being understood that Railroad shall have entire discretion to revoke this Right of Entry at any time prior to the expiration of the term, upon notice to that effect to the Company, which notice shall be effective forthwith upon receipt by the Company or at such later date indicated by Railroad in the aforesaid notice.
5. The Railroad grants this consent subject to the understanding that Company and its authorized employees, servants, agents or contractors who enter upon Railroad property will:
 - 5.1. See that any activities conducted on said Railroad property are done in a good workmanlike manner, in compliance with applicable laws, statutes, regulations, policies, directives, orders, approvals and other legal requirements and in such manner and at such time as not to obstruct or interfere with Railroad's operation, trains or the functioning of its signal and communications systems or any fibre optic cable system or unduly delay the safe passage of Railroad's trains;
 - 5.2. Observe, abide by and comply with any and all guidelines, directives and policies adopted from time to time by Railroad including, without limitation (i) Railroad's drug and alcohol policy; and (ii) Safety Guidelines for Contractors and Non-CN Personnel; and
 - 5.3. Take due precautions against injury and damage to persons or property located upon said Railroad property.
 - 5.4. No work shall be performed or equipment located within twenty-five (25) feet of the centerline of the nearest railroad track without flagging protection being provided by Railroad or other form of positive protection, (*exemptions may apply as authorized by system safety dept*).
6. This Right of Entry shall be governed by the laws of the jurisdiction where Railroad property accessed under the authority hereof is located, as noted under Exhibit "A" hereto.

The parties have executed this Agreement this _____ day of _____ 20____.

RAILROAD

Signed: _____

Print Name: _____

Title: _____

COMPANY

Signed: _____

Print Name: _____

Title: _____

SECTION D

RIGHT OF ENTRY FORM FOR INVITEES

General Conditions

1. "Railroad" refers to Canadian National Railway Company or such of its affiliates or associates (within the meaning ascribed to those terms under the *Canada Business Corporations Act*) to whose property this authorization and consent relates.
2. This Agreement is entered into as of this _____ day of _____, 20____ between Railroad, having its registered office at 935 de la Gauchetière West, Montreal, Quebec, H3B 2M9, and [Individual Name] _____ ("Invitee"), residing at [Address] _____.
3. The Railroad, solely to the extent of its right, title and interest, without any warranty, expressed or implied, at law, under contract or otherwise, hereby grants to invitee, authorization and consent to enter upon the property described under Schedule "A" hereto (the "Railroad property") for the sole purpose described under Schedule "A" hereto.
4. This Right of Entry shall terminate forthwith upon expiration of the term noted in Schedule "A" hereto, it being understood that Railroad shall have entire discretion to revoke this Right of Entry at any time prior to the expiration of the term, upon notice to that effect to the Invitee, which notice shall be effective forthwith upon receipt by the Invitee or at such later date indicated by Railroad in the aforesaid notice.
5. The Railroad grants this consent subject to the understanding that Invitee will:
 - 5.1. See that any activities conducted on said Railroad property are done in compliance with applicable laws, statutes, regulations, policies, directives, orders, approvals and other legal requirements and in such manner and at such time as not to obstruct or interfere with Railroad's operation, trains or the functioning of its signal and communications systems or any fiber optic cable system or unduly delay the safe passage of Railroad's trains;
 - 5.2. Observe, abide by and comply with any and all guidelines, directives and policies adopted from time to time by Railroad including, without limitation (i) Railroad's drug and alcohol policy; and (ii) Safety Guidelines for Contractors and Non-CN Personnel; and
 - 5.3. Return said Railroad property to the same condition, reasonable wear and tear excepted, as existed prior to such work, failing which Railroad, after providing written notice to Invitee, and allowing Invitee a reasonable amount of time to return the Railroad property to the same condition, may do so at Invitee's sole cost and expense.

Indemnity

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

Miscellaneous

6. The invitee shall not have the right to transfer and/or assign this Right of Entry or any of its rights hereunder without Railroad's prior written consent, which consent Railroad shall have entire discretion to withhold or delay.
7. This Right of Entry shall be governed by the laws of the jurisdiction where Railroad property accessed under the authority hereof is located, as noted under Schedule "A" hereto.

The parties have executed this Agreement this _____ day of _____ 20____.

RAILROAD

Signed: _____

Print Name: _____

Title: _____

COMPANY

Signed: _____

Print Name: _____

Title: _____

Schedule A

Railroad Property

*(indicate if access is for property,
locomotives or other equipment)*

Limited Access Purpose

For the limited purpose of _____
[insert detailed description].

