

Compensation for lost of fish habitat in calm water and wetland, Île Lapierre

Lot 1 – Bridge consolidation, Dclearing and Dry Excavation

Technical Specifications for submittal – 99%

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Section A – Technical Specifications

PART 1 - General

1.1 RELATED REQUIREMENTS

- .1 All Sections included in present Specifications

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- .1 The work covered by this contract include the first phase of the restoration of a wetland and the creation of fish habitat in the calm water of Lapierre Island, park Ruisseau-de-Montigny, Borough Rivière-des-Prairie – Pointe-aux-trembles, Montreal.
- .2 Work includes, but is not limited to:
 - .1 The consolidation of the bridge, by the modification and addition of cross bracings between the steel beams, reinforcement of the deck where the steel beams rest, waterproofing of the deck slab, correction of the backfill close to the abutment pier and the approach of the bridge, and other work, such as described in the specifications.
 - .2 The clearing and grubbing (including the removal of the root system) and the cutting of isolated trees.
 - .3 Eliminating warbler.
 - .4 The relocation of brown snakes and maintenance in good conditions the brown snake/sedimentation exclusion fence.
 - .5 The removal and management of topsoil in indicated areas (temporary storage and/or disposal).
 - .6 Dry excavation required above the water level.
 - .7 The management of contaminated soil off-site (temporary storage and/or disposal).
 - .8 Environmental measures for the work on the stream, along the coast, and in the outskirts of the marsh.
 - .9 The cleaning of Gouin Boulevard during and at the end of the work, or on demand of the Departmental Representative.
 - .10 The adjustment, the restoration and the installation of the fence, and its access door from Gouin Boulevard.
 - .11 The restauration of the access lock at the south approach of the bridge.

1.3 CONSTRUCTION METHOD

- .1 Construct Work under single unit price contract.
- .2 Payment posts are described in the bid Form.
- .3 For description of payment posts and payment measures, refer to section 01 29 00 Payment
- .4 Calendar: The Contractor has 130 working days to complete the work.

1.4 WORK SEQUENCE

- .1** Construct Work in stages, in accordance with following restrictions
 - .1** The bridge consolidation must be finished before allowing the circulation of heavy machinery or trucks for the evacuation off-site of dredged material from the north side.
 - .2** Before starting work on the island, ensure the good condition of the exclusion fence of the brown snakes/sedimentation.
 - .3** The clearing and grubbing on the north side of the bridge may be done at the same time as the consolidation of the bridge, though the waste material may not be evacuated before the end of the consolidation work.

1.5 CONTRACTOR USE OF PREMISES

- .1** Coordinate use of premises under direction of Departmental Representative.
- .2** Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .3** Remove or modify the existing work to prevent damage on the pieces left in place.
- .4** Repair or replace, according to the Departmental Representative's directives, the existing parts that have been modified during the Work so as to reconnect them to the existing work, an adjacent work, or to harmonize them. Once the Work has ended, the existing work need to be in a condition deemed equivalent or superior to the baseline condition.

1.6 EXISTING PUBLIC UTILITIES

- .1** Before interrupting any service facilities inform Departmental Representative and utility company concerned and obtain all necessary authorizations.
- .2** Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours' notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by Departmental Representative with minimum disturbance to pedestrian traffic and tenant operations.
- .3** Before beginning work, define the scope of work and location of public utilities that are in work zone and inform Departmental Representative.
- .4** Submit Departmental Representative a calendar related to installation or active works closing for approval, including communication services outage or power supplies. Respect the approved calendar and inform all the parties affected by these.
- .5** When non-indexed public utilities are discovered, immediately inform Departmental Representative and put it in writing.
- .6** Protect, move or keep in service public utilities that are working. If non-functioning drains are found during work, close them in an authorized manner, by competent authorities.
- .7** Register the localisation of utility canalisations that are maintained, moved or abandoned.

1.7 REQUIRED DOCUMENTS

- .1** At all time, the following documents must be kept on building site.
 - .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

PART 2 - Products (N/A)

PART 3 - Execution (N/A)

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1 The overall sections included in this present quote.

1.2 ACCESS AND EGRESS

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including a temporary access way (traffic lane), access ramps, truck loading docks and waiting area, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.3 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Therefore, respect the different zones and reserved areas shown on the layout plan. Make arrangements with Departmental Representative to facilitate work as stated.
- .2 Where security is reduced by work provide temporary means to maintain security to assure the security of the goods and people on site.
- .3 The Contractor will provide a trailer on site, including sanitary facilities for use by Contractor's personnel and Departmental Representative. The contractor shall keep facilities clean. An area has been assigned for this on the plan.
- .4 The Contractor's employees are not allowed to park personal vehicles on the work site.
- .5 This zone must be respected to limit invasion of the brown snake's natural habitat.

1.4 EXISTING SERVICES

- .1 Construct barriers in accordance with Section 01 56 00 - Access work and temporary protection.

1.5 SPECIAL REQUIREMENTS

- .1 Deforestation work (tree cutting) and excavation work must be executed before March 31st 2017. According to the restrictions of the City of Montreal, ash timber transport should not be performed before September 15 to prevent the spread of the emerald ash borer.
- .2 Work done in water is prohibited between April 1st and October 15.
- .3 Carry out noise generating Work according to what is stated in section 01 35 43 – Environmental procedures, article 1.8.6.
- .4 Submit schedule in accordance with Section 01 32 16.07 - Construction Progress Schedule - Bar (GANTT) Chart.
- .5 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

- .6 Keep within limits of work and access roads.
- .7 Contractor's vehicles access to site is limited. Employee's access with a personal vehicle is prohibited.
- .8 Deliver materials between 09h00 and 15h30, unless otherwise approved by Departmental Representative.

1.6 SECURITY

- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.

PART 2 - Products (N/A)

PART 3 - Execution (N/A)

END OF SECTION

PART 1 - General

1.1 REFERENCES

- .1 Agreement between the Department Representative and the Contractor

1.2 MEASURE

- .1 Method of measure
 - .1 Provision of materials, labor including supervision, tools, equipment, protection, transport, unloading, customs and administration fees, profits, financing, etc. are included in each of the positions described here, necessary to perform the work of this project, unless otherwise noted.
 - .2 Costs of required related work, not specifically mentioned in the Technical Specification, but necessary for the realization of the work, have to be included in the most appropriate items of the bid form.
 - .3 The materials actually incorporated in the work and accepted by the Department Representative, are not taken into account for measuring purposes.

1.3 COST BREAKDOWN

- .1 Before asking the first installment payment, present a detailed breakdown of costs as required by the Departmental Representative, for the lump-sum price items. Once approved by the Departmental Representative, the breakdown of costs will be used as a calculating base for installment payments.

1.4 PRESENTED ITEMS IN THE TENDER DOCUMENT

Description of the items in the bid form below.

A – WORK ORGANIZATION

- .1 Work site organization, safety and environmental protection measures:
 - .1 Work Site Organization
 - .1 This item is a lump-sum price to compensate for all costs incurred for the necessary installation for the execution of the work as well as the costs that are not part of other payment items in the tender document, in accordance with the instructions of the technical specifications. The price covers, without limitation:
 - a. The required coordination of the Contractor with the Departmental Representative, le ministère du développement durable, environnement et lutte contre les changements climatiques (MDDELCC), the City of Montreal and other participant, including obtaining all required permits for the completion of the work.
 - .2 All that is required in the following sections and that is not charged directly or in a related way to a different position of the Tender document:
 - b. Section 01 31 19 Project Reunion

- c. Section 01 32 16.07 Construction Progress Schedule – Bar (GANTT) Chart
- d. Section 01 33 00 Documents and Samples to Submit
- e. Section 01 35 43 Environment Protection
- f. Section 01 52 00 Construction Facilities
- g. Section 01 71 00 Preparation Exam
- h. Section 01 74 11 Cleaning
- i. Section 01 78 00 Document to Deliver at the Completion of the Work
- .3 The set of work shown and described in the Existing Conditions/Removals Plan as well as in the Specifications – contains all the requirements described in the Division 01
- .4 Surveyor costs, picket work and survey fee which are not allocated to any of the other items in the bid form.
- .5 Mobilization and demobilization.
- .6 Maintenance of the site and its access.
- .7 Site surveillance fees (if required)
- .8 Land rental fees and/or materials storage space.
- .9 Energy and telecommunications expenses associated with the installation of the work field.
- .10 Development of the site where trailers will be installed on the work field, including site preparation, backfilling, grading, construction of a platform suitable for motor vehicles, the development of storage area, delivery of the site to its original condition at the end of the work as well as any incidental expenses.
- .11 Work field trailers including the interior installation and their access as well as sanitary installations.
- .12 Site fencing, sediment control fencing, the access path and trucks waiting areas, the material storages areas, electrical power, water and work field lighting, furniture, telephone (including internet, fax, etc.), heating and air conditioning of the work field offices, scaffolding, work field panels and maintenance.
- .2 New fence with a gate with two doors
 - .1 The Contractor shall tender a lump-sum price for the installation of a fence with a gate with double gates. The price includes, but is not limited to:
 - .1 Dismantling the existing fence between the existing corner post and the existing intermediate post (\pm 20 meters)
 - .2 Installation of two (2) corner posts at the ends of the new barrier and two (2) intermediate posts
 - .3 Installation of new fence sections (\pm 14 meters) and the new barrier with double gates with a free clearance of 6 meters
 - .4 Stops and hook inserted in the center in a concrete base
 - .5 Installing a locking system consisting of two channels each provided with a padlock with 3 copies of the key.
- .3 Traffic maintenance

- .1 The Contractor shall include the cost of work related to traffic maintenance and management of impacts for the complete period of work in the item "Maintenance of traffic and road safety" of the tender document. The lump-sum price includes:
 - .1 The submittal of signage and traffic maintenance flow diagrams, pavement marking and removal for each phase and for each closure to execute in accordance with the document 01350006-Special Procedures - Regulation circulation;
 - .2 Supply, installation, preservation, maintenance, moving and dismantling of all traffic management equipment (visual landmarks, work panels, light signaling arrows, barriers, etc.) for all work under the contract according to the laws and the applicable standards and requirements of the contract documents;
 - .3 Supply, installation, preservation, moving and dismantling of all additional road signs required for all work according to the signage and the traffic maintenance flow diagram approved by the Departmental Representative;
 - .4 Management of existing road signs in conflict with the temporary signs (masking, unmasking panels);
 - .5 All costs associated with the closures for the execution of all work (including setting up and dismantling work areas), as well as any necessary changes during work (configuration changes) planned under this contract;
 - .6 All costs associated with the necessary temporary signs, for the additional transitions that the Contractor may require to meet the deadline;
 - .7 Management of maintenance of access to local residents and any other incidental expenses;
 - .8 Supply, installation, preservation, moving and removing freestanding fences;
 - .9 The wage of signalers (provided in this document, as well as for the needs of the Contractor);
 - .10 Related expenses of traffic coordinator, the site manager, the traffic sign teams and signage maintenance teams;
 - .11 Related expenses for work in road lanes and all other incidental expenses;
 - .12 The costs associated with special meetings concerning the traffic maintenance;
 - .13 The costs of all coordination related to all closures with neighboring construction sites;
 - .14 All incidental expenses.
- .4 Environmental protection measures
 - .1 Environmental protection measures are paid as a lump-sum price. The price includes all materials, labor and methods taken by the Contractor to meet the laws, environmental standards and requirements. The price includes the implementation of measures to dismantle them, transportation, loading, off-site waste materials at an authorized site, the rehabilitation of sites and adding or repeat measures as the requirements of the Departmental representative.

B – WORK ORGANIZATION

.2 Site preparation

.1 Tree cutting and stump removal (BHD less than 150 mm)

- .1** The Contractor shall bid a unit price for cutting, grubbing, transportation and disposal of existing tree off site. Before starting work, the Contractor shall identify, on plan, to the Department Representative the trees to be cut.

.2 Tree cutting and stump removal (BHD more than 150 mm)

- .1** The Contractor shall bid a unit price for cutting, grubbing, transportation and disposal of existing tree off site. Before starting work, the Contractor shall identify, on plan, to the Department Representative the trees to be cut.

.3 Tree cutting and stump removal (variable BHD)

- .1** The Contractor shall bid a unit price for cutting, grubbing, transportation and disposal of existing tree off site. Before starting work, the Contractor shall identify, on plan, to the Department Representative the trees to be cut. The Contractor shall ensure that remaining tree are not damaged and remove cuttings in a way that minimized as much as possible damage to surrounding vegetation.

.4 Clearing

- .1** The Contractor shall tender a lump-sum price for the deforestation flush to the ground. This involves cutting, flush or near the existing ground level, brush, shrubs, trees less than 10 cm in diameter at breast height, roots, stumps, logs partially buried, eliminating giblets and debris littering the ground, transport and disposal off-site of existing plants. Before starting work, the Contractor shall identify, on plan, to the Department Representative the existing plants to cut.

.5 Tree pruning

- .1** Pruning, treatment of cut surfaces will be paid by unit worked hours and approved by the Departmental Representative. An hour of work corresponds to one (1) certified arborist with more than 10 years of experience, and two apprentices. All equipment and accessories is included. These times correspond to the time spent at the site and not to dispose of scrap off site

.6 Excavation, transport and disposal of excavation soil type <A

- .1** This activity is measured and paid per metric ton of <A type soils, excavated, segregated and disposed of in a place authorized by the MDDELCC. The unit price must include, among others, the excavation, segregation, sorting, sifting, loading directly from excavations or temporary storage areas, weighing, transport and disposal of materials as well as all other related work.
- .2** The quantities indicated in the price schedule are approximate and may vary depending on conditions encountered in the field. Only the actual amounts will be paid to the Contractor. In the event that additional amounts would be identified by the Contractor, he must report beforehand to the Department Representative for an approval.

- .7 Excavation, transport and disposal of excavation soil type AB
 - .1 This activity is measured and paid per metric ton of AB type soils, excavated, segregated and disposed of in a place authorized by the MDDELCC. The unit price must include, among others, the excavation, segregation, sorting, sifting, loading directly from excavations or temporary storage areas, weighing, transport and disposal of materials as well as all other related work.
 - .2 The quantities indicated in the price schedule are approximate and may vary depending on conditions encountered in the field. Only the actual amounts will be paid to the Contractor. In the event that additional amounts would be identified by the Contractor, he must report beforehand to the Department Representative for an approval.
- .8 Excavation, transport and disposal of excavation soil type BC
 - .1 This activity is measured and paid per metric ton of BC type soils, excavated, segregated and disposed of in a place authorized by the MDDELCC. The unit price must include, among others, the excavation, segregation, sorting, sifting, loading directly from excavations or temporary storage areas, weighing, transport and disposal of materials as well as all other related work.
 - .2 The quantities indicated in the price schedule are approximate and may vary depending on conditions encountered in the field. Only the actual amounts will be paid to the Contractor. In the event that additional amounts would be identified by the Contractor, he must report beforehand to the Department Representative for an approval.
- .9 Excavation, transport and disposal of excavation soil type >C
 - .1 This activity is measured and paid per metric ton of >C type soils, excavated, segregated and disposed of in a place authorized by the MDDELCC. The unit price must include, among others, the excavation, segregation, sorting, sifting, loading directly from excavations or temporary storage areas, weighing, transport and disposal of materials as well as all other related work.
 - .2 The quantities indicated in the price schedule are approximate and may vary depending on conditions encountered in the field. Only the actual amounts will be paid to the Contractor. In the event that additional amounts would be identified by the Contractor, he must report beforehand to the Department Representative for an approval.
- .10 Excavation and off-site management of residual materials
 - .1 This activity is measured and paid per metric ton of disposed materials in a place authorized by the MDDELCC. The unit price must include, among others, the excavation, segregation, sorting, sifting, loading, weighing, transport and disposal of materials as well as all other related work.
 - .2 Amounts indicated in the price schedule are approximate and may vary depending on conditions encountered in the field. Only the actual amounts will be paid to the Contractor. In the event that additional amounts would be

identified by the Contractor, he must report beforehand to the Departmental Representative for an approval.

.11 Water Management

- .1** This activity is measured and paid as lump sum. The price includes, among others, the mobilization and demobilization of pumps, piping and temporary storage tanks, the pumping of water from the water table and of precipitations directly from the excavations, the cleaning water for trucks and other equipment's, their temporary on-site storage, the release into the sewage network of the city, as well as all other related work.
- .2** Snow management is the Contractor's responsibility. Snow must be loaded and disposed off-site.

.12 Excavator

- .1** This activity is measured and paid by the hour of actual work performed. The unit price must include, among others, the provision of an excavator, its operator, washing of materials contaminated with petroleum hydrocarbons, equipment maintenance, as well as any other related work. The excavator must have at least a horsepower of 120 KW and be equipped with a bucket of a minimum of 1 m wide and with a minimum capacity of 1m³.

C – BRIDGE REINFORCEMENT AND REPAIR

.3 Reinforcement of steel structure

- .1** Adding and reinforcing bracing L102x102x6. in X
 - .1** The Contractor shall tender a lump-sum price for this work.
 - .2** The dismantling of existing braces as shown on the structural drawings.
 - .3** Cleaning of steel surfaces from dirt and unwanted deposits before installing new steel elements.
 - .4** The supply and installation of the steel components (angle iron, WT sections and gussets) as shown on the structural drawings. The price covers, among others, the supply of the required documents, the supply of materials, the manufacture, handling, transport, assembly and includes any incidental expense.
 - .5** The lump sum should also include the cost of quality assurance check as described in CCDG, section 15.7.1.
- .2** Modifying beams supports
 - .1** Support elements will be in unitary amount. The amount includes performing oblong slots and all incidental expenses.

.4 Bridge works

- .1** Installation of the new jersey type guardrail on the deck
 - .1** The unit price is for the installation of new rails. The price covers the provision, manufacture, handling, transport, assembly and includes all incidental expenses.

- .2 Closing the openings of the bridge
 - .1 The unit price is for the supply and installation of sump covers on the bridge deck.
- .3 Sealing of openings in the abutment end section wall
 - .1 The Contractor shall provide a price per square meter for closing openings in the walls of reinforced concrete guard strike. The price includes, among others:
 - a. The excavation of the soil near the openings. The price includes removing concrete blocks used to close openings.
 - b. Supply, transportation and installation of the rebar as shown on the structural drawings.
 - c. Supply, transportation and installation of formwork openings in the walls of the abutment end section wall.
 - d. Supply, transportation and installation of concrete as stipulated plans and specifications.
- .4 Adding a layer of bituminous membrane sealing coating.
 - .1 The Contractor shall submit a cubic meter price for the installation of a temporary asphalt layer. The price covers the supply of materials, manufacturing, handling, transportation, installation and includes any incidental expense.
 - .2 The price of the bitumen incorporated to the asphalt will be adjusted every month during which there is asphalt paving happening and where a variation higher than 5% is registered between the reference price of the current month and the price of the previous month. The price adjustment will be calculated in accordance with the price adjustment formula applicable described in paragraph 2.
 - .3 Price adjustment formula
 - a. When the reference price of the month when there is asphalt paving is higher than 105% of the reference price from the month before the bid closing, Canada will allocate the contractor a compensation calculated as follows:

(Example based on a 5% increase)
 $MA = (Pre - 1.05 PRs) \times \text{quantity of bitumen in tons}$
 - b. When the reference price of the month when there is asphalt paving is lower than 95% of the reference price from the month before the bid closing, Canada will deduct the contractor an amount calculated as follows:

(Example based on a 5% decrease)
 $MA = (0.95 PRs - Pre) \times \text{quantity of bitumen in tons}$

MA= Amount of adjustment of the price of bitumen, in dollars
PRs= Reference price from the month before the bid closing
Pre: reference price of the month when there is asphalt paving

The reference price will be the one (Asphalt Cement Index Price) published monthly in the Contract Bulletin from the Ministry of Transportation of the government of Ontario (TGO) which is published on the website of the TGO <http://www.mto.gov.on.ca/>. This reference price will be used to calculate the adjustment amount per ton of any performance class of bitumen accepted for work.

- .4 For every month where an adjustment amount is established, the Canada will determine the quantity of bitumen used based on the percentage of bitumen fixed in the final coated formula.
- .5 The adjustment amounts will appear in the form of Request for Progress Payment for the months where asphalt paving has happened.
- .5 Backfill at abutments and approaches
 - .1 Common excavation
 - .1 The Contractor shall provide a price per cubic meter as specified in section 11.4.5.4 of the CCDG.
 - .2 Crushed stone backfill MG- 20
 - .1 The Contractor shall provide a price per tonne, including, and without limitation, the supply of materials, loading, transportation to the work site, application, implementation, the moisture control, compaction materials and any incidental expense. Embankment preparation work (removal of organic materials, realization of stands for the stability of the projected granular fill) are paid at the post "common excavation" of the schedule.
 - .3 Crushed stone backfill MG-56
 - .1 The Contractor shall provide a price per tonne, including, and without limitation, the supply of materials, loading, transportation to the work site, application, implementation, the moisture control, compaction materials and any incidental expense.
 - .4 Crushed stone backfill MG-112
 - .1 The Contractor shall provide a price per tonne, including, and without limitation, the supply of materials, loading, transportation to the work site, application, implementation, the moisture control, compaction materials and any incidental expense. Embankment preparation work (removal of organic materials, realization of stands for the stability of the projected granular fill) are paid at the post "common excavation" of the schedule.
 - .5 Protective stone layer 300-500 mm calibre
 - .1 The Contractor shall provide a price per tonne, including, and without limitation, the supply of materials, loading, transportation to the work site, application, implementation and any incidental expense.
- .6 Gabion Walls
 - .1 Non-vegetated gabion section

- c. The Contractor shall provide a price per cubic meter for the amount of stones used to fill the cages installed.
 - d. The price covers the excavation and preparation of the subgrade and the supply and installation of desired particle size filler stones. The price also includes the supply, installation and any incidental expense of a geotextile membrane as shown on the structural drawings.
- .2 Vegetated gabion section
 - e. The Contractor shall provide a price per square meter of wall area actually vegetated and incorporated into the upper section of walls at the bridge ends. The price must include the supplying and planting of the plants.
- .3 Seeding of the slopes and of the flat area next to the bridge
 - .1 The Contractor must provide a price per square meter for the topsoil, the membrane and the seeding. The price must include the entirety of the installation work, the labor and the products for these surfaces.

PART 2 - Products (N/A)

PART 3 - Execution (N/A)

END OF SECTION

PART 1 - General

1.1 RELATED REQUIREMENTS

- .1 Section 03 10 00 Concrete forming and accessories
 - Section 03 20 00 Concrete reinforcing
 - Section 03 30 00 Cast in place concrete
 - Section 03 30 51 Concrete for bridge deck
 - Section 03 35 00 Concrete finishing
 - Section 07 12 13 Asphalt waterproofing
 - Section 31 36 00 Gabions
 - Section 31 00 99 Earthwork for minor work
 - Section 32 12 16.01 Asphalt paving – short form
- .2 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under sections as follows:
 - .1 03 10 00 Concrete forming and accessories
 - .2 03 20 00 Concrete reinforcing
 - .3 03 30 00 Cast in place concrete
 - .4 03 30 51 Concrete for bridge deck
 - .5 03 35 00 Concrete finishing
 - .6 07 12 13 Asphalt waterproofing
 - .7 31 36 00 Gabions
 - .8 31 00 99 Earthwork for minor work
 - .9 32 12 16.01 Asphalt paving – short form

1.2 APPOINTMENT AND PAYMENT

- .1 Departmental Representative will appoint and pay for services of testing laboratory except follows:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
 - .4 Mill tests and certificates of compliance.
 - .5 Tests specified to be carried out by Contractor under supervision of Departmental Representative.
- .2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, the Contractor must pay costs for additional tests

or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.3 CONTRACTOR'S RESPONSIBILITIES

- .1** Provide labour, equipment and facilities to:
 - .1** Provide access to Work for inspection and testing.
 - .2** Facilitate inspections and tests.
 - .3** Make good Work disturbed by inspection and test.
 - .4** Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
- .2** Notify Departmental Representative 48 hours minimum sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3** Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4** Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

PART 2 - Products (N/A)

PART 3 - Execution (N/A)

END OF SECTION

PART 1 - General

1.1 RELATED REQUIREMENTS

- .1 Section 01 32 16.07 – Construction progress schedule bar chart (GANTT)

1.2 ADMINISTRATIVE

- .1 Schedule and administer project meetings throughout the progress of the work, every second week, and assure the management of the points under the responsibility of the Contractor.
- .2 The Departmental Representative will notify in writing the Contractor of a meeting no later than 3 days before the scheduled date.
- .3 The Departmental Representative will indicate a room for meetings.
- .4 The Departmental Representative will chair the project meetings.
- .5 The Departmental Representative will draft the minutes of the meetings, it will indicate all questions and major decisions and specify the actions taken by the various parties.
- .6 The Departmental Representative will make copies of the minutes and distribute them to participants and stakeholders absent from the meeting within seven days following the date of the meeting.
- .7 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.3 PRECONSTRUCTION MEETING

- .1 Within 15 days of the acceptance notice, attend the meeting to discuss administrative procedures and define the responsibilities of each.
- .2 Departmental Representative or their principal representatives, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3 The Departmental Representative will establish the time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Points to transmit to the Departmental Representative during the kick-off meeting:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work: in accordance with Section 01 32 16.07 – Construction progress schedule – Bar (GANTT)
 - .3 Schedule of submission of shop drawings, samples, mock-ups, colour chips. Submit submittals in accordance with Section 01 33 00 – Submittal Procedure.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 – Construction Facilities.
 - .5 Site security in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.

- .6 Requirements concerning Health and Security, in accordance with section 01 35 29 06.

1.4 PROGRESS MEETINGS

- .1 Major Subcontractors involved in Work and Departmental Representative are to be in attendance.
- .2 Notify parties mat least 5 days prior to meetings.
- .3 Points listed in the agenda to be discussed at progress meetings (without limitations):
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Corrective measures and procedures to regain projected schedule.
 - .6 Revision to construction schedule.
 - .7 Progress schedule, during succeeding work period.
 - .8 Review submittal schedules: expedite as required.
 - .9 Maintenance of quality standards.
 - .10 Review proposed changes for effect on construction schedule and on completion date.
 - .11 Health and Security
 - .12 Environment Protection
 - .13 Other business.

PART 2 - Products (N/A)

PART 3 - Execution (N/A)

END OF SECTION

Part 1 - General

1.1 RELATED REQUIREMENTS

- .1 N/A

1.2 DEFINITIONS

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
- .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
- .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7 Milestone: significant event in project, usually completion of major deliverable.
- .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.3 REQUIREMENTS

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately [10] working days, to allow for progress reporting.

- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Certificate of Substantial Performance and Certificate of Completion as defined times of completion are of essence of this contract.

1.4 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit to Departmental Representative within 7 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 The calendar must include all the planning of work to be realized, including the consolidation of the bridge, the layout of the access path and storage area, the clearing and grubbing, the principal excavation and all of the related work.
- .4 The schedule should be done with MS Project 2013, submit to the Departmental Representative an electronic copy of the source file and PDF for the reference calendar and each delivery of revised execution calendar.
- .5 Reference implementation schedule
 - .1 The Contractor shall submit at the beginning of the project a work schedule that will be used as a reference calendar for monitoring the project and grant deadlines if necessary.
 - .2 This implementation schedule will fully respect the characteristics listed by the owner. The Departmental Representative will issue a compliance notice; otherwise he will give the Contractor a detailed list of corrections.
 - .3 When the compliance notice will be issued the implementation calendar will be considered the reference implementation schedule.
 - .4 Activities schedule must be detailed and grouped in a structured manner. At a minimum this structure must include the following groups:
 - .1 Project Management (administration, mobilization, permitting, approving plans and methods, demobilization).
 - .2 Supply (granting of sub-contracts, shop drawings preparation/sample, review and approval of drawings, manufacturing and delivery)
 - .3 Construction (for activity scheduling, duration, speaker, approval and monitoring time)
- .6 Modifications of reference implementation schedule
 - .1 The Contractor shall provide at all site meetings a calendar showing the updates by setting the date in which the state when unpredictable work conditions or modifications requested by the Departmental Representative or any other reasons modifying the reference schedule. All changes to the schedule must be justified to the Departmental Representative and be endorsed by him.

1.5 PROJECT MILESTONES

- .1 Project milestones form interim targets for Project Schedule

- .1 Consolidation of the bridge must be done at the latest 46 working days after the contracts attribution date.
- .2 Tree cutting work must be done at the latest 46 working days after the contract attribution date.
- .3 Excavation and site grading must be done at the latest 128 working days after the contract attribution date.
- .4 Certificate of Substantial Performance within 138 working days of Award of Contract date.

1.6 MASTER PLAN

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 Departmental Representative will review and return revised schedules within 5 working days.
- .3 Revise impractical schedule and resubmit within 5 working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.7 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Award;
 - .2 Launch of Work meeting;
 - .3 Shop Drawings, Samples;
 - .4 Permits;
 - .5 Mobilization and preparation of access roads and area of Site;
 - .6 Consolidation of the bridge;
 - .7 Clearing;
 - .8 Grubbing;
 - .9 Dry excavation, higher than water level;
 - .10 Certificate of Substantial Performance;
 - .11 Restrictions for work in water;
 - .12 General migratory bird nesting area (earth work);
 - .13 Approval time under different requirements in the Specifications document.

1.8 PROJECT SCHEDULE REPORTING

- .1 Update Project Schedule on fortnightly basis reflecting activity changes and completions, as well as activities in progress.
- .2 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.

1.9 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 (N/A)

Part 3 - Execution (N/A)

END OF SECTION

PART 1 - General

1.1 RELATED REQUIREMENTS

- .1 All sections included in Specifications document.

1.2 ADMINISTRATIVE

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric, or in the case where characteristics aren't given in SI Metric, units converted values are acceptable.
- .5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10 Keep one reviewed copy of each submission on site.

1.3 SHOP DRAWINGS AND PRODUCT DATA

- .1 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.

- .2 Submissions shall include
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Materials and details of fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Standards.
- .3 After Departmental Representative's review, distribute copies of shop drawings and product data.
- .4 Submit one electronic copy of shop drawings for each requirement requested in specification Sections.
- .5 Submit one electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .6 Submit one electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award for project.
- .7 Submit one electronic copy of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
- .8 Submit one electronic copy of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative.

- .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .9 Submit one electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .10 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .11 Submit one electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
- .12 Delete information not applicable to project.
- .13 Supplement standard information to provide details applicable to project.
- .14 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .15 The review of shop drawings by the Departmental Representative is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that the Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.
 - .3 Schedule a period of seven business days for the review of shop drawings by the Departmental Representative.

1.4 SAMPLES

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .5 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.

- .6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5 MOCK-UPS

- .1 Erect mock-ups in accordance with Section 01 45 00 – Quality Control.

1.6 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Safety and Insurance Board Experience Report.

PART 2 - Products (N/A)

PART 3 - Execution (N/A)

END OF SECTION

PART 1 - General

1.1 REFERENCES

- .1 Ministère des Transports, de la Mobilité durable et de l'Électrification des transports du Québec
 - .1 Collection Normes - Ouvrages routiers, Tomes I à VIII
- .2 Répertoire des dispositifs de signalisation routière
(<http://www.rsr.transports.gouv.qc.ca/>)
- .2 Ville de Montréal
 - .1 Cahier des charges normalisées « Maintien de la circulation, signalisation temporaire et gestion des impacts » édition 2014

1.2 PROTECTION OF PUBLIC TRAFFIC

- .1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.
- .2 When working on travelled way
 - .1 Place equipment in position to minimize interference and hazard to travelling public.
 - .2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
 - .3 Do not leave equipment on travelled way overnight.
- .3 Close lanes of road only after receipt of written approval from Departmental Representative.
 - .1 Before re-routing traffic erect suitable signs and devices in line with present specifications and with the standardized specifications « Maintien de la circulation, signalisation temporaire et gestion des impacts » edition 2014 of Ville de Montréal.
- .4 Keep travelled way graded, free from pot holes and of sufficient width for required number of lanes of traffic.

1.3 INFORMATIONAL AND WARNING DEVICES

- .1 Provide, erect and maintain signs, and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.
- .2 Supply and erect signs, delineators, barricades and miscellaneous warning devices in line with standardized specifications « Maintien de la circulation, signalisation temporaire et gestion des impacts » edition 2014 from Ville de Montréal and in Collection Normes - Ouvrages routiers, Tomes I à VIII from the Ministère des Transports, de la Mobilité durable et de l'Électrification des transports of Québec.

- .3 Place signs and other devices in locations recommended in the standardized specifications « Maintien de la circulation, signalisation temporaire et gestion des impacts » edition 2014 from Ville de Montréal and in Collection Normes - Ouvrages routiers, Tomes I à VIII from the Ministère des Transports, de la Mobilité durable et de l'Électrification des transports of Québec.
- .4 Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of Departmental Representative.
- .5 Before mobilizing on site, the Contractor shall submit for approval a fire protection plan with the Fire Department of the City of Montreal.
- .6 The Contractor shall establish a truck traffic plan with the borough Rivière-des-Prairies-Pointe-aux-Trembles. The resource person in the borough is the division chief Mr. Bernard Donato he can reach by calling 514 868-4283. There will be limits to the number of trucks on the site at the same time , especially near the residences.
- .7 Continually maintain traffic control devices in use:
 - .1 Check signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
 - .2 Remove or cover signs which do not apply to conditions existing from day to day.

1.4 CONTROL OF PUBLIC TRAFFIC

- .1 Provide competent flag personnel, trained in accordance with, and properly equipped to the standardized specifications « Maintien de la circulation, signalisation temporaire et gestion des impacts » edition 2014 from Ville de Montréal for situations as follows:
 - .1 When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.
 - .2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.
 - .3 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.
 - .4 Where temporary protection is required while other traffic control devices are being erected or taken down.
 - .5 For emergency protection when other traffic control devices are not readily available.
 - .6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
 - .7 Delays to public traffic due to contractor's operators: 15 minutes maximum.

1.5 OPERATIONAL REQUIREMENTS

- .1** Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken as specified and approved by Departmental Representative to protect and control public traffic, existing conditions for traffic to be restricted as follows:
 - .1** Section of Gouin Boulevard from 4^{ème} avenue and 10^{ème} avenue to set access to site, in front of the 7380 Gouin Est Boulevard: Occasional hindrance under DN-V-4-TLD 007, modified according to Contractor needs (maximum period: 5 weeks)
 - .1** Make sure a flag person is present at all time to insure the machinery and delivery trucks move safely, that entrances and exits to the site are managed including the management of the surrounding road system. If needed, additional flag person could be demanded by the Departmental Representative.
 - .2** Adjust existing signs to temporary configuration in reason of Work.
 - .3** Maintain at all time, pedestrian and cyclist passage free from obstacle.
 - .4** Obstruction of the road and bicycle lane is not permitted.
 - .5** Put in place two (2) signs « Passage de camions » (T-D-270-11-D et T-D-270-11-G) of 450mm x 450mm (dimensions proportional to the 600mm x 600mm sign available in the Répertoire des dispositifs de signalisation routière du Québec) 40m away from site access in both directions.
 - .6** Employee parking is prohibited on Gouin boulevard.
 - .7** Trucks must use following itinerary: West on Gouin Boulevard, South on Langelier Boulevard, East in Léger Boulevard, South on Albert-Hudon boulevard, East on Maurice-Duplessis boulevard and access to Highway 25 towards final destination.

PART 2 - Products

2.1 SIGNAL DEVICE

- .1** The signal device must be like-new when installed and kept in that state for the duration of Work. They must be cleaned regularly and stored so they can retain the required reflectivity. The signs must conform to the norm so they can be seen and understood correctly by drivers.

PART 3 - EXECUTION

3.1 PRINCIPLE OF CIRCULATION MANAGEMENT

- .1** The principles of circulation management represent the main phases of Work to carry out. The Contractor must add the unnamed works to the Contract Documents in the main phases of Work. The Contractor can present another phasing of work, but the new phasing must be validated and accepted by Departmental Representative. If the Contractor presents a new phasing, he must assume entire responsibility and will not be

compensated in any way. In that case, the payment to maintain circulation will be the same as the one intended in the quote.

- .2 The Contractor must execute signage and marking work according to demands and recommendations of Departmental Representative. The Contractor must correct any deficiencies observed by the Departmental Representative in the case of signage, marking, bollard installation, self-supporting fence work and any other impairment related to circulation maintaining devices, at his expense. If the correction of these deficiencies requires the shifting of the Contractor's work teams and a new mobilisation on site, the Contractor must assume the expense. The deficiency correction costs cannot be charged to the Departmental Representative by the Contractor.