Term

A term of _____ [number of days/months/years], beginning on [commencement
date] _____ and terminating on [termination date] _____, unless sooner terminated
as provided hereunder.

Representative

(name, title and address)

SECTION E

SAMPLE LETTER OF INTRODUCTION

Appropriate VP letterhead

Date xxxxx

To: *(Train Crews between Melville & Winnipeg) or
(Superintendent - MacMillan Yard)*

This is to advise you that _____ *(name of Licensee)* _____ has been granted permission to *(ride trains between Point A and Point B)* for the purpose of *(collecting data on locomotive cab conditions)* or *(performing audits)*.

This **approval** is for the period from *Date A* to *Date B*.

This **approval** is contingent on the following conditions:

- *must be given a full safety briefing*
- *crew must inform RTC when visitor is riding on a train*

Should there be any questions regarding this permission, contact *Jane Smith* at _____.

Signature: _____

Date: _____

Title: _____

APPENDIX B

Right of Entry Form for Contractors

Section B

RIGHT OF ENTRY FORM FOR CONTRACTORS General Conditions

1. "Railroad" refers to Canadian National Railway Company or such of its affiliates or associates (within the meaning ascribed to those terms under the *Canada Business Corporations Act*) to whose property this Authorization and Consent relates.
2. This Agreement is entered into as of this [date]_____ between Railroad, having its registered office at 935 de la Gauchetière West, Montreal, Quebec, H3B 2M9, and [Company Name]_____ ("Company"), having a _____ place of business at [Address]._____
3. The Railroad, solely to the extent of its right, title and interest, without any warranty, expressed or implied, at law, under contract or otherwise, hereby grants to Company and its authorized employees, servants, agents or contractors, Authorization and Consent to enter upon the property described under Exhibit "A" hereto (the "Railroad property") for the sole purpose described under Exhibit "A" hereto.
4. This Authorization and Consent shall terminate forthwith upon expiration of the term noted in Exhibit "A" hereto, it being understood that Railroad shall have entire discretion to revoke this Authorization and Consent at any time prior to the expiration of the term, upon notice to that effect to the Company, which notice shall be effective forthwith upon receipt by the Company or at such later date indicated by Railroad in the aforesaid notice.
5. The Railroad grants this consent subject to the understanding that Company and its authorized employees, servants, agents or contractors who enter upon Railroad property will:
 - 5.1. See that any activities conducted on said Railroad property are done in a good workmanlike manner, in compliance with applicable laws, statutes, regulations, policies, directives, orders, approvals and other legal requirements and in such manner and at such time as not to obstruct or interfere with Railroad's operation, trains or the functioning of its signal and communications systems or any fiber optic cable system or unduly delay the safe passage of Railroad's trains;
 - 5.2. Observe, abide by and comply with any and all guidelines, directives and policies adopted from time to time by Railroad including, without limitation (i) Railroad's drug and alcohol policy; and (ii) Safety Guidelines for Contractors and Non-CN Personnel; and
 - 5.3. Return said Railroad property to the same condition, reasonable wear and tear excepted, as existed prior to such work, failing which Railroad, after providing written notice to Company, and allowing Company a reasonable amount of time to return the Railroad property to the same condition, may do so at Company's sole cost and expense.
6. No work shall be performed or equipment located within twenty-five (25) feet of the centerline of the nearest railroad track without flagging protection being provided by Railroad, at the Company's expense. Said work must be

arranged no less than ten (10) business days in advance of starting work.

Indemnity

7. Company agrees to indemnify and save harmless Railroad, its affiliates and associates and their employees, servants, and agents (collectively the "Indemnitee") from and against claims, demands, suits, judgments, actions, liens and other encumbrances, settlements, liability, costs and expenses (including, without limitation, court costs, experts' fees and attorneys' fees) when the injury, death, damage, loss or destruction is caused by the breach of contract or warranty, violation of statute, intentional misconduct or negligent act or omission of the Company, its employees, agents, contractors or subcontractors or when such act or omission is the kind for which one is made strictly liable, whether such claim arises in equity, at common law, or by statute, or under the law of contracts, torts (including without limitation, negligence and strict liability without regard to fault) or property of every kind or character (including Railroad property) ("Claims") and including, without limitation, Claims for personal injury or bodily injury to or death of any person, emotional distress, real and personal property damage and including derivative, consequential, indirect damages and economic loss, and also including, without limitation, Claims arising in favor of or brought by any of Company's employees, agents, contractors or representatives, or by any governmental agency or any other third party. Company shall not, however, be responsible for any such Claims to the extent it is solely caused by the gross negligence or wilful misconduct of the Indemnitee.