3.2 STUDY OF TEMPORARY SIGNAGE WORK

- .1 The Work includes, but is not limited to, the providing and erection of temporary signage, where required, so as to maintain circulation and to protect workers during Work of still water and wetland fish habitat compensation , along Gouin Boulevard, between 6th avenue and Marc-Aurèle Fortin Boulevard in Rivière-des-Prairies-Pointe - aux-Trembles borough, and all related work specified in Contract Documents.
- .2 The objectives aimed by traffic maintenance and signage work are to assure the security of road users as well as workers, the accessibility to waterfront and commercial properties, the circulation of emergency vehicles and of public works, and to maintain a fluid circulation on road. The Departmental Representative can ask for additional temporary signage to help achieve these objectives. In that case, the Contractor needs to be able to provide these services in set timeframe.
- .3 The Contractor must take appropriate measures with his work team and with his subcontractors so that the material, materials, installations, vehicular movement on site and Work don't disturb circulation, exploitation of public utilities and surrounding businesses.
- .4 In addition to traffic maintenance work, temporary signage and impact management included in the standardized specifications « Maintien de la circulation, signalisation temporaire et gestion des impacts » edition 2014 from Ville de Montréal, is also included in the Work the following:
 - .1 The preparation of all boards for signage and traffic maintenance, site access, marking and erasure signed and sealed by and engineer member of the Ordre des Ingénieurs du Québec;
 - .2 The supply, mobilisation, conservation, maintenance, movement and demobilization of temporary signage according to signage boards produced by Contractor;
 - .3 Hindrances to movement must be conform to standard drawings from the Normes - Ouvrages routiers, Tome V, Signalisation routière » pour de la signalisation de travaux de longue durée en milieu urbain;
 - .4 Manufacturing, mobilisation, maintenance, movement and demobilization of complementary signage boards (in Répertoire des dispositifs de signalisation routière du Québec) as indicated in section 1.5 of present document; in addition the

Departmental Representative can ask for complementary signage boards to satisfy management scenarios and ensure the security of workers and road users.

- .5 The maintenance, at all times, to local traffic access;
- .6 The Contractor must take all necessary measures and dispositions so the traffic lanes are in a safe condition for vehicular and cyclist circulation;
- .7 The maintenance, at all times, of a pedestrian corridor, when a sidewalk is blocked because of the Work, a temporary passage of at least 1.5m large, must be set on site, or off the street.
- .8 The supply, installation, maintenance, movement and removal of self-supporting fences if needed for vehicular and pedestrian circulation;
- .9 The presence of at least one (1) flag person during the period of Work to ensure management of traffic in Work area, as well as on adjacent streets;
- .10 In absence of Work, the storage of signage for circulation system must keep circulation lanes and sidewalks free from any obstacle;
- .11 Hampered traffic lanes must be restored to circulation and freed of any debris.
- .12 If applicable, the Contractor must coordinate obstructions on traffic lanes with neighbouring building sites; the coordination of Work must be reflected on circulation boards.

3.3 TEMPORARY SIGNAGE BOARDS

- .1 For every phase of the project, the Contractor must present temporary signage boards to the Departmental Representative, signed and sealed by an engineer member of the Ordre des Ingénieurs du Québec. For every phase, these boards must be approved by the Departmental Representative at least ten (10) days before their implementation.
- .2 The signage boards must conform to standardized Project Manual « Maintien de la circulation, signalisation temporaire et gestion des impacts » edition 2014 from Ville de Montréal, be faithful to site conditions, include details of signage device and localisation. The boards must conform to the « Normes – Ouvrages routiers, Tome V, volumes 1 et 2, Signalisation routière », the laws and regulations in effect, the requirements of the Commission de la santé et sécurité au travail and the requirements of the present document. The Departmental Representative reserves the right to modify them if he judges it is necessary to ensure the safety of the road users and the workers.

3.4 PUBLIC DOMAIN OCCUPANCY PERMIT

- .1 The Contractor must acquire a temporary occupation permit in accordance with standardized Project Manual « Maintien de la circulation, signalisation temporaire et gestion des impacts » edition 2014 from Ville de Montréal. There is no related cost to this permit for the Contractor.
- .2 The Contractor, must respect the time slots, as well as areas of Work that he is allowed to use according to the public domain occupancy permit or the agreement reached with the concerned borough. In case of contradiction, between occupation permit and present document, concerning allowed time slots, the public domain occupancy permit outweighs present document.

3.5 SPECIAL EVENTS

- .1** If a holiday or a special event impacts the circulation next to the area of Work, the Minister or the Departmental Representative are allowed to keep lanes or sidewalks open to circulation, or to modify times slots, or to suspend a public domain occupancy permit to fit their needs, with no compensation.

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

General note: In the present section, the term «worksite» is applicable to the entirety of the installations found on the site where the work is taking place (the worksite, access, infrastructures, parking, etc.)

- .1 Section 01 33 00 Submittal procedures
- .2 Section 03 10 00 Concrete forming and accessories
- .3 Section 03 20 00 Concrete reinforcing
- .4 Section 03 30 00 Cast-in-place concrete
- .5 Section 03 30 51 Concrete for bridge deck
- .6 Section 03 35 00 Concrete finishing
- .7 Section 05 12 33 Structural steel for bridge
- .8 Section 31 00 99 Earthwork for minor work
- .9 Section 31 36 00 Gabions
- .10 Section 32 31 13 Chain link fences and gates
- .11 Section 32 93 43.01 Tree pruning
- .12 Section 35 42 19 Preservation of water courses and wetlands

1.2 REFERENCES

- .1 Province of Québec
 - .1 Loi sur la santé et la sécurité du travail L.R.Q., c. S-2.1

1.3 ACTION AND INFORMATION SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental representative, and the CNESST the site-specific prevention program, as outlined in the article “GENERAL REQUIREMENTS”, at least 10 days prior to the start of work.
- .3 Departmental representative will review Contractor’s site-specific prevention program and provide comments to Contractor within 10 days after receipt of the document. Revise plan as appropriate and resubmit to Departmental representative within 5 days after receipt of comments from Departmental representative. Departmental representative reserves the right not to authorize the start of work on the construction site as long as the content of the prevention program is not satisfactory. The Contractor shall then update his prevention program and resubmit it to the Departmental representative if the scope of work changes or if the working methods of the Contractor differ from his initial plans or for any other applicable new condition.

- .4 Departmental representative's review of Contractor's site-specific prevention program should not be construed as approval of the program and does not reduce the Contractor's overall responsibility for construction Health and Safety during the work.
- .5 Submit copies of Contractor's authorized representative's construction site health and safety inspection reports to Departmental representative, at least once per week.
- .6 Submit to Departmental representative within 24 hours a copy of any inspection report, correction notice or recommendation issued by Federal, Provincial and Territorial health and safety inspectors.
- .7 Submit to Departmental representative within 24 hours an investigation report for any accident involving injury and any incident exposing a potential hazard. The investigation report shall contain at least the following:
 - .1 date, time and place of accident;
 - .2 name of sub-contractor involved in the accident;
 - .3 number of persons involved and condition of wounded;
 - .4 witness identification;
 - .5 detailed description of tasks performed at the time of the accident;
 - .6 equipment being used to accomplish the tasks performed at the time of the accident;
 - .7 corrective measures taken immediately after the accident;
 - .8 causes of the accident;
 - .9 preventive measures that have been put in place to prevent a similar accident.
- .8 Submit to Departmental representative WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 – Submittals. Contractor must also keep one copy of these documents on the construction site.
- .9 Medical Surveillance: where prescribed by legislation, regulation or prevention program, submit certification of medical surveillance for construction site personnel prior to commencement of Work, and submit additional certifications for any new construction site personnel to Departmental representative.
- .10 Submit to Departmental representative an on-site Emergency Response Plan at the same time as the prevention program. The Emergency Response plan must contain the elements listed in the article "GENERAL REQUIREMENTS" of this section.
- .11 Submit to Departmental representative copies of all training certificates required for the application of the prevention program, in particular (if applicable) for the following:
 - .1 first aid in the workplace and cardiopulmonary resuscitation;
 - .2 work likely to release asbestos dust (mandatory for all work where asbestos is present);
 - .3 work in confined spaces (mandatory for all work in confined spaces);
 - .4 lockout-tagout procedures (mandatory for all work requiring lockout);
 - .5 safely operating forklift trucks (mandatory for all forklift usage);

- .6 safely operating elevating work platforms (mandatory for the use of all elevating platforms);
- .7 any other requirement of Regulations or the safety program.

In addition, the certifications of the Cours de santé et sécurité générale pour les chantiers de construction (General Health and Safety Training for Construction Sites) shall be available on demand on the construction site.

- .12 Engineer's plans and certificates of compliance: Contractor must submit to the Departmental representative and to the Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST) a copy signed and sealed by engineer of all plans and certificates of compliance required pursuant to the Code de sécurité pour les travaux de construction (S-2.1, r.4) (Safety code for the construction industry) or by any other legislation or regulation or by any other clause in the specifications or in the contract. The Contractor must also submit a certificate of conformity signed by an engineer once the facility for which these plans were prepared has been completed and before a person uses the facility. A copy of these documents must be available on site at all times.

1.4 FILING OF NOTICE OF CONSTRUCTION SITE OPENING

- .1 Notice of construction site opening shall be submitted to the CNESST before work begins. A copy of such notice and acknowledgment of receipt from the CNESST shall be submitted to Departmental representative. At the completion of all the work, a notice of construction site closing shall be submitted to the CNESST, with a copy to Departmental representative.
- .2 The Contractor shall assume the role of being the Principal Contractor in the limits of the construction site and elsewhere where he must execute work within the framework of this project. The Contractor shall recognize the responsibility of being the Principal Contractor of the project and identify himself as such in the notice of the construction site opening he provides to the CNESST.
- .3 The Contractor shall accept to divide and identify the construction site adequately in order to define time and space at all times throughout the course of the project.

1.5 HAZARD ASSESSMENT

- .1 The contractor must perform construction site specific safety hazard assessment related to project.

1.6 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental representative prior to commencement of Work.
- .2 Contractor's representative with decision power must attend any meetings at which construction site safety and health issues are to be discussed.
- .3 If it is anticipated that there will be 25 workers or more on the construction site at any given time, the Contractor shall set up a worksite committee and hold meetings as required by the Code de sécurité pour les travaux de construction (S-2.1, r. 4) (Safety code for the construction industry). A copy of the minutes of the meetings of the

committee shall be provided to the Departmental representative no later than 5 days after the committee meeting.

1.7 REGULATORY REQUIREMENTS

- .1** Comply with all legislation, regulations and standards applicable to the construction site and its related activities.
- .2** Comply with specified standards and regulations to ensure safe operations on a site containing hazardous or toxic materials.
- .3** Always use the most recent version of the standards specified in the Code de sécurité pour les travaux de construction (S-2.1, r.4) (Safety code for the construction industry), notwithstanding the date indicated in that Code.

1.8 COMPLIANCE REQUIREMENTS

- .1** Comply with the Loi sur la santé et la sécurité du travail (L.R.Q., c. S-2.1) (Act Respecting Occupational Health and Safety) and the Code de sécurité pour les travaux de construction (S-2.1, r. 4.) (Safety code for the construction industry) in addition to respecting all the requirements of this specification manual.

1.9 RESPONSIBILITIES

- .1** The Contractor must acknowledge and assume all the tasks and obligations which customarily devolve upon a principal Contractor under the terms of the Loi sur la santé et la sécurité du travail (L.R.Q., ch. S-2.1) (Act Respecting Occupational Health and Safety) and the Code de sécurité pour les travaux de construction (S-2.1, r.4) (Safety code for the construction industry).
- .2** The Contractor must be responsible for health and safety of persons on construction site, safety of property on construction site and for the protection of persons adjacent to construction site and the environment to the extent that they may be affected by conduct of the work.
- .3** No matter the size or location of the construction site, the Contractor must clearly define the limits of the construction site by physical means and respect all specific regulation requirements applicable in this regard. The means chosen to define the limits of the construction site must be submitted to the Departmental representative.
- .4** 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 prevention Plan.

1.10 GENERAL REQUIREMENTS

- .1** Before undertaking the work, prepare a site-specific prevention program based on the hazards identified according to the article “HAZARD ASSESSMENT” and the article “RISKS INHERENT TO THE WORKSITE” in this section. Apply this program in its totality from the start of the project until demobilization of all personnel from the construction site. The prevention program shall take into consideration the specific

characteristics of the project and cover all the work to be executed on the construction site.

The safety program must include at least the following:

- .1 Company safety and health policy;
- .2 Description of the stages of the work;
- .3 Total costs, schedule and projected workforce curves;
- .4 Flow chart of safety and health responsibilities;
- .5 Physical and material layout of the construction site;
- .6 Risk assessment for each stage of the work, including preventive measures and the procedures for applying them;
- .7 Identification of the preventive measures relative to the specific risks inherent to the worksite indicated in the article “RISKS INHERENT TO THE WORKSITE”;
- .8 Identification of preventive measures for health and safety of employees and / or public works site as indicated in the article “SPECIFIC REQUIREMENTS FOR THE HEALTH AND SAFETY OF OCCUPANTS AND PUBLIC”;
- .9 Training requirements;
- .10 Procedures in case of accident/injury;
- .11 Written commitment from all parties to comply with the safety program;
- .12 Construction site inspection checklist based on the preventive measures;
- .13 Emergency response plan which shall contain at least the following:
 - .1 Construction site evacuation procedures;
 - .2 Identification of resources (police, firefighters, ambulance services, etc.);
 - .3 Identification of persons in charge of the construction site;
 - .4 Identification of the first-aid attendants;
 - .5 Communication organizational chart (including the person responsible for the site and the departmental representative);
 - .6 Training required for those responsible for applying the plan;
 - .7 Any other information needed, in the light of the construction site’s characteristics.

If available the Departmental representative will provide the evacuation procedures to the Contractor who shall then coordinate the construction site procedure with that of the site and submit it to the Departmental representative.

- .2 Departmental representative may respond in writing, where deficiencies or concerns are noted in the prevention program and may request resubmission with correction of deficiencies or concerns.
- .3 In addition to the prevention program, during the course of the work the Contractor shall elaborate and submit to the Departmental representative specific written procedures for any work having a high risk factor of accident (for example: demolition procedures,

specific installation procedures, hoisting plan, procedures for entering a confined space, procedures for interrupting electric power, etc.) or at the request of the Departmental representative.

- .4 The Contractor shall plan and organize work so as to eliminate the danger at source or ensure collective protection, thereby minimizing the use of personal protective equipment.
- .5 Equipment, tools and protective gear which cannot be installed, fitted or used without compromising the health or safety of workers or the public shall be deemed inadequate for the work to be executed.
- .6 All mechanical equipment (for example, but not limited to: hoisting devices for persons or materials, excavators, concrete pumps, concrete saws) shall be inspected before delivery to the construction site. Before using any mechanical equipment, the Contractor shall obtain a certificate of compliance signed by a qualified mechanic dated less than a week prior to the arrival of each piece of equipment on the construction site; the certificate shall remain on the construction site and transmitted to the Departmental representative on demand.
- .7 Ensure all inspections (daily, periodic, annual, etc.) for the hoisting devices for persons or materials required by the current standards are carried out and be able to provide a copy of the inspection certificates to the Departmental representative on demand.
- .8 The Departmental representative can at all times, if he suspects a malfunction or the risk of an accident, order the immediate stop of any piece of equipment and require an inspection by a specialist of his choice.
- .9 The Departmental representative must be consulted for the location of storing gas cylinders and tanks on the construction site.

1.11 RISK INHERENT TO THE WORKSITE

- .1 In addition to the risks related to the tasks to be carried out, personnel responsible for the execution of the work on the construction site will be exposed to the following risks, inherent to the area where the work will be executed.
- .2 At the worksite there is in particular the presence of the following:
 - .1 overhead power lines;
 - .2 underground services (electric, gas, vapour, water system, etc.);
 - .3 trees and landscaping to preserve and protect;
 - .4 potentially unstable ground;
 - .5 body of water close by;

The Contractor shall process to a risk assessment of the site to validate this information and see if other risks are present on the site. He must include in its prevention program all risks that have been identified.

1.12 SPECIFIC REQUIREMENTS FOR THE HEALTH AND SAFETY OF OCCUPANTS AND PUBLIC

- .1** The worksite is occupied by employees and/or the public during the following times: [specify the times]. The Contractor shall consider the following specific requirements for the protection of employees and / or the public:

- .1** secure the work site at all time]
- .2** control possible egress points
- .3** ensure that all dangers within the construction area is well identified and visible to avoid injuries to trespassers, even at night.

These requirements must be included in the Contractor's site-specific safety plan as well as any other measures provided by the Contractor to protect the health and safety of employees and / or the public on the site.

1.13 UNFORESEEN HAZARDS

- .1** Whenever a source of danger not defined in the specifications or identified in the preliminary construction site inspection arises as a result of or in the course of the work, the Contractor must immediately suspend work, notify the person responsible for health and safety on the construction site, take appropriate temporary measures to protect the workers and the public and notify Departmental representative, both verbally and in writing. Then the Contractor must do the necessary modifications to the prevention program or apply the security measures required in order to resume work.

1.14 PERSON IN CHARGE OF HEALTH AND SAFETY

- .1** If the construction site meets the requirements of article 2.5.3 of the Code de la sécurité pour les travaux de construction (S-2.1, r.4) (Safety code for the construction industry), the Contractor needs to hire a competent person authorized as a safety officer and appoint this person full time from the beginning of the work. This person's tasks shall solely be dedicated to the management of health and safety on the construction site. This safety officer must have the following qualifications:
 - .1** Have a safety officer certificate issued by the CNESST;
 - .2** Have site-related working experience specific to the activities associated with the present project;
 - .3** Have working knowledge of occupational health and safety regulations in the workplace;
 - .4** 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 the construction site to perform work;
 - .5** Be responsible for implementing, enforcing in detail and monitoring site-specific Contractor's Health and prevention program;
 - .6** Be on construction site at all times during execution of work;

- .7 Inspect the work and ensure compliance with all regulatory requirements and those indicated in the contract documents or the site-specific prevention program.
- .8 Keep a daily log of actions taken and submitting a copy to Departmental representative each week.

The safety officer's certificate shall be submitted to the Departmental representative before the start of the work.

- .2 When the hiring of a safety officer is not required or if this person is hired by the Departmental representative, the Contractor shall designate a competent person to supervise and take responsibility for health and safety, no matter the size of the construction site or how many workers are present at the workplace. This person shall be on construction site at all times and be able to take all necessary measures to ensure the health and safety of persons and property at or in the immediate vicinity of the construction site and likely to be affected by any of the work. The Contractor shall submit the name of this person to the Departmental representative before the start of work.

1.15 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on construction site in accordance with Acts and Regulations of the Province, and in consultation with Departmental representative.
 - .1 At a minimum, the following information and documents must be posted in a location readily accessible to all workers:
 - .1 Notice of construction site opening;
 - .2 Identification of principal Contractor;
 - .3 Company OSH policy;
 - .4 Site-specific prevention program;
 - .5 Emergency plan;
 - .6 Minutes of worksite committee meetings;
 - .7 Names of worksite committee representatives;
 - .8 Names of the first-aid attendants;
 - .9 Action reports and correction notices issued by the CNESST.

1.16 INSPECTION OF THE CONSTRUCTION SITE AND CORRECTION OF NON-COMPLIANCES

- .1 Inspect the construction site and complete the construction site inspection checklist and submit it to the Departmental representative in accordance with the article "ACTION AND INFORMATION SUBMITTALS" in this section.
- .2 Immediately take all necessary measures to correct any situations deemed non-compliant during the inspections mentioned in the previous paragraph or noticed by the authorities having jurisdiction or the Departmental representative or his agent.
- .3 Submit to Departmental representative written confirmation of all measures taken to correct the situation in case of non-compliance in matters pertaining to health and safety.

- .4 The Contractor shall give the safety officer or, where there is no safety officer, the person assigned to safety and health responsibilities, full authority to order cessation and resuming of work as and when deemed necessary or desirable in the interests of safety and health. This person should always act so that the safety and health of the public and construction site workers and environmental protection take precedence over cost and scheduling considerations.
- .5 The Departmental representative or his agent may order cessation of work if the Contractor does not make the corrections needed to conditions deemed non-compliant in matters pertaining to health and safety. Without limiting the scope of the preceding articles, the Departmental representative may order cessation of work if, in his view, there is any hazard or threat to the safety or health of construction site personnel or the public or to the environment.

1.17 PREVENTION OF VIOLENCE

- .1 Health and safety management of Public Works and Government Services Canada construction sites includes the implementation of measures designed to protect the psychological health of all persons who access the construction site where the work is taking place. Consequently, in addition to physical violence, verbal abuse, intimidation and harassment are not tolerated on the construction site. Any person who demonstrates such actions or behaviors will receive a warning and/or could be definitely expelled from the construction site by the Departmental representative.

1.18 USE OF PUBLIC ROADS

- .1 Where it is necessary to encroach on a public road for operational reasons or to ensure the security of the workers, the occupants or the public (for example: the use of scaffolding, cranes, excavation work, etc.), the Contractor shall obtain at his own expense any authorizations and permits required by the competent authority.
- .2 The Contractor shall install at his own expense any signage, barricades or other devices needed to ensure the safety and security of the public and the Contractor's own facilities.

1.19 EXPOSURE TO SILICA

- .1 For any interior or exterior work generating silica, the Contractor must respect the following requirements, in addition to those in the Code de sécurité pour les travaux de construction S-2.1, r.4 (Safety code for the construction industry).
 - .1 Work in wet environment or use tools with the inflow of water in order to reduce dustiness, if not, collect dust at the source and retain it with a high-efficiency filters not to propagate dust in the environment.
 - .2 Clean surfaces and tools with water, never with compressed air.
 - .3 Sand and pickle surfaces by using an abrasive containing less than 1% of silica (also called amorphous silica).
 - .4 Install shields or other containment device to prevent silica dust from migrating toward other workers or the public.

- .5 Wear individual respiratory and ocular protection equipment during all the operations that could generate silica dust in accordance with the requirements of the Code de sécurité pour les travaux de construction, S-2.1, r.4 (Safety code for the construction industry).
- .6 Wear coveralls to prevent contamination outside the construction site.
- .7 Do not eat, drink, or smoke in a dusty environment.
- .8 Wash the hands and the face before drinking, eating or smoking.

1.20 SANDBLASTING

- .1 Prior to starting any sandblasting work, the Contractor must:
 - .1 Provide a written procedure of the work that meets the requirements of section 3.20. of the Code de sécurité pour les travaux de construction, S-2.1, r.4 (Safety code for the Construction Industry).
 - .2 Demonstrate that he has all the material and equipment required on hand to respect the procedure and for safely conducting the work.
 - .3 All sanding and sandblasting work shall be done by using an abrasive containing less than 1% of silica.

1.21 EXPOSURE TO ANIMAL'S FECAL DROPPINGS

- .1 Provide a written procedure for the work which respects all the requirements of the Code de sécurité pour les travaux de construction S-2.1, r- 4, (Safety code for the construction industry), as well as the requirements indicated in the document “Des fientes de pigeons dans votre lieu de travail: méfiez-vous” (Pigeon droppings in your workplace: Beware” published by the CNESST (http://www.csst.qc.ca/publications/100/Documents/DC100_1331_1web2.pdf)
- .2 Demonstrate that he has all the material and equipment required on hand to respect the procedure and for safely conducting the work.

1.22 RESPIRATORY PROTECTION

- .1 Contractor must ensure that all workers who must wear a respirator as part of their duties have received training for that purpose as well as fit testing of their respirator, in accordance with CSA Standard Z94.4 Selection, use and care of respirators. Submit the certificates of the fit testings to the Departmental representative on demand.

1.23 FALL PROTECTION

- .1 Plan and organize work so as to eliminate the risk of fall at the source or ensure collective protection, thereby minimizing the use of personal protective equipment. When personal fall protection is required, workers must use a safety harness that complies with CSA standard CAN/CSA Z-259.10 M90. A safety belt must not be used as fall protection.
- .2 Every person using an elevating platform (scissors, telescopic mast, articulated mast, rotative mast, etc.) must have a training regarding this equipment.

- .3 The use of a safety harness is mandatory for all elevating platforms with telescopic, articulate or rotative mast.
- .4 Define the limits of the danger zone around each elevating platform.
- .5 All openings in a floor or roof must be surrounded by a guardrail or provided with a cover fixed to the floor able to withstand the loads to which it could be exposed, regardless of the size of the opening and the height of the fall it represents.
- .6 Everyone who works within two meters from a fall hazard of three meters or more must use a safety harness in accordance with the requirements of the regulation, unless there is a guardrail or another device offering an equivalent safety.
- .7 Despite the requirements of the regulation, the Departmental representative may require the installation of a guardrail or the use of a safety harness for specific situations presenting a risk of fall less than three meters.

1.24 EXCAVATION WORK

- .1 In addition to the requirements of the Code de sécurité pour les travaux de construction (Safety code for the construction industry), the Contractor who performs the digging of trenches or excavations must respect the following requirements:
 - .1 Fill out the following form and submit it to the Departmental representative before beginning to excavation work.
- .2 Submit to the Departmental representative, as appropriate, the following documents:
 - .1 Plans and specifications, signed and sealed by an engineer, of the shoring needed to be installed for the excavation work; or
 - .2 Engineer's advice specifying the wall angles of the trench or excavation.

- .2 Lifting mechanical/electrical equipment on a roof or on the floor of a building;
 - .3 Lifting of loads encroaching on the public road;
 - .4 Lifting large dimensions or very heavy loads;
 - .5 All other lifting operation, in accordance with the requirements of the departmental representative.
- .3 In addition to the above requirements, the Contractor must plan the hoisting operations in a way as to avoid that the loads pass over the occupied zones on the site. When there is no alternative, the hoisting plan must absolutely be signed and sealed by an engineer and must guarantee the security of the occupants in that zone; the plan must also be approved by the Departmental representative. The Departmental representative can, if he deems necessary, require that the work be done at night or on weekends.
- .4 Upon the beginning of the work on the construction site, the Contractor must submit the list of the hoisting plans anticipated for the whole project to the Departmental representative. That list shall be updated as needed if changes occur during the work.
- .5 In addition to the mechanical service inspection certificate, the annual inspection certificate and the crane logbook must be aboard all cranes and boom truck cabs.
- .6 The entire lifting area shall be marked off to prevent the entry of non-authorized persons.
- .7 The Contractor shall carefully inspect all of the slings and lifting accessories and make sure that those in poor condition are destroyed and scrapped.
- .8 Compressed-gas cylinders shall be lifted with a basket specially designed for this purpose.

Minimum Content of Hoisting Plan

- sketch indicating at a minimum, the location of the crane, the surrounding facilities, the zone covered by the hoisting operations, the pedestrian's pathways and vehicular routes, the security perimeter, etc.;
- weight of loads;
- dimensions of loads;
- list of hoisting devices and weight of each;
- total weight lifted;
- maximum height of obstacles to clear;
- height of loads lifting relative to the surface of the roof (in the case of loads to be placed on roofs);
- use of guide cables;
- type of crane used;
- crane capacity;
- boom length;
- boom angle;

- crane's radius of action;
- deployment of stabilizers;
- percentage usage of the crane's capacity;
- verification confirmation of hoisting equipment;
- identification of the crane operator and the person responsible for the hoisting operations with date and signatures.

1.26 HOT WORK

- .1 Hot work means any work where a flame is used or a source of ignition may be produced, i.e., riveting, welding, cutting, grinding, burning, heating, etc.
 - .1 Before the beginning of each shift of work and for each sector, the Contractor must obtain a "Hot Work Permit" emitted by the person responsible for the site.
 - .2 A working portable fire extinguisher suitable to the fire risk shall be available and easily accessible within a 5 m radius from any flame, spark source or intense heat.
 - .3 The Contractor must appoint an individual to do continuous monitoring of the fire risks for a period of one hour after the end of the shift of hot work. This individual shall sign the section for this purpose on the permit and give it to the person in charge of the construction site after the one-hour period.
 - .4 When the hot work is done in areas where there is combustible materials or where the walls, ceilings or floors are made of or covered with combustible materials, a final inspection of the work area must be scheduled four hours after the work has finished. Unless specified otherwise by the Departmental representative, the Contractor must assign a person to carry out this monitoring.

Welding and Cutting

In addition to the requirements prescribed in the preceding paragraphs, the Contractor must respect the following requirements:

- .1 Welding and cutting work must be carried out in accordance with the requirements of the *Code de Sécurité pour les travaux de construction, S-2.1, r.4* (Safety code for the construction industry) and CSA standard W117.2, Safety in Cutting, Welding and Allied Processes.
- .2 Air extraction system with filters must be used for all welding and cutting work performed inside.
- .3 Stop all activities producing flammable or combustible gas, vapours or dust in the vicinity of the welding or cutting work.
- .4 Store all compressed gas cylinder on a fireproof fabric and make sure that the room is well ventilated.
- .5 Store all oxygen cylinders more than 6 metres from a flammable gas cylinder (ex: acetylene) or a combustible such as oil or grease, unless the oxygen cylinder is separated from it by a wall made of non-combustible material as mentioned in the

article 3.13.4 of the Code de sécurité pour les travaux de construction, S-2, r. 6 (Safety code for the construction industry)

- .6 Store the cylinders far from all heat sources.
- .7 Not to store the cylinders close to the staircases, exits, corridors and elevators.
- .8 Do not put acetylene in contact with metals such as silver, mercury, copper and alloys of brass having more than 65% copper, to avoid the risk of an explosive reaction.
- .9 Check that welding equipment with electric arc has the necessary tension and are grounded.
- .10 Ensure that the conducting wires of the electric welding equipment are not damaged.
- .11 Place the welding equipment on a flat ground away from the bad weather.
- .12 Install fireproof canvas when the welding work is done in a superposition and where there is the risk of falling sparks.
- .13 Move away or protect the combustible materials which are closer than 15 metres from the welding work.
- .14 Prohibition to weld or cut any closed container.
- .15 Do not perform any cutting, welding or work with a naked flame on a container, a tank, a pipe or other container containing a flammable or explosive substance unless:
 - .1 They have been cleaned and air samples indicating that work can be done without danger has been taken; and
 - .2 Provisions to ensure the safety of the workers have been made.

1.27 STEEL STRUCTURE ERECTION OR DISMANTLING WORK

- .1 In addition to respecting section 3.24 du Code de sécurité pour les travaux de construction (S-2.1, r.4) (Safety code for the Construction Industry), the Contractor must also respect the requirements described in the following paragraphs.
- .2 Contractor must submit the following documents to the Departmental representative before the beginning of steel structure erection work:
 - .1 Erecting procedures in accordance with article 3.24.10 du Code de sécurité pour les travaux de construction (S-2.1, r.4) (Safety code for the Construction Industry);
 - .2 Rescue procedures for the release of a worker suspended in a safety harness within a maximum of 15 minutes; procedures must be adapted to the construction site and in accordance with article 3.24.4 of that same code; the procedure must be accompanied by a written confirmation that it has been tested;
 - .3 Statement from an engineer that the anchor rods have been installed in accordance with the anchoring plan as required by the article 3.24.12 of that same code;
 - .4 Hoisting procedures in cases where the lifting is done in one of the ways described in the article 3.24.15 of that same code;

- .5 Name of the individual identified as rescuer and his rescue training certificate;
- .6 Name of the individual identified as first-aid attendant and his first-aid training certificate.
- .3 The Contractor must make sure that the following documents are available for consultation on construction site at all times:
 - .1 Steel structure manufacturer's erection plan in accordance with the requirements of article 3.24.9 du Code de sécurité pour les travaux de construction (S-2.1, r.4) (Safety code for the Construction Industry);
 - .2 Column anchor rods's anchoring plan in accordance with the requirements of article 3.24.11 du Code de sécurité pour les travaux de construction (S-2.1, r.4) (Safety code for the Construction Industry).

1.28 WORK NEAR BODIES OF WATER

- .1 For all work done near a body of water (such as work above water, work on a wharf, work on the edge of a watercourse, etc.), the Contractor must respect the requirement of the following paragraphs in addition to those in article 2.10.13 du Code de sécurité pour les travaux de construction (Safety code for the Construction Industry).
- .2 The Contractor must plan his work in a way to implement safety measures to prevent any worker from falling in the water. The use of theses measures should be favoured over the wearing of a life jacket.
- .3 Submit the following documents to the Departmental representative before the beginning of the work:
 - .1 Description of the body of water;
 - .2 Description of the work done next to this body of water;
 - .3 Plan of transportation on water adapted to the work and to the characteristics of the body of water;
 - .4 Rescue plan adapted to the work and to the characteristics of the body of water;
- .4 Each of the document listed above must contain at a minimum the information required in section 11 of the Code de sécurité pour les travaux de construction (S-2.1, r.4) (Safety code for the Construction Industry).
- .5 If there is the possibility that all or part of the work can be done during the winter, the safety measures included in the documents required above must be adapted accordingly.
- .6 The Contractor must submit to the Departmental representative the certificate of training required in article 11.2 du Code de sécurité pour les travaux de construction (S-2.1, r.4) (Safety code for the Construction Industry) for the following individuals:
 - .1 The person assigned to prepare the documents required in the preceding paragraph; and
 - .2 Each person responsible for the transport or rescue operations
- .7 If the rescue plan stipulates the use of a vessel, the Contractor must submit to Departmental representative the competency card or certificate for the individuals in the rescue team for his work, issued by Transport Canada.

- .8 The Contractor must include in his weekly inspection checklist the devices required in the articles 11.4 and 11.5 du Code de sécurité pour les travaux de construction (S-2.1, r.4) (Safety code for the Construction Industry).
- .9 Ensure that a rescue vessel moored and in the water is available at each place where a worker may fall in the water. However, a vessel may serve more than one workplace on the same construction site provided the distance between any of these workplaces and the vessel is less than 30 m.
- .10 Where the construction site is a wharf, a pier, a quay or any similar structure, a ladder with at least two rungs below the surface of the water shall be installed on the front of the structure every 60 m.

1.29 TEMPORARY HEATING

- .1 In addition to respecting section 3.11 of the Code de sécurité pour les travaux de construction (S-2.1, r.4) (Safety code for the Construction Industry), the Contractor must also respect the requirements described in the following paragraphs.
- .2 A portable fire extinguisher must be available at all times near the heating units, no matter what type of heating is used.
- .3 The heating units must always be used in accordance with the manufacturer's specifications.
- .4 If applicable, the canvas or tarpaulins used next to the heating units must be solidly fixed so as not to be projected on the heaters, on the pipes connected to the heaters or on any other heat source.
- .5 The gas cylinders must be installed in a way that they are protected from vehicle and other equipment traffic.
- .6 For the use of heating units other than electric, the Contractor must install a carbon monoxide detector in the work area, next to the heating units and/or the workers, throughout the course of the heating period. The Contractor must immediately apply the corrective measures required to the heating units if the detector's alarm goes off.
- .7 The Contractor must ensure a minimum surveillance of the heating units outside the hours of work (nights and weekends). He must submit a surveillance plan to the Departmental representative before the use of the heating units.

1.30 WORK NEAR OVERHEAD POWER LINES

- .1 When there is an overhead power line in the work zone and that the Contractor chooses to apply paragraph b) of article 5.2.2 of the Code de sécurité pour les travaux de construction (2.1, r.4) (Safety code for the Construction Industry), a copy of the agreement with the electrical power company and a copy of the work process, required in the article 5.2.2 b), must be submitted to the Departmental representative before the beginning of the work in relation to these documents.

1.31 HEALTH AND SAFETY SUBORDINATION AGREEMENT

Project: _____ Address: _____

EXTERNAL CONTRACTOR

I hereby agree to submit to the authority of (name of the Principal Contractor's business) _____, which is the Principal Contractor for the project indicated above during the entire duration of our work on the construction site. Accordingly, I confirm that I have reviewed the Principal Contractor's prevention program, and I agree to:

- Inform my employees of the content of the Principal Contractor's prevention program and ensure that its content are complied with at all times;
- Apply the prevention program that is specific to the activities that we carry out under this project;
- Inform the Principal Contractor of my actions or dealings on the construction site and obtain the Principal Contractor's agreement before the start of work; and
- Follow the health and safety directives provided by the representative of the Principal Contractor on the construction site and, depending on requirements, attend training sessions and health and safety meetings organized by the representative of the Principal Contractor.

Name of representative: _____

Name of business: _____

Description of work to be done on the construction site: _____

Approximate dates of work (start-end): _____

Signature: _____ Date: _____

PRINCIPAL CONTRACTOR

I hereby agree to allow the business (name of external contractor) _____ to perform the work under this project indicated above and, as Principal Contractor, to take the necessary steps to protect the health and safety of workers on the construction site. Should the Contractor repeatedly refuse or fail to comply with my directives, I agree to inform PWGSC's Departmental representative of this and to provide documentary evidence of my actions or dealings with the Contractor.

Name of representative: _____

Name of the Principal Contractor's business: _____

Signature: _____ Date: _____

Submit a completed and signed copy to PWGSC's Departmental representative

PART 2 - Products(n/a)

PART 3 - Execution (n/a)

END OF SECTION

Partie 1 General

General note: the «Section D» includes mitigation measures that are the result of the certificate application and must be respected the same way as the elements of the present section. In case of conflict between the two measures of mitigation, the most restrictive will apply.

1.1 RELATED REQUIREMENTS

- .1** Section 03 10 00 Concrete forming and accessories
- .2** Section 03 20 00 Concrete reinforcing
- .3** Section 03 30 00 Cast-in-place concrete
- .4** Section 03 30 51 Concrete for bridge deck
- .5** Section 03 35 00 Concrete finishing
- .6** Section 05 12 33 Structural steel for bridge
- .7** Section 31 00 99 Earthwork for minor work
- .8** Section 31 36 00 Gabions
- .9** Section 32 31 13 Chain link fences and gates
- .10** Section 32 93 43.01 Tree pruning
- .11** Section 35 42 19 Preservation of water courses and wetlands

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 contamination, pollution and habitat or environment disruption during construction. Prevention of environmental pollution and damage requires consideration of soil, water and air; biological and cultural resources; and includes management of visual esthetics; noise; solid, chemical, gaseous and liquid waste; radiant energy and radioactive material, as well as other pollutants.

1.3 DOCUMENTS/SAMPLES TO SUBMIT FOR APPROVAL/INFORMATION

- .1** Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2** Product Data:
 - .1** Submit manufacturer's instructions, printed product literature and data sheets for the biodegradable oils for the machinery, used for the work on the water and the shore and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2** Submit 2 copies of WHMIS MSDS, conform to section 01 35 29.06 – Health and Safety Requirements.
- .3** Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.
- .4** The plan must present a complete overview of the environmental problems known or potential to be solved during the bridge repairs, deforestation and excavation.
- .5** Address topics at level of detail commensurate with environmental issue and required construction task[s].
- .6** 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 contaminated soil and sediments to be removed from site
 - .3** Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
 - .4** Names and qualifications of persons responsible for training site personnel.
 - .5** Descriptions of environmental protection personnel training program.
 - .6** A plan of the work areas, showing the activities in each part of the construction zone and indicating the restricted use areas as well as the areas prohibited to use (protection of the brown snake and the shoreline outside of the work area).
 - .1** The plan should include measures to mark the limits of the usable areas and elements of protection methods lying within the permitted work areas and to be preserved.
 - .7** Erosion of soil and transport of sediment control plan, delivered to the Departmental Representative before start of Work, identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations and EPA 832/R-92-005, Chapter 3. The drawings exposing the methods used to control runoff water during bridge and excavation work on the riverbanks. The plan shall also include the method used to carry out dry works for the installation of gabions to the bridge (e.g. cofferdams).

- .8 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, stockpiles of excess or spoil materials and storage zone for fossiliferous rocks for the city of Montreal.
- .9 Drawings illustrating methods meant to enable the excavation of the wildlife habitats in dried environment and methods of disposal of wastewater following the drying up of the excavation area.
- .10 Methods of disposal of snow during winter Work.
- .11 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
 - .1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.
- .12 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .13 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris originating from bridge refection.
- .14 Waste disposal plan for woody material and first meter of soil contaminated by invasive plants must be provided by Contractor before start of Work.
- .15 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
- .16 Sound climate prevention plan, stating the measures to maintain the noise level to an acceptable level during work.
- .17 Water quality protection plan, including measures to enforce during work on the river for the installation of the gabions.
- .18 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .19 Waste Water Management Plan identifying methods and procedures for management or discharge of waste waters which are directly derived from construction activities, such as excavation dewatering, refection work on bridge and dewatering
- .20 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

1.4 FIRES

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

1.5 DRAINAGE

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and

reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations, EPA 832/R-92-005, Chapter 3

- .2 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .3 Ensure pumped water into waterways is free of suspended materials, or shows an increase of less than 25mg/L in relation to the natural content for a release in the Rivière des Prairies. The levels of suspended materials in the river must be inferior to a 25mg/L increase outside the area of Work, mainly for the bridge refection Work. The Contractor must provide, to the city's Environment service, measures to control the wastewater discharge to acquire the required temporary permits according to the by-law «Assainissement des eaux de la Communauté métropolitaine de Montréal» (by-law 2008-47 of the CMM) and the discharges at purification works on the territory of the urban agglomeration of Montréal (by-law RCG 08-041 from the urban agglomeration of Montreal).
- .4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements. Provide decantation of the dewatering water in the area of Work and provide detail of system before start of Work.

1.6 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties as indicated.
- .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.
- .5 Restrict tree removal to areas indicated.
- .6 During the ash cutting, off-site transportation of these cut trees will be made only by September 15 in order to prevent the spread of the Emerald Ash Borer.

1.7 WORK ADJACENT TO WATERWAYS

- .1 Construction equipment to be operated on land only.
- .2 Use waterway beds for borrow material only after written receipt of approval from MDDELCC in authorization certificate.
- .3 Waterways to be kept free of excavated fill, waste material and debris.

- .4 Limit encroachment in Rivière des Prairies to area of Work.
- .5 All the machinery and equipment used on or within 20 m from the natural high water line of a stream will use biodegradable hydraulic oil with:
 - .1 A bio based content of at least 80%, and:
 - .2 A certified biodegradability according to OECD B301 or equivalent standard (\geq 60% biodegradability in 28 days).
- .6 The Contractor shall take the necessary measures to fully drain the machinery before making the filling with vegetable oil or biodegradable; a maximum of 5% of residual oil will be tolerated.

1.8 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .1 Control emissions from equipment and plant in accordance with local authorities' emission requirements. The Contractor must provide, to the city's Environment service, measures to control the emission of particles in the atmosphere to acquire the required temporary permits according to the by-law by the Communauté métropolitaine de Montréal sur le rejet à l'atmosphère (règlement 90 (2001-10 CMM)).
- .2 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- .4 Considering the borough of Rivière-des-Prairies-Pointe-aux-Trembles does not have any specific regulations for noise pollution in regulation RCA09-Z0, the Contractor shall respect the following criteria during Work. The environmental noise to take into account shall be provided by a specialized firm designated by the Departmental Representative.
- .5 The zone and land-use of the site is qualified as 'sensible to sounds', as defined by the following graphic.

Zones and land use	Noise levels not to exceed (dBA) (Ambient noise and worksite combined)					
	Day (7am to 7pm)		Evening (7pm to 11pm)		Night (11pm to 7am)	
	L10	Lmax	L10	Lmax	L10	Lmax
Zones sensitive to noise: houses, hospitals and schools, parks, hotels, etc.	75 or ambient noise +5	85 or 90 for impact noise	Ambient noise +5	85	Ambient noise +5 (if ambient noise <70) Ambient noise +3 (if ambient noise \geq 70)	80
Commercial zones: offices, stores, etc.	80 or ambient noise +5	None	Ambient noise +5	None	None	None
Industrial zones: factories, workshops, etc.	85 or ambient noise +5	None	None	None	None	None

- (1) The highest out of two, becomes the sound level not to surpass
 - (2) The impact noise is an intermittent noise that quickly becomes more intense
 - (3) If applicable, during opening hours of stores
 - (4) The L 10 measured, is the average over a period of thirty (30) minutes
 - (5) Lmax measured represents the maximum value of a sound emission. The measurement time is generally of a second.
- .6** Work must happen between 7:00am and 7:00pm and cannot happen during the weekend. During winter the work day may be reduced according to sunshine hours.
 - .7** Use well-maintained and heavy machinery and equipment in good functioning order, in accordance with operation characteristics by inspecting them before their introduction on the Work site.
 - .8** Use low-noise equipment. Make sure the equipment used has a good quality well-functioning muffler.
 - .9** Use air-tight dump truck or standard, depending on needs, covered with a tarp, to reduce fine particle air dispersion.
 - .10** The Contractor must establish a truck circulation plan with the borough of Rivière-des-Prairies-Pointe-aux-Trembles. Primary contact is head of division Mr. Bernard Donato that can be reached at (514)868-4283. The number of trucks on site at the same time should be limited, especially close to residences.
 - .11** Locate noisy equipment far from sensible zones (residences) if possible, such as for shredding.
 - .12** Equip vehicles with a functional anti-pollution exhaust system.
 - .13** Set up reverse signal alarm with variable intensity.
 - .14** Avoid impact noise from dump truck rear panel and adopt procedure of discharge to limit impact noise.
 - .15** Limit use of engine breaks to emergency situations.
 - .16** Turn off any mechanical or electrical equipment that are not used.
 - .17** Equip the site with a recovery bed for sludge from vehicles at the exit of the site on Gouin Boulevard, according to indications on plan. If needed, set up a station to wash tires.
 - .18** Clean the streetsg.
 - .19** The municipal and provincial criterias shall be respected :

	1 hour	3 hours	8 hours	24 hours
Fine Particules (2.5um)	-	35 ug/m3 (Environment Canada)	-	30 ug/m3 (Annex K of the Regulation on clean atmosphere)
Total Particules	300 ug/m3 (Relative Regulation on clean air and replacing regulations 44 and 44-1 of the Community)	-	190 ug/m3 (Relative Regulation on clean air and replacing regulations 44 and 44-1 of the Community)	120 ug/m3 (Annex K of the Regulation on clean atmosphere)

1.9 HISTORICAL/ARCHAEOLOGICAL CONTROL

.1 Special Conditions

- .1 All excavation soil recognized as possibly containing the remains may be monitored if an archaeologist appointed by the Departmental Representative. Following a preliminary study the archaeological potential of the island Lapierre was considered very low. However if discoveries are made in the achievement of the work the following measures must be respected.

.2 Access and Collaboration

- .1 The Contractor shall cooperate and comply with all instructions of the Departmental Representative during the excavation, to avoid any loss of archaeological information on the site.
- .2 The Contractor shall facilitate access to work and collaborate with the Archaeologist. The archaeologist or his representative will be based on site as required by the needs related to the protection and registration of the remains. Their role will be to guide the Contractor to prevent any loss of archaeological information and gather information on the remains
- .3 The Contractor shall allow the archaeological team to conduct examinations and archaeological surveys.

.3 Archaeological Discoveries

- .1 The Contractor shall notify the Departmental Representative of any archaeological discoveries (remains of construction or installations, objects and fragments of objects) done on the premises and wait his written instructions before continuing work at the place of discovery.
- .2 Remains, antiques and other items with some historical interest, archaeological or scientific (remains, object or object fragment) found on site or in areas to excavate or demolish remain the property of Canada. The Contractor shall

protect and obtain instructions from the Departmental Representative in this regard.

.4 Stop work

.1 The contractor must plan in his contract, at his cost, 5 minutes stops per hour excavating in areas requiring the presence of the archaeologist. These stops, if not used, will be accumulated and can be reused later as needed. A statement of the unused time will be held by the Departmental Representative in accordance with the Contractor and the Archaeologist.

.2 In a stop of more than 30 minutes, the Departmental Representative will assess the implications of this stop and will advise the Contractor. He may be required to affect the machinery to another area to allow the continuation of work of the archaeologists. If reassignment is not possible, the Contractor will receive compensation from the bank of hours or, if it is exhausted, according to the agreements provided at the first site meeting.

.5 Manual excavations for archaeological purposes

.1 Given the possibility of archaeological discoveries, the Contractor is advised that during work, manual excavation may be required as well as all the necessary work to ensure the protection of the discoveries. The contractor will be compensated according to the agreements provided at the first site meeting.

.6 Protection of remains and structures

.1 The Contractor shall take all reasonable precautions during the excavations and all work to protect the remains and to allow examination by the archaeologists. The Departmental Representative will not tolerate any derogation in this regard. If the Contractor deteriorates by neglect whichever remains, he will be held responsible and Canada will judge the incidents.

.2 In the case where the Departmental Representative authorized the demolition of elements on the site, the Contractor shall take the necessary precautions to ensure the protection of adjacent structures which are not to be demolished. The demolition of the elements must be carried out gradually and in a controlled manner after the archaeological surveys have been completed. If structures are damaged during the work, notify the Departmental Representative immediately.

1.10 MANAGEMENT AND MAINTENANCE OF EXCLUSION FENCE/SEDIMENT BARRIER

.1 Exclusion fence consists of a standard sediment barrier in woven geotextile (91 cm wide) set using industrial staples to wooden stakes (1.22 m long) spaced every 3 meters. The membrane will be buried at the base on 10 to 20 cm deep and shall have a minimum height of 60 cm to prevent the snakes to sneak in below or to climbs over the fence. (As shown on the drawings)

.2 The fence serves to the exclusion of the brown snake in the work sector and prevents the leached soils to travel over water.

- .3 During work period, the Contractor is responsible for maintaining the integrity and making sure the exclusion fence/sediment barrier are functioning.
- .4 The entirety of the fence shall be inspected at least every week for the entirety of the Work and correctives actions must be immediately applied in situations where damage is observed. The frequency of the inspections should be adjusted according to the conditions of the site, winds, strong rain, and the activities on site.
- .5 In the case where damage is observed, additional stakes can be added at places to help make the repairs or to offer better resistance. The inserted membrane in the ground will also regularly be checked and correctives must immediately be applied when necessary. If needed, the vegetation or debris found on the fence will be removed to keep the snakes from sliding over.

1.11

CAPTURE AND OPPORTUNISTIC RELOCALISATION OF SNAKES

- .1 To capture and relocate the snakes, the Contractor must have in his possession a SEG permit delivered by the ministère des Forêts de la Faune et des Parcs (MFFP). The permit application and the activity report must be completed by the Contractor on an annual basis from January 1st to December 31st, every year.
 - .1 Snake active season (between April 1st and October 31st)
 - .1 If garden snakes are observed outside the exclusion fence delimited Work zone, they must be manually captured and moved towards one of the hibernacula identified in the conservation zone.
 - .2 Snake hibernation season (between November 1st to March 31st)
 - .1 If any living snake is observed outside the Work zone during this period, the Contractor must capture it by hand and bring it immediately to a heated place (ex: construction trailer) where they will be kept in a plastic bin provided for that purpose. The bin will be supplied to the Contractor. The snakes must be kept in a temperature higher than 10°C, but lower than 30°C at all time, until a specialist comes to retrieve it or give the Contractor instructions as to how to proceed. The specialist must immediately be advised if one or more than one snake is captured so that he can undertake the necessary steps. It is possible the specialist might recommend for the Contractor to move the snakes to one of the protected hibernacula on the Lapierre Island.

1.12

NOTIFICATION

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, mitigation measure stated in present document, 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.

Partie 2 Products (N/A)

Partie 3 Execution

3.1 CLEANING

- .1** Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1** Leave Work area clean at end of each day.
- .2** Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
- .3** Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .4** Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 35 21 – Construction/Demolition Waste Management and Disposal.
 - .1** Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1 Section 31 00 99 Earthwork for minor work
- .2 Section 31 36 00 Gabions
- .3 Section 32 31 13 Chain link fences and gates
- .4 Section 32 93 43.01 Tree pruning
- .5 Section 35 42 19 Preservation of water courses and wetlands
- .6 All other applicable sections

1.2 INDEPENDENT – INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.

1.3 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

1.4 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.5 REPORTS

- .1 Submit 2 copies of inspection and test reports to Departmental Representative.

- .2 Provide copies to Subcontractor of work being inspected or tested.

1.6 TESTS AND MIX DESIGNS

- .1 Furnish test results and mix designs as may be requested.
- .2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Departmental Representative and may be authorized as recoverable.

1.7 MOCK-UPS

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.
- .2 Construct in all locations approved by Departmental Representative.
- .3 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 If requested, Departmental Representative will assist in preparing a schedule fixing dates for preparation.
- .6 Remove mock-up at conclusion of Work or when acceptable to Departmental Representative.

1.8 MILL TESTS

- .1 Submit mill test certificates as requested

PART 2 - Products (N/A)

PART 3 - Execution (N/A)

END OF SECTION

PART 1 - General

1.1 RELATED REQUIREMENTS

- .1 N/A

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA A23.1/A23.2-[F04], Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-Z321-[F96(C2001)], Signs and Symbols in the work environment
 - .3 Ministère des Transports, de la Mobilité durable et de l'Électrification des transports du Québec - Collection Normes - Ouvrages routiers, Tome V - Signalisation routière, dernière édition.

1.3 DOCUMENTS/SAMPLES TO SUBMIT FOR APPROVAL/INFORMATION

- .1 Provide submittals in accordance with Section 01 33 00 – Documents and samples to submit.

1.4 INSTALLATION AND REMOVAL OF MATERIALS

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which have to be graveled to prevent tracking of mud.
- .3 Indicate use of supplemental or other staging area.
- .4 Provide construction facilities in order to execute work expeditiously.
- .5 Remove from site all such work after use.
- .6 Clean debris
- .7 Protect temporary work areas against erosion.

1.5 HOISTING

- .1 Provide, operate and maintain hoists/cranes or other hoisting equipment required for moving of workers, materials and equipment and provide their upkeep and maneuver. Make financial arrangements with Subcontractors for use thereof.
- .2 Hoists/cranes shall be operated by qualified operator.

1.6 SITE STORAGE/LOADING

- .1 Confine work and operations of employees to areas defined by Contract Documents. Do not unreasonably encumber premises with products.

- .2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

1.7 CONSTRUCTION PARKING

- .1 Parking will not be permitted on site.
- .2 Provide and maintain adequate access to project site.

1.8 SECURITY

- .1 Pay for responsible security personnel to guard site and contents of site after working hours and during holidays and assume charges.

1.9 OFFICES

- .1 Provide office heated to [22]°C, lighted [750] lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table. The office has to be situated according to the area defined by Contract Documents.
- .2 Provide a clearly marked and fully stocked first-aid case in a readily available location.
- .3 Departmental Representative's Site office.
 - .1 Provide temporary office for Departmental Representative.
 - .2 Insulate building and provide heating system to maintain 22° C inside temperature at -20° C outside temperature.
 - .3 Equip office with one drawing laydown table with two (2) lockable drawers and one stool, one desk with lockable drawers and three (3) chairs, two (2) clothing cupboard, one chemical or flush toilet, one refrigerator, one microwave, and a sink with clean running water, hot and cold.
 - .4 The office needs to be functional before the start of the Work. The water, electricity, heating and telephone need to be installed. These installations need to be present until the end of the project.
 - .5 The Contractor needs to provide, throughout the entire Work period, a telephone in the temporary office, connected to an individual line, with its own voice mail and fax machine.
 - .6 The fees for the permits and temporary connections to the water and sewage systems is assumed by the Contractor.
 - .7 The Contractor needs to provide, for the exclusive use of the Departmental Representative, from the start of the Work until the end of the correction of identified deficiencies at the provisional acceptance inspection, a functional fax machine, a photocopier, and a high-speed internet.
 - .8 The Contractor is responsible of maintaining a comfortable temperature in this office, and to light, clean and ventilate it.

1.10 EQUIPMENT, TOOLS AND MATERIALS STORAGE

- .1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

1.11 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.12 CONSTRUCTION SIGNAGE

- .1 Provide and erect, within three weeks of signing Contract, a project sign in a location designated by Departmental Representative.
- .2 No other signs or advertisements, other than warning signs, are permitted on site.
- .3 Provide project identification site sign comprising foundation, framing, and one 1200 x 2400 mm signboard as detailed and as described below:
 - .1 Foundations: 15 MPa concrete to CSA A23.1/A23.2 minimum 200 mm x 900 mm deep.
 - .2 Framework and battens: SPF, pressure treated minimum 89 x 89 mm.
 - .3 Signboard: Medium Density Overlaid Douglas Fir Plywood to CSA O121.
 - .4 Paint: alkyd enamel to CAN/CGSB-1.59 over exterior alkyd primer to CAN/CGSB-1.189.
 - .5 Fasteners: hot-dip galvanized steel nails and carriage bolts.
 - .6 Vinyl sign face: printed project identification, self-adhesive, vinyl film overlay, supplied by Departmental Representative.
- .4 Locate project identification sign as directed by Departmental Representative and construct as follows:
 - .1 Build concrete foundation, erect framework, and attach signboard to framing.
 - .2 Paint all surfaces of signboard and framing with one coat primer and two coats enamel. Colour white on signboard face, black on other surfaces.
 - .3 Apply vinyl sign face overlay to painted signboard face in accordance with installation instruction supplied.
- .5 Direct requests for approval to erect a Consultant/Contractor signboard to Departmental Representative. For consideration general appearance of Consultant/Contractor signboard must conform to project identification site sign. Wording shall be in both official languages.
- .6 Signs and notices for safety and instruction shall be in both official languages. Graphic symbols shall conform to CAN/CSA-Z321.

- .7 Maintain approved signs and notices in good condition for duration of project, and dispose of off-site on completion of project or earlier if directed by Departmental Representative.

1.13 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Provide access and temporary relocated roads as necessary to maintain traffic.
- .2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
- .3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .4 Protect travelling public from damage to person and property.
- .5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .6 Refer to the arrondissement of Rivière-des-Prairies-Pointe-aux-Trembles during the planning of the materials transportation to the site to approve the trucking route in accordance with the local street network.
- .7 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .8 Construct access and haul roads necessary according to indications.
- .9 Dust control: adequate to ensure safe operation at all times.
- .10 Location, grade, width, and alignment of construction and hauling roads need to be compliant with the indications in contract documents and are subject to approval by Departmental Representative.
- .11 Upon completion of work, preserve haul roads and waiting areas for trucks and haul roads and waiting areas for trucks against erosion.

1.14 CLEANING

- .1 In accordance with section 01 74 11 Cleaning
- .2 Remove construction debris, waste materials, packaging material from work site daily.
- .3 Store materials resulting from excavation and consolidation work on the bridge.
- .4 Do not store new or salvaged material on site installations.

Part 2 - Product (N/A)

PART 3 - Execution

**3.1 TEMPORARY MEANS OF CONTROL OF THE SPREAD OF CONTENTS
SUSPENDED IN WATER RUNOFF**

- .1** The Contractor shall develop and submit a plan of measures against erosion and sediment transport, indicating the means that will be implemented, including work site supervision and the production of reports to verify the compliance of these measures with the laws and federal, provincial and municipal regulations, and with the document EPA 832/R-92-005, chapter 3, according to section 013543 – Environmental protection requirements

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 03 10 00 - Concrete Forming and Accessories
- .2 Section 03 20 00 - Concrete Reinforcing.
- .3 Section 03 30 00 - Cast-in-Place Concrete.
- .4 Section 03 30 51 – Concrete for bridge deck
- .5 Section 03 35 00 – Concrete Finishing
- .6 Section 05 12 33 – Construction Steel for Bridge
- .7 Section 31 00 99 – Earthwork for Minor Work
- .8 Section 31 36 00 – Gabions
- .9 Section 32 31 13 Chain link fences and gates

1.2 REFERENCES

- .1 Bureau de normalisation du Québec (BNQ).
 - .1 BNQ 2501-170: Soils – Determination of Water Content.
 - .2 BNQ 2501-255: Soils - Determination of the Water-Density Relation - Modified Effort Compaction Test (2 700 kN.m/m³).
 - .3 BNQ 2560-114: Civil Engineering Work - Aggregates.
- .2 Ministère des Transports, de la Mobilité durable et de l'Électrification des transports (MTMDET)
 - .1 Cahier des charges et devis généraux (CCDG) – Infrastructures routières – Construction et réparation - Ministère des Transports du Québec.
 - .2 Cahiers des normes, Ouvrages routiers, Tome I « Conception routière », dernière édition.
 - .3 Cahiers des normes, Ouvrages routiers, Tome VII «Matériaux ».
 - .1 Standard 2101 - Aggregates.
 - .2 Standard 2102 – Granular material for foundation, subgrade, layer of granular rolling and shoulder.
 - .3 Standard 13101 - Geotextile.

1.3 INSTALLATION AND REMOVAL OF MATERIAL

- .1 Provide, implement or develop temporary access structures and protection necessary in order to execute Work expeditiously.
- .2 Dismantle the material and remove from site when not needed.

1.4 ACCESS TO SITE

- .1 The entrance to the site is controlled by a fence and an access gate for vehicles. It's locked with a padlock from the Gouin Boulevard. The Contractor should note that the fence is not tight along its length and it's possible for individuals to access. Before work begins, a security fence with access gate will be installed by others, on the bridge, at the southern end, to better control access to the excavation area.
- .2 At the beginning of the work, the Contractor shall erect fence sections with a barrier with two gates as indicated in the plan and in Section 32 31 13 Chain link fences and gates.
- .3 Before work begins, another security fence with access gate will be installed by others on the bridge at the southern end, to better control access to the excavation area.
- .4 The Contractor shall take all additional security measures he deems necessary to limit access to the site and protect the installations from vandalism.
- .5 Install fencing around trees and plants to be left in place, to protect against damage that may be caused by the materials used or certain construction practices.

1.5 ACCESS ROUTE TO SITE AND RESERVED AREAS FOR THE CONTRACTOR

- .1 Before the work begins, a sediment exclusion fence/gate will be installed along the boundary of the work, north of the bridge, as shown on plans.
- .2 The contractor shall install access roads, reserved areas for the Contractor and the necessary access ramp to access the site and to complete the work.
- .3 Access roads and reserved areas for the Contractor and the access ramp must be arranged within the demarcated area by the fence sediment exclusion fence/gate or boundary of the work, as shown on plans. Under no circumstance, shall it be permitted to create installations or to circulate outside the demarcated areas, without the authorization of the Departmental Representative.
- .4 At the end of the work, all the installations have to remain in place, in other words:
 - .1 The access path and trucks waiting areas
 - .2 The fossils storage area
 - .3 The fill treatment area
 - .4 The area reserved for trailers
- .5 Pavement structure for the access paths, the truck waiting areas and the reserved areas for the Contractor must at least meet the following requirements:
 - .1 The access path must be suitable for WB15M type trucks, for 5000 total passages.
 - .2 Stone Foundation 56 MG, 300 mm min
 - .3 Geomembrane (geotextile type II) for tight separation between the foundation and the soil in place, also for strengthening the subgrade.
 - .4 Surfaces should be molded with crossway runoff slopes of 2% to allow the runoff of surface water towards the sediment control measures, as indicated in the plans.

- .5 Pavement structure must be put constructed as fill, after stripping of existing top soil.
- .6 In addition to what is mentioned above, the pavement structure of the fill treatment area contains on surface a geomembrane (geotextile type II) to prevent sediment-laden runoff water, coming from the fill heap, to infiltrate into the foundation stone.
- .7 Install a vehicle sludge recovery bed at the exit site on Gouin Boulevard, as shown in the plans and in accordance with the following requirements:
 - .1 First install filter berm and sediment trap.
 - .2 On the area planned for the stone cushion, remove the loose soil to reach a stable surface.
 - .3 Submit a clean stones cushion: cushion thickness ≥ 20 cm, width ≥ 3.6 m. The size of the rocks must be 50 to 100 mm and the elevation of the cushion relative to adjacent land \geq to 75 mm.
 - .4 Mold the cushion with a transverse depression slightly sloping towards the sediment trap
 - .5 If needed, complete the reduction measurement by adding a tire washing station.
- .8 For the maintenance of the vehicles sludge recovery bed:
 - .1 Replace roadbeds when clogged.
 - .2 Clean the adjacent roadway.
 - .3 Maintain the filter or waterproof berm and drain the sediment trap when filled to 50%.
- .9 Elements to submit
 - .1 Control of erosion and sediments: Submit a copy of the erosion and sediment control plan in accordance with Section 01 35 43 Environment Protection
 - .2 Aggregates: According to the supply source, the Contractor shall provide the results of the test BNQ 2501-255: Soils - Determination of the Water-Density Relation - Modified Effort Compaction Test (2 700 kN.m/m³). According to the supply source, the Contractor shall provide the test results (compliance certificate) to demonstrate the compliance of the granular materials proposed in relation to the requirements.
 - .3 Geotextiles : according to the Standard 13101 du Tome VII de la collection Normes – Ouvrages Routiers du MTMDET «Matériaux ».

1.6 PUBLIC TRAFFIC FLOW

- .1 Provide and maintain competent signal flag operators as required to perform Work and protect the public.

1.7 FIRE ROUTES

- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.8 PROTECTION OF OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and disposal in accordance with Section 01 74 21 - Waste Management and disposal of construction/demolition.

PART 2 - PRODUCTS

2.1 GEOTEXTILE

- .1 Geotextiles in place for the infrastructure have to be type II (for soil reinforcement and sealed separation), in accordance with the requirements of the standard 13101 of the Ministry "geotextiles"

2.2 FOUNDATION AGGREGATE MATERIALS

- .1 Granular materials used for the implementation of foundations (MG- 56) must comply with the requirements of the 2101 standard of the Ministry "aggregates" and must comply with the requirements set out below:
 - .1 Crushed stone, sand or gravel, of screening or run-of-the-mill stone;
 - .2 The sifter's openings size must comply with this test standard LC 21-040;
 - .3 Absence of organic substance.

PART 3 - Execution (access route and reserved areas for the contractor)

3.1 GENERAL

- .1 The Contractor shall retain appropriate construction methods to build the access path and reserved areas for the contractor, which will be kept in place at the end of the work. The choice of equipment's, machinery and trucks must be appropriate to the bearing capacity of the soil in place during the different stages of construction.
- .2 The Contractor shall assume the costs associated with the corrections of the profile in the event of deformations of the foundation during construction until provisional acceptance.

3.2 EXAMINATION

- .1 Verification of Conditions: prior to the installation of the granular base, ensure that the states of the previously installed surfaces/supports are acceptable and permit carrying out the work according to the requirements of the plans and Technical Specifications.
- .2 Perform a visual inspection of surfaces/supports in the presence of the Department Representative. Start the installation work only after correcting the unacceptable conditions and received the approval of the Department.

3.3 PREPARATION

- .1 At the south end of the bridge, put up temporary means of erosion and sediment control to prevent soil loss and to prevent settling on the adjacent land surfaces, sediments carried by runoff water or dust and particles carried by the wind, and this in accordance with the erosion and sediment control plan.
- .2 Inspect the control methods in place (including the existing sediment barrier north of the bridge and in assuring the maintenance and the required repairs.

3.4 INSTALLATION

- .1 The location of the path and areas reserved to the Contractor, the Contractor shall proceed to the minimum stripping to obtain a uniform surface, for the establishment of the pavement structure, according to section 31 00 99 - Earthwork for Minor Work.
- .2 Put in place the geotextile material and the granular base (min 300 mm thick), once the infrastructure is inspected and approved by the Departmental Representative.
- .3 Ensure that no frozen material is put in place. Put the materials in place in a clean surface and unfrozen, free of snow and ice.
- .4 Spread materials across the width of the work to achieve, in uniform layers of up to 300 mm thick.

3.5 COMPACTING

- .1 Compact till the corrected maximum dry densities (modified Proctor), at least 95 % of modified Proctor.
- .2 Correct surface irregularities by loosening the soil and adding or removing materials, until the level of the surface conforms.

3.6 RELATED INSTALLATIONS

- .1 Install a vehicle sludge recovery bed at the exit of the site on Gouin Boulevard.

3.7 CLEANING

- .1 According to section 01 74 11 – Cleaning.

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1 Section 31 00 99 – Earthwork for Minor Work
- .2 Section 31 36 00 – Gabions

1.2 REFERENCES

- .1 Owner's identification of existing survey control points and property limits.

1.3 QUALIFICATION OF SURVEYER

- .1 Qualified registered land surveyors, licensed to practice in Place of Work, acceptable to Departmental Representative.

1.4 SURVEY REFERENCE POINTS

- .1 Existing base horizontal and vertical control points are designated on drawings.
- .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Departmental Representative.
- .4 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

1.5 SURVEY REQUIREMENTS

- .1 Establish a sufficient number of permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
- .2 Establish lines and levels, locate and lay out, by instrumentation.
- .3 Stake for grading.

1.6 EXISTING SERVICES

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.

1.7 RECORDS

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

- .3 Record locations of maintained, re-routed and abandoned service lines.

1.8 DOCUMENTS/SAMPLES TO SUBMIT FOR APPROBAL/INFORMATION

- .1 Submit name and address of Surveyor to Departmental Representative
- .2 On request of Departmental Representative, submit documentation and samples to verify accuracy of geotechnical surveys.
- .3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.9 SUBSURFACE CONDITIONS

- .1 Promptly notify the Departmental Representative in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.
- .2 After prompt investigation, should the Departmental Representative determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

PART 2 - Products (N/A)

PART 3 - Execution (N/A)

END OF SECTION

PART 1 - General

1.1 RELATED REQUIREMENTS

- .1 Section 01 74 21 – Construction/Demolition waste management and disposal
- .2 Section 31 00 99 – Earthwork for minor work
- .3 Section 31 11 00 – Clearing and grubbing
- .4 Section 32 31 13 – Chain link fences and gates
- .5 Section 32 93 43.01 –Tree pruning
- .6 Section 35 42 19 – Preservation of water courses and wetlands

1.2 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including those generated by Owner or other Contractors.
- .2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless authorized by the Departmental Representative.
- .3 Keep the access path, the access ramp and loading zone as well as the trucks waiting stations for free of ice and snow. Evacuate the snow off-site to a site authorized by the MDDELEC .
- .4 Make sure to keep the sidewalk and the bike lane at the exit of the site, free form any mud, debris or waste accumulation from the site. To do so, clean the exit's surroundings mid-day and at the end of the work day
- .5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .6 Provide on-site containers for collection of waste materials and debris.
- .7 Provide and use clearly marked separate bins for recycling. Refer to Section 01 74 21 – Construction/Demolition Waste management and disposal.
- .8 Dispose of waste materials and debris off site.

1.3 FINAL CLEANING

- .1 When work is substantially performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining work.
- .2 Remove waste products and debris, and leave work site clean and suitable for occupancy.
- .3 Prior to final review, remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris including those caused by Owner or other Contractors.

- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Access road and reserved areas for Contractor
 - .1 Remove all waste products and debris from reserved areas
 - .2 If any rutting is visible, replenish and compact the granular base so as to insure an adequate slope for surface water run-off.
- .8 Sludge recovery bed
 - .1 Replace clogged granular bed
 - .2 Empty sediment trap and replace it
- .9 Inspect the control measures for the dispersion of suspended materials in the runoff water along the North Shore. Replace any defective part or at the request of the Departmental Representative
- .10 Sweep and clean the sidewalks, bike lane, as well as the road at the exit of the site on Gouin Boulevard.

PART 2 - Product (N/A)

PART 3 - Execution (N/A)

END OF SECTION

PART 1 - General

1.1 OBJECTIVES IN TERMS OF WASTE MANAGEMENT

- .1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss Canada's waste management goal and Contractor's proposed Waste Reduction Workplan for Construction, Renovation and/or Demolition (CRD) waste to be project generated.
- .2 Prior to project completion provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.
- .3 Target in percentage for specific materials reused and/or recycled according to Canada, in terms of waste reclamation.
- .4 Minimize amount of non-hazardous solid waste generated by project and accomplish maximum source reduction, reuse and recycling of solid waste produced by CRD activities.
- .5 Protect environment and prevent environmental pollution damage.

1.2 RELATED SECTIONS

- .1 Section 03 10 00 - Concrete Forming and Accessories
- .2 Section 03 20 00 - Concrete Reinforcing.
- .3 Section 03 30 00 - Cast-in-Place Concrete.
- .4 Section 03 30 51 – Concrete for bridge deck
- .5 Section 03 35 00 – Concrete Finishing
- .6 Section 05 12 33 – Construction Steel for Bridge
- .7 Section 31 00 99 – Earthwork for Minor Work
- .8 Section 31 36 00 – Gabions
- .9 Section 32 31 13 – Chain link fence and gates
- .10 Section 32 93 43.01 - Tree Pruning
- .11 Section 35 42 19 - Preservation of Water Courses and Wetlands

1.3 REFERENCES

- .1 Definitions
 - .1 Approved/Authorized recycling facility: waste recycler approved by applicable provincial authority or other users of material for recycling approved by the Departmental Representative.
Class III: non-hazardous waste - construction renovation and demolition waste.

- .2 Construction, Renovation and/or Demolition (CRD) Waste: Class III solid, nonhazardous waste materials generated during construction, demolition, and/or renovation activities.
- .3 Inert Fill: inert waste - exclusively asphalt and concrete.
- .4 Waste Source Separation Program (WSSP): implementation and co-ordination of ongoing activities to ensure designated waste materials will be sorted into predefined categories and sent for recycling and reuse, maximizing diversion and potential to reduce disposal costs.
- .5 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .6 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .7 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .8 Reuse: Repeated use of product in same form but not necessarily for same purpose. Reuse includes:
 - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
 - .2 Returning reusable items including pallets or unused products to vendors.
- .9 Salvage: Removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .10 Separate Condition: Refers to waste sorted into individual types.
- .11 Source Separation: Acts of keeping different types of waste materials separate beginning from first time they became waste.
- .12 According to the MDDELCC, the expression «residual material» includes non-hazardous material, biomedical waste, pesticides, fertilizing residual materials, and snow. In the context of this project, recyclable residual materials are distinguished from those destined to be eliminated.
- .2 References
 - .1 Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC)
 - .1 Loi sur la qualité de l'environnement du Québec.
 - .2 Règlement sur les matières dangereuses du Québec.
 - .3 Regulation respecting the landfilling and incineration of residual materials
 - .4 Canadian Construction Association (CCA): CCA 81 – 2001: A Best Practices Guide to Solid Waste Reduction
 - .5 Public Works and Government Services Canada (PWGSC)
 - .1 2002 National Construction, Renovation and Demolition Non-Hazardous Solid Waste Management Protocol.

- .2 CRD Waste Management Market Research Report (available from PWGSC's Environmental Services).
- .3 Sustainable Development Strategy 2007-2009: Target 2.1 Environmentally Sustainable Use of Natural Resources.
 - .1 Contractually ensure resources used in construction or maintenance are consumed and recovered in a sustainable manner.