Insurance

(Required when Company accesses the property with equipment, including vehicles)

8. Company shall provide and keep in force and effect throughout the term of this Authorization and Consent:
 - 8.1. Comprehensive General Liability insurance in an amount of no less than five million dollars (\$5,000,000), or such greater amounts as Railroad may reasonably require from time to time, combined single limit for bodily/personal injury including death and/or damage to or destruction of property (including loss of use) caused by an accident or an occurrence and also including contingent employers liability, products and completed operations coverage, non-owned automobile liability and contractual liability endorsement specifically granting coverage for all liability assumed under this agreement. This insurance shall name Railroad as additional insured and shall contain cross liability clause and shall specifically include liability for operations within or around railroads and railway tracks;
 - 8.2. Automobile Liability insurance on all licensed vehicles owned by, hired, leased to or on behalf of the Company in an amount no less than five million dollars (\$5,000,000) per occurrence; and
 - 8.3. If available in the jurisdiction covered by this Agreement Worker's Compensation insurance in amounts not less than the statutory limits and

employer's liability in an amount no less than five million dollars (\$5,000,000).

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

Miscellaneous

9. Company shall not have the right to transfer and/or assign this Authorization and Consent or any of its rights hereunder without Railroad's prior written consent, which consent Railroad shall have entire discretion to withhold or delay.
10. This Authorization and Consent shall be governed by the laws of the jurisdiction where Railroad property accessed under the authority hereof is located, as noted under Exhibit "A" hereto.

The parties have executed this Agreement this _____ day of _____, 200__.

RAILROAD

Print Name:

Title:

COMPANY

Print Name:

Title:

Railroad property: _____

Limited Access Purpose:

For the limited purpose of _____

[insert detailed description].

Equipment Involved (including vehicles)

Yes

☐

Note: If access to the property involves equipment, including vehicles, Company must provide and keep in force and effect throughout the term of this Authorization and Consent, the insurance set forth under Section 8 hereof.

No

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Term:

A term of _____[number of days/months/years], beginning on [commencement date]_____ and terminating on [termination date]_____, unless sooner terminated as provided hereunder.

Representative:

(name and address)

APPENDIX C

Safety and Related Requirements and Instructions for Work on Railway Right-of-Way by Non-CN Personnel

Section C

SAFETY AND RELATED REQUIREMENTS AND INSTRUCTIONS FOR WORK ON RAILWAY RIGHT-OF-WAY ("CN RIGHT-OF-WAY") BY NON-CN PERSONNEL

Introduction

The objective of this document is to outline CN's Safety Guidelines for Contractors and non-CN personnel. For the purposes of this document "Contractor" may also apply to individuals on CN property, whether under contract to CN or not.

These guidelines are not to be considered as a substitute for the applicable government regulations. These guidelines are the minimum requirement and must be exceeded where the hazard or government regulations warrant.

It is not possible to deal with every hazard in this one handbook. These guidelines are to be employed in conjunction with Government Acts, Regulations, local Ordinances and good judgment to facilitate the safe completion of the work.

Additional information regarding safe work practices may be included in contract documents and specifications. In the event of a discrepancy between these guidelines and the contract, the contract shall govern.

CN's Basic Safety Requirements

The Contractor's attention is drawn to the following highlights from CN's "Basic Safety Requirements":

1. Take all reasonable measures to ensure the protection of employees, customers, property, and the general public.
2. Address promptly all environmental and safety concerns.
3. Analyze all accidents or incidents resulting in, or having potential for, loss or injury, and take remedial action promptly to prevent recurrence.
4. Require all persons granted access to Company property to comply with applicable *Risk Management* policies, standards, and procedures.
5. Provide employees with appropriate training to enable them to work safely.
6. Inspect personal protective equipment (PPE), tools and equipment before use to ensure that they are in good working condition.
7. Contractors' employees or sub-contractors are required to familiarize themselves with the Contractor Safety Video entitled "Consider Yourself one of Us " and the "Safety Guidelines for Contractors Annex D".

CN's Risk Management policy is premised on the following:

- to work in a safe manner is a condition of employment/Contract
- all accidents or incidents resulting in loss or injury are preventable;
- it is possible to eliminate or safeguard all operating conditions that may result in injury, property damage, or other losses;
- employees must be provided with appropriate training to enable them to work safely;
- employees and management must work jointly in efforts to promptly resolve and improve safety and health conditions in the workplace;

GENERAL RULES AND INFORMATION

"Expect the movement of a train, engine, rail car or track unit at any time, on any track, in either direction. Protect yourself and others from the movement of trains, engines, railcars and track units and do not expect them to stop."