1.4 SUBMITTALS

- .1 Submittals of documents and samples in accordance with Section 01 33 00 – Submittal procedures.
- .2 Prepare and submit following at least once a month, throughout the project or at defined intervals by the Departmental Representative the following:
 - .1 Receipts, scale tickets, waybills, and/or waste disposal receipts that show quantities and types of materials reused, recycled, or disposed of.
 - .2 Written monthly summary report detailing cumulative amounts of waste materials reused, recycled and landfilled, and brief status of ongoing waste management activities.
- .3 Submit before final payment the following:
 - .1 Receipts, scale tickets, waybills, and/or waste disposal receipts that show quantities and types of materials reused, recycled, or disposed of as well as their destination.

1.5 PROGRAM OF WASTE SORTING AT THE SOURCE

- .1 As part of the waste reduction plan, prepare PTDS before work begins.
- .2 PTDS will detail the methodology and planned activities on site for the sorting of reusable material and recycling and waste to landfill.
- .3 Provide list and drawings of the locations that will be available for sorting, collecting, handling and storage of quantities of reusable and recycling materials anticipated.
- .4 Provide on-site enough facilities and containers to collect, handle and store the anticipated quantities of reusable and recyclable waste materials.
- .5 Place containers in a way to facilitate the deposit of waste materials without affecting the site's activities.
- .6 Provide to subcontractors, to workers a training on the handling and separation of materials for reuse/rework and/or recycling.
- .7 Place scrap materials sorted at one of the places where they will suffer the least possible damage.
- .8 Label clearly and safely the containers to indicate the type/status of accepted materials; helping the sub-contractors to sort the material properly.
- .9 Monitoring activities related to waste management on site by conducting periodic site inspections to verify the status of the signalizations, the contamination levels, the

location and condition of the containers, the staff participation, the use of monitoring forms of waste and collection of car notes, receipts and invoices.

- .10 In place sale of recovered waste materials is not permitted without written permission of the Departmental Representative and provided that the safety regulations at the scene and that the security requirements are met.
- .11 The objectives for the recovery of trees to be cut are (Caliber, and or nature, percentage of valuation, valuation suggested use:
 - .1 Trees and branches less than 10 cm diameter: 100% mulch, disposed off-site or wood chips can be extended into the surrounding wooded forest.
 - .2 Deciduous trees under 30 cm diameter: 100% firewood, carpentry.
 - .3 Coniferous trees under 20 cm diameter: 100% mulch disposed off-site or wood chips can be extended into the surrounding wooded forest.
 - .4 Coniferous trees over 30 cm diameter: 100% use of timber.
 - .5 Hardwood (maple, birch, oak) of more than 30 cm diameter: 100% carpentry, timber, firewood.
 - .6 Deciduous trees (elm, ironwood, poplar, apple, hawthorn, other): 100% carpentry, firewood.
 - .7 Diseased trees: 100% must be evacuated from the site and burned. In relation with the emerald-ash borer, the ash wood may only be transported between September 15th and April 15th towards a site authorised for its deposit and treatment.
- .12 The Contractor shall provide a report at the end of work specifying the number of dependent cord of wood, the number of PPM lumber and wood peeling from activities related to the work.

1.6 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises.
- .2 Maintain security measures established by facility provide temporary security measures approved by Departmental Representative

1.7 WASTE PROCESSING SITES

- .1 Contractor is responsible to research and locate waste diversion resources and service providers. Salvaged materials are to be transported off site to approved and/or authorized recycling facilities or to users of material for recycling.

1.8 STORAGE, HANDLING AND PROTECTION

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.

- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.
- .6 Separate and store materials produced during dismantling of structures in designated areas.
- .7 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off-site processing facility for separation.
 - .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.
 - .4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

1.9 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner, into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
 - .1 Number and size of bins.
 - .2 Waste type of each bin.
 - .3 Total tonnage generated.
 - .4 Tonnage reused or recycled.
 - .5 Reused or recycled waste destination.
- .4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.
- .5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.10 SCHEDULING

- .1 Coordinate Work with other activities at site to ensure timely and orderly progress of Work.

Part 2 - Products (N/A)

PART 3 - Execution

3.1 APPLICATION

- .1 Do Work in compliance with WRW and WSSP
- .2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse/recycling in accordance with following Section.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
 - .2 Source separate materials to be reused/recycled into specified sort areas.

3.3 DIVERSION OF MATERIALS

- .1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative and consistent with applicable fire regulations.
 - .1 Mark containers or stockpile areas.
 - .2 Provide instruction on disposal practices.
- .2 On-site sale of recovered reusable material is not permitted.

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1 Section 03 10 00 - Concrete Forming and Accessories
- .2 Section 03 20 00 - Concrete Reinforcing.
- .3 Section 03 30 00 - Cast-in-Place Concrete.
- .4 Section 03 30 51 – Concrete for bridge deck
- .5 Section 03 35 00 – Concrete Finishing
- .6 Section 05 12 33 – Construction Steel for Bridge
- .7 Section 31 00 99 – Earthwork for Minor Work
- .8 Section 31 36 00 – Gabions
- .9 Section 32 31 13 – Chain link fences and gates
- .10 Section 32 93 40.01 – Tree pruning
- .11 Section 35 42 19 – Water Stream Preservation and Wetland

1.2 INSPECTION AND DECLARATION

- .1 Procedure of work reception
 - .1 Contractor's Inspection: Contractor shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
 - .2 Request Departmental Representative's Inspection.
 - .2 Departmental Representative's Inspection:
 - .1 Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies.
 - .2 Contractor to correct Work accordingly.
 - .3 Completion: submit written English and French document, that certificate that following have been performed:
 - .1 Work has been completed and inspected for compliance with Contract Documents.
 - .2 Defects have been corrected and deficiencies have been completed.
 - .3 Work is complete and ready for final inspection.
 - .4 Final Inspection
 - .1 When items noted above are completed, request final inspection of Work by Departmental Representative and Contractor.
 - .2 If Work is deemed incomplete by Departmental Representative and the Project Manager, complete outstanding items and request a new inspection.

- .5 Declaration of Substantial Completion: When the Departmental Representative considers that the shortcomings and flaws have been corrected and that contract requirements seem largely satisfied, apply for the production of a certificate of substantial completion.

1.3 FINAL CLEANING

- .1 In accordance with Section 01 74 11 - Cleaning.
 - .1 Remove waste and surplus materials, tools and equipments.
- .2 Waste Management: accordance with Section 01 74 21 – Construction Waste Management.

PART 2 - Products (N/A)

PART 3 - Execution (N/A)

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures

1.2 SUBMISSION

- .1 Documents/Elements to Submit
 - .1 Project record documents, samples and specifications
 - .2 Shop drawings
 - .3 Noted copies of the plans, compliant with execution
 - .4 Product data, materials, material and finishing products and related information
 - .5 Materials/material of replacement, special tools and replacement parts
- .2 Submit required documents and samples in accordance with section 01 33 00 – Submittal Procedures
- .3 Two (2) weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, two (2) final copies of maintenance manuals and commissioning documentation in French.
- .4 Ensure spare parts, maintenance materials and special tools provided are of same quality and manufacture as products provided in Work.
- .5 Copy will be returned after final inspection, with Departmental Representative's comments.
- .6 Revise content of documents as required prior to final submittal.
- .7 If requested, furnish evidence as to type, source and quality of products provided.
- .8 The Contractor must provide the PDF files of all documents submitted at the end of Work.

1.3 FORMAT

- .1 Organize data in the form of an instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used, correlate data into related consistent groupings.
 - .1 Identify contents of each binder on spine.
Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .4 Arrange content by [systems,] [process flow,] under Section numbers and sequence of Table of Contents.

- .5 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .6 Text: Manufacturer's printed data, or typewritten data.
- .7 Drawings: provide with reinforced punched binder tab.
 - .1 Bind in with text; fold larger drawings to size of text pages.
- .8 Provide 1:1 scaled CAD files in dwg on CD.

1.4 CONTENTS – EACH VOLUME

- .1 Table of Contents: provide title of project;
 - .1 Date of submission;
 - .2 Names, Addresses, and telephone numbers of Contractor and Departmental Representative with name of responsible parties;
 - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
 - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 – Quality Control.
- .6 Training: Refer to Section 01 79 00 – Demonstration and Training.

1.5 AS BUILTS AND SAMPLETS

- .1 In addition to requirements in General Conditions, maintain at the site for Departmental Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Amendments and addenda.
 - .4 Change Orders and other modifications to the Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.

- .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

1.6 RECORDING ACTUAL SITE CONDITIONS

- .1 Record information on set of two (2) black line opaque drawings, and in copy of Project Manual.
- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .2 Field changes of dimension and detail.
 - .3 Changes made by change orders.
 - .4 Details not on original Contract Drawings.
 - .5 References to related shop drawings and modifications.
- .5 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Amendments and change orders.
- .6 Where applicable, supply digital photos to add to the project file.

1.7 MATERIALS AND FINISHES

- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and Weather-exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

- .4 Additional Requirements: as specified in individual specifications sections.

1.8 STORAGE, HANDLING AND PROTECTION

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store spare parts, maintenance materials, and special tools in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

PART 2 - Products (N/A)

PART 3 - Execution (N/A)

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1 Section 03 20 00 – Concrete Reinforcing.
- .2 Section 03 30 00 – Cast-in-Place Concrete.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CAN/CSA A23.1-14/A23.2-14, Concrete materials and methods of concrete construction/Test methods and standard practices for concrete.
 - .2 CAN/CSA O86-14, Consolidation-Engineering Design in Wood.
 - .3 CSA O121-08(R2013), Douglas Fir Plywood.
 - .4 CSA O151-09, Canadian Softwood Plywood.
 - .5 CSA O153-M1980 (R2008), Poplar Plywood.
 - .6 CAN/CSA-0325.0-92(R2007), Intermediate Construction Coating.
 - .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(R2008), Concrete Formwork, National Canadian Standard.

1.3 SHOP DRAWINGS

- .1 Submit shop drawings for formwork and falsework in accordance with Section 01 33 00 - Documents and samples to submit.
- .2 Submit shop drawings for concrete formwork and temporary shoring work.
 - .1 Each shop drawing submission shall bear stamp and signature of qualified professional engineer registered or licensed in Province of Quebec, Canada.
- .3 Submit the required data sheets in accordance with the Information System on dangerous materials used in work (SIMDUT), Section 02 81 01 – Dangerous Materials.
- .4 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1, for falsework drawings. Comply with CAN/CSA-S269.3 for formwork drawings.
- .5 Indicate formwork design data, such as permissible rate of concrete placement, and temperature of concrete, in forms.
- .6 Indicate sequence of erection and removal of formwork/falsework as directed by Departmental Representative.

1.4 TRANSPORT, STORAGE AND HANDLING

- .1** Waste management and disposal.
 - .1** Separate waste to be able to reuse and recycle waste materials in accordance with Section 01 74 21 – Waste Management and Disposal of Construction/Demolition.
 - .2** Place materials defined as hazardous or toxic waste in designated containers.
 - .3** Dispatch the unused wood to a recycling, reusing or composting facility authorized by the Departmental Representative.
 - .4** Dispatch unused form release materials to a registered site that collects dangerous materials, authorized by the Departmental Representative.

PART 2 - Products

2.1 MATERIALS

- .1** Formwork materials
 - .1** For concrete without special architectural features, use wood and wood product formwork materials to CAN/CSA S269.3
- .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 dia. in concrete surface.
- .3** Form release agent: non-toxic, biodegradable, low VOC.
- .4** Falsework materials: to CSA S269.1.

PART 3 - Execution

3.1 FABRICATION AND ERECTION

- .1** Verify lines, levels and centers before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2** Obtain Departmental Representative's approval before pouring the concrete directly on the ground or for use of earth forms framing openings not indicated on drawings.
- .3** Fabricate and erect falsework in accordance with CSA S269.1.
- .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 15 mm chamfer strips on external corners and/or 15 mm fillets at interior corners, joints, unless specified otherwise.
- .9 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .10 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.
 - .1 Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .11 Clean formwork in accordance with CSA A23.1/ A23.2, before placing concrete.
- .12 If flying forms are used, submit details in accordance with article SHOP DRAWINGS, from PART 1

3.2 REMOVAL AND RESHORING

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
 - .1 3 days for walls.
 - .2 3 days for beam soffits, slabs and other structural members.
- .2 Remove formwork when concrete has reached 70% of its design strength or minimum period noted above, whichever comes first.
- .3 Re-use formwork and falsework subject to requirements of CSA A23.1/A23.2.

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1 Section 03 30 00 – Cast-in-Place Concrete.
- .2 Section 03 31 00 - Concrete Forming and Accessories
- .3 Payment
 - .1 Include reinforcement costs in items of concrete work in Section 03 30 00- Cast-In-Place Concrete.

1.2 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 A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
- .3 CSA International
 - .1 CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA A23.3-14, Design of Concrete Structures.
 - .3 CSA G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .4 CSA W186-M1990 (R2012), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .4 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC-2006, Reinforcing Steel Manual of Standard Practice.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 – Documents and Samples to Submit.
- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice.
- .3 Shop Drawings
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
 - .1 The drawings have to indicate placing of reinforcement and:
 - .1 Bar bending details.
 - .2 Lists of reinforcement.

- .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.

1.4 QUALITY ASSURANCE

- .1 Submit in accordance with Section 01 45 00 - Quality Control and as described in PART 2 - SOURCE QUALITY CONTROL.
 - .1 Mill Test Report: Provide Departmental Representative with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.
 - .2 Submit in writing to Departmental Representative proposed source of reinforcement material to be supplied.

1.5 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 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.
- .4 Chairs, bolsters, bar supports, spacers: to CSA A23.1/A23.2.

2.2 FABRICATION

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

- .3 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

- .1 Provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.
- .2 Inform Departmental Representative of proposed source of material to be supplied.

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] [and] in accordance with CSA A23.1/A23.2.
- .2 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.
- .3 Ensure cover to reinforcement is maintained during concrete pour.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work areas clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11-Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 35 21 - Waste Management and disposal of construction/demolition.

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1** Section 03 10 00 Concrete Forming and Accessories
- .2** Section 03 20 00 Concrete Reinforcing
- .3** Payment
 - .1** Measurement and Payment
 - .2** Measurement Procedures: in accordance with Section 01 29 00.
 - .1** Measure cast-in-place concrete in square meters, calculated from neat dimensions as indicated by Departmental Representative.
 - .2** No deductions will be made for volume of concrete displaced by reinforcing steel, structural steel, or piles.

1.2 REFERENCES

- .1** Abbreviations and Acronyms:
 - .1** Portland Cement: hydraulic cement or blended hydraulic cement (where the suffix “b” denotes blended product)
 - .1** Type GU, GUb and GUL - General use cement.
 - .2** Type MS and MSb - Moderate sulphate-resistant cement.
 - .3** Type MH, MHb and MHL - Moderate heat of hydration cement.
 - .4** Type HE, HEb and HEL - High early-strength cement.
 - .5** Type LH, LHb and LHL - Low heat of hydration cement.
 - .6** Type HS and HSb - High sulphate-resistant cement.
 - .2** Fly ash
 - .1** Type F - with CaO content less than 15%.
 - .2** Type CI - with CaO content ranging from 15 to 20%.
 - .3** Type CH - with CaO greater than 20%.
 - .3** TYPE S- Ground, granulated blast-furnace slag.
- .2** Reference Standards
 - .1** ASTM International
 - .1** ASTM C260/C260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.
 - .2** ASTM C309-11, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - .3** ASTM C494/C494M-15a, Standard Specification for Chemical Admixtures for Concrete.
 - .4** ASTM C1017/C1017M-13, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

.2 CSA International

- .1** CSA A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2** CSA A283-06, Qualification Code for Concrete Testing Laboratories.
- .3** CSA A3000-13, Cementitious Materials Compendium (Consists of A3002, A3003, A3004 and A3005).

1.3 ADMINISTRATIVE REQUIREMENTS

- .1** Pre-installation Meetings: convene pre-installation meeting 3 week prior to beginning concrete works.
 - .1** Ensure Departmental Representative, specialty contractor – finishing/forming, concrete producer and testing laboratories attend.
 - .1** Verify project requirements.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1** Provide submittals in accordance with Section 01 33 00 - Documents and samples to submit.
- .2** Provide testing results and reports for review by Departmental Representative and do not proceed without written approval when deviations from mix design or parameters are found.
- .3** Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.
- .4** Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.
- .5** Submit MSDS required under WHMIS, in accordance with Section 01 35 29.06 - Health and Safety 01 35 43 – Environment Protection

1.5 QUALITY ASSURANCE

- .1** Quality Assurance: in accordance with Section 01 45 00 – Quality Control.
- .2** Provide Departmental Representative, minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.
 - .1** Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.
- .3** Minimum 4 weeks prior to starting concrete work, provide proposed quality control procedures for review by Departmental Representative on following items:
 - .1** Falsework erection.
 - .2** Hot weather concrete.

- .3 Cold weather concrete.
- .4 Curing.
- .5 Finishes.
- .6 Formwork removal.
- .7 Joints.
- .4 Sustainability Standards Certification:
 - .1 Construction Waste Management: provide copy of plan.

1.6 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 laboratory representative and concrete producer as described in CSA A23.1/A23.2.
 - .2 Deviations to be submitted for review by Departmental Representative.
 - .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

PART 2 - Product

2.1 DESIGN CRITERIA

- .1 Alternative 1 - Performance: to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

2.2 PERFORMANCE CRITERIA

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Departmental Representative and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

2.3 MATERIALS

- .1 Hydraulic cement: Type GU and/or GUbSF to CSA A3001.
- .2 Water: to CSA A23.1.
- .3 Aggregates: to CSA A23.1/A23.2.
- .4 Admixtures
 - .1 Air entraining admixture: to ASTM C260.
 - .2 Chemical admixture: to ASTM C494 or ASTM C1017. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.

- .5 Curing compound: to CSA A23.1/A23.2.

2.4 MIXES

- .1 Performance Method for specifying concrete: to meet Departmental Representative performance criteria to CSA A23.1/A23.2.
 - .1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as in Quality Control Plan.
 - .2 Provide concrete mix to meet following plastic state requirements
 - .1 Uniformity: ± 0.10 .
 - .2 Workability: free of segregation.
 - .3 Finish ability: 2% amount of bleeding.
 - .4 Set time: 1.5 hours maximum.
 - .3 Provide concrete mix to meet following hard state requirements:
 - .1 Durability and class of exposure: C-1.
 - .2 Compressive strength at 28 age: 35 Mpa minimum.
 - .3 Intended application: exposed.
 - .4 Aggregate size 20 mm maximum.
 - .5 Volume stability: acceptable volume change range 0.08% due to shrinkage, creep and freeze thaw cycle.
 - .4 Provide quality management plan to ensure verification of concrete quality to specified performance.
 - .5 Concrete supplier's certification: both batch plant and materials meet CSA A23.1 requirements.

PART 3 - Execution

3.1 PREPARATION

- .1 Obtain Departmental Representative's written approval before placing concrete.
- .2 Provide 24 hours minimum notice prior to placing of concrete.
- .3 Place concrete reinforcing in accordance with Section 03 20 00- Concrete Reinforcing.
 - .1 During concreting operations
 - .1 Development of cold joints not allowed.
 - .2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
- .4 Pumping of concrete is permitted only after approval of equipment and mix.
- .5 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .6 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing.

- .7 Protect previous Work from staining.
- .8 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .9 In locations where new concrete is dowelled to existing work, drill holes in existing concrete.
 - .1 Place steel dowels of deformed steel reinforcing bars and pack solidly with epoxy grout to anchor and hold dowels in positions as indicated.
- .10 Do not place load upon new concrete until authorized by Departmental Representative.

3.2 INSTALLATION/APPLICATION

- .1 Do cast-in-place concrete work to CSA A23.1/A23.2.
- .2 Sleeves and inserts
 - .1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through joists, beams, column capitals or columns, except where indicated or approved by Departmental Representative.
 - .2 Where approved by Departmental Representative, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere.
 - .3 Sleeves and openings greater than 100 x 100 mm not indicated, must be reviewed by Departmental Representative.
 - .4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from Departmental Representative before placing of concrete.
- .3 Drainage holes and weep holes
 - .1 Install weep hole tubes and drains as indicated.
- .4 Finishing and curing
 - .1 Finish concrete to CSA A23.1/A23.2.
 - .2 Use procedures as reviewed by Departmental Representative to remove excess bleed water. Ensure surface is not damaged.
- .5 Damp-proof membrane:
 - .1 Install damp-proof membrane under concrete slabs-on-grade inside building.
 - .2 Lap damp-proof membrane minimum 150 mm at joints and seal.
 - .3 Seal punctures in damp-proof membrane before placing concrete.
 - .4 Use patching material at least 150 mm larger than puncture and seal.

3.3 SURFACE TOLERANCE

- .1 Concrete tolerance to CSA A23.1, to tolerance schedule as indicated.

3.4 FIELD QUALITY CONTROL

- .1 Site tests: conduct tests as follows in accordance with Section 01 45 00-Quality Control and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
 - .1 Concrete pours.
 - .2 Slump.
 - .3 Air content.
 - .4 Compressive strength at 7 and 28 days.
 - .5 Air and concrete temperature.
- .2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1/A23.2.
 - .1 Ensure testing laboratory is certified to CSA A283.
- .3 Ensure test results are distributed for discussion at pre-pouring concrete meeting between testing laboratory and Departmental Representative.
- .4 Departmental Representative will pay for costs of tests as specified in Section 01 29 83-Payment-Testing Laboratory Services.
- .5 Departmental Representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

3.5 CONCRETE REPAIR

- .1 Remove and replace any damaged or defective concrete with concrete meeting the specifications and requirements of the plans.
- .2 After the removal of the formwork, voids, honeycombs and other identified defects on the surface of concrete when stripping, they should not be repaired before the Departmental Representative has examined them. Submit, for the approval of the Departmental Representative, repair methods for the voids, honeycombs or other defects. Do not make any corrections of surfaces before receiving the authorization of the Departmental Representative. Wherever it is possible, complete the repairs on the formed surfaces as soon as possible after stripping.
- .3 Smudges, streaks and other unsightly irregularities of the banchées surfaces that remain exposed or that will receive a waterproofing membrane must be removed within 24 hours after stripping. The holes left by the rods have to be also closed at the same time.

3.6 CUTS, DRILLS AND NOTCHES IN CONCRETE

- .1 It is never permitted for any reason whatsoever, to cut, drill or notch elements already concreted, unless the Departmental Representative has authorized it.
- .2 Any cut, drills or notch into the hardened concrete authorized by the Departmental Representative shall be conducted at the exact place and according to the exact dimensions approved with. Use rotary tools that prevent splitting of concrete.

3.7 TOLERANCE/DEFECTIVE CONCRETE

- .1 If the tolerances specified in section 6.4 of CSA-A23.1/A23.2 standard were not observed during the construction of any element on either installation shown on the plans, the Departmental Representative may require that this be demolished and rebuilt according to the tolerances of that article, all costs incurred will be the Contractor's responsibility.
- .2 If the concrete of an already built part of the structure shown on the plans has not the compressive strength required, thereby compromising its structural efficiency, the Departmental Representative will require that the element be reinforced or demolished and rebuilt, all costs incurred will be borne by the Contractor.
- .3 If the concrete of an already built part of the structure shown on the plans has not the minimum resistance to the specified compression, but if, after checking his notes calculations, the Departmental Representative considers it there is no need to require the replacement or reinforcement of the element, however the Contractor shall bear all costs of this audit and give a rebate based on the difference between the requested and obtained resistance of the defective concrete.

3.8 CLEANING

- .1 Clean in accordance with Section 01 74 11-Cleaning.

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1 Section 03 20 00 – Concrete Reinforcing
- .2 Section 03 30 00 – Cast-in-Place Concrete.
- .3 Payment
 - .1 No measurement will be made under this section.
 - .2 Include costs of items in Section 03 30 00 – Cast-in Place Concrete

1.2 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CAN/CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

1.3 DOCUMENTS/SAMPLES TO SUBMIT FOR APPROVAL/INFORMATION

- .1 Submit the documents and samples required according to Section 01 33 00-Documents and Samples to Submit.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials for reuse and recycling in accordance with Section 01 74 21- Waste Management and Disposal of Construction/Demolition.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Dispatch plasticizers, water-reducing agents and unused air-entraining agents to a registered site that collects dangerous materials, authorized by the Departmental Representative.
- .4 It is prohibited to pour plasticizers, water-reducing agents and unused air-entraining agents in the sewers, water streams , lake, ground or any other place where it presents a risk to the health or environment.

PART 2 - Products

2.1 MATERIALS

- .1 Concrete mixes and materials: to Section 03 30 00 - Cast-In-Place Concrete.
- .2 Reinforcing steel: to Section 03 20 00 - Concrete Reinforcing.

PART 3 - Execution

3.1 CONSTRUCTION

- .1 Do concrete work in accordance with Section 03 30 00- Cast-In-Place Concrete.

- .2 Proceed with concrete pour with respect of the temperature limites according to CSA-A23.1/A23.2.
- .3 Use floats to remove roughness and minor irregularities left by strike board or finishing machine and to seal concrete surface to approval of Departmental Representative.
- .4 Finishing bridge deck slab: when concrete has hardened sufficiently to prevent dislodgement of coarse aggregate particles, give surface a uniform broom finish free from porous spots, irregularities, depressions, small pockets or rough spots.

3.2 PROTECTION

- .1 Protection and curing for concrete placed between November 1st and March 31st comply with following requirements in addition to the cold weather requirements of CSA A23.1/A23.2.
 - .1 Protect concrete with windproof shelter of canvas or other material to allow free circulation of inside air around fresh concrete.
 - .2 At no point let walls of shelter touch formwork.
 - .3 Provide sufficient space for removal of formwork for finishing.
 - .4 Use heating equipment approved by Departmental Representative.
 - .5 Vent the products of combustion outside protective shelter. Equipment to be capable of keeping inside air at constant temperature sufficiently high to maintain concrete at following curing temperatures:
 - .1 For initial 3 days: minimum temperature of 15°C, maximum of 27°C at concrete surfaces.
 - .2 For concrete abutments, solid piers, footings: cure at 10°C for additional 4 days.
 - .3 For superstructure: maintain concrete at 10°C for additional [14] days.
 - .6 Keep concrete surfaces continually moist as long as concrete is protected from the cold.
- .2 Unformed surfaces: cure with burlap and water
 - .1 Carefully place two layers of damp burlap on surface of concrete.
 - .2 Overlap each strip by minimum 75 mm and secure against displacement by wind.
 - .3 Maintain burlap in place and keep thoroughly wet for seven days after placement.
- .3 Formed surfaces
 - .1 No additional curing will be required if formwork is left in place for seven days or more.
 - .2 If formwork removed in less than seven days, cure in manner specified for unformed surfaces for remainder of seven day period.

3.3 PROTECTION AND WEATHERING STEEL BEAM

- .1 In the case of weathering steel beams it's important to plan the work so it does not disturb the uniformity of the rust build up.
- .2 Protect the beams against marks and dirt.
 - .1 Seal the joints in between the forms, the steel elements, including the inside beams and the diaphragm to avoid the leaks from the concrete or cement paste.
 - .2 Use a draught proofing product, duck tape, Ethafoam foam, or any other materials or appropriate methods to seal the joints.
- .3 If undesirable materials spread on the beams despite the protection used, wipe, clean and power wash the dirty surfaces according to the directives of the Departmental Representative.
- .4 If the exterior faces of the beams are marked or dirty, lightly strip and polish all the exterior surfaces that are in the same direction, to permit a uniform color according to the directives of the Departmental Representative.
- .5 Spray clean water on the exterior surfaces of the beams, let them dry, then repeat these steps multiples times till desired polish is obtained.
 - .1 The spraying (or mist) will permit the beams to be damp without having excess water on the surface. Repeat these steps once the beams are completely dry.

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1 Section 03 30 00 – Cast-in-Place Concrete.
- .2 Section 03 30 51 – Concrete for Bridge Deck.
- .3 Payment
 - .1 Measurement for payment.
 - .2 Measurement Procedures: in accordance with Section 01 29 00 - Payment.
 - .3 Measure cast-in-place concrete finishing in square meters, calculated from neat dimensions as indicated by Departmental Representative.

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-25.20-95, Surface Sealer for Floors.
- .2 CSA International
 - .1 CAN/CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit submittals in accordance with Section 01 33 00 - Documents and Samples to Submit.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature and data sheets for concrete finishes and include product characteristics, performance criteria, physical size, finish and limitations.
 - .1 Provide 1 copies of WHMIS MSDS in accordance with Section 01 35 43 – Protection of the environment and 01 35 29.06 – Health and Security. WHMIS MSDS acceptable to Labour Canada and Health and Welfare Canada for concrete floor treatment materials. Indicate VOC content in g/L.
 - .2 Include application instructions for concrete floor treatment products.

1.4 ENVIRONMENTAL REQUIREMENTS

- .1 Work area
 - .1 Make work area water tight protected against rain and detrimental weather conditions.
- .2 Temperature

- .1 Maintain ambient temperature of not less than 10 degrees C from 7 days before installation to at least 48 hours after completion of work and maintain relative humidity not higher than 40% during same period.
- .3 Moisture
 - .1 Ensure concrete substrate is within moisture limits prescribed by manufacturer.
- .4 Safety
 - .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with the section on manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements
 - .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
- .3 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding and packaging materials in accordance with Section 01 74 21 – Waste management and Disposal of Construction/Demolition.

PART 2 - Products

2.1 SUSTAINABLE DEVELOPMENT

2.2 PERFORMANCE REQUIREMENTS

- .1 Submit written declaration that components used are compatible and will not adversely affect finished flooring products and their installation adhesives.

PART 3 - Execution

3.1 EXAMINATION

- .1 Verify that slab substrate surfaces are ready to receive work and elevations are as recommended by manufacturer's written instructions.

3.2 PREPARATION OF EXISTING SLAB

- .1 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radiuses edges, unless otherwise indicated.
- .2 Use mechanical stripping to remove chlorinated rubber or existing surface coatings.
- .3 Use protective clothing, eye protection and respiratory equipment during stripping of chlorinated rubber or existing surface coatings.

3.3 APPLICATION

- .1 After floor treatment is dry, seal control joints and joints at junction with vertical surfaces with sealant.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.5 PROTECTION

- .1 Protect finished installation in accordance with manufacturer's instructions.

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1** All Sections included in the requirements
- .2** Payment
 - .1** Measure structural steel in kilograms of steel incorporated into work..
 - .2** Ensure lump sum price includes radiographic examination of shop splices.
 - .3** Bearings will be paid for on lump sum basis. The price includes slotted holes and additional field splices.

1.2 REFERENCES

- .1** ASTM International (ASTM)
 - .1** ASTM A325M-14, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength Metric.
- .2** CSA International (CSA)
 - .1** CSA G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Construction Steel.
 - .2** CAN/CSA G164-M92 (R2003), Hot galvanization of irregular objects.
 - .3** CAN/CSA-S6-14, Canadian Highway Bridge Design Code.
 - .4** CSA S16-14, Design of Steel Structures. (Calculation rule of steel framework)
 - .5** CSA S269.1-16, Falsework for Construction Purposes.
 - .6** CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding.
 - .7** CSA W59-13 Welded Steel Construction, (Metal Arc Welding).

1.3 ADMINISTRATIVE REQUIREMENTS

- .1** Pre-Installation Meetings:
 - .1** Convene pre-installation meeting (1) week prior to beginning work of this Section, with Contractor's Representative and Departmental Representative in accordance with Section 01 31 19 – Project Meeting, which will contain what follows:
 - .1** Verify project requirements.
 - .2** Review installation and substrate conditions.
 - .3** Co-ordination with other building subtrades.
 - .4** Review manufacturer's written installation instructions and warranty requirements.
 - .2** Prior to start of Work arrange for site visit with Departmental Representative to examine existing site conditions adjacent to demolition work.
 - .3** Hold project meetings every 2 week.

- .4 Ensure key personnel, site supervisor, subcontractor representative, laboratory representative and client representative attend.
- .5 Departmental Representative will provide written verbal notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.

1.4 ACTION AND INFORMATION SUBMITTALS

- .1 Submit required documents/samples in accordance with Section 01 33 00 – Documents/Samples to Submit.
- .2 Product Data
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for structural steel and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 1 copies of WHMIS MSDS in accordance with Section 01 35 29.06 – Health and Security 01 35 43 – Environment Protection.
- .3 Shop Drawings
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
 - .2 Indicate shop and erection details including shop splices, cuts, copes, connections, holes, bearing plates, threaded fasteners, rivets and welds. Indicate welds by CSA W59, welding symbols.
 - .3 Documents stating the proposed welding procedures need to be stamped and approved by Canadian Welding Bureau.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Provide protective blocking for lifting, transportation and storing.
 - .1 Exercise care during fabrication, transportation and erection of beams to avoid damage.
 - .2 Do not notch edges of members.
 - .3 Do not cause excessive stresses.
- .2 Mark mass on members weighing more than 3 tons.
- .3 Protect unpainted weathering steel, before erection, with waterproof covering.
- .4 Ensure that no portion of steel comes into contact with ground.
- .5 Ensure Departmental Representative has delivery schedules 7 days minimum prior to shipping.
- .6 Packaging Waste Management: remove for reuse by manufacturer of pallets, crates, padding, and packaging materials in accordance with Section 01 35 21 – Waste Management and disposal of construction/demolition.

1.6 QUALITY ASSURANCE

- .1 Preconstruction Testing:
 - .1 Provide suitable facilities and cooperate with Departmental Representative in carrying out inspection and tests required.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Structural steel: to CSA G40.20/G40.21, grade and types 350 AT Category 2.
 - .1 Leave atmospheric corrosive resistant steel and connections material in unpainted, include bolts, nuts, washers and weld deposits of compatible weathering characteristics.
- .2 For this project the steel used for the plates is grade 300W and 350W for the angle-bars and profiles.
- .3 High strength bolts, nuts and washers: to ASTM A325M.
- .4 Anchor bolts, washers and nuts: to CSA G40.20/G40.21, grade 300W galvanized.
- .5 Welding electrodes: to CSA W48 series.
- .6 The steel sections and bolts that are installed permanently have to be galvanized in accordance with WHMIS A123 even if they are receiving a paint coating or any other coating, unless otherwise noted on drawings.
- .7 Hot dip galvanizing: to CAN/CSA-G164 and minimum zinc coating of 600 g/m².
- .8 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents.

2.2 SOURCE QUALITY CONTROL

- .1 Steel producer qualifications: certified in accordance with CSA G40.20/G40.21.
- .2 Submit to Departmental Representative 2 copies of certified test reports for Charpy V-notch test.
- .3 Provide suitable facilities and co-operate with Departmental Representative in carrying out inspection and tests required.

PART 3 - Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for structural steel installation in accordance with manufacturer's written instructions.
 - .1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 PRÉPARATION

- .1 Clean steel surfaces as directed by Departmental Representative when staining or defacing occurs, according to the requirements of the norm SSPC-SP 6 and the CCDG.
- .2 Verify location of substructure units, elevations of bearing seats and location of anchor bolts before erection of structural steel; report discrepancies to Departmental Representative.
- .3 Work near river banks or embankments in accordance with written instructions from Departmental Representative.
- .4 Restrict drifting during assembly to minimum required to bring parts into position without enlarging or distorting holes, and without distorting, kinking or sharply bending metal of any unit.
 - .1 Enlarge holes if necessary by reaming only after receipt of written approval from Departmental Representative.
 - .2 Ensure reamed holes are 2 mm maximum larger than bolt size used.
- .5 Fabricate and install bearings as indicated.

3.3 INSTALLATION

- .1 Do falsework in accordance to CSA S269.1.
- .2 Do fabrication and erection of structural steel in accordance with CAN/CSA-S6, Design of Highway Bridges
- .3 Do welding in accordance with CSA W59, except where specified otherwise.
 - .1 For CSA G40.20/G40.21, grade 350A steel, deposited weld metal to have Charpy V-Notch value not lower than that of steel.
 - .2 Do welding in shop unless otherwise permitted by Departmental Representative.
 - .3 Weld only at locations indicated.
- .4 Finish: members true to line, free from twists, bends, open joints, sharp corners and sharp edges.
- .5 Allowable tolerance for bolt holes
 - .1 Matching holes for bolts to line up so that dowel 2 mm less in diameter than hole passes freely through assembled members at right angles to such members.
 - .2 Finish holes not more than 2 mm in diameter larger than diameter of rivet or bolt unless otherwise specified by Departmental Representative.
 - .3 Centre-to-centre distance between any two holes of group to vary by not more than 1 mm from dimensioned distance between such holes.
- .6 Span length tolerances
 - .1 Brace: plus or minus 3 mm
- .7 Field splices: to approval of Departmental Representative.
- .8 Mark members in accordance with CSA G40.20/G40.21.

- .1 Do not use die stamping.
- .2 Place marking at locations hidden when viewed from exterior after erection when steel is to be left in unpainted condition.
- .9 Assembly mark: mark in shop the bracing pieces for assembly.
 - .1 Remove waterproof covers and drains and holding structures when steel erection complete.

3.4 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, protecting and cleaning of steel.
 - .2 Submit manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
 - .3 Schedule site visits
 - .1 After delivery and storage of products, and when preparatory Work, or other Work, on which the Work of this Section depends, is complete but before installation begins.
 - .2 Twice during progress of Work at 25% and 60% complete.
 - .3 Upon completion of the Work, after cleaning is carried out.