If any situation arises which affects the safe movement of trains, CN must be contacted immediately at:

1-800-465-9239

Alternatively, contact CN's Network Operations Centre in Edmonton at:

1-800-661-3963

Before any digging is performed on CN property, proper clearance and instructions must be obtained through the Information Technology Command Centre (ITCC Network Management Centre) at:

1-800-661-3687 or 1-800-NO1-FOTS

In an emergency, any object waved violently by anyone on or near the track is a signal for trains to stop.

Violation of CN's "Risk Management Policy" or contravention of these guidelines may result in the immediate removal of the Contractor or the offending personnel from CN property.

Compliance with Government Regulations

Contractors shall follow all applicable Federal, Provincial, State, and Municipal Acts, Regulations, Laws and Codes, including but not limited to those related to the licensing of workers, occupational health and safety, transportation or handling of dangerous substances, inspection and certification of equipment. As CN is a federally regulated enterprise, Contractors are advised that work undertaken on CN right-of-way may be governed by Federal regulation.

The Contractor shall become familiar with CN's Risk Management Policy as well as all applicable regulations and shall ensure compliance by workers at the job site. Supplementary instructions may be issued by CN representatives from time to time.

Instructions

1. Before entering upon CN right-of-way, the Contractor must have all documentation properly executed and available for review by CN personnel at the working site (Permits, Licenses, Contract Documents, Contractor Safety Approved Sticker and/or Waivers).
2. Periodic briefings must be held at every work site to review the contents of these guidelines and any unique conditions at the site relating to safety.
3. Unless explicitly permitted by CN, no equipment or vehicle may enter upon the operated right-of-way.
4. Unless explicitly permitted by CN, no work shall take place within eight (8) meters or approximately twenty-five (25 feet) of the centerline of the nearest rail except in the presence of a CN assigned person. CN assigned persons are concerned only with the safe movement of trains and will not be responsible for the safety of the Contractor, the Contractor's personnel or the Contractor's equipment.
5. Equipment operating within eight (8) meters or approximately twenty five (25 feet) of the nearest rail must come to a complete stop prior to the passage of engines, railcars, or track units.
6. No vehicle or heavy equipment may be situated or moved closer than five (5) meters or fifteen (15 feet) from the nearest rail unless a CN assigned person has placed a block on train movements.
7. Upon the passage of a train, Contractor's personnel shall stand no closer than five (5) meters or fifteen (15 feet) from any switch stand and, if possible, on the opposite side of the track.

8. Contractor's personnel shall not crawl under, climb over or pass through standing railway equipment.
9. Contractor's personnel shall not cross a track within eight (8) meters or approximately twenty five (25 feet) of standing railway equipment.
10. CN has many power and/or communication cables buried within the CN right-of-way. The Contractor shall be sure of their location before making any excavation, driving stakes or otherwise penetrating the ground surface (Please refer to previous page for contact number to call for authority).
11. In accordance with CN's safety standards, contractor's personnel must wear CN required personal protective equipment at all times while on CN right-of-way. Such equipment will include hard hats, safety footwear, (protective footwear shall meet or exceed CSA Z195 and/or ANSI 41.1, shall cover and support the ankle and have a defined heel a minimum of 13 mm (1/2 inch) and shall not exceed 25 mm (1 inch), boots must be equipped with laces, which must be laced to the top and tied) safety glasses and reflective apparel. Hearing and respiratory protection and fall arrest equipment shall be worn where signs are posted or when a potential hazard exists.
12. No CN plant, signal, structure, equipment or property of any kind may be tampered with, modified or removed.
13. "Hi-rail" equipment shall only be operated on the track by personnel qualified in the latest version of the "Canadian Rail Operating Rules".
14. Horseplay, practical jokes, fighting or any other activity that may create a hazard will not be tolerated.
15. Contractor's personnel shall immediately abide by instructions from CN personnel.

Drug and Alcohol Policy

Contractor's personnel will be bound by the provisions of CN's "Policy to Prevent Workplace Alcohol and Drug Problems" while on CN property. All employees are required to report and remain fit for duty, free of the negative effects of alcohol and other drugs. It is prohibited to be on duty or to be in control of a vehicle or equipment while under the influence of alcohol or other drugs, including the after-effects of such use.

1. **Policy Standards:** The Contractor is to ensure that all employees and employees of sub-contractors adhere to the following standards when on CN business or premises:
 1. No use, possession, distribution, offering or sale of illegal drugs or drug paraphernalia.
 2. No use, possession, distribution, offering or sale of alcohol.
 3. Responsible use of prescribed and over-the-counter medications.
 4. No trafficking, distribution, offering or sale of prescription medications.
 5. Report fit for duty and remains fit for duty.
2. **Policy Violation Procedures:** Where a CN representative has reasonable grounds to believe any individual in the employ of the Contractor is on duty in an unfit condition, or where during the preliminary phase of an investigation an individual has been identified as being directly involved in the chain of acts or omissions leading up to an accident or incident:
 1. The Contractor will be notified.
 2. The Contractor will be required to conduct the individual(s) to a safe place.
 3. The Contractor will be expected to investigate the situation.
 4. The Contractor must satisfy CN that there was not a policy breach.
 5. The individual(s) will not be allowed to return to any position with CN without the written permission of a CN official and will be required to adhere to any conditions regarding their return.

3. **Consequences of Violation:** Failure of the Contractor, its employees or sub-contractors to meet these standards will be considered a breach of contract.

Firearms

Firearms (loaded or empty) are not permitted on CN property, except for CN Police officers and other designated persons performing authorized work and when authorized to do so. In all cases, any firearms must be accompanied with a written authorization from the Chief of CN Police and the person should have in his possession all pertinent government permits.

Explosives

No explosives will be permitted on CN property without written CN approval.

Vehicles

Contractor's vehicles on the site must be in safe operating condition. Operators must observe all site speed limits. Unattended vehicles must not be left running unnecessarily. Where they must be left running, the hand brake must be applied. The operator is responsible for the safety of all passengers and the stability of materials being transported.

Smoking in the Workplace

Smoking is not permitted in any CN interior workplace or motor vehicle.

Security

All vehicles will be parked in a pre-determined area and where required, a designated Contractor entrance shall be used.

Contractor's personnel will proceed directly to the Contractor's work location. Contractor's employees must remain at their designated work site and must not wander about the site.

The Contractor shall not permit persons other than the Contractor's personnel to enter the site without the prior written authority of the CN representative.

Emergency Evacuation Procedures

Prior to commencing work, all Contractor's employees must be familiar with the emergency evacuation plan for that work site. The Contractor shall issue written emergency and rescue procedures to the Contractor's personnel and shall post such procedures on the job site.

Unsafe Conditions or Practices

Contractors shall correct or report any unsafe conditions or practices they observe. All such conditions or practices shall be reported to the CN representative at the work site as soon as practical.

Reporting Accidents / Incidents

All accidents / incidents occurring on CN property, that result in or had the potential of causing serious injury, lost work days, vehicle or property damage must be reported to the CN representative within 24 hours. All such incidents will be fully investigated by the Contractor.

The Contractor shall subsequently provide a written report to CN (i.e. Company Officer assigned as Liaison to Contractor) within seven (7) days detailing the nature of the incident, the cause(s), regulatory authorities notified, and a specific action plan to prevent recurrence.

Treatment of Injured Personnel (Contractors)

Contractors shall ensure the following is provided for their personnel as required by CN and in accordance with applicable government regulations:

1. Adequate first-aid supplies and equipment.

2. Qualified personnel to render first-aid treatment.

Personal Identification

When not accompanied by a CN representative, Contractor's personnel shall carry an identification card on their person. Such identification card will be issued by the Contractor and will be of standard business card size (3-1/2" X 2"). It will contain the following information:

1. Contractor's name, address and telephone number,
2. CN representative responsible for the job,
3. Employee's full name and personal identification details (e.g. Driver's License No.)
4. Name of Contractor's representative issuing the card.

Such personnel shall also have a CN approved sticker (CN Safety Guidelines for Contractors Sticker) affixed to Contractor's personnel hardhat.

Audio and Visual Recording Equipment

Cameras and audio-visual equipment are not permitted on CN property without prior approval.

Summary

In conclusion, CN requires the full cooperation of the Contractor and the Contractor's employees with these guidelines and all other applicable regulations. Should there be any doubt as to the meaning or interpretation of these guidelines, consult with the CN representative responsible for the worksite.

Contractor Acknowledgement

Contractor/sub-contractor personnel must read and understand CN "[Safety Guidelines for Contractors and Non-CN Personnel](#)":

The contractor/sub-contractor must sign the proper document to confirm compliance to the above.