END OF SECTION

Partie 1 GENERAL BUILT-UP

1.1 RELATED REQUIREMENTS

- .1 Section 32 12 16.01 Asphalt paving

1.2 REFERENCES

- .1 ASTM International
- .1 ASTM C728-13, Standard Specification for Perlite Thermal Insulation Board.
- .2 ASTM D41/D41M-11, Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
- .3 ASTM D226/D226M-09, Standard Specification for Asphalt Saturated Organic Felt Used in Roofing and Dampproofing.
- .4 ASTM D312-00(2006), Standard Specification for Asphalt Used in Roofing.
- .5 ASTM D449/D449M-03(2014)e1, Standard Specification for Asphalt Used in Dampproofing and Waterproofing.
- .6 ASTM D1863/D1863M-05(2011)e1, Standard Specification for Mineral Aggregate Used on Built-Up Roofs.
- .7 ASTM D2178/D2178M-13, Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
- .8 ASTM D4601/D4601M-04(2012)e1, Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
- .9 ASTM D6380/D6380M-03(2013)e1, Standard Specification for Asphalt Roll Roofing (Organic Felt).
- .2 Canadian Roofing Contractors Association (CRCA)
- .1 CRCA Roofing Specifications Manual - 2012.
- .3 CSA Group
- .1 CAN/CSA-A123.2-03(R2013), Asphalt-Coated Roofing Sheets.
- .2 CSA A123.3-05(R2010), Asphalt Saturated Organic Roofing Felt.
- .3 CAN/CSA-A123.4-F04(C2013), Asphalt for Constructing Built-Up Roof Coverings Waterproofing Systems.
- .4 CAN/CSA-A123.16-F04(C2009), Asphalt-Coated Glass Base Sheets.
- .5 CSA A123.17-05(R2009), Asphalt Glass Felt Used for Roofing and Waterproofing.
- .6 CSA A231.1/A231.2-14, Precast Concrete Paving Slabs/Precast Concrete Pavers.
- .7 CAN/CSA-ISO 9001-F08(C2014), Quality Management Systems - Requirements.
- .8 CAN/CSA-ISO 14001-F04(R2009), Environmental Management Systems.

- .9 CSA O121-F08(R2014), Douglas Fir Plywood.
- .10 CSA O151-F09, Canadian Softwood Plywood.
- .11 CAN/CSA-Z809-F08(C2013), Sustainable Forest Management.
- .4 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001 (V4-0)-2013, FSC Principle and Criteria for Forest Stewardship.
- .5 Green Seal (GS)
 - .1 GS-11-2013, Standard for Paints and Coatings.
- .6 South Coast Air Quality Management District (SCAQMD)
 - .1 SCAQMD Rule 1168-05, Adhesives and Sealants.
- .7 Sustainable Forestry Initiative (SFI)
 - .1 SFI-2010-2014 Standard.
- .8 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - .2 CAN/ULC-S702-10, Standard for Thermal Insulation Mineral Fibre for Buildings.
 - .3 CAN/ULC-S704-11, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
 - .4 CAN/ULC-S706-09, Standard for Wood Fibre Thermal Insulation for Buildings.

1.3 DOCUMENTS AND SAMPLES SUBMITTAL FOR APPROUVAL/INFORMATION

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt waterproofing and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 43 - Environmental protection. The safety data sheets (SDS) must indicate the VOC content for:
 - .1 Primers.
 - .2 Asphalt.
 - .3 Sealers.
 - .4 Filter fabric.

.3 Shop Drawings:

- .1** Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.
- .2** Provide shop drawings and indicate:
 - .1** Flashing,
 - .2** Layout for insulation blocks

.4 Certificates:

- .1** Submit manufacturer's certificate, certify that products meet or exceed specified requirements.
 - .1** CAN/CSA-ISO 9001 registration and compliance.
 - .2** CAN/CSA-ISO 14001 registration and compliance.

.5 Test and Evaluation Reports:

- .1** Submit laboratory test reports certifying compliance membrane with specification requirements.
- .2** Compatibility of materials: submit written declaration to Departmental Representative as described in PART 2, PERFORMANCE CRITERIA.

.6 Manufacturer's Installation Instructions: submit manufacturer's installation instructions and special handling criteria, special precautions required for handling and seaming of the membrane, installation sequence and cleaning procedures.

.7 Manufacturer's Field Reports:

- .1** Submit to manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3, FIELD QUALITY CONTROL.
- .2** Indicate procedures followed, weather during roofing application including ambient temperatures and wind velocity.

.8 Sustainable Design Submittals:

- .1** Construction Waste Management:
 - .1** Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.

.9 Wood Certification: submit Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.

1.4 QUALITY ASSURANCE

- .1** Installer qualifications: company or person specializing in application of built-up bituminous waterproofing systems approved by manufacturer.
- .2** Mock-ups:

- .1 Construct mock-up in accordance with Section 01 45 00 – Quality control.
- .2 Construct mock-up 10 m² minimum size showing typical lap joint and one inside corner. Accepted mock-up may form part of complete work.
- .3 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with waterproofing work.

1.5 FIRE PROTECTION

- .1 Fire Extinguishers:
 - .1 Maintain one stored pressure rechargeable type with hose and shut-off nozzle.
 - .2 ULC labelled for A, B and C class protection.
 - .3 Size 14 kg on roof per torch applicator, within 6 m of torch applicator.
- .2 Maintain fire watch for [1] hour after each day's roofing operations cease.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .1 Ensure shelf life of materials has not expired.
 - .2 Deliver fasteners in boxes or kegs and keep in protective storage until used.
 - .1 Do not oil or grease fasteners.
- .2 Storage and Handling Requirements:
 - .1 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.
 - .2 Provide and maintain dry, off-ground weatherproof storage.
 - .3 Store materials on supports to prevent deformation.
 - .4 Remove only in quantities required for same day use.
 - .5 Store materials in accordance with manufacturers written instructions.
 - .6 Store insulation protected from weather and deleterious materials exposure.
 - .7 Replace defective or damaged materials with new.
- .3 Packaging Waste Management: remove for reuse of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 – Construction waste management and disposal.

1.7 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Apply built-up bituminous membranes only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

- .2 Do not install built-up bituminous membranes when air and substrate temperature remains below 5 degrees C or when wind chill gives equivalent cooling effect.
- .3 Install built-up bituminous membranes on dry substrate, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into system.
- .2 Ventilation:
 - .1 Departmental Representative will arrange for ventilation system to be operated during installation of damp proofing. Ventilate area of work as directed by Departmental Representative by use of approved portable supply and exhaust fans.
 - .2 Provide continuous ventilation during and after damp proofing application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of damp proofing installation.

1.8 WARRANTY

- .1 For the Work of this Section 07 12 13 - Built-up Asphalt Waterproofing, 12 months warranty period is extended to 60 months.

Partie 2 PRODUCTS

2.1 PLANT AND EQUIPMENT

- .1 Do not use direct fired equipment.
- .2 Use only kettles equipped with thermometers or gauges in good working order.
- .3 Locate kettles in safe place outside of building or, if approved by Departmental Representative, on noncombustible substrate at location to avoid danger of igniting combustible material below.
 - .1 When locating kettles, give consideration to direction of prevailing winds, building fans and air handling units to minimize possibility of smoke and fumes entering surrounding occupied buildings.
 - .2 If wind direction causes smoke and fume problems, relocate kettles on daily basis when directed by Departmental Representative.
- .4 Maintain supervision while kettles are in operation and provide metal covers for kettles to smother flames in case of fire.
 - .1 Provide suitable fire extinguishers.
- .5 Maintain efficiency of kettles and equipment by frequent cleaning.
 - .1 Remove carbonized bitumen.
- .6 Use only fibreglass roofing mops.

2.2 SYSTEM DESCRIPTION

- .1** Built-Up Membrane: 3-4 ply asphalt and felt built-up waterproofing system.

2.3 PERFORMANCE CRITERIA

- .1** Waterproofing System: capable of resisting moisture/water, and preventing moisture migration to interior.
- .2** Compatibility between components of system and adjacent materials is essential.
 - .1** Provide written declaration to Departmental Representative stating that materials and components, as assembled in system, meet this requirement.

2.4 PRIMERS

- .1** Asphalt primer: to ASTM D41/D41M and to GS-11 Standard, maximum VOC limit 250g/L.

2.5 BITUMEN

- .1** Asphalt: to CAN/CSA-A123.4, Type 2 ASTM D312.

2.6 FELTS

- .1** Saturated organic felts: to CSA A123.3 No.15 and ASTM D226/D226M, saturant asphalt.
- .2** Asphalt coated sheets: to CAN/CSA-A123.2, ASTM D6380/D6380M Type S, smooth surface No. 50.
- .3** Saturated glass fibre felts: to CSA A123.17 ASTM D2178/D2178M, Type IV-ply sheet.
- .4** Asphalt impregnated and coated glass fibre base sheet: to CAN/CSA-A123.16, ASTM D4601/D4601M, Type 1.

2.7 POLYSTYRENE INSULATION

- .1** Extruded polystyrene (XPS) insulation conform to norm CAN/ULC-S701, Type 2, thickness as indicated, square edges.

2.8 SEALERS

- .1** Plastic cement: asphalt.
- .2** Sealing compound: rubber asphalt type.
 - .1** Sealants: maximum VOC limit 70g/l to SCAQMD Rule 1168.
 - .2** Eco-certified products.

2.9 WALKWAYS

- .1** Walkways to consist of one additional ply of cap sheet membrane. Colour to be different from field membrane as selected by Departmental Representative.

2.10 CANT STRIPS

- .1** Cut from 38 mm thick fibreboard material, to measure 140 mm on slope.
 - .1** CAN/CSA-Z809 or FSC or SFI certified.
- .2** Prefabricated cants:
 - .1** CAN/CSA-Z809 or FSC or SFI certified.

2.11 FILTER FABRIC

- .1** UV resistant, black woven polyolefin fabric for installation between insulation and stone ballast in protected membrane system.
 - .1** Fabric to meet recommendation of insulation manufacturer.
 - .2** Product weight 93.5 g/m².

2.12 SOURCE QUALITY CONTROL

- .1** Provide laboratory test reports certifying compliance of bitumens with specification requirements as described in PART 1, QUALITY ASSURANCE.

Partie 3 EXECUTION

3.1 QUALITY OF WORK

- .1** Do examination, preparation and waterproofing Work in accordance with CRCA Roofing Specification Manual, particularly for fire safety precautions, and to ULC Design No..
- .2** Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 SUBSTRATE EXAMINATION

- .1** Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for asphalt waterproofing installation in accordance with manufacturer's written instructions.
 - .1** Visually inspect substrate in presence of Departmental Representative.
 - .2** Inform Departmental Representative of unacceptable conditions immediately upon discovery.

- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.
- .2 Evaluation and Assessment: prior to beginning of work ensure:
 - .1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris.
 - .2 Mounting frames and walls have been built.
 - .3 Drains have been installed at proper elevations relative to finished roof surface.
 - .4 Plywood and lumber nailer plates have been installed to walls, supports and parapets as indicated.
- 3.3 PREPARATION - HEATING OF ASPHALT**
 - .1 Asphalt: heat in kettle or tanker sufficiently to provide correct Equiviscous Temperature (EVT) range at point of application.
 - .2 In cold weather insulate hauling equipment and re-circulation lines to minimize heat loss.
 - .3 Do not heat asphalt above its Final Blowing Temperature (FBT) in tanker.
 - .4 Heating asphalt above its FBT may be permissible in kettle as long as asphalt is used up within four hours.
 - .5 Equip kettle and tanker with working thermometers.
- 3.4 PROTECTION OF IN-PLACE CONDITIONS**
 - .1 Cover walls and adjacent work where materials hoisted or used.
 - .2 Use warning signs and barriers.
 - .1 Maintain in good order until completion of work.
 - .3 Clean off drips and smears of bituminous material immediately.
 - .4 Dispose of rain water off substrates and away from face of building until drains or hoppers installed and connected.
 - .5 Protect from traffic and damage.
 - .1 Comply with precautions deemed necessary by Departmental Representative.
 - .6 Place plywood runways over work to enable movement of material and other traffic.
 - .7 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed work and materials out of storage.
 - .8 Install insulation promptly to avoid possibility of condensation beneath vapour retarder.

3.5 PRIMING DECK

- .1 Apply deck primer to concrete support at the rate specified on the container.

3.6 MEMBRANE APPLICATION

- .1 Membrane application:

- .1 Starting at low point, perpendicular to slope, embed four plies of felts in asphalt applied at rate of 1 kg/m^2 for organic felt.
- .2 Extend felts to top of cant strip.
- .3 Apply flood coat in two applications at rate of 2.2 kg/m^2 for first and 1.2 kg/m^2 for second.

- .2 Flashing application:

- .1 Build flashings out of four (4) layers of felt strippings cemented together and to back-up wall with asphalt.
- .2 On exterior walls extend membrane flashing up inside face of parapet and over top to outside face of wall.
- .3 On interior walls, build base flashing up to cavity wall or through wall flashing.
- .4 Keep nails 200 mm above top of cant strip.
- .5 Secure drains to deck and to drain pipe and seal to membrane.

- .3 Insulation application:

- .1 Place insulation in parallel rows with width parallel to slope, after asphalt has cooled to prevent adhesion.
- .2 Insulation to be loose laid in parallel rows with ends staggered.
- .3 Where insulation is in contact with cants bevel insulation edges to fit snug to cant slope.

- .4 Filter fabric application: protected membrane system only.

- .1 Apply fabric unbonded over installed insulation.
- .2 Overlap edges 300 mm minimum.
- .3 Cut fabric around drains, vents and other penetrations and extend under metal flashings.

3.7 ROADWAYS

- .1 Install walkway modified bitumen cap sheet (glass felt BUR prior to surfacing) as indicated.

3.8 FIELD QUALITY CONTROL

- .1 Inspections:

- .1 Inspection and testing of BUR application will be carried out by testing laboratory designated by Departmental Representative.

- .2 Departmental Representative will pay for tests as specified in Section 01 29 83 - Payment procedures for testing laboratory services.
- .3 Inspection and testing of waterproofing application will be carried out by testing laboratory designated by Departmental Representative.
- .4 Costs of tests will be paid by Owner.
- .2 Testing:
 - .1 Do not conceal waterproofing until inspection and testing are completed to satisfaction of Departmental Representative.
 - .2 Temporarily plug drains and dam horizontal surface areas to be tested and flood with water to minimum depth of 80 mm.
 - .3 Maintain flooded depth for [24] hours.
 - .4 If leaks occur repair and retest.
 - .5 Remove water at end of test.

3.9 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .1 Clean to Departmental Representative's approval, soiled surfaces, spatters, and damage caused by work of this Section.
 - .2 Check drains to ensure cleanliness and proper function, and remove debris, equipment and excess material from site.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction waste management and disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.10 PROTECTION OF COMPLETED WORK

- .1 Ensure membrane is undamaged before application of protection board.
- .2 Apply protection board to cover membrane at locations as indicated.

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1 Section 01 29 00 – Payment Procedures
- .2 Section 31 36 00 – Gabions
- .3 Section 35 42 19 – Preservation of Water Courses and Wetlands

1.2 EXTENT OF EXCAVATION WORK

- .1 The work of Phase 1 include the pumping of the cleaning water for trucks and other equipment's on the washing area, as well as the pumping of water during the drying of the enclosure of the cofferdams for the repairs work of the bridge.
- .2 The excavation work for phase 1 of the installation requires excavation to point 9.8 m within the limits of the installation of the soils of category <A, A-B, B-C and >C. These work will produce approximately 30,175 m³ of excavated soil divided into the following soil categories:
 - .1 < A : 18 176 m³
 - .2 A-B : 11 839 m³
 - .3 B-C : 110 m³
 - .4 > C : 50 m³
 - .5 The Table 1 (Summary table of contaminated soil) and the Figure 1 (Interpretation of the extent of contamination) in the annex B, produced by AECOM, present an update of the environmental data for present specifications.
- .3 The excavation work for this project also include the excavation of waste within the limits of installation for off-site disposal.
- .4 The excavation work will also involve the management of runoff and infiltration water including pumping, treatment of these waters if needed, appropriate environmental controls and obtaining permits and authorization.
- .5 During the excavation, the Contractor shall sort out the fossil rocks to pile on the site, in the designated storage area on the plans. A Representative of the City will assist the Departemental Representative (in collaboration with the Montreal gem and mineral club). The Departemental Representative will assist the Contractor with the selection of fossiliferous rocks to retrieve on site. Once the capacity of the storage area is reached, the Contractor may dispose of the excavated soils, in accordance with this section of the quote.
- .6 Please note that the Contractor may, if desired, dispose of the material A-B and <A at Montreal's Saint-Michel Environnemental Complex (CESM). The CESM's conditions of acceptance and operations can be found at the following website: http://ville.montreal.qc.ca/portal/page?_pageid=7237,75372057&_dad=portal&_schema=PORTAL. It is the Contractor's responsibility to come to an agreement with the CESM and to respect their conditions.

1.3 REFERENCES

- .1 ASTM International
 - .1 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600kN-m/m³).
- .2 Ministère du Développement Durable, de l'Environnement et de la Lutte aux Changements Climatiques (MDDELCC)
 - .1 Regulation respecting contaminated soil storage and contaminated soil transfer stations
- .3 Ministère des Transports, de la Mobilité durable et de l'Électrification des transports (MTMDET)
 - .1 Proposal and general quotes (CCDG): road infrastructure, Edition, last version.
- .4 Geotechnical study report (in Annex)
- .5 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.
- .6 The Contractor will have to follow, without limiting himself to the laws, regulations, guides, politics and bellow codes:
 - .1 “Law on the quality of the environment”
 - .2 “Law on the health and safety at work”
 - .3 “Regulation on burying contaminated soil”
 - .4 “Regulation on burying and incinerating residual materials”
 - .5 “Regulation on dangerous materials”
 - .6 “Guide d'intervention - Protection des sols et réhabilitation des terrains contaminés”
 - .7 “Safety code for the construction industry”

1.4 DEFINITIONS

- .1 Clearing at flush to ground involves cutting , flush or near the existing ground level, standing trees , brush, shrubs, roots, stumps and the logs partially buried , and remove giblets as well as the debris littering the ground.
- .2 Cutting isolated trees is to cut the trees to a designated height above ground level without exceeding the specified height , and remove giblets and debris.
- .3 Clearing involves removing brush, dead wood and trees whose trunk has a diameter less than 50 mm, and remove giblets and debris.
- .4 Grubbing is to pull stumps and roots to a depth below the existing level of not less than that prescribed ground and to remove these materials.

- .5 Soils <A: Designates soils with contaminant concentrations that are lower than the A criteria of the “Guide d’intervention - Protection des sols et réhabilitation des terrains contaminés” of Ministère du Développement durable, de l’Environnement et de la lutte contre les changements climatiques (MDDELCC)
- .6 Soils A-B: Designates soils with contaminant concentrations that are in the range of A-B criteria of the “Guide d’intervention - Protection des sols et réhabilitation des terrains contaminés” (MDDELCC)
- .7 Soils B-C: Designates soils with contaminant concentrations that are in the range of B-C criteria of the “Guide d’intervention - Protection des sols et réhabilitation des terrains contaminés” (MDDELCC)
- .8 Soils >C: Designates soils with contaminant concentrations that exceed the criteria C of the “Guide d’intervention - Protection des sols et réhabilitation des terrains contaminés” (MDDELCC)
- .9 Soils RESC: Designates soils with contaminant concentrations that exceed the limits of Annex 1 of the « Règlement sur l’enfouissement des sols contaminés »
- .10 Residual materials: non-hazardous materials, biomedical waste, pesticides, fertilizing residuals materials and snow. In the context of the project, we distinguish among others, valuable residual materials from those meant to be disposed.
- .11 Fossiliferous rocks: sedimentary rock of varying range that contains fossils, on its outer surface, namely plants and animals imprints.

1.5 SOIL SUMMARY DESCRIPTION

- .1 According to the data obtained through the nineteen (19) surveys, taken at depths varying between 4.5m and 2.1m, the general stratigraphy of the site consists of a layer of fill, followed by natural soils. The rock formation was not reached. The location of the surveys is as shown on the drawings.
- .2 The surface of the site is composed of granular materials. The fill is made from a mix of silty gravelly sand, with 20-0mm caliber rock sediments in places.
 - .1 The presence of debris was noted in the following surveys:
 - .1 TR-1: debris (<1%) of brick and wood identified between 0.0m and 0.6m and debris (1-10%) of asphalt between 1.1m and 2.1m of depth.
 - .2 TR-2: debris (<1%) of brick and concrete identified between 0.0m and 0.5m followed by debris (15-20%) of asphalt between 0.5m and 1.5m of depth.
 - .3 TR-3: debris (1-10%) of asphalt and concrete identified between 0.0m and 1.0m followed by a layer of asphalt between 1.5m and 1.6m of depth.
 - .4 TR-4: debris (< 5%) of asphalt identified between 1.5m and 2.0m of depth.
 - .5 TR-5: debris of concrete (<1%) identified between 0.5m and 1.0m followed by a layer of asphalt between 1.0m and 1.1m of depth.
 - .6 TR-6: debris of concrete (<1%) identified between 0.0m and 1.5m followed by debris of asphalt (<1%) and wood between 1.5m and 1.8m of depth.
 - .7 TR-7: debris (10-20%) of asphalt identified between 1.2m and 1.8m of depth.

- .8 TR-8: debris (<1%) of concrete identified between 0.5m and 1.5m of depth.
 - .9 TR-10: debris of brick (<1%) identified between 1.5m and 2.0m of depth and debris (1-10%) composed of brick and asphalt between 2.5m and 3.0m of depth.
 - .10 TR-11: debris (<5%) of brick, wood, metal, and concrete between 0.0m and 2.5m of depth.
 - .11 TR-12: debris (<5%) of concrete and brick identified between 0.5m and 1.0m followed by debris of concrete and wood between 1.0m and 1.7m of depth.
 - .12 TR-13: debris (<1%) of concrete identified between 0.0m and 0.5m followed by debris (<5%) of asphalt between 0.5m and 1.5m of depth.
 - .13 TR-14: debris (<5%) of concrete and wood identified between 0.0m and 1.0m followed by debris (1-10%) of asphalt between 1.0m and 2.3m of depth.
 - .14 TR-15: debris (>50%) of asphalt identified between 1.7m and 2.3m of depth.
 - .15 TR-101: debris (1-10%) of asphalt and brick identified between 1.4m and 2.4m of depth.
 - .16 TR-102: debris (10-15%) of asphalt identified between 1.2m and 1.7m followed by debris (1-10%) of asphalt, brick and concrete between 1.7m and 2.1m of depth.
 - .17 TR-103: debris (<5%) of asphalt identified between 1.2m and 1.8m followed by debris (<5%) of asphalt, brick and mortar between 1.8m and 2.4m of depth.
 - .18 TR-104: debris (5-10%) of asphalt and wood identified between 1.9m and 2.4m of depth.
- .3 The natural ground level was met at an average depth of 2.28m under the present surface of the site. At said depth, a deposit mostly composed of grey hard to soft clayey silt and silty clay was observed.

1.6 DOCUMENTS/SAMPLES TO SUBMIT FOR APPROBATION/INFORMATION

- .1 Submit the required documents and samples in accordance with Section 01 33 00 - Documents/Samples to Submit
- .2 Samples
 - .1 Submit three 3 samples of the products mentioned below, for approval, before delivering them to the site.
 - .2 Healing Coating: containing one 1 liter, bearing the manufacturer's label.
- .3 Submit documents signed by manufacturer certifying that the products and materials comply with specifications for the physical characteristics and performance criteria.
- .4 Submit instructions of installation/application provided by the manufacturer.
- .5 The Contractor shall provide mechanical and structural inspection reports before the work begins.

- .6 The Contractor shall submit to the Departmental Representative for approval he's work plan, including the sequence of work with schedule before the work begins. In particular, the work plan should contain the following:
 - .1 Contaminated soil management plan;
 - .2 Waste Management Plan (reusable materials, materials for disposal);
 - .3 Pumping method, storage and storm water treatment system and infiltration, permits and authorization.
- .7 The Contractor shall prepare a daily work report describing equipment and labor used. This report will be submitted to the Departmental Representative the day after the mentioned date. The original weight tickets will be compiled on a daily basis.
- .8 The Contractor shall obtain and maintain in effect all permits or approvals for the execution of the work (e.g. Occupation of the public domain permit).
- .9 Excavations and off-site management of soils and residual materials
 - .1 The transport tickets must be signed by the Departmental Representative before leaving the site and said tickets must specify the place of disposal and time of departure from site.
 - .2 The weighing tickets must specify the transport ticket number and the time of weighing at the place of disposal. Canada may refuse to pay the weighing ticket if the transport ticket hasn't been signed by the Departmental Representative or if the transport time is not conform to the usual time it takes to reach the disposal place.
 - .3 The original weighing tickets shall be delivered daily to the Departmental Representative and serve as proof of receipt to the final recipients of materials for purposes of payment.
 - .4 Provide weekly reports accepted by the Departmental Representative.
 - .5 Provide proof of certification by Weights and Measures Canada's of the balance weighing of the receiving site for the excavated material.

1.7 QUALITY INSURANCE

- .1 Take necessary measures for health and safety in construction, in accordance with Section 01 35 29.06 - Health and Safety.
- .2 The Contractor shall provide full cooperation with the Departmental Representative, particularly during the verification and monitoring of the work. The Contractor shall inform regularly the Departmental Representative of the work progress and if special controls, inspections or approvals are required under (i) the contract, (ii) instructions from the Departmental Representative, or (iii) laws or regulations applicable to the site, advise, with a reasonable notice, of the appropriate times for the works to be inspected. Notwithstanding the foregoing, the Departmental Representative shall have access to the work for means of inspection at any time, whether that the work is in preparation or underway. The Contractor shall cooperate to provide such access.
- .3 Protection of workers

- .1 Workers must wear gloves, a respirator, a dust mask, long sleeved clothing, eye protection, protective clothing .
- .2 Spills of preservatives should be immediately cleaned with absorbing materials, which must be properly disposed of in a landfill.

1.8 STORAGE AND PROTECTION

- .1 The Contractor shall ensure to store properly its equipment, materials and machinery. The Contractor shall also carry out maintenance of its equipment, its materials and its machinery in order to prevent spills and to protect the environment and wetlands. The Contractor is responsible for the protection of the lockout and storage of its equipment, materials and machinery.
- .2 During the work of materials management or other work, the Contractor shall perform them in order to protect the installations, railways, structures, buildings, pipelines and other public utilities buried or not. The Contractor shall also perform all the necessary steps to locate or to localize the existing underground infrastructure.
- .3 Machinery (excavators, trucks) will have to be maintained in order to avoid spreading off-site the contaminated soils.
- .4 The Contractor shall verify that no contaminated soil is spread on the public roads. In case of this happens, he will be the responsible for the cleaning as required by the Departmental Representative, with a mechanical street broom or any other equivalent system. He will also be responsible for the proper management of recovered substances. If the cleanup is not completed to the satisfaction of the Departmental Representative, he reserves the right to have them executed by a third party at the expense of the Contractor.
- .5 The Contractor shall keep clean and free the work areas and paths from the accumulation of materials. The residual materials will be regularly arranged. At the end of the project, the scene will be free of such products. The Contractor shall clean, at its expense, any accidental spill resulting from he's negligence.
- .6 Ensure protection of fences, trees, landscaped areas, natural elements, grading benchmarks, paved areas, utilities pipelines, rivers, tree roots, to conserve.
 - .1 If necessary, repair the damaged items to the requirements of the Departmental Representative.
 - .2 If the trees to keep have been damaged, replace them according to the Departmental Representative directives.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate wastes in accordance with Section 01 74 21 – Waste Management and Disposal of Construction/Demolition.

PART 2 - Products

2.1 MATERIALS

- .1 Crushed granular material must conform to the document CCDG. Bituminous tar wound of current production, specially designed to treat trees injuries.

.2 Backfill Materials

- .1** Excavation: free of debris, trash, waste, roots, wood, vegetable material, unsuitable soft particles and suffocating or harmful substances.
- .2** Excavations removed and stockpiled for reuse.

PART 3 - Execution

3.1 EXAMINATION

.1 Verification of Conditions:

- .1** Examine soil report available at the annex of the present section.
- .2** Before commencing work locations of buried services on and adjacent to site.

.2 Evaluation and Assessment:

- .1** Arrange with appropriate authority for relocation of buried services that interfere with execution of work. Pay costs of relocating services.
- .2** Testing of materials and compaction of backfill will be carried out by testing laboratory designated by Departmental Representative.
- .3** Not later than 48 hours before backfilling or filling with approved material, notify Departmental Representative so that compaction tests can be carried out by designated testing agency.
- .4** This section describes the environmental monitoring program that is in place and implemented by the Departmental Representative during the execution of the rehabilitation works. These activities may include, among others, the elements listed below:
 - .1** The coordination and surveillance of the collective rehabilitation work covered by this quote;
 - .2** Monitoring the application of the current laws and regulations, as well as the safety procedures for the execution of the work;
 - .3** Sampling and analysis of walls and the bottom of excavations;
 - .4** Sampling and analysis of the water collected in the storage tanks;
 - .5** Every control or sample deemed appropriate by the Departmental Representative, by interrupting temporarily if necessary the excavation work;
 - .6** Holding site meetings and writing reports of the reunion.
- .5** In the assessment and implementation of his work; the Contractor must take in account of this environmental monitoring program.

3.2 PREPARATION WORK

- .1** With the Departmental Representative, inspect the sites and review what elements to preserve.
- .2** Identify and protect the utilities pipes; be sure to keep in good condition the pipes that are still in use on the field.

- .1 Immediately notify, the Departmental Representative of the discovery of undetected existing pipelines or any damage to such works.
- .2 When the pipes to remove were discovered inside the work area, notify well in advance the Departmental Representative so as to minimize disruption of services.
- .3 Notify the utility companies before starting the clearing and grubbing work.
- .4 Keep roads, access routes and sidewalks free of dirt and debris.
- .5 Temporary Erosion and Sedimentation Control:
 - .1 Use temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
 - .2 Inspect control methods implemented by assuring required maintenance and repair until permanent vegetation is established.
- .6 Protection of in-place conditions:
 - .1 Protect excavations against frost for the installation of access paths and reserved areas for the Contractor.
 - .2 Keep excavations clean, free of standing water, and loose soil.
 - .3 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.
 - .4 Protect buried services pipes that are to remain undisturbed.
- .7 Removal work
 - .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
 - .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.
 - .3 Remove stem and tree roots that are under the access paths and the reserved area for the Contractor.

3.3 COMPLIANCE

- .1 Manufacturer's Instructions: comply with requirements, with manufacturer's written data, including all products' technical bulletins, instructions related to the handling, storage and installation of the products and to the indications of the data sheets.

3.4 CLEARING FLUSH TO THE GROUND

- .1 Perform cuts less than 100 mm above the ground.
- .2 Perform clearing operations by hand flush to the ground, so as not to damage the muskeg.
- .3 Cut tree branches that overhang the cleared areas according to the Departmental Representative, directives.

- .4 Cut diseased branches of trees to maintain, according to the Departmental Representative, directives.

3.5 ISOLATED TREES

- .1 Cut isolated trees as per the directives of the Departmental Representative, at a maximum height of 300 mm above the ground.
- .2 Tear stumps of isolated trees that were cut.
- .3 Prune isolated trees as directed.
- .4 Prune trees that will not be slaughtered in the work area; dispose of dead branches 4 cm or more in diameter, then cut the branches to the desired height.
- .5 Cut the main branches and sub-branches respectively flush with the trunk or of the carrier branch.
- .6 Cover the injury of more than 3 cm with an approved wound plaster.

3.6 SELECTIVE TREE CUTTING

- .1 In selective cutting area, the Contractor shall take care not to damage the existing trees to remain and shall eliminate waste by ensuring minimum damage vegetation in place. The Contractor will have to adapt its method of work and have it approved by the Departmental Representative before starting work.
- .2 The Departmental Representative will identify trees to be cut and the extent of pruning on the site prior to cutting and pruning of trees by the Contractor.
- .3 The Contractor shall:
 - .1 Cut isolated trees as directed by the Departmental Representative, at a maximum height of 300 mm above the ground.
 - .2 Cut isolated trees as directed
 - .3 Prune trees that will not be cut in the work area; rid tree of dead branches 4 cm or more in diameter, then cut the branches to the desired height.
 - .4 Cut the main branches and secondary branches flush with the trunk or flush with carrier branch in that order.

3.7 GRUBBING

- .1 In areas where grubbing is indicated, remove and eliminate the roots of 7.5cm in diameter or more, the tangled roots and the designated stump.
- .2 Pull the stumps and roots up to at least 200 mm below ground level.
- .3 In the access paths and reserved areas for the Contractor, fill the holes left by the removed stumps with suitable fill materials, frost-resistant and compacted up to the subgrade of the road and put the ground surface in a state consistent with the adjacent surface.
- .4 Elsewhere with the exception of the excavation area, fill holes left by the removed stumps with suitable fill materials and recover the soil surface in a state consistent with the adjacent surface.

3.8 REMOVAL AND ELIMINATION OF WASTE

- .1 Transport off-site debris from land clearing and grubbing to landfill indicated by the Department Representative and in accordance with the separation of waste at source program (PTDS).
- .2 The management of ash wood, in reference to the emerald ash borer pest, and its transportation may only occur between September 15th and April 15th to an authorised deposit and treatment site.
- .3 Remove diseased trees designated by the Departmental Representative, and eliminate according to a method approved by the Departmental Representative.

3.9 EXCAVATION

- .1 Shore and brace excavations, protect slopes and banks and perform work in accordance with Provincial and Municipal regulations.
- .2 Topsoil stripping
 - .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.
 - .2 Strip topsoil to depths as indicated and according to construction. Avoid mixing topsoil with subsoil.
 - .3 Strip topsoil over areas to be covered by new construction, over areas where grade changes are required, and so that excavated material may be stockpiled without covering topsoil.
 - .4 Stockpile in locations as indicated.
 - .5 Dispose of topsoil off site in a technical landfill area approved by MDDELCC.
- .3 Excavate as required to carry out work, in all materials met.
 - .1 Do not disturb soil or rock below bearing surfaces. Notify Departmental Representative when excavations are complete.
 - .2 In access routes and Contractor reserved areas, the Contractor has to make sure the ground bearing capacity is adequate for the use of trucks and other machinery. The Contractor is responsible for the sizing of the access routes and shall take all necessary measures to avoid rutting. No extra cost can be claimed for taking the necessary measures, including over excavating and planning a deeper road structure.
 - .3 The Contractor has to select the right work method and equipment to respect the contract's objectives and schedule. In any case, the Contractor remains technically and financially the only person responsible of he's decisions and work. He shall not undertake any work implying additional cost without the pre-approval of the Department Representative. He also has to submit a weekly countdown of the quantities of work executed and to be done. The location of the contaminated materials is presented in the annex of the present quote. The Contractor has to survey the site to follow the grades and excavation zones identified on the plan.

- .4 Soils and residual materials will be excavated in zones and layers while avoiding to mixing them. If necessary, access ramps will be built to reach the bottom of excavations. The Contractor shall undertake selective excavation of existing material in sectors and the predetermined levels by the Departmental Representative. The Contractor shall provide all necessary cooperation to the progress of the work to ensure that the site rehabilitation objectives will be achieved. The Contractor shall consider the lateral extent and elevations defining the horizons in ways that the excavation may be different from those provided in the plans. Similarly, it is also possible that local over-excavations be carried out to achieve the rehabilitation goals.
- .5 The Contractor shall consider that a Departmental Representative will be present for the duration of the excavation work and that he may, at any time, stop the work in one area to go ahead with observations, samplings and analyzes.
- .6 Excavations of the fraction of the lots to rehabilitate must begin in the location of the survey having shown contamination, or nearby, and move radially outward. This procedure aims to locate contaminated horizons described in survey reports while limiting the volume of material to be excavated.
- .7 Excavation slopes must meet the requirements contained in the "Safety Code for the Construction Work."
- .8 Soil and residual materials excavated within the limits of the basin will be managed off-site directly from the excavations. Soil and residual materials will be transported in a place authorized by the MDDELCC. The sites selected for the management of these materials must be approved by the Departmental Representative prior to the start of the works. The Contractor will be responsible for the sites selection. He will manage these materials so as to promote the principle of source reduction, reuse, recycling and recovery. The management of excavated material is supervised by the Departmental Representative which decides the level of the soils.
- .9 Each of the materials and soil loads transported off site must be monitored by the Departmental Representative, including through the issuance of transport tickets or weighing notes signed by him and by the Contractor. A weight ticket (proof of receipt) issued by the controller of contaminated soil and the head of the disposal site must be given to the Departmental Representative, for each trip.
- .10 During the work, the bottom of the excavation must be kept dry. To do this, one or more low points should be developed to collect water from precipitation that will be falling into the excavation. They will be placed at suitable locations, depending on the depth and location of contaminated soil to be removed. The pumped water will be directed to temporary storage tanks. The Contractor must minimize the release of particles in suspension by the installation of sediment barrier or curtain of turbidity or other as required. The quality of the reclaimed water will be determined following the sampling test results conducted by the Departmental Representative. The scan time will be 48 hours. The period begins at the time of sample collection on site, which will be at 17h. In cases where the analyzes show that levels meet discharge criteria to the storm or sanitary sewer or to the river, the Contractor shall be authorized to discharge the waters in the storm or sanitary network of the city or directly to the river as appropriate. The Contractor

is responsible for the choice of its water management method, which must be approved by the Departmental Representative prior to the beginning of the work.

- .4 The Contractor will provide the necessary equipment's to execute all the operations linked to the excavation of materials. The equipment's are backhoe type or hydraulic shovels mounted on caterpillar tracks. The buckets used have to maintain smooth and non-reshuffled surface in the excavation trenches. The Contractor shall use a comb bucket to sift and to set apart the rough materials or waste.
- .5 Trucks that contain watertight buckets with cover will be used to transport materials off-site (residual soil and materials).
- .6 During the excavation, the Contractor has to recuperate all the fossil bearing rocks from the waste, get rid of the soil lump and store it on site in the indicated area. Once the designated storing area on site is at full capacity, dispose of the waste according to the present section.

3.10 SITE QUALITY CONTROL

- .1 Fill material and spaces to be filled to be inspected and approved by Departmental Representative.
- .2 The Contractor will punctually provide a mechanical shovel of Caterpillar 320 type or equivalent to the Departmental Representative. This shovel will be used to obtain samples of ground in exploration trenches by the Departmental Representative. These trenches are proposed around test pits F-05-2016, F-07-2016 and F-08-2016.

3.11 BACKFILLING – ACCESS ROAD AND AREAS RESERVE TO CONTRACTOR

- .1 Start backfilling only after inspection and receipt of written approval of fill material and spaces to be filled from Departmental Representative.
- .2 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.
- .3 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.
- .4 Compaction of subgrade: compact existing subgrade under walks, paving, and slabs on grade, to same compaction as specified for fill. Fill excavated areas with selected subgrade material compacted as specified for fill.
- .5 Placing
 - .1 In accordance with plan indications.
 - .2 Place backfill, fill and base course material in 150 mm lifts. Add water as required to achieve specified density.
 - .3 Place unshrinkable fill in areas as indicated. Consolidate and level unshrinkable fill with internal vibrators.
- .6 Compaction: compact each layer of material to following densities for material to ASTM D698:
 - .1 Base courses: 95%. (Access route and reserved zone for Contractor use)

3.12 GRADING

- .1** Grade the ground according indications on drawings.

3.13 CLEANING

- .1** Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1** Dispose of cleared and grubbed material off site daily.
- .2** Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3** Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 35 21 – Waste Management and disposal of construction/demolition.
- .4** Once the installation work and performance control is completed, evacuated surplus materials, rubbish, tools and equipment from the site.

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1 Section 01 29 00 – Payment procedures.
- .2 Section 31 00 00 – Earthwork for Minor Work.

1.2 REFERENCE

- .1 Ministère des Transports, de la Mobilité durable et de l'Électrification des transports du Québec
 - .1 Collection Normes - Ouvrages routiers, Tomes I à VIII
 - .2 Répertoire des dispositifs de signalisation routière (<http://www.rsr.transports.gouv.qc.ca/>)
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM A313/A313M-13, Standard Specification for Stainless Steel Spring Wire.
 - .2 ASTM A764-07(R2012), Standard Specification for Metallic Coated Carbon Steel Wire, Coated at Size and Drawn to Size For Mechanical Springs.
- .3 Canadian Standards Association (CSA)
 - .1 CAN/CSA-G164-M92 (R 2003, hot galvanization of irregular form objects.

1.3 SCOPE OF WORK

- .1 The bridge repair work requires two cofferdam to permit the dry installation of the gabions. After the installation of the gabions, pumping the water inside the enclosure of the cofferdam shall be executed according to the environmental criteria's in Section 01 35 43 – Protection of the environment, in the recent document.
- .2 Revegetation and seeding is required for vegetated gabions as well as for slopes and flat areas next to the bridge.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21- Waste Management and disposal of construction/demolition.
- .2 Collect and separate plastic, paper packaging, corrugated cardboard, in accordance with Waste Management Plan.
- .3 Place materials defined as hazardous or toxic in designated containers.
- .4 Fold up metal banding, flatten and place in designated area for recycling.
- .5 Divert left over aggregate material from landfill to a local facility as approved by Departmental Representative.
- .6 Divert left over metal materials to a local recycling facility as approved by Departmental Representative.

- .7 Divert left over geotextiles from landfill to a local plastic recycling facility as approved by Departmental Representative.

1.5 COFFERDAM

- .1 The present requirements concern the preparation of drying work required to begin strengthening the bridge's abutment with gabions.
- .2 Cofferdam Conception:
 - .1 The conception, placement and dismantling of the temporary cofferdam are the Contractor's responsibility.
 - .2 The Contractor has to forecast the adequate pumping method to dry out the enclosure work and to pump the infiltrated water as soon as they resurge.
 - .3 The Contractor will submit he's cofferdam and pumping concept to the Departmental Representative.
- .3 Quality protection of the river's water
 - .1 During the placement of the cofferdam, the enclosure work drying operations and the dismantling of the cofferdams, the Contractor has to forecast and put in place all the ways to stop the migration of the suspended particles in the river's water
 - .2 The water pumped from the enclosure during its clearing process and during the work shall respect the discharge criteria's for the suspended materials of the river, before disposing of it in this area.
 - .3 The Contractor shall present to the Departmental Representative all the measures he will adopt to protect the quality of the river's water.
 - .4 The discharge standard for the suspended materials has a maximum increase of 25 mg/liter compared to the natural levels of the river. However, during the implementation of the cofferdams, an increase in suspended materials is tolerated over a distance of 50m from the installation, upstream from the turbidity curtain that will need to be installed in the river before the cofferdam.
 - .5 The Contractor will provide all the necessary equipment to carry out the water pumping operations related to maintaining dry excavations, as well as the trucks and the other equipment's. The polluted water to be pumped when washing the wheels of vehicles are included in this category, as well as the waters pumped inside the cofferdam during the bridge's repair. He will also provide temporary storage tanks for the pumped water in order to allow verification of quality. The Contractor shall provide the equipment and manpower needed to treat on site or eliminate offsite in an authorized place the water pumped and stored that do not respect the discharge criteria's of the storm or sanitary sewer water of the city of Montreal or the discharge criteria's in the «Rivière des Prairies»
- .4 Grading
 - .1 The excavations done in the river bed have to be done dry. This applies to the installation of the fill materials.
- .5 Waste Management

- .1 The backfill has to be managed according to the current regulations and to the unloading criteria's of the disposal sites. The Contractor has the responsibility of selecting the disposal site.

PART 2 - Products

2.1 MATERIALS

.1 Gabion

- .1 The gabions (or gabion baskets) have to be factory fabricated so that sides, ends, lid, partitions and internal diaphragms can be readily assembled at site into rectangular baskets of sizes as indicated.
- .2 Single unit construction or with joints having strength and flexibility equal to that of mesh.
- .3 Provide diaphragms of same mesh as gabion walls, when length exceeds horizontal width. Diaphragms to divide basket into equal cells of length not to exceed horizontal width.
- .4 Wire mesh gabions

Wire mesh: uniform hexagonal pattern wire woven in triple twist pattern with openings of approximately 80 x 100 mm, non-raveling.

Securely selvedge perimeter edges to form joints connecting selvedges with same strength as mesh body.

Wire to have following dimensions:

- .1 Mesh: 3.0 PVC covered wire 2.4 mm diameter.
- .2 Selvedges: 3.8 PVC covered wire 3.4 mm diameter.
- .3 Binding: 2.0 mm diameter.

Wire: hot dip galvanized with minimum coverage of 260 g/m² to conform with the CAN/CSA G164 standard. Cover with minimum 0.5 mm thick poly vinyl chloride coating.

Interlocking wire fasteners: galvanized steel to ASTM A764, finish 1, class 1, type 3, stainless steel to ASTM A313.

.5 Geogrid gabions:

Geogrid mesh: rigid type, uniform, square pattern, non-corrosive, high density polyethylene with inhibitors added to resist deterioration by ultra-violet and heat exposure.

- .1 Geogrid openings: 50 x 50 mm.

Geogrid mechanical properties: tensile modulus at 2% elongation: modified to manufacturer's recommendations, minimum 290 kN/m.

- .2 Junction strength: minimum 90% of single rib strength.

.2 Gabion mats

- .1 The gabions (or gabion baskets) have to be factory fabricated so the sides, ends, lid, partitions and internal diaphragms can be ready to assemble at site into rectangular mats.

- .2 Single unit construction or with joints having strength and flexibility equal to that of mesh.
 - .3 Provide diaphragms of same mesh as gabion walls, when length exceeds horizontal width. Diaphragms to divide mat into equal cells not to exceed 1 m x 3 m.
 - .4 Wire mesh gabion mats:

Wire mesh: uniform hexagonal pattern wire woven in triple twist pattern with openings of approximately 80 x 100 mm, non-raveling.

 - .1 Securely selvedge perimeter edges of mesh to form joints connecting selvedges with same strength as mesh body.

Wire to have following dimensions:

 - .2 Mesh: 2.20 mm diameter.
 - .3 Selvedges: 2.65 mm diameter.
 - .4 Binding: 2.20 mm diameter.

Wire: hot dip galvanized with minimum coverage of 260 g/m² to CAN/CSA-G164.
Interlocking wire fasteners: galvanized steel to ASTM A764, finish 1 class 1, type 3, stainless steel to ASTM A313.
 - .5 Geogrid gabion mats:

Geogrid mesh: rigid type, uniform, square pattern, non-corrosive, high density polyethylene with inhibitors added to resist deterioration by ultra-violet and heat exposure. Geogrid opening: 50 x 50 mm.

Geogrid mechanical properties:

 - .1 Tensile modulus at 2% elongation: minimum 290 kN/m.
 - .2 Junction strength: minimum 90% of single rib strength.
- .3 Stone fill
- .1 Hard, durable, abrasion resistant, capable of resisting degradation from action of wetting and drying, wave action, freezing and thawing cycles.
 - .2 Minimum 100 mm to maximum 200 mm dimension for individual stones.
 - .3 The cell fill has to be done manually with stones to the 14501 Standard of the “Ministère des Transports, de la Mobilité durable et de l'Électrification des transports du Québec”.
- .4 Geotextile filter: the geotextile used has to be of IV type.
- .5 Vegetated Gabions
- .1 The gabions (or gabion baskets) have to be factory fabricated so the sides, ends, lid, partitions and internal diaphragms can be ready to assemble at site into rectangular mats of sizes as indicated on the plan.
 - .2 Single unit construction or with joints having strength and flexibility equal to that of mesh.
 - .3 Provide diaphragms of same mesh as gabion walls, when length exceeds horizontal width. Diaphragms to divide basket into equal cells of length not to exceed horizontal width.

.4 Wire mesh gabion mats

Wire mesh: uniform hexagonal pattern wire woven in triple twist pattern with openings of approximately 80 x 100 mm, non-raveling.

- .1** Securely selvedge perimeter edges of mesh to form joints connecting selvages with same strength as mesh body.

Wire to have following dimensions:

- .2** Mesh: 2.20 mm diameter.
.3 Selvages: 2.65 mm diameter.
.4 Binding: 2.20 mm diameter.

Wire: hot dip galvanized with minimum coverage of 260 g/m² to CAN/CSA-G164.

Interlocking wire fasteners: galvanized steel to ASTM A764, finish 1 class 1, type 3, stainless steel to ASTM A313.

.5 Fill Materials:

The interior of the gabion, the bottom and sides, will be lined with a woven geotextile type TBS64 with filtration openings of 600 µm, with an overlap of at least 30 cm from each edge. Then inside of the geotextile, the bottom and sides will be lined again with an erosion control blankets 100% coconut, with an overlap of at least 30 cm from each edge.

A sufficiently long edge of coco fiber mattress's will start from the rear inner side to fall back on the inner front side of the gabion and so to close the upper surface of the gabion after its fill.

Vegetated gabions will be filled with a homogeneous mixture of stones and soil (50%: 50%) then the mixture will be compacted before folding the coco fiber mat to cover the surface and the mesh cover of the gabion. The topsoil must have the following physico-chemical characteristics:

PHYSICO-CHEMICAL ANALYSIS	
pH	6 - 7
Organic matter (Walkley Black)	> 15 %
C.E.C. (Cation exchange capacity)	10 - 20 meq. / 100 g of soil
Salinity (electric conductance)	< 3,5 mmhos / cm
Compaction	35%
P (Phosphorus) Mehlich 3	> 85 ppm
K (Potassium) Mehlich 3	> 260 ppm
Mg (Magnesium) Mehlich 3	> 280 ppm
Ca (Calcium) Mehlich 3	> 2400 ppm
Saturated packed density	1325 kg / m ³
Sifting dimension	20 mm
Composition : lime, compost, organic fertilizer, sand, black soil Recycled imputc : 20 %	

.6 Vegetating Gabions

The upper side of gabions must be vegetated with a row of large-sized plants (pfd) of riverbank vines (*Vitis riparia*) spaced 30 cm between each. Then the rest of the gabion will be planted with large-sized plants (pfd) of common ninebark (*Physocarpus opulifolius*) and bush honeysuckle (*Diervilla lonicera*) spaced 50 cm between plants and placed staggered.

Shrub species to plant in vegetated gabions

Common name	Latin name	Format	Spacing (cm)	Quantity per gabion
Riverbank grape	<i>Vitis riparia</i>	hdp	30	7
Common ninebark	<i>Physocarpus opulifolius</i>	hdp	50	4
Bush honeysuckle	<i>Diervilla lonicera</i>	hdp	50	3

*HDP: high dimension plant

Representation of planted species in vegetated gabions

P	P	P	P
	D	D	D
V	V	V	V

.7 Ensemencement hydraulique

Composition of grasses and legume mix¹

Latin name	Common name	Quantity (%)
<i>Festuca rubra</i>	Red fescue	45
<i>Festuca ovina</i>	Sheep fescue	25
<i>Poa compressa</i>	Canada bluegrass	15
<i>Agrostis alba</i>		5
<i>Trifolium repens</i>	White clover	5
<i>Trifolium pratense</i>	Red clover	5

¹Mix of seeds Herbio® Restauration 2016 de Gloco inc.

Herbaceous honey plants mix¹

Latin name	Common name	%
<i>Asclepias syriaca</i>	Common milkweed	10
<i>Coreopsis lanceolata</i>	Lanceleaf coreopsis	10,7
<i>Chamerion angustifolium</i>	Fireweed	0,3
<i>Desmodium canadense</i>	Showy ticktrefoil	10

<i>Eutrochium maculatum</i>	Spotted joe pye weed	1
<i>Heliopsis helianthoides</i>	Smooth oxeye	20
<i>Liatris spicata</i>	Dense blazing star	20
<i>Lolium multiflorum</i>	Italian rye-grass	25
<i>Solidago canadensis</i>	Canada goldenrod	1
<i>Symphotrichum novae-angliae</i>	New England aster	1
<i>Trifolium arvense</i>	Rabbitfoot clover	1

¹Seed mix « Indigo Plantes mellifères vivaces »

PART 3 - Execution

3.1 INSTALLATION OF GABIONS

- .1 Install gabions and geotextiles to lines and grades as indicated. Follow manufacturer's instructions in assembling of gabions and mats.
- .2 Excavate and fill for the installation of the gabions in accordance with Section 31 00 99 – Earthwork for Minor Work.

3.2 PLACING GABIONS

- .1 Wherever possible, place gabions and mats in position prior to filling with stones.
- .2 Join adjacent gabions mats together at corners as recommended by manufacturer, to ensure joints are as strong as mesh.
- .3 For underwater placement, prefill gabions. Provide special devices to handle filled gabions and mats without distortion and to place them in position. Connect adjacent gabions together when in place using a diver.

3.3 FILLING BASKETS AND MATS

- .1 Tension geogrid gabions according to manufacturer's instructions before filling with stone. Do not release wall tension until sufficient stone fill has been placed to prevent wall slackening.
- .2 On exposed faces of gabions, place stones by hand with flattest surfaces bearing against face mesh to produce satisfactory alignment and appearance.
- .3 For wire mesh gabions, fill gabion cells in lifts not to exceed 300 mm and connect opposite walls with two tie wires after each lift.
- .4 For geogrid gabions, fill cells in lifts not to exceed 300 mm and connect opposite walls with two polyethylene braids after each lift.

3.4 SEEDING OF SLOPES AND FLAT AREAS NEXT TO THE BRIDGE

- .1 Proceed to manual or hydraulic seeding of the two seed mixes in equivalent 50:50 proportions at the rate recommended by suppliers for each of the mixes. Fertilizer may not be added during seeding. Cover seeding with 100% coconut anti-erosion mats.

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1 Section 01 74 11 – Cleaning

1.2 Products Supplied only for this Section

- .1 The Departmental Representative will provide the concrete binder, which will be delivered to the site by truck.
- .2 Inform the Departmental Representative of the date of implementation of the materials. The program of order and delivery of materials must coincide with the work schedule.

1.3 MEASURE FOR PAYMENT

- .1 Measure the road concrete pavement in metric tons of bituminous concrete actually incorporated in the work.
- .2 Measure the supply of asphalt binder in liters, at a temperature of 15 degrees Celsius.
- .3 Measure the supply of slaked lime in metric tons.

1.4 REFERENCES

- .1 American Association of State Highway and Transportation Officials (AASHTO)
 - .1 AASHTO M320-10, Standard Specification for Performance Graded Asphalt Binder.
 - .2 AASHTO R29-08, Standard Specification for Grading or Verifying the Performance Graded of an Asphalt Binder.
 - .3 AASHTO T245-97(2008), Standard Method of Test for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.
- .2 Asphalt Institute (AI)
 - .1 AI MS-2-1994, Mix Design Methods for Asphalt Concrete and Other Hot-Mixes.
- .3 ASTM International
 - .1 ASTM C88-05, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
 - .2 ASTM D698-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ [600 kN-m/m³]).
- .4 Gouvernement du Québec, Transports Québec
 - .1 Cahier des charges et devis généraux (CCDG) - Infrastructure routières - Construction et réparation, édition 2013.
- .5 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS 302-2012, Construction Specification for Primary Granular Base.

- .2 OPSS 310-2012, Construction Specification for Hot Mixed Asphalt.
- .3 OPSS 314-2004, Construction Specification for Untreated Granular, Subbase, Base, Surface Shoulder and Stockpiling.
- .4 SP 110S13-2011, Amendment to OPSS 1010, Material Specification for Aggregates, Granular A, B, M and Select Subgrade Material.
- .5 OPSS 1103-2012, Material Specification for Emulsified Asphalt.
- .6 OPSS 1150-2010, Material Specification for Hot Mixed Asphalt.
- .6 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - édition courante.
 - .1 MPI #32, Traffic Marking Paint, Alkyd.
- .7 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 – Action and Informational Submittals.
- .2 Product Data
 - .1 Submit product data and instructions and the manufacturer's documentation for concrete mixtures and aggregates. The technical data must include product characteristics, performance criteria, size, finish and limits.
 - .2 Four weeks before the start of the work, submit the viscosity-temperature graph of the proposed concrete binder, indicating either the viscosity Saybolt Furol in seconds, the cinematic viscosity in centistokes, for a temperature range of 105 to 175 degrees Celsius.
- .3 Samples
 - .1 Four weeks before the start of work, notify the Departmental Representative of the proposed source of supply for aggregates and provide access

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver aggregates and pile them up. Before undertaking the preparation of concrete mixture, put in piles at least 50% of the total quantity of required aggregates.
- .2 When is necessary to mix aggregates from one or more sources to obtain a mixture of the required particle size, do not combine different types of aggregates in the same job.
- .3 Pile separately small and large aggregates; it is permissible to pile mixtures with more than two different types of aggregates.
- .4 Provide storage areas, heating tanks and pumping facilities previously approved for the concrete binding.
- .5 Upon receipt of the concrete binder, submit to the Departmental Representative copies of transport bills and of road sheets.

- .1 Departmental Representative reserves the right to check the materials upon their arrival.

PART 2 - Products

2.1 MATERIALS

- .1 Aggregates to: OPS 110S13.
 - .1 Granular A.
 - .2 Granular B Type I.
 - .3 Select subgrade.
- .2 Prime coat: SS-1 to OPSS 1103.
- .3 Tack coat: SS-1 to OPSS 1103.
- .4 Asphalt concrete: to OPSS 1150.
- .5 Aggregates: to CCDG.
 - .1 Crushed Granular MG 20.
 - .2 Natural Gravel 80-0.
 - .3 Gravel and sand.
- .6 Prime coat: RC-30 to CCDG.
- .7 Tack coat: SS-1 to CCDG.
- .8 Asphalt concrete: to CCDG.
- .9 Prime coat: 0.15 to 0.25 L/m².
- .10 Traffic paint: yellow to MPI #32.

PART 3 - Execution

3.1 EXAMINATION

- .1 Verification of Conditions: before installing the bituminous coating floor, ensure that the state of surfaces/supports previously implemented under other sections or contracts is acceptable and can perform the work in accordance with the written instructions of the manufacturer.
 - .1 Visual inspection of surfaces/supports in the presence of the Departmental Representative.
 - .2 Immediately notify the Departmental Representative of unacceptable conditions detected.
 - .3 Proceed with installation only after correcting the unacceptable conditions and received written approval of the Departmental Representative.

3.2 FOUNDATIONS

- .1 Foundations for roadways comprise:
 - .1 300 mm compacted thickness of granular subbase 56-0.
 - .2 150 mm compacted thickness of granular base 20-0.
- .2 Construction of granular foundations: CCDG.
- .3 Compaction: compact each lift of granular material to 100% maximum density to ASTM D698. Maximum lift thickness: 150 mm.

3.3 PAVEMENT THICKNESS

- .1 Pavements for roadways:
 - .1 Base course: 40 mm HL8.
 - .2 Wear course: 25 mm HL3.

3.4 PAVEMENT CONSTRUCTION

- .1 Application of prime coat: OPSS 302.
- .2 Construction of asphalt concrete: OPSS 310.
- .3 Surface preparation: CCDG.
- .4 Application of prime coat and tack coat: CCDG.
- .5 Construction of asphalt concrete: CCDG.

3.5 TRAFFIC MARKINGS

- .1 Paint parking space divisions and other pavement markings in accordance with manufacturers recommendations and as indicated.
- .2 Use paint thinner in accordance with manufacturer's requirements.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: Dispose of surplus materials, waste, tools and equipment's from the work site, according to section 01 74 11 – Cleaning.

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1 Section 01 29 00 Payment

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A53/A53M-10 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A90/A90M-09, Standard Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
 - .3 ASTM A123/A123M-09, Standard Specification for Zinc (Hot Dip Galvanized) coatings on Iron and Steel Products.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-138.1, Fabric for Chain Link Fence.
 - .2 CAN/CGSB-138.2, Steel Framework for Chain Link Fence.
 - .3 CAN/CGSB-138.3, Installation of Chain Link Fence.
 - .4 CAN/CGSB-138.4, Gates for Chain Link Fence.
- .3 CSA International
 - .1 CSA A23.1-14/A23.2-F09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A3000-F08, Cementitious Materials Compendium.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 – Action and Informational Submittals.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for concrete mixes, fences, posts and gates and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Construction Waste Management:
 - .1 According to section 017421 – Construction/Demolition Waste Management and Disposal.

1.4 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 in accordance with manufacturer's recommendations.
 - .2 Store and protect fence and gate materials from damage.
 - .3 Replace defective or damaged materials with new.

PART 2 - Products

2.1 MATERIALS

- .1 Concrete mixes and materials: in accordance with CSA A23.1 standards.
 - .1 Nominal coarse aggregate size: 20-5.
 - .2 Compressive strength: 30 MPa minimum at 28 days.
- .2 Chain-link fence fabric: to CAN/CGSB-138.1 standards.
 - .1 Fabric Type 1, Class B, medium kind, grade 2.
 - .2 Height of fabric: 2.2 m.
- .3 Posts, braces and rails: to CAN/CGSB-138.2, galvanized steel pipe, 88,9 mm diameter for the corner post and gate extrimities, 60,3 mm for the line post.
- .4 Tension wire: to CAN/CGSB-138.2, single strand, galvanized vinyl coated steel wire.
- .5 Tie wire fasteners: steel wire vinyl coated.
- .6 Tension bar: to ASTM A653/A653M, 5 x 20 mm minimum galvanized steel.
- .7 Gates: to CAN/CGSB-138.4.
- .8 Gate frames: to ASTM A53/A53M, standard weight, 50 mm outside diameter pipe for outside frame, 40 mm outside diameter pipe for interior bracing.
 - .1 Furnish double swing gates with chain hook to hold gates open and centre rest with foot bolt for closed position.
- .9 Fittings and hardware: to CAN/CGSB-138.2, galvanized steel.
 - .1 Tension bar bands: 3 x 20 mm minimum galvanized steel or 5 x 20 mm minimum aluminum.
 - .2 Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.
 - .3 Turnbuckles to be drop forged.
- .10 Grounding rod: copperweld rod, 16, 3 m long.
- .11 A locking system consisting of two (2) safety chains, at least 600 mm long, industrial strength, steel, each with a padlock and key 3 copies, for locking at the top and bottom of the gate.

2.2 FINISHES

- .1 Galvanizing:**
 - .1** For chain link fabric: to CAN/CGSB-138.1 Grade 2.
 - .2** For other fittings: to ASTM A123/A123M standards.
- .2 Vinyl coating: to ASTM F1664.**
 - .1** 0.045 mm dry film thickness minimum.

PART 3 - Execution

3.1 EXAMINATION

- .1** Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for fence and gate installation in accordance with manufacturer's written instructions.
- .2** Visually inspect substrate in presence of Departmental Representative.
- .3** Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .4** Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:**
 - .1** Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to Section 013543 – Environment Protection
 - .2** Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3** Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .2 Grading:**
 - .1** Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.
 - .1** Provide clearance between bottom of fence and ground surface of 30 mm to 50 mm.

3.3 ERECTION OF FENCE

- .1** Erect fence along lines as indicated and to CAN/CGSB-138.3.

- .2 Excavate post holes with an auger to allow the installation of a Sonotube of 1400mm deep.
 - .1 The diameter of the sonotube must be of 350mm for posts of 88,9mm of diameter.
 - .2 The diameter of the sonotube must be of 250mm for posts of 60,3mm of diameter.
- .3 Space line posts maximum 3.5 m apart, measured parallel to ground surface.
- .4 Install end posts at end of fence and at buildings.
 - .1 Install gate posts on both sides of gate openings.
- .5 Place concrete in post holes then embed posts into concrete to depths indicated to minimum 1000 mm.
 - .1 Extend concrete 30 mm above ground level and slope to drain away from posts.
 - .2 Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.
- .6 Install fence fabrics after concrete has cured, minimum of 5 days.
- .7 Install brace between end and gate posts and nearest line post, placed in center of panel and parallel to ground surface.
 - .1 Install braces on both sides of corner and straining posts in similar manner.
- .8 Install overhang tops and caps.
- .9 Install top rail between posts and fasten securely to posts with overhang tops and caps.
- .10 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.
- .11 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals.
 - .1 Knuckled selvedge at bottom.
 - .2 Twisted selvedge at top.
- .12 Secure fabric to top rails, line posts and bottom tension wire with tie wires at 450 mm intervals.
 - .1 Give tie wires minimum two twists.
- .13 Secure barbed tape and fasten to each extension wire.
- .14 Install grounding rods as indicated.

3.4 INSTALLATION OF GATES

- .1 Install gates in locations as indicated on plans.
- .2 Level ground between gate posts and set gate bottom approximately 40 mm above ground surface.
- .3 Determine position of centre gate rest for double gate.
 - .1 Cast gate rest in concrete as directed.

.2 Dome concrete above ground level to shed water.

.4 Install gate stops where indicated.

3.5 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 35 21 – Construction/Demolition Waste Management and disposal.

END OF SECTION

PART 1 - General

1.1 RELATED SECTIONS

- .1 Section 01 29 00 – Payment procedures
- .2 Section 03 30 99 – Clearing and Grubbing.
- .3 Section 35 42 19 – Preservation of Water Courses and Wetlands.

1.2 REFERENCES

- .1 American National Standard Institute (ANSI)
 - .1 ANSI A300 (Part 1)-2001, Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance - Standard Practices (revision and re-designation of ANSI A300-1995) (includes supplements.
 - .2 ANSI A300 (Part 2)-1998, Tree Care Operations - Tree, Shrub, and Other Woody Plant Maintenance - Standard Practices - Part2 - Fertilization.
 - .3 ANSI A300 (Part 3)-2000, Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance: Standard Practices – Part 3 - Tree Support Systems (a. Cabling, Bracing, and Guying) (supplement to ANSI A300-1995).
- .2 Canadian Nursery Landscape Association (CNLA)
- .3 International Society of Arboriculture (ISA)
- .4 Ontario Ministry of Agriculture, Food and Rural Affairs
 - .1 Publication 483-2004, Pruning Ornamentals.

1.3 DEFINITIONS

- .1 Crown Cleaning: consists of selective removal of one or more of following items: dead, dying or diseased branches, weak branches and water sprouts.
- .2 Crown Thinning: consists of selective removal of branches to increase light penetration, air movement and reduce weight.
- .3 Crown Raising: consists of pruning the lower branches of a tree to raise the crown of the tree and form height as long as possible to facilitate the passage of people and vehicles.
- .4 Crown Reduction or Crown Shaping: decreases tree height and/or spread.
- .5 Vista Pruning: is selective thinning of framework limbs or specific crown areas to improve views.
- .6 Crown Restoration: improves structure, form and appearance of trees that have been damaged.

1.4 QUALITY ASSURANCE

- .1 Certification: Canadian Nursery Landscape Association certification.

- .2 Regulatory requirements: provide safety certificate as approved by local hydro utility.
- .3 Field Samples: do sample pruning in manner to enable Departmental Representative to identify:
 - .1 Knowledge of target areas including branch bark ridge and branch collars.
 - .2 Technique for selection process and pruning used to establish desired form and shape for each species.
- .4 Acceptance of Work will be determined by Departmental Representative from field sample.
- .5 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 – Health and Safety.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Waste Management and disposal of construction/demolition.
- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Dispose of unused disinfectant at official hazardous material collections site approved by Departmental Representative.
- .4 Ensure emptied containers are sealed and stored safely.
- .5 Disposal of wood material must conform to the separation of waste at source program for wood resource.

1.6 TOOL MAINTENANCE

- .1 Ensure that tools are clean and sharp throughout pruning operation: do not use tools that crush or tear bark.
- .2 Disinfect tools before each tree is pruned.
- .3 On diseased plant material disinfect tools before each cut.

PART 2 - Products

2.1 DISINFECTANT

- .1 20% solution of sodium hypochlorite or 70% solution of ethyl alcohol.

PART 3 - Execution

3.1 APPLICATION

- .1 Manufacturer's instructions: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 GENERAL

- .1 Prune in accordance with ANSI A300 standard, and as directed by Departmental Representative. Where discrepancies occur between standard and specifications, specifications govern.
- .2 Notify immediately Departmental Representative conditions detrimental to health of trees or pruning operations.
- .3 Prune during plant dormant period or after leaves have matured. Avoid pruning during leaf formation, at time of leaf fall, or when seasonal temperature drops below minus 10°C.
- .4 Prune each species when in full leaf.
- .5 Retain natural form and shape of plant species.
- .6 Do not:
 - .1 Flush cut branches.
 - .2 Crush or tear bark.
 - .3 Cut behind branch bark ridge.
 - .4 Damage branch collars.
 - .5 Damage branches to remain.

3.3 PRUNING

- .1 Remove dead, dying, diseased and weak growth from trees to provide crown cleaning as designated by Departmental Representative in order to promote healthy growth.
- .2 Remove live branches that:
 - .1 Interfere with healthy development and structural strength including branches crossed or rubbing more important branches.
 - .2 Are of weak structure including narrow crotches.
 - .3 Obstruct development of more important branches.
 - .4 Are broken.
- .3 Remove live branches to re-establish natural species form including:
 - .1 One or more developing leaders.
 - .2 Multiple growth due to previous topping.
 - .3 Branches extending outward from natural form.
 - .4 Undesirable sucker growth.
- .4 Remove loose branches, twigs and other debris lodged in tree.
- .5 Remove vines.
- .6 For branches under 50 mm in diameter:

- .1 Locate branch bark ridge and make cuts smooth and flush with outer edge of branch collar to ensure retention of branch collar. Cut target area to bottom of branch collar at angle equal to that formed by line opposite to branch bark ridge.
- .2 Make cuts on dead branches smooth and flush with swollen callus collar. Do not injure or remove callus collar.
- .3 Do not cut lead branches unless directed by Departmental Representative.
- .7 For branches greater than 50 mm in diameter:
 - .1 Make first cut on lower side of branch 300 mm from trunk, one third diameter of branch.
 - .2 Make second cut on upper side of branch 500 mm from trunk until branch falls off.
 - .3 Make final cut adjacent to and outside branch collar.
- .8 Ensure that trunk bark and branch collar are not damaged or torn during limb removal.
 - .1 Repair areas which are damaged, or remove damaged area back to next branch collar.
- .9 Remove additional growth designated by Departmental Representative.

3.4 ROOT GIRDLING

- .1 For girdling roots one-quarter size of trunk diameter or larger, V-cut girdling root one-half way through at point where root is crossing.
- .2 Remove exposed portion of girdling root as directed by Departmental Representative after cleanly cutting root flush with grade on each side of parent root. Do not injure bark or parent root.

3.5 CARE OF WOUNDS

- .1 Shape bark around wound to oblong configuration ensuring minimal increase in wound size. Retain peninsulas of existing live bark.

3.6 CLEAN-UP

- .1 Proceed the cleaning work in accordance with Section 01 74 11 - Cleaning.
- .2 Collect compost/recycle whenever applicable pruned material.
- .3 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 SECTIONS

- .1 Section 03 10 00 - Concrete Forming and Accessories
- .2 Section 03 20 00 - Concrete Reinforcing.
- .3 Section 03 30 00 - Cast-in-Place Concrete.
- .4 Section 03 30 51 – Concrete for bridge deck
- .5 Section 03 35 00 – Concrete Finishing
- .6 Section 05 12 33 – Construction Steel for Bridge
- .7 Section 31 00 99 – Earthwork for Minor Work
- .8 Section 31 36 00 - Gabions
- .9 Section 32 31 13 Chain link fences and gates
- .10 Section 32 93 43.01 - Tree Pruning
- .11 Section 01 35 43 – Environmental procedures

1.2 ENVIRONMENTAL REQUIREMENTS

- .1 Operation of construction equipment in water is prohibited. The media must be dried before allowing the rolling of machinery.
- .2 Use borrowed material from watercourse beds only after receipt of written approval from Departmental Representative.
- .3 Dumping excavated fill, waste material, or debris in watercourse or wetland is prohibited.
- .4 Underwater blasting within 100 m of indicated spawning beds is not permitted.

1.3 REFERENCES

- .1 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit documents and samples in accordance with Section 01 33 00 – Documents/Samples to Submit.
- .2 Sustainable Design Submittals:
 - .1 Erosion and Sedimentation Control: submit 1 copy of erosion and sedimentation control plan in accordance with Section 01 35 43 – Environment Protection.

PART 2 - Products (N/A)

PART 3 - Execution

3.1 EXISTING CONDITIONS

- .1 Maintain existing flow pattern in natural watercourse systems and allow the free movement of fish.
- .2 In natural systems, maintain existing riffle pool and step pool patterns.
- .3 In wetland systems, maintain existing hydrological conditions.

3.2 SITE CLEARING AND PLANT PROTECTION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to the sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 and in concordance with Section 01 35 43.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .2 Clear out the land while minimizing disturbance to vegetated buffer zones. Protect trees and plants on site and adjacent properties where indicated.
- .3 Delineate a tree and shrub protection area adjacent to construction work, storage areas and trucking lanes.
- .4 Protect roots of designated trees to dripline (typically corresponds to the surface of the crown) during excavation and site grading to prevent disturbance or damage.
 - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
 - .2 In accordance with Section 31 00 99 - Earthwork for minor work, elimination of waste must conform to the separation of waste at source program (PTDS).
- .5 Remove only trees that have been identified on plans.
- .6 Maintain temporary erosion and pollution control features installed under this contract.

3.3 DRAINAGE

- .1 Pumping water containing suspended materials into watercourse is prohibited beyond the CCME(2002) Standard that has been increased of 25 mg/L compared to natural levels.
- .2 Develop a drainage plan in accordance with Section 01 35 43 – Environment Protection

3.4 SITE RESTORATION

- .1** Upon completion, the site will be cleaned of all debris that will be transported to an authorized LET. Areas disturbed by the work, access route, storage areas, etc. will be restored.

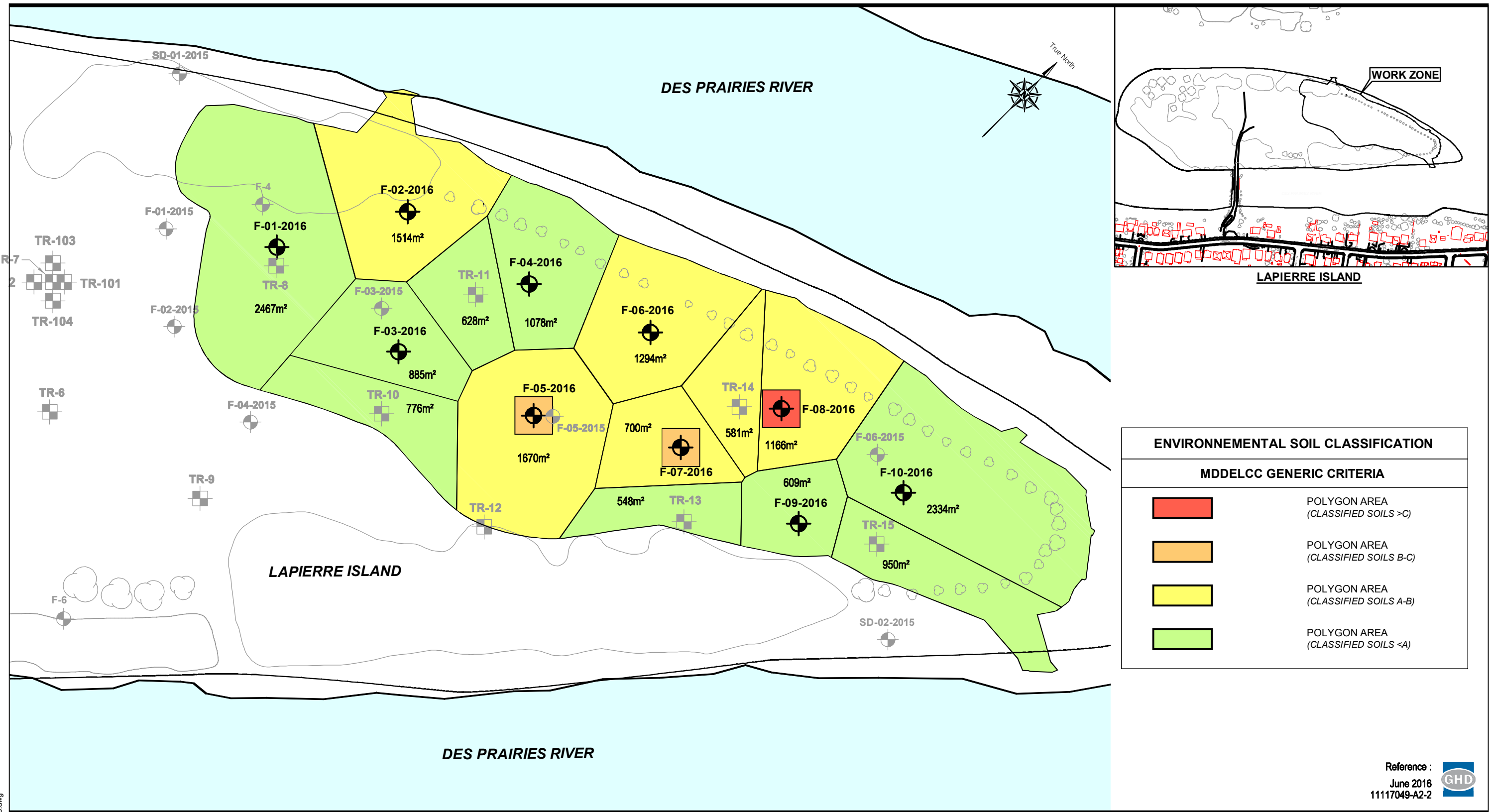
END OF SECTION

Section B – Report of Geotechnical Study

Annex B-1

**Interpretation of the extent of contamination
and summary table of contaminated soil**

Tuesday, 23 August 2016, 11:28
Figure 1 - anglais.dwg
Date d'impression:
Nom du fichier:



LEGEND:	
	F-01-2016 BOREHOLE AND NUMBER
	TR-1 TEST PIT AND NUMBER (INSPIC-SOL, REFERENCE NO. M020690-E2, NOVEMBER 2006)
	F-01-2015 BOREHOLE AND NUMBER
	SD-01-2015 (PREVIOUS STUDIES, YEARS 2016 AND 1981) F-1

AECOM

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514 287-8500 Tel.
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PROJECT NAME:	COMPENSATION FOR LOSS OF FISH HABITAT IN WETLANDS AND CALM WATER LAPIERRE ISLAND
DRAWING NAME:	Interpretation of the Extent of Contamination

DESIGNED BY:	PROJECT NO.:	DATE:
J. Marcotte	60447701	July 2016
DRAWN BY:	SCALE:	
F. Moisan	1:1000	
DRAWING NO.:	REV.:	0

Figure 1

Table 1
Summary of contaminated soil volumes

Project Name: Compensation for loss of fish habitat in wetlands and calm water, Lapierre Island
Project number: 60447701
Client Name: PWGSC

Boreholes	Range of elevation considered contaminated (m)		Area (m²)	Parameters exceeding the criteria or standards ¹					Estimated volumes ² (m³)				
				Soils matrix					Contaminated soils				
	From	To		Range of contamination									
				<A	A-B	B-C	>C	>RBCS	<A	A-B	B-C	>C	>RBCS
F-01-2016	11,49	9,80	2467	PH, PAH, M					4169	0	0	0	0
F-02-2016	10,73	9,80	1514		PAH				0	1408	0	0	0
F-03-2016	11,67	9,80	885	PH, PAH, M					1655	0	0	0	0
F-04-2016	11,19	9,80	1078	PH, PAH, M					1498	0	0	0	0
F-05-2016	11,93	9,80	25			PH			0	0	53	0	0
F-05-2016	11,93	9,80	1670		PH*				0	3557	0	0	0
F-06-2016	11,18	9,80	1294		PH, M				0	1786	0	0	0
F-07-2016	12,06	9,80	25			PH			0	0	57	0	0
F-07-2016	12,06	9,80	700		PH*				0	1582	0	0	0
F-08-2016	11,81	9,80	25				PH		0	0	0	50	0
F-08-2016	11,81	9,80	1166		PH*				0	2344	0	0	0
F-09-2016	11,84	9,80	609	PH, PAH, M					1242	0	0	0	0
F-10-2016	11,61	9,80	2334	PH, PAH, M					4225	0	0	0	0
TR-10	11,70	9,80	776	PH, PAH, M					1474	0	0	0	0
TR-11	11,30	9,80	628	PH, PAH, M					942	0	0	0	0
TR-13	12,10	9,80	548	PH, PAH, M					1260	0	0	0	0
TR-14	11,80	9,80	581		PAH				0	1162	0	0	0
TR-15	11,60	9,80	950	PH, PAH, M					1710	0	0	0	0
									0	0	0	0	0
									0	0	0	0	0
TOTAL :									18176	11839	110	50	0

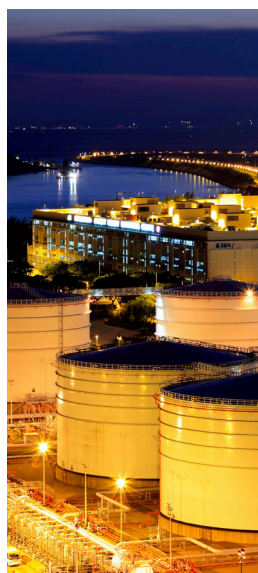
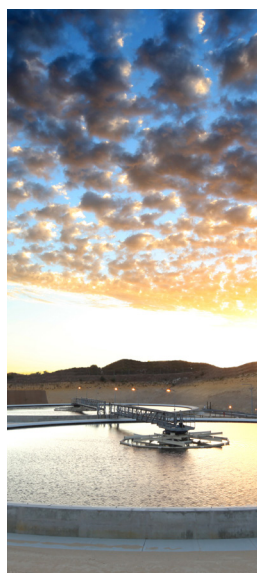
TONNAGE 36353 23677 220 101 0

¹ Refer to appendix 2 of the MSDEFCC Politic and appendix 1 of the RBCS for criteria or standards
M : Metals
PAH : Polycyclic aromatic hydrocarbons
PH : Petroleum hydrocarbons C10-C50

² The hypotheses to define the volumes of contaminated soils are as follows:
• the lateral extent was defined by the midpoint between the boreholes;
• the vertical extent of the affected area was agreed in considering that the entire sample characterized layer or sub-layer stratigraphy where it was picked up;
• excavation slopes are vertical;
• the surface has been multiplied by the thickness selected.

For boreholes F-05-2016, F-07-2016 and F-08-2016, a 25 m² area is determined, sidewalls will be characterized to identify level of contamination.
Approximative Elevation

Annex B-2
Complementary Summary
Environmental Characterization
of the site, Fish habitat compensation
in calm water and wetland,
Île Lapierre, Montreal, Quebec
11117049 | A2 | Report no 2
(GHD Consultants Limitées,
June 28th 2016)



Summary Complementary Environmental Site Characterisation

Construction of a pond on Lapierre Island
Borough of Rivière-des-Prairies–Pointe-aux-Trembles
Montreal, Quebec

AECOM

GHD Consultants Limited
4600, boul. de la Côte-Vertu Montréal Québec H4S 1C7
11117049 | A2 | Report No 2 (EN) | June 23 2016

AECOM

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Summary Complementary Environmental Site Characterisation

Construction of a pond on Lapierre Island
Borough of Rivière-des-Prairies–Pointe-aux-Trembles
Montreal, Quebec

Ref. No.: 11117049-A2 (2) (EN)

June 23, 2016

Prepared by :



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Appendices

Appendix A	Site Plans
Appendix B	Field Logs
Appendix C	Certificates of Chemical Analysis (Maxxam Analytique Inc.)

1. Introduction

The professional services of GHD Consultants Limited (GHD) were retained by AECOM (Client), represented by Mr. Serge Poitras, Architect, to conduct a Summary Complementary Environmental Site Characterisation (ESC) of soils on Lapierre Island in the Borough of Rivière-des-Prairies–Pointe-aux-Trembles in the City of Montreal, Quebec (Site or Property).

Prior to conducting the Summary Complementary Environmental Site Characterisation, GHD (formerly Inspec-Sol) conducted a Phase II ESC (report Reference No. M020690-E2, dated January 2007). The goal of the Phase II ESC, undertaken by GHD, was to assess the environmental quality of the soil at the Site with regard to potential environmental risks identified in the Phase I ESA (report Reference No. M020690-E1, dated November 2006). The program of the previously conducted Phase II included the excavation of 19 test pits (TR-01 to TR-15 and TR-101 to TR-104) and sampling of the soil. In total, 19 soil samples, one (1) from each sampling location, were selected and submitted for chemical analysis of petroleum hydrocarbons (C_{10} to C_{50}), polycyclic aromatic hydrocarbons (PAHs) and six (6) metals (cadmium, chromium, copper, nickel, lead and zinc). Based on the analytical data obtained at the investigated locations, soils classified in range “>C”, “B-C” and “B-C” of generic criteria from the *“Politique de protection des sols et de réhabilitation des terrains contaminés”* (Politique) of the *ministère du Développement durable, de l’Environnement et de la Lutte contre les changements climatiques* (MDDELCC) were identified respectively in locations of Test pits nos TR-7 (HAP), TR-101 (HAP) and TR-102 (HAP).

Additionally, prior to conducting the present investigation, GHD conducted a geotechnical study (report Reference No. 11117049-A1 revision 1, dated April 15 2016) as part of the pond development project. The field program included the drilling of eight (8) boreholes (F-01-2015 to F-08-2015) in the area of the future pond and sampling of the soil. Two (2) samples (SD-01-2015 and SD-02-2015) were collected manually on the northern and southern borders of the island in surface sediments from the Rivière-des-Prairies bed. In total, four (4) soil samples were selected and submitted for chemical analysis of petroleum hydrocarbons (C_{10} to C_{50}), polycyclic aromatic hydrocarbons (PAHs) and 13 metals (silver, arsenic, barium, cadmium, chromium, cobalt, copper, tin, manganese, molybdenum, nickel, lead, zinc). All chemical analysis results for soil samples submitted over the course of the geotechnical study were below the generic “A” criterion for all parameters analysed.

Chemical analysis of studies previously realised on Site by GHD are included in the present report.

The purpose of the present investigation, undertaken by GHD, was to assess the environmental quality of soils and determine the approximate extent of contaminated soils on Site for soils management purposes during excavation work. The following program was carried out for the Summary Complementary Environmental Site Characterisation, as detailed in GHD’s Confirmation dated April 25, 2016 (Proposal No. 11108000-A00386-2):

- Advancement of boreholes;
- Collection of soil samples following guidelines outlined by the *Ministère du Développement durable, de l’Environnement et de la Lutte contre les changements climatiques* (MDDELCC);
- Chemical analysis of a selection of soil samples; and

- Interpretation and qualitative assessment of analytical results in terms of criteria outlined by the *MDDELCC*.

This report includes details of the field work, an outline of the chemical analyses performed, the presentation of results and the corresponding conclusions. It also includes three (3) appendices containing a Site plan depicting a general view of the entire property and borehole locations, and the interpretation of the contamination (Appendix A), field logs of the boreholes (Appendix B), and Certificates of Chemical Analysis (Appendix C).

It should be noted that in parallel to this environmental characterisation, a summary complementary geotechnical study was carried out on site by GHD (Report No. 11117049-A2 (3)) and the report will be forwarded separately. Borehole logs are presented in this report for information purposes. A more detailed description of soil of the Site is included in the geotechnical study.

This report is subject to certain limitations that are a consequence of problems inherent to environmental contamination phenomena. The scope of the study conducted and its applicable limitations are stated at the end of the technical text. These limitations are an integral part of this report and the reader is asked to be aware of them in order to facilitate the understanding, interpretation and usage of this document.

2. Methodology

2.1 Field Work

The field work was carried out between May 10, 2016 and May 19, 2016, under the constant supervision of a GHD technical representative. The work program included the drilling of 10 boreholes (F-01-2016 to F-10-2016), sampling of the soil and the completion of a topographic survey.

The aforementioned boreholes were positioned on Site by a GHD technical representative, considering the location of the underground services and physical limits. All boreholes were drilled in the central and northeast area of the island.

A general view of the entire Site, with field locations of the boreholes, is presented on Plan No. 11117049-A2-1 in Appendix A. The field logs are included in Appendix B.

2.2 Sample Management

The GHD technical representative was at all times responsible for handling the samples collected. A rigorous sample management procedure was followed over the course of this study. The management procedure complies with various *MDDELCC* requirements outlined in its publication entitled “*Guide d’échantillonnage à des fins environnementales*” relating to sample collection, sample identification, temporary storage and safe transportation of samples to the analytical laboratory.

2.3 Topographic Survey

The field survey was carried out by an GHD technical representative. Elevations and the exact location of the boreholes were measured using a Leica® brand precision global positioning system (GPS). Geodetic coordinates were provided according to the projection system Modified Transverse Mercator (MTM) and the North American Datum of 1983 (NAD 83).

3. Chemical Analyses

3.1 Analytical Program

For the present mandate, 20 soil samples, two (2) from each borehole, were selected and submitted for chemical analysis of one or more of the following parameters: petroleum hydrocarbons (C₁₀ to C₅₀), polycyclic aromatic hydrocarbons (PAHs) and 13 metals (silver, arsenic, barium, cadmium, chromium, cobalt, copper, tin, manganese, molybdenum, nickel, lead, zinc).

The choice of parameters to be analyzed is based on our knowledge of the historical Site information, as detailed in previous studies and on contaminants that are likely to be found on Site. This choice is also based on the potential environmental risk identified in each sampling location, such as the presence of hydrocarbon odors, visual evidence of contamination or presence of debris noted during sampling, stratigraphic position, or volatile organic vapour concentrations measured using a photoionisation detection device.

Following the reception of chemical analysis results and the client request, chromatographic profiles were provided by Maxxam laboratory in order to identify the origin of petroleum product from samples F-05-CFE-2, F-07-CFE-5 and F-08-CFE-1 respectively classified in range “B-C”, “B-C” and “>C” of generic criteria for petroleum hydrocarbons (C₁₀ to C₅₀) contamination. These profiles are included in Appendix C.

3.2 Chemical Laboratory

All chemical analyses were performed by Maxxam Analytique Inc. (Maxxam), a recognised, MDDELCC certified chemical laboratory. The analyses were performed in accordance with the “*Guide des méthodes de conservation et d’analyses des échantillons d’eau et de sol*”, published by the MDDELCC. The Certificates of Chemical Analysis issued by Maxxam for the samples submitted are enclosed in Appendix C.

Maxxam maintains a strict protocol for internal quality control to ensure that the analytical methods and results are reliable. The protocol includes the use of internal duplicate tests, sample blanks, matrix spikes and surrogates, which are presented in the Certificates of Chemical Analysis provided in Appendix C of this report.

3.3 Interpretation Criteria

The analytical results of the soil samples submitted for chemical analysis were interpreted using the “*Grille des critères génériques pour les sols*” from the “*Politique de protection des sols et de réhabilitation des terrains contaminés*” (Politique) (MDDELCC). According to these guidelines, generic criteria “C” are considered to be the acceptable limits for a property under or destined for commercial, industrial and non sensitive institutional use, and generic criteria “B” are considered to be the acceptable limits for a property under or destined for residential and sensitive institutional use such as the Site currently under investigation.

For the management of excavated soils, analytical results of the soil samples submitted for chemical analysis were also interpreted using the limit values defined in the “*Règlement sur l’enfouissement des sols contaminés*” (Règlement) (RESC).

3.4 Chemical Analysis of Soils

The following Table No. 3.1 presents, for the parameters analysed, the environmental classification of the soil samples when compared to the generic criteria of the MDDELCC.

Table 3.1 Environmental Soil Classification Compared to the Generic Criteria

Borehole No.	Sample No.	Depth interval (m)	Parameters Analysed		
			C ₁₀ to C ₅₀	PAHS	Metals
Summary Complementary Environmental Site Characterisation – GHD June 2016					
F-01-2016	CFE-3	1,22 – 1,83	<A	<A	<A
	CFE-5	2,44 – 3,05	<A	<A	A-B
F-02-2016	CFE-1	0,00 – 0,61	<A	A-B	<A
	CFE-4	1,83 – 2,44	<A	<A	<A
F-03-2016	CFE-2	0,61 – 1,22	<A	<A	<A
	CFE-6B	3,24 – 3,66	<A	<A	<A
F-04-2016	CFE-2	0,61 – 1,22	<A	<A	<A
	CFE-5	2,44 – 3,05	<A	<A	<A
F-05-2016	CFE-2	0,61 – 1,22	B-C	<A	<A
	CFE-7	3,66 – 4,27	<A	<A	<A
F-06-2016	CFE-3	1,22 – 1,83	A-B	<A	A-B
	CFE-5	2,44 – 3,05	<A	<A	<A
F-07-2016	CFE-5	2,44 – 3,05	B-C	<A	<A
	CFE-7	3,66 – 4,27	<A	A	<A
F-08-2016	CFE-1	0,00 – 0,61	>C	<A	<A
	CFE-7	3,66 – 4,27	<A	<A	<A
F-09-2016	CFE-3A	1,22 – 1,44	<A	<A	<A
	CFE-7	3,66 – 4,27	<A	<A	<A
F-10-2016	CFE-4	1,83 – 2,44	<A	<A	<A
	CFE-6	3,05 – 3,66	<A	<A	<A
Geotechnical study - GHD April 2016					
F-01-2015	CF-3	1,22 – 1,83	<A	<A	<A
F-02-2015	CF-3	1,22 – 1,83	<A	<A	<A
Phase II ESC - GHD January 2007					
TR-1	VRE-1	0,0 – 0,6	< A	< A	< A
TR-2	VRE-1	0,0 – 0,5	< A	< A	< A
TR-3	VRE-	1,0 – 1,5	< A	< A	< A
TR-4	VRE-3	1,0 – 1,5	< A	< A	< A
TR-5	VRE-2	0,5 – 1,0	< A	< A	< A
TR-6	VRE-1	0,0 – 0,5	< A	< A	< A

Table 3.1 Environmental Soil Classification Compared to the Generic Criteria

Borehole No.	Sample No.	Depth interval (m)	Parameters Analysed		
			C ₁₀ to C ₅₀	PAHS	Metals
TR-7	VRE-3	1,2 – 1,8	A - B	> C	< A
TR-8	VRE-3	1,0 – 1,5	< A	A – B	< A
TR-9	VRE-2	0,5 – 1,0	< A	< A	< A
TR-10	VRE-4	1,5 – 2,0	< A	< A	< A
TR-11	VRE-1	0,0 – 0,5	< A	< A	< A
TR-12	VRE-2	0,5 – 1,0	< A	< A	< A
TR-13	VRE-2	0,5 – 1,0	< A	< A	< A
TR-14	VRE-1	0,0 – 0,5	< A	A – B	< A
TR-15	VRE-3	1,0 – 1,7	< A	< A	< A
TR-101	VRE-3	1,4 – 2,0	---	B – C	---
TR-102	VRE-1	1,2 – 1,7	---	B – C	---
TR-103	VRE-1	1,2 – 1,8	---	A – B	---
TR-104	VRE-1	1,3 – 1,9	---	< A	---

---: not analysed

The following Table No. 3.2 presents, for the parameters analysed, the environmental classification of the sediments samples when compared to the generic criteria of the MDDELCC

Table 3.2 Environmental Sediment Classification Compared to the Generic Criteria

Sediments from Rivière-des- Prairies	Sample No.	Depth interval (m)	Parameters Analysed		
			PAHS	C ₁₀ to C ₅₀	Metals
	SD-01	Surface	B-C	A-B	A-B
	SD-02	Surface	<A	A-B	A-B

3.5 Quality Control

Quality control is based on a recommendation of the “*Centre d’expertise en analyse environnementale du Québec*” (CEAEQ), which recommends a verification of the variance between results. For the current study all duplicate chemical analysis results had variances that meet or exceed the general recommendation of the CEAEQ.

In addition to Maxxam’s internal quality control procedures, GHD performed the following verifications in order to ensure validity of the Maxxam results.

- It was initially ensured that the analytical methods to be used by Maxxam were all recognised and recommended by the MDDELCC.
- The numbered samples submitted and related depths corresponded to our request.
- The analysed parameters were those requested.
- The methods used to analyse the duplicate samples were the same as those used on the initial samples.

- The detection limits are compatible with the mandate's objective.
- The analytical results obtained for internal duplicate(s) issued by the laboratory correspond to their original counterparts; and
- The analysis blanks performed internally by Maxxam did not result in any anomalies.

No anomalies were detected over the course of the above mentioned verifications. The chemical analysis results for the soils are considered to be valid with respect to the requirements of this study.

4. Conclusions

GHD has conducted a Summary Complementary Environmental Site Characterisation of soils on Lapierre Island in the Borough of Rivière-des-Prairies–Pointe-aux-Trembles in the City of Montreal, Quebec. Over the course of the study, 10 boreholes (F-01-2016 to F-10-2016) were drilled. Soil samples were collected and a selection of these was submitted for chemical analysis.

The purpose of the present investigation, undertaken by GHD, was to assess the environmental quality of soils and to determine the approximate extent of contaminated soils on Site for soils management purposes during excavation work. Chemical analysis of studies previously realised on Site by GHD are included in the present report.

According to the *Politique* of the MDDELCC, generic criteria “B” are considered to be the acceptable limits for a property under or destined for sensitive institutional use, such as the Site currently under investigation.

Based on the analytical data obtained at the investigated locations, soils classified above the “B” criteria were identified in the following locations, and are not considered to be of acceptable environmental quality for the Site use:

- > C ” soil (C₁₀ to C₅₀) in Sample No. CFE-1 from Borehole No. F-08-2016.
- > C ” soil (PAHs) in Sample No. VRE-3 from Test pit No. TR-7.
- B-C ” soil (C₁₀ to C₅₀) in Sample No. CFE-2 from Borehole No. F-05-2016.
- B-C ” soil (C₁₀ to C₅₀) in Sample No. CFE-5 from Borehole No. F-07-2016.
- B-C ” soil (PAHs) in Sample No. VRE-3 from Test pit No. TR-101.
- B-C ” soil (PAHs) in Sample No. VRE-1 from Test pit No. TR-102.

Following the analysis and interpretation of the chromatograms as requested, soil samples Nos. F-05-CFE-2, F-07-CFE-5 and F-08-CFE-1 demonstrate that petroleum hydrocarbons C₁₈-C₅₀⁺ present in these soils are of the same chromatographic region as asphalt and tar. Note that chromatograms are made available to Client for informational purposes only.

It is important to note that generic criterion “A” is considered to be the threshold value above which restrictions could be applied to off Site disposal in the event that soils are excavated. It should be noted that if soils are excavated, soils classified within the “A-B”, “B-C” and greater than “C” (> C) ranges will have to be managed in accordance with the guidelines in the “*Grille intérimaire de gestion des sols contaminés excavés*” published by the MDDELCC (see Appendix C).

However, considering the note of instructions from the MDDELCC (see Appendix C) for the management of native soils classified A-B (metals), an unrestricted management could apply.

If environmental remediation work is carried out on Site, a compliance with regulations and policies applicable to the protection of rivers, shorelines, coastlines, high water line and flood plains is needed to limit damages of these areas.

5. Limitations

This environmental report is intended solely for the Client, for whom it was prepared. Its contents reflect GHD's best judgement in light of the information available to GHD at the time of preparation. This report must be considered in its entirety only. No portion of this report may be used as a separate entity. Any use made of this report, or decisions made based on its contents, by any other party is/are the responsibility of such other parties.

The environmental interpretation of the analytical results presented in this report and the ensuing conclusions are based on data collected during the work carried out within the scope of the present mandate. The interpretations and conclusions in this report refer to environmental standards, policies and regulations that were applicable and in effect at the time of the study.

The contamination levels were determined according to the chemical analysis results for a limited number of samples. The nature and extent of contamination between the sampling points can vary in terms of the conditions encountered at the locations where the analysed samples were taken.

The selection of parameters analysed is based on GHD's understanding of the Site history and the contaminants suspected to be present. This selection also considers budgetary constraints and turnaround times. The decision to not analyse for a certain parameter does not rule out the possibility that this parameter exists at a concentration above naturally occurring levels or detection limits.

Considering the heterogeneous nature of environmental contamination phenomena, the conclusions given in this study should only refer to the locations investigated. The general conclusions regarding the entire Site are for information purposes and are probability based. They do not indicate in any way the absence or presence of contaminant concentrations in locations other than those investigated.

The contamination levels described in this report should only be considered valid at the time of sampling, as these levels may vary due to activities that subsequently occur on the Site under study or adjoining properties.

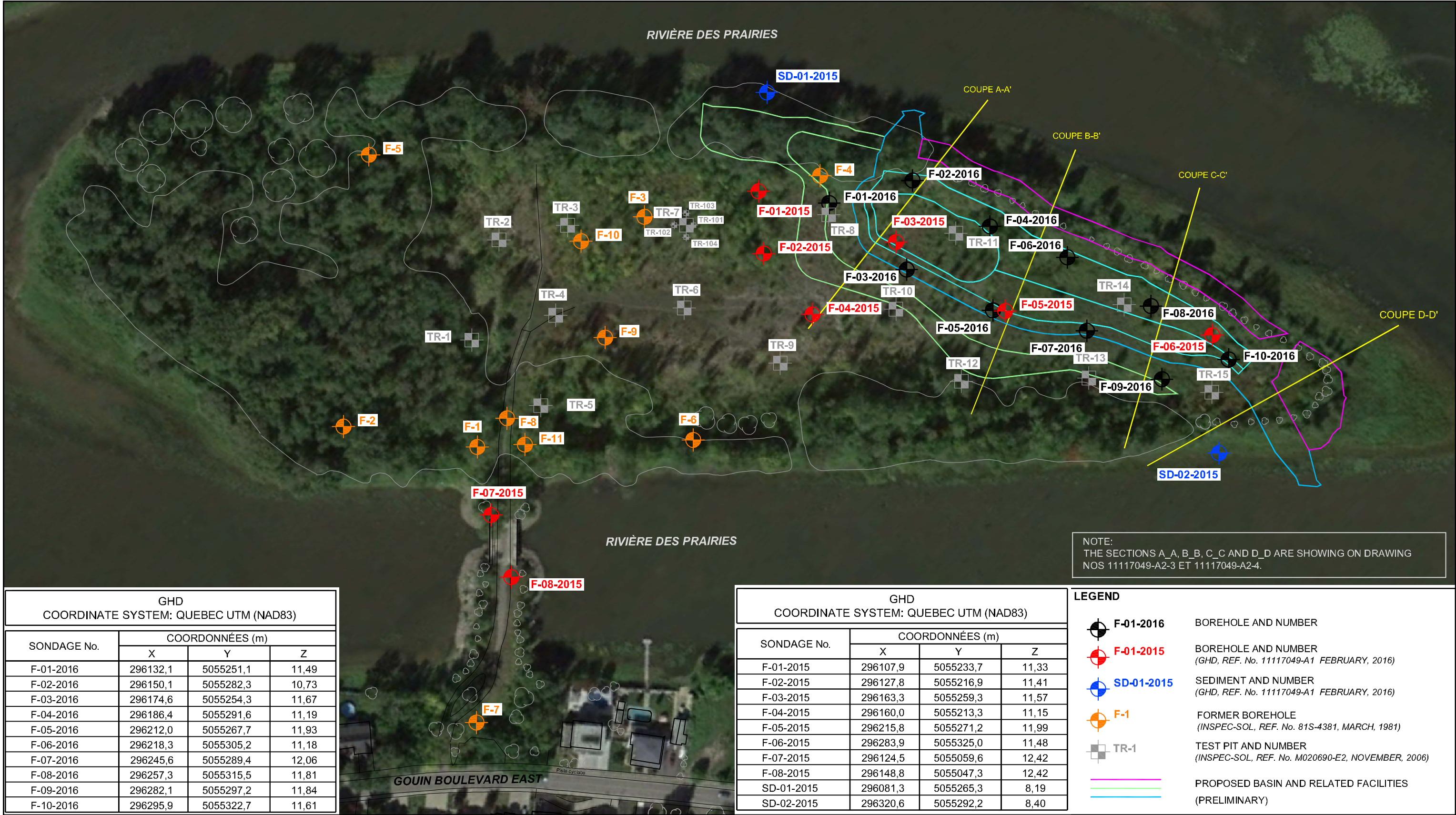
It is important to note that this report was prepared solely within the context of an environmental characterisation study. Therefore, it can in no way be used for geotechnical purposes (i.e., establishing foundation conditions such as allowable bearing capacity, foundation type, etc.), or work requiring geotechnical parameters.

RM/ACN/amd

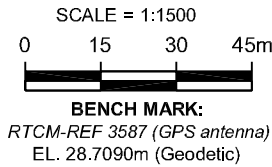
Appendices

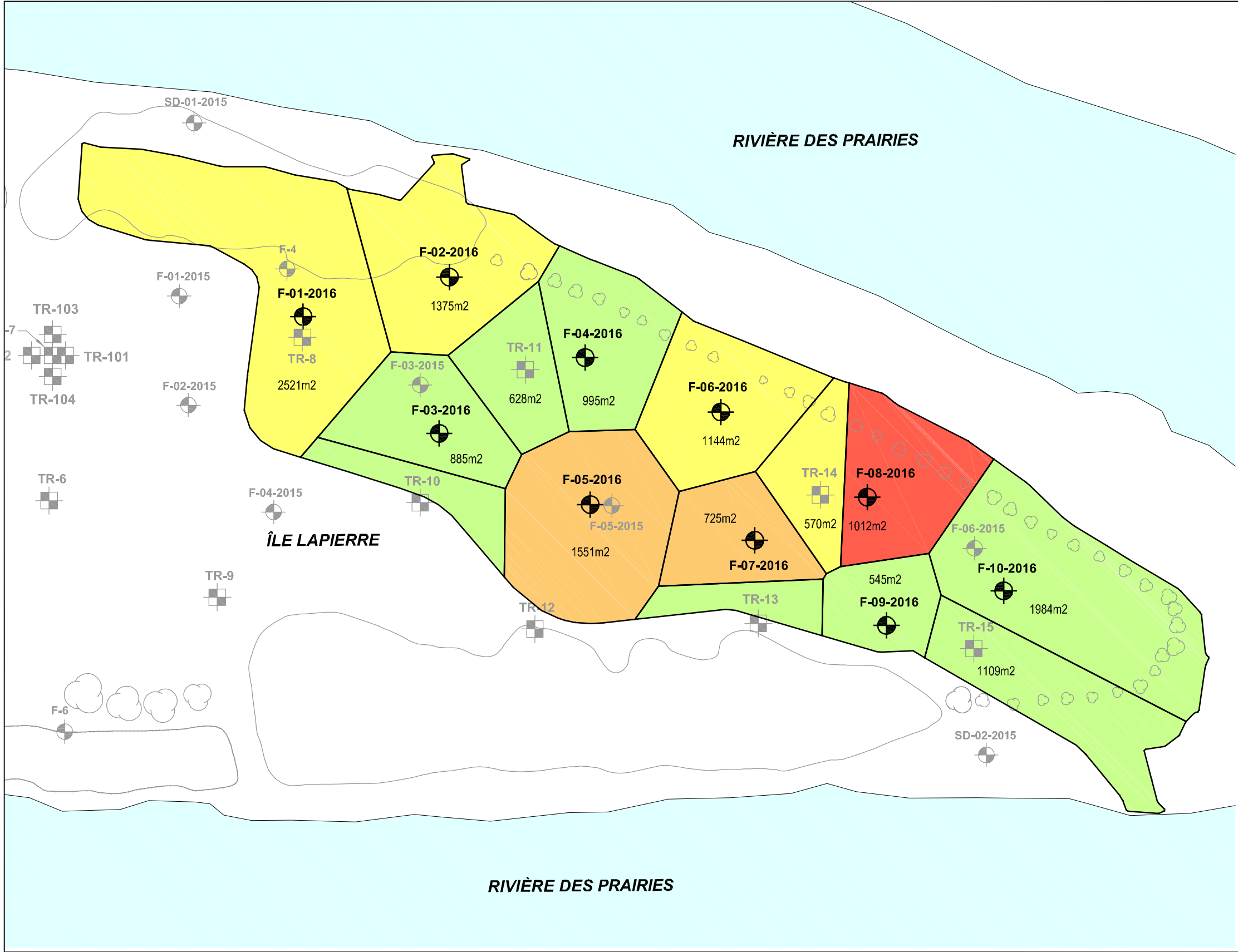
Appendix A

Plans







Source: Map data © 2015 Google or Image © 2015 Google, DigitalGlobe.





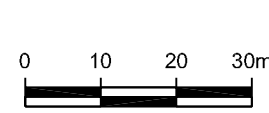
ÎLE LAPIERRE

LEGEND

-  **F-01-2016** BOREHOLE AND NUMBER
-  **TR-1** TEST PIT AND NUMBER (INSPEC-SOL, REFERENCE NO. M020690-E2, NOVEMBER 2006)
-  **F-01-2015** BOREHOLE AND NUMBER (PREVIOUS STUDY, YEARS 2016 AND 1981)
-  **SD-01-2015** F-1

ENVIRONMENTAL CLASSIFICATION OF SOIL	
MDDELCC GENERIC CRITERIA	
1012m²	POLYGON AND AREA (SOIL CLASSIFIED >C)
725m²	POLYGON AND AREA (SOIL CLASSIFIED B-C)
570m²	POLYGON AND AREA (SOIL CLASSIFIED A-B)
1109m²	POLYGON AND AREA (SOIL CLASSIFIED <A)

Source: FILE PROVIDED BY THE CLIENT.



DRAWN BY:
Y. DESJARDINS

CHECKED BY:
L. OUEHB/A.-C. NDJOUOU



AECOM
ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC
DEVELOPMENT OF AN AQUATIC POOL
GEOTECHNICAL STUDY AND ENVIRONMENTAL CHARACTERISATION OF SOIL (ADDITIONAL STUDIES)
INTERPRETATION OF SOIL CONTAMINATION

11117049-A2
06/06/2016

11117049-A2-4

Appendix B

Field logs



Notes on Borehole and Test Pit Reports

Soil description :

Each subsurface stratum is described using the following terminology. The relative density of granular soils is determined by the Standard Penetration Index ("N" value), while the consistency of clayey soils is measured by the value of undrained shear strength (Cu).

Classification (Unified system)			
Clay	< 0.002 mm		
Silt	0.002 to 0.075 mm		
Sand	0.075 to 4.75 mm	fine	0.075 to 4.25 mm
		medium	0.425 to 2.0 mm
		coarse	2.0 to 4.75 mm
Gravel	4.75 to 75 mm	fine	4.75 to 19 mm
Cobbles	75 to 300 mm	coarse	19 to 75 mm
Boulders	>300 mm		

Terminology	
"trace"	1-10%
"some"	10-20%
adjective (silty, sandy)	20-35%
"and"	35-50%

Relative density of granular soils	Standard penetration index "N" value (BLOWS/ft – 300 mm)
Very loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very dense	>50

Consistency of cohesive soils	Undrained shear strength (Cu)	
	(P.S.F)	(kPa)
Very soft	<250	<12
Soft	250-500	12-25
Firm	500-1000	25-50
Stiff	1000-2000	50-100
Very stiff	2000-4000	100-200
Hard	>4000	>200

Rock quality designation	
"RQD" (%) Value	Quality
<25	Very poor
25-50	Poor
50-75	Fair
75-90	Good
>90	Excellent

STRATIGRAPHIC LEGEND			
Sand	Gravel	Cobbles & boulders	Bedrock
Silt	Clay	Organic soil	Fill

Samples:

Type and Number

The type of sample recovered is shown on the log by the abbreviation listed hereafter. The numbering of samples is sequential for each type of sample.

SS: Split spoon

ST: Shelby tube

AG: Auger

SSE, GSE, AGE: Environmental sampling

PS: Piston sample (Osterberg)

RC: Rock core

GS: Grab sample

Recovery

The recovery, shown as a percentage, is the ratio of length of the sample obtained to the distance the sampler was driven/pushed into the soil

RQD

The "Rock Quality Designation" or "RQD" value, expressed as percentage, is the ratio of the total length of all core fragments of 4 inches (10 cm) or more to the total length of the run.

IN-SITU TESTS:

N: Standard penetration index

N_c: Dynamic cone penetration index

k: Permeability

R: Refusal to penetration

Cu: Undrained shear strength

ABS: Absorption (Packer test)

Pr: Pressure meter

LABORATORY TESTS:

I_p: Plasticity index

H: Hydrometer analysis

A: Atterberg limits

C: Consolidation

O.V.: Organic vapor

W_l: Liquid limit

GSA: Grain size analysis

w: Water content

CS: Swedish fall cone

W_p: Plastic limit

γ: Unit weight

CHEM: Chemical analysis



BOREHOLE REPORT

Borehole No. F-01-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETIC COORDINATES (MTM, NAD-83) (m) X : 296132.1 Y : 5055251.1 Z : 11.49		- WATER LEVEL Date : 2016-05-19 Depth (m) : 2.16 ; 2.3 Location plan : 11117049-A2-1	
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-10 Date (finish) : 2016-05-10		SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample					

STRATIGRAPHY				SAMPLE				TESTS RESULTS			
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) Atterberg limits (%) □ C _u (Lab, kPa) "N" Standard penetration test value ▲ "N _c " Dynamic penetration test value
0.00	11.49		Ground surface								
1.0			Fill: Compact to dense, grey gravelly sand, traces to some silt, moist		SSE-1	77			7-11-15-23 (N)	17	
1.22	10.27		Compact, grey sandy gravel, some silt, moist		SSE-2	49			13-23 11-10	34	
1.83	9.66		Compact, brown sandy and gravelly silt, moist		SSE-3	38	CA		9-16-17-7 (N)	27	
2.44	9.05		Native soil: Firm. grey silt, some clay, traces of sand, moist		SSE-4	43			10-17-8-7	25	
3.05	8.44		Very loose, grey sand, traces of silt, very moist to saturated		SSE-5	57	CA		1-1-1-2	2	
4.57	6.92		Firm, grey clayey silt, traces of sand, saturated		SSE-6	54			2-1-1-1	2	
					SSE-7	61			0-1-0-1	1	
					SSE-8A				H.W.	1	
					SSE-8B	92					
					SSE-9	79			H.W.	1	
					SSE-10	90			H.W.	1	
					SS-11	90			H.W.	1	
					SS-12	100			H.W.	1	
					SS-13	100			H.W.	1	

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-01-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETTIC COORDINATES (MTM, NAD-83) (m) X : 296132.1 Y : 5055251.1 Z : 11.49		- WATER LEVEL Date : 2016-05-19 Depth (m) : 2.16 ; 2.3 Location plan : 11117049-A2-1	
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-10 Date (finish) : 2016-05-10		SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample					
STRATIGRAPHY				SAMPLE				TESTS RESULTS					
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) Atterberg limits (%) □ C _u (Lab, kPa) "N" Standard penetration test value ▲ "N _c " Dynamic penetration test value		
8.00	3.49		Ground surface								10 20 30 40 50 60 70 80 90		
8.53	2.96		Very dense, grey gravelly sand, some silt, traces of clay, saturated (till)		SS-14	82			H.W.	1			
9.0					SS-15	90			33-41 39-44	80			
9.56	1.93		End of borehole Refusal of auger upon probable bedrock		SS-16	43			26-29 50/12cm	R			
10.0			Note: CF: Split spoon H.W. Hammer weight (N): SS caliber N (64mm)										
11.0													
12.0													
13.0													
14.0													
15.0													

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-02-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETIC COORDINATES (MTM, NAD-83) (m) X : 296150.1 Y : 5055282.3 Z : 10.73		- WATER LEVEL Date : 2016-05-19 Depth (m) : 1.55 Location plan : 11117049-A2-1	
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-11 Date (finish) : 2016-05-11		SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample					

STRATIGRAPHY				SAMPLE				TESTS RESULTS														
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) Atterberg limits (%) □ C _u (Lab, kPa) "N" Standard penetration test value "N _c " Dynamic penetration test value										Water level	
0.00	10.73		Ground surface								10 20 30 40 50 60 70 80 90											
			Fill: Loose, brown sandy silt, some gravel, moist		SSE-1	36	CA		3-8-4-6 (N)	8												
1.0					SSE-2	54			4-4-3-5	7												
1.22	9.51		Loose, gravel, some sand, traces of silt, very moist		SSE-3	38			3-4-4-32	8												
2.0			Native soil: Firm to stiff, grey clayey silt, traces of sand, very moist to saturated		SSE-4	59	CA		12-13-3-2	16												
2.60	8.13		Very loose, grey sand, traces of silt, saturated		SSE-5A																	
3.0					SSE-5B	69			1-1-2-1	3												
3.64	7.09		Firm, grey clayey silt, traces of sand, saturated		SSE-6	61			0-0-1-0	1												
4.0					SSE-7	100			H.W.	1												
					ST-8	--																
5.0					SSE-9	100			H.W.	1												
6.0					SSE-10	100			H.W.	1												
					SS-11	100			H.W.	1												
7.0					SS-12	100			0-0-1-0	1												
7.31	3.42		Compact to dense, grey sandy gravel, traces of silt and clay, saturated (till)		SS-13	82			0-3-40-50	43												

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-02-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETTIC COORDINATES (MTM, NAD-83) (m) X : 296150.1 Y : 5055282.3 Z : 10.73		▼ - WATER LEVEL Date : 2016-05-19 Depth (m) : 1.55 Location plan : 11117049-A2-1								
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-11 Date (finish) : 2016-05-11		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample														
STRATIGRAPHY				SAMPLE				TESTS RESULTS												
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) ▭ Atterberg limits (%) □ C _u (Lab, kPa) ● "N" Standard penetration test value ▲ "N _c " Dynamic penetration test value									
8.00	2.73		Ground surface								10 20 30 40 50 60 70 80 90 Water level									
8.76	1.97		End of borehole Refusal of auger upon probable bedrock Note: CF: Split spoon TM: Shelby tube H.W. Hammer weight (N): SS caliber N (64mm)		SS-14	69			28-18-4-17	22										
9.0					SS-15	0			50/0cm	R										
10.0																				
11.0																				
12.0																				
13.0																				
14.0																				
15.0																				

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-03-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETIC COORDINATES (MTM, NAD-83) (m) X : 296174.6 Y : 5055254.3 Z : 11.67		- WATER LEVEL Date : 2016-05-19 Depth (m) : 2.48 Location plan : 11117049-A2-1	
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-11 Date (finish) : 2016-05-11		SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample					

STRATIGRAPHY				SAMPLE				TESTS RESULTS			
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) □ Atterberg limits (%) □ C _u (Lab, kPa) ● "N" Standard penetration test value ▲ "N _c " Dynamic penetration test value
0.00	11.67		Ground surface								
1.0			Fill: Loose to compact, brown gravelly sand, traces of silt, moist		SSE-1	30			11-20-25-15 (N)	29	
1.22	10.45		Loose to compact, silt, some clay, sand and gravel, moist. Presence of cobbles		SSE-2	26	CA		2-3-3-2	6	
2.0					SSE-3	84			1-7-8-8	15	
3.0					SSE-4	33			26-50/5cm (N)	R	
3.24	8.43		Native soil: Firm to stiff, clayey silt, traces of sand, very moist		SSE-5	49			1-3-6-8	9	
4.0					SSE-6A						
					SSE-6B	62	CA		5-5-2-3	7	
					SSE-7A						
			Grey sand, traces of silt, saturated		SSE-7B	100			1-1-1-2	2	
					SSE-8	54			0-0-1-2	1	
5.0	4.87		Firm, grey clayey silt, traces of sand, saturated		SSE-9	100			P.M.	1	
6.0					ST-10		Cur = 9kPa				
7.0					SS-11	100			H.W.	1	
					SS-12	100			H.W.	1	
					SS-13	100			H.W.	1	

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-03-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETTIC COORDINATES (MTM, NAD-83) (m) X : 296174.6 Y : 5055254.3 Z : 11.67		- WATER LEVEL Date : 2016-05-19 Depth (m) : 2.48 Location plan : 11117049-A2-1	
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-11 Date (finish) : 2016-05-11		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample							

STRATIGRAPHY				SAMPLE				TESTS RESULTS				
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) □ Atterberg limits (%) □ C _u (Lab, kPa) ● "N" Standard penetration test value ▲ "N _c " Dynamic penetration test value	Water level
8.00	3.67		Ground surface									
8.53	3.14		becoming gravelly		SS-14	100			H.W.	1		
8.84	2.83		Dense to very dense, grey sandy gravel, traces of silt, saturated (till)		SS-15	100			0-0-19-25	19		
					SS-16	64			24-44 47-65	91		
					SS-17	66			35-37 42-14	79		
					SS-18	43			1-25-13-2	36		
11.27	0.40		End of borehole									
Note: CF: Split spoon TM: Shelby tube H.W. Hammer weight (N): SS caliber N (64mm)												

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-04-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETIC COORDINATES (MTM, NAD-83) (m) X : 296186.4 Y : 5055291.6 Z : 11.19		- WATER LEVEL Date : 2016-05-19 Depth (m) : 1.99 ; 2.39 Location plan : 11117049-A2-1	
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-12 Date (finish) : 2016-05-12		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample							
STRATIGRAPHY				SAMPLE				TESTS RESULTS					
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) Atterberg limits (%) □ C _u (Lab, kPa) "N" Standard penetration test value ▲ "N _c " Dynamic penetration test value	Water level	
0.00	11.19		Ground surface										
0.61	10.58		Fill: Compact, sandy silt, traces of gravel, moist		SSE-1	25			8-8-13-21 (N)	18			
1.0			Loose to compact, silt, some sand, traces of gravel, moist		SSE-2	82	CA		7-5-7-10	12			
2.0					SSE-3	43			5-8-5-6 (N)	9			
2.44	8.75		Native soil: Firm to stiff, grey clayey silt, traces of sand, very moist		SSE-4	25			2-12-7-6	19			
3.0					SSE-5	64	CA		1-1-1-1	2			
3.24	7.95		Very loose, grey sand, traces of silt, saturated		SSE-6A SSE-6B	79			1-1-3-2	4			
4.0					SSE-7	82			1-1-1-3	2			
4.39	6.80		Firm, grey clayey silt, traces of sand, saturated		SSE-8A SSE-8B	77			H.W.	1			
5.0					SSE-9	93			H.W.	1			
6.0					ST-10								
7.0					SS-11	100			H.W.	1			
					SS-12	100			H.W.	1			
					SS-13	100			H.W.	1			

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-04-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETTIC COORDINATES (MTM, NAD-83) (m) X : 296186.4 Y : 5055291.6 Z : 11.19		- WATER LEVEL Date : 2016-05-19 Depth (m) : 1.99 ; 2.39 Location plan : 11117049-A2-1	
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-12 Date (finish) : 2016-05-12		SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _P : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample					
STRATIGRAPHY				SAMPLE				TESTS RESULTS					
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) Atterberg limits (%) □ C _u (Lab, kPa) "N" Standard penetration test value "N _c " Dynamic penetration test value		
8.00	3.19		Ground surface								10 20 30 40 50 60 70 80 90		
8.53	2.66		Grey sand, some silt, saturated		SS-14	100			H.W.	1			
8.83	2.36		Dense to very dense, grey sandy gravel, traces of silt and clay, saturated (till)		SS-15A	100			8-41 42-45	83			
					SS-15B								
					SS-16	100			46-23 12-15	35			
9.0													
9.90	1.29		End of borehole Refusal of auger upon probable bedrock										
10.0													
11.0			Note: CF: Split spoon TM: Shelby tube H.W. Hammer weight (N): SS caliber N (64mm)										
12.0													
13.0													
14.0													
15.0													

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-05-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETIC COORDINATES (MTM, NAD-83) (m) X : 296212.0 Y : 5055267.7 Z : 11.93		- WATER LEVEL Date : 2016-05-19 Depth (m) : 3.19 Location plan : 11117049-A2-1	
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-12 Date (finish) : 2016-05-12		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample							

STRATIGRAPHY				SAMPLE				TESTS RESULTS			
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) ○ Atterberg limits (%) □ C _u (Lab, kPa) ● "N" Standard penetration test value ▲ "N _c " Dynamic penetration test value
0.00	11.93		Ground surface								
0.61	11.32		Fill: Compact, gravelly sand, traces of silt, slightly moist		SSE-1	30			16-22 18-62 (N)	26	
1.0			Compact, brown sandy and gravelly silt, moist		SSE-2	72	CA		7-9-9-6	18	
					SSE-3	54			6-8-18-65 (N)	17	
2.0	10.10		Compact, grey clayey silt, traces of sand, moist		SSE-4	39			14-6-7-17	13	
2.44	9.49		Dense, brown sandy and gravelly silt, moist		SSE-5	90			4-6-27-17	33	
3.0	8.88		Dense, sandy gravel, traces of silt, saturated		SSE-6	23			14-50 82/5cm	R	
3.66	8.27		Native soil: Firm to stiff, grey clayey silt, traces of sand, saturated		SSE-7	64	CA		3-2-1-1	3	
4.0					SSE-8	80			1-1-1-2	2	
5.0	7.06		Very loose, grey sand, traces of silt, saturated		SSE-9	100			0-1-1-1	2	
5.37	6.56		Firm, grey clayey silt, traces of sand, saturated		SSE-10	82			H.W.	1	
6.0					ST-11						
7.0					SS-12	100			H.W.	1	
					SS-13	100			H.W.	1	

Water level
3.19 m

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-05-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETTIC COORDINATES (MTM, NAD-83) (m) X : 296212.0 Y : 5055267.7 Z : 11.93		- WATER LEVEL Date : 2016-05-19 Depth (m) : 3.19 Location plan : 11117049-A2-1	
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-12 Date (finish) : 2016-05-12		SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample					

STRATIGRAPHY				SAMPLE				TESTS RESULTS			
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) Atterberg limits (%) □ C _u (Lab, kPa) "N" Standard penetration test value ▲ "N _c " Dynamic penetration test value
8.00	3.93		Ground surface								
9.0					SS-14	100			H.W.	1	
					SS-15	100			H.W.	1	
9.29	2.64		Dense to very dense, grey sandy gravel, traces of silt and clay, saturated (till)		SS-16A						
					SS-16B	100			0-34 30-45	64	
10.0					SS-17	100			21-58 48-47	106	
11.0					SS-18	67			12-21-13-10	34	
11.27	0.66		End of borehole								
12.0			Note: CF: Split spoon TM: Shelby tube H.W. Hammer weight (N): SS caliber N (64mm)								
13.0											
14.0											
15.0											

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-06-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETIC COORDINATES (MTM, NAD-83) (m) X : 296218.3 Y : 5055305.2 Z : 11.18		- WATER LEVEL Date : Depth (m) : 2.25		Location plan : 11117049-A2-1	
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-16 Date (finish) : 2016-05-16		SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample							
STRATIGRAPHY				SAMPLE				TESTS RESULTS							
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) CA: chemical analysis □ C _u (Lab, kPa) "N" Standard penetration test value "N _c " Dynamic penetration test value	Water level			
0.00	11.18		Ground surface												
0.00	11.18		Fill: Compact, brown sandy silt, some gravel, moist		SSE-1	79			3-6-6-7	12					
1.0					SSE-2	82			7-8-7-17	15					
2.0					SSE-3	74	CA		4-6-8-6	14					
2.44	8.74		Native soil: Firm, grey calyey silt, traces of sand, moist		SSE-4	41			6-8-6-4	14					
3.0					SSE-5	77	CA		0-1-3-2	4					
3.66	7.52		Very loose, grey sand, traces of silt, saturated		SSE-6	92			1-1-1-1	2					
4.0					SSE-7	82			1-0-1-1	1					
4.64	6.54		Firm, grey clayey silt, traces of sand, saturated		SSE-8A	100			1-1-1-1	2					
5.0					SSE-8B										
5.0					SSE-9	100	Cur = 3kPa		H.W.	1					
6.0					SSE-10	90			H.W.	1					
7.0					ST-11										
					SS-12	97			1-1-1-1	2					
					SS-13	100			H.W.	1					

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-06-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETIC COORDINATES (MTM, NAD-83) (m) X : 296218.3 Y : 5055305.2 Z : 11.18		- WATER LEVEL Date : Depth (m) : 2.25 Location plan : 11117049-A2-1	
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-16 Date (finish) : 2016-05-16		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample							

STRATIGRAPHY				SAMPLE				TESTS RESULTS			
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) □ Atterberg limits (%) □ C _u (Lab, kPa) ● "N" Standard penetration test value ▲ "N _c " Dynamic penetration test value
8.00	3.18		Ground surface								
8.53	2.65		Grey silty sand, moist		SS-14	100			H.W.	1	
8.97	2.21		Dense to very dense, grey sandy gravel, traces of silt and clay, saturated (till)		SS-15A SSE-15 SS-15B	100			17-16-21-0	37	
					SS-16	51			3-18 38-45	56	
					SS-17	54			33-35-12 50/6cm	47	
10.41	0.77		End of borehole								
Note: CF: Split spoon TM: Shelby tube H.W. Hammer weight											

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-07-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETIC COORDINATES (MTM, NAD-83) (m) X : 296245.6 Y : 5055289.4 Z : 12.06		- WATER LEVEL Date : Depth (m) : 1.27		Location plan : 11117049-A2-1	
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-13 Date (finish) : 2016-05-16		SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample							
STRATIGRAPHY				SAMPLE				TESTS RESULTS							
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) □ CA: chemical analysis □ C _u (Lab, kPa) ● "N" Standard penetration test value ▲ "N _c " Dynamic penetration test value	Water level			
0.00	12.06		Ground surface												
1.0			Fill: Compact to dense, brown sandy and gravelly silt, moist		SSE-1	30			5-23-30-50 (N)	35					
1.22	10.84		becoming very dense, blackish-brown, slightly moist		SSE-2	51			3-7-11-9	18					
2.0			Compact, clayey silt, traces of sand and gravel, moist		SSE-3	64			10-37-30-7	67					
2.44	9.62		Compact, sandy gravel, traces of silt, saturated		SSE-4	74			12-9-7-8	16					
3.0					SSE-5	25	CA		4-10-5-2	15					
3.66	8.40		Native soil: Stiff, grey clayey silt, traces of sand, moist		SSE-6	64			1-6-15-10	21					
4.0					SSE-7	54	CA		1-1-1-2	2					
4.55	7.51		Very dense, grey silty sand, saturated		SSE-8A	66			0-1-1-2	2					
5.0					SSE-8B										
5.48	6.58		Stiff to firm, grey clayey silt, traces of sand, moist		SSE-9	90			0-1-0-1	1					
6.0					SSE-10	49	Cur = 17kPa		H.W.	1					
7.0					ST-11										
					SS-12	75			H.W.	1					
					SS-13	100			H.W.	1					

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-07-2016

CLIENT: AECOM		GEODETTIC COORDINATES (MTM, NAD-83) (m)		▼ - WATER LEVEL								
PROJECT: DEVELOPMENT OF AN AQUATIC POOL		X : 296245.6 Y : 5055289.4 Z : 12.06		Date : Depth (m) : 1.27								
LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC				Location plan : 11117049-A2-1								
DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB										
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-13 Date (finish) : 2016-05-16		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost								
		TEST SYMBOL		GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample								
STRATIGRAPHY				SAMPLE				TESTS RESULTS				
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) Atterberg limits (%) □ C _u (Lab, kPa) "N" Standard penetration test value ▲ "N _c " Dynamic penetration test value	Water level
8.00	4.06		Ground surface									
9.0					SS-14	100			H.W.	1		
					SS-15	100			H.W.	1		
9.14	2.92		Grey silty sand, saturated		SS-16A	100			0-0-10-29	10		
9.67	2.39		Dense to very dense, grey sandy gravel, traces of silt, saturated (till)		SS-16B							
10.0					SS-17	15			24-50/5cm	R		
10.66	1.40		Very dense, grey silty sand, saturated		SS-18				4-16 34-40	55		
11.0												
11.27	0.79		End of borehole									
12.0			Note: CF: Split spoon TM: Shelby tube H.W. Hammer weight (N): SS caliber N (64mm)									
13.0												
14.0												
15.0												

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-08-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETIC COORDINATES (MTM, NAD-83) (m) X : 296257.3 Y : 5055315.5 Z : 11.81		- WATER LEVEL Date : Depth (m) : 2.7 Location plan : 11117049-A2-1	
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-16 Date (finish) : 2016-05-16		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample							

STRATIGRAPHY				SAMPLE				TESTS RESULTS			
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) □ Atterberg limits (%) □ C _u (Lab, kPa) ● "N" Standard penetration test value ▲ "N _c " Dynamic penetration test value
0.00	11.81		Ground surface								
0.61	11.20		Fill: Compact, brown silty and gravelly sand, moist		SSE-1	59	CA		6-10 34-18 (N)	29	
1.0			Compact, blackish-brown sandy silt, some gravel, moist		SSE-2	56			5-4-8-10	12	
					SSE-3	66			4-12-14-13	26	
1.83	9.98		Blackish-brown sandy gravel		SS-4A						
2.02	9.79		Clayey silt		SS-4B	92			5-4-4-3 (N)	5	
2.44	9.37		Compact, greenish-brown sandy silt, some gravel, moist		SSE-5	72			2-6-7-9	13	
3.05	8.76		Very loose, greenish-brown sandy silt, traces of clay, moist		SSE-6	82			3-2-2-2 (N)	3	
3.66	8.15		Native soil: Stiff, grey clayey silt, traces of sand, very moist		SSE-7	100	CA		2-1-2-1	3	
4.53	7.28		Very loose, grey sand, traces of silt, saturated		SSE-8	90			0-2-2-1 (N)	3	
					SSE-9A	79			1-1-1-1	2	
5.23	6.58		Firm, grey clayey silt, traces of sand, very moist to saturated		SSE-9B				H.W.	1	
					SSE-10	80	Cur = 10kPa		H.W.	1	
					ST-11						
					SS-12	92			H.W.	1	
					SS-13	72			H.W.	1	

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-08-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETTIC COORDINATES (MTM, NAD-83) (m) X : 296257.3 Y : 5055315.5 Z : 11.81		▼ - WATER LEVEL Date : Depth (m) : 2.7		Location plan : 11117049-A2-1						
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-16 Date (finish) : 2016-05-16		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample														
STRATIGRAPHY				SAMPLE				TESTS RESULTS												
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	<div> ○ Water content (%) △ C_u (Field, kPa) □ Atterberg limits (%) □ C_u (Lab, kPa) ● "N" Standard penetration test value ▲ "N_c" Dynamic penetration test value </div>									
8.00	3.81		Ground surface								<div> 10 20 30 40 50 60 70 80 90 </div>									
9.0					SS-14	100			H.W.	1										
					SS-15	100			H.W.	1										
9.14	2.67		Compact, grey silty sand, saturated		SS-16A															
9.51	2.30		Sandy gravel, traces of silt and clay, saturated (till)		SS-16B	95			0-6-20-36	26										
9.75	2.06		Compact, grey silty sand, saturated		SS-17A															
10.0					SS-17B	100			13-50-50/10cm											
10.20	1.61		Sandy gravel, saturated																	
10.51	1.30		Grey silty sand, saturated																	
11.0					SS-18	70			0-2-8-16	10										
11.27	0.54		End of borehole																	
12.0			Note: CF: Split spoon TM: Shelby tube H.W. Hammer weight (N): SS caliber N (64mm)																	
13.0																				
14.0																				
15.0																				

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-09-2016

CLIENT: AECOM					PROJECT: DEVELOPMENT OF AN AQUATIC POOL					GEODETIC COORDINATES (MTM, NAD-83) (m)					▼ - WATER LEVEL				
LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC					X : 296282.1 Y : 5055297.2 Z : 11.84					Date : Depth (m) : 2.8									
DESCRIBED BY: F. FERRAK					VERIFIED BY: L. OUEHB					Location plan : 11117049-A2-1									
Borehole type : Core bit size : Hammer type : Energy ratio : Date (start) : Date (finish) :		Auger 200mm B + N Automatic 2016-05-17 2016-05-17		SAMPLE TYPE		SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE		☒ Remoulded ☒ Intact ☐ Diamond drilling ■ Lost		TEST SYMBOL		GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w : water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample					
STRATIGRAPHY					SAMPLE					TESTS RESULTS									
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) ▮ Atterberg limits (%) □ C _u (Lab, kPa) ● "N" Standard penetration test value ▲ "N _c " Dynamic penetration test value								
0.00	11.84		Ground surface								10 20 30 40 50 60 70 80 90	Water level							
1.0 1.44 1.83 2.44 3.05 3.66 4.54 5.27 6.0 7.0			Fill: Compact to very dense, brown sandy and gravelly silt, moist		SSE-1	8	CA		4-6-13-12 (N)	12	●	 2.8 m							
					SSE-2	57			9-5-14-14	19	●								
					SSE-3A	80			5-20-24-7	64	●								
			10.40		Blackish gravelly sand, traces of silt		SSE-3B	80											
			10.01		Blackish silty clay, moist		SSE-4	92		3-3-5-8	8				●				
			9.40		Greenish-grey clayey silt, moist		SSE-5	62		5-4-7-5	11				●				
			8.79		Compact, brown sandy and gravelly silt, saturated		SSE-6	36		5-11-6-4	17				●				
			8.18		Native soil: Stiff, grey, clayey silt, traces of sand, saturated		SSE-7	87	CA	2-1-2-2	3				●				
							SSE-8A												
			7.30		Very loose, grey sand, traces of silt, saturated		SSE-8B	72		0-0-2-2	2				●				
							SSE-9A	100		1-1-1-2	2				●				
			6.57		Firm, grey clayey silt, traces of sand, saturated		SSE-9B												
							SSE-10	100		H.W.	1				●				
					ST-11														
					SS-12	100		H.W.	1	●									
					SS-13	100		H.W.	1	●									

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-09-2016

CLIENT: AECOM		GEODETTIC COORDINATES (MTM, NAD-83) (m)		▼ - WATER LEVEL	
PROJECT: DEVELOPMENT OF AN AQUATIC POOL		X : 296282.1 Y : 5055297.2 Z : 11.84		Date : Depth (m) : 2.8	
LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC				Location plan : 11117049-A2-1	
DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB			
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-17 Date (finish) : 2016-05-17		SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost	
TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample					

STRATIGRAPHY				SAMPLE				TESTS RESULTS													
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) Atterberg limits (%) □ C _u (Lab, kPa) "N" Standard penetration test value "N _c " Dynamic penetration test value										
8.00	3.84		Ground surface																		
8.73	3.11		Compact, grey silty sand, saturated		SS-14	100			H.W.	1											
					SS-15A																
					SS-15B	100			H.W.	1											
					SS-16A	100			0-1-21 50/7cm	22											
9.67	2.17		Very dense, grey sandy gravel, traces of silt, saturated (till)		SS-16B																
					SS-17	62			49-41 42-33	83											
10.66	1.18		Grey silty sand, saturated																		
10.86	0.98		Compact, grey sandy gravel, traces of silt, saturated		SS-18	72			9-6-8-14	14											
11.27	0.57		End of borehole																		
Note: CF: Split spoon TM: Shelby tube H.W. Hammer weight (N): SS caliber N (64mm)																					

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-10-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETIC COORDINATES (MTM, NAD-83) (m) X : 296295.9 Y : 5055322.7 Z : 11.61		- WATER LEVEL Date : Depth (m) : 2.73		Location plan : 11117049-A2-1	
Borehole type : Auger 200mm Core bit size : B + N Hammer type : Automatic Energy ratio : Date (start) : 2016-05-17 Date (finish) : 2016-05-18		SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample		SAMPLE STATE Remoulded Intact Diamond drilling Lost		TEST SYMBOL GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample							
STRATIGRAPHY				SAMPLE				TESTS RESULTS							
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	Water content (%) Atterberg limits (%) "N" Standard penetration test value "N _c " Dynamic penetration test value	C _u (Field, kPa) C _u (Lab, kPa)	Water level		
0.00	11.61		Ground surface												
0.00	11.61		Fill: Loose to compact, brown sandy and gravelly silt, moist		SSE-1				2-6-8-5	14					
0.00	11.61				SSE-2				4-10-7-7	17					
0.00	11.61				SSE-3				10-6-3-2	9					
0.00	11.61				SSE-4		CA		3-1-3-3	4					
0.00	11.61				SSE-5				50/8cm	R					
3.05	8.56		Native soil: Stiff, grey clayey silt, traces of sand, moist		SSE-6		CA		0-0-2-1	2					
4.07	7.54		Very loose, grey sand, traces of silt, saturated		SSE-7A				2-2-2-2	4					
4.07	7.54				SSE-7B				H.W.	1					
4.07	7.54				SSE-8										
5.23	6.38		Firm, grey clayey silt, traces of sand, moist to saturated		SSE-9A				1-1-1-2	2					
5.23	6.38				SSE-9B										
5.23	6.38				SSE-10		Cur = 4kPa		H.W.	1					
5.23	6.38				ST-11										
5.23	6.38				SS-12				H.W.	1					
5.23	6.38				SS-13				H.W.	1					

See the attached explicative note for the complete list of symbols and abbreviations



BOREHOLE REPORT

Borehole No. F-10-2016

CLIENT: AECOM		PROJECT: DEVELOPMENT OF AN AQUATIC POOL		LOCATION: ÎLE LAPIERRE - RIVIERE DES PRAIRIES, MONTREAL, QUEBEC		DESCRIBED BY: F. FERRAK		VERIFIED BY: L. OUEHB		GEODETTIC COORDINATES (MTM, NAD-83) (m) X : 296295.9 Y : 5055322.7 Z : 11.61		▼ - WATER LEVEL Date : Depth (m) : 2.73	
Borehole type : Auger 200mm		Core bit size : B + N		Hammer type : Automatic		Energy ratio :		Date (start) : 2016-05-17		Date (finish) : 2016-05-18		SAMPLE TYPE SS(E) - Split Spoon (Environment) RC(E) - Rock diamond core AU(E) - Auger TEE - Sampling Tube Environment ST - Shelby tube GS(E) - Grab sample	
SAMPLE STATE <input checked="" type="checkbox"/> Remoulded <input checked="" type="checkbox"/> Intact <input type="checkbox"/> Diamond drilling <input checked="" type="checkbox"/> Lost		TEST SYMBOL		GSA: grain size analysis CA: chemical analysis W _L : liquid limit W _p : plastic limit w: water content C _u : undrained shear strength S _r : sensitivity Dup: duplicate sample		Location plan : 11117049-A2-1							

STRATIGRAPHY				SAMPLE				TESTS RESULTS				
Depth (m)	Elevation (m)	Symbol	Description	State	Type and Number	Recovery %	Other tests	PID (ppm)	6 in / 15 cm Blow counts (sampler size)	N, N _c or RQD	○ Water content (%) △ C _u (Field, kPa) Atterberg limits (%) □ C _u (Lab, kPa) "N" Standard penetration test value "N _c " Dynamic penetration test value	Water level
8.00	3.61		Ground surface									
8.68	2.93		Grey silty sand, saturated		SS-14				0-0-2-1	2		
					SS-15A							
					SS-15B				2-1-1-2	2		
					SS-16A							
9.41	2.20		Dense to very dense, grey sandy gravel, traces of silt and clay, saturated (till)		SS-16B				0-8-25-33			
					SS-17				12-46 44-44	90		
10.56	1.05		Grey gravelly sand, traces of silt, saturated		SS-18				0-1-7-15	8		
11.17	0.44		End of borehole									
			Note: CF: Split spoon TM: Shelby tube H.W. Hammer weight									

See the attached explicative note for the complete list of symbols and abbreviations

Appendix C

Certificates of Chemical Analysis (Maxxam Analytique Inc.)



**Interim Guidelines for the Management
of Excavated Soils (January 26, 1999)
Ministry of Sustainable Development, Environment
and the Fight Against Climate Change**

Contamination Level	Management Options
< A	1. Unrestricted use.
A – B range	1. Use as backfill material on contaminated sites having a residential usage and slated for environmental restoration*, on any commercial or industrial property, providing that their use does not result in an increase in contamination** of the receptor site and, for a residential property, providing that the soils do not emit perceptible hydrocarbon odors. 2. Use as daily cover material at a sanitary landfill. 3. Use as final cover material in a sanitary landfill providing that they are overlain by 15cm of clean soil.
B – C range	1. Optimal*** decontamination at an authorized treatment facility with subsequent management based on the final contaminant level obtained. 2. Use as backfill material on the site of origin providing that its use does not result in an increase in contamination** of the site and that the said site has a commercial or industrial usage. 3. Use as daily cover material at a sanitary landfill.
> C	1. Optimal*** decontamination at an authorized treatment facility with subsequent management based on the final contaminant level obtained. 2. If the latter option is not practical, ultimate disposal in a maximum-security landfill authorized to receive soils.

* Contaminated sites having a residential usage and slated for environmental restoration are those for which a characterisation has shown contamination above level « B » and where an exterior soil supply will be needed during the course of site restoration work.

** The contamination refers to the nature of the contaminants and their concentration.

*** Optimal treatment is defined for all contaminants as the attainment of level « B » or by an 80% reduction in the initial contaminant concentration and, for volatile compounds, by the attainment of level « B ».

Basic rules :

1. The quality of clean soils must be maintained and protected.
2. The decontamination of contaminated soils that are excavated is favoured.
3. Dilution is unacceptable.
4. The objective of decontamination is soil reuse.

Note : The preceding document is a translation made by GHD (for business purposes) of « Critères génériques pour les sols », Appendix 2 of "Politique de protection des sols et de réhabilitation des terrains contaminés" (1998, Rev. 1999) of the Ministry of Sustainable Development, Environment and the Fight Against Climate Change. This translation is not recognised officially by the Ministry of Sustainable Development, Environment and the Fight Against Climate Change and, as such, is in no way binding, nor can it be used in place of the original document.

Your P.O. #: 76203012
Your Project #: 11117049-A2
Site Location: ILE LA PIERRE
Your C.O.C. #: E911175

Attention: Anne Clarisse NDJOUOU

GHD Consultants Ltée
MONTREAL
4600 COTE VERTU
SUITE 200
VILLE ST-LAURENT, QC
H4S 1C7

Report Date: 2016/05/20
Report #: R2141281
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B628299

Received: 2016/05/12, 16:15

Sample Matrix: SOIL
Samples Received: 4

Analyses	Date		Date Analyzed	Laboratory Method	Primary Reference
	Quantity	Extracted			
Petroleum Hydrocarbons (C10-C50)*	4	2016/05/18	2016/05/18	STL SOP-00172	MA.400-HYD. 1.1 R2 m
Total Extractable Metals by ICP*	4	2016/05/18	2016/05/19	STL SOP-00006	MA200-Mét 1.2 R5 m
Polycyclic Aromatic Hydrocarbons*	4	2016/05/18	2016/05/18	STL SOP-00178	MA400-HAP 1.1 R5 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

* Maxxam is accredited as per the MDDELCC program.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Karima Dlimi, B.Sc., Chemist, Project Manager

Email: KDlimi@maxxam.ca

Phone# (514)448-9001 Ext:6270

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B628299
Report Date: 2016/05/20

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LA PIERRE
Your P.O. #: 76203012

PAH BY GCMS (SOIL)

Maxxam ID					CI7338		CI7339		CI7339		CI7340			
Sampling Date					2016/05/10		2016/05/10		2016/05/10		2016/05/11			
COC Number					E911175		E911175		E911175		E911175			
	Units	A	B	C	F-01-CFE-3	CR	F-01-CFE-5	CR	F-01-CFE-5 Lab-Dup	CR	F-03-CFE-2	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	20		27		27		23		N/A	N/A
PAH														
Acenaphthene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Acenaphthylene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Anthracene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Benzo(a)anthracene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Benzo(a)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Benzo(b)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Benzo(j)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Benzo(k)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Benzo(b+j+k)fluoranthene	mg/kg	-	-	-	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Benzo(c)phenanthrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Benzo(ghi)perylene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Chrysene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Dibenz(a,h)anthracene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
7,12-Dimethylbenzanthracene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Fluoranthene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Fluorene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
3-Methylcholanthrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Naphthalene	mg/kg	0.1	5	50	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Phenanthrene	mg/kg	0.1	5	50	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Pyrene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1606885
2-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
1-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
1,3-Dimethylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
2,3,5-Trimethylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1606885
Surrogate Recovery (%)														
D10-Anthracene	%	-	-	-	80		82		76		78		N/A	1606885
D12-Benzo(a)pyrene	%	-	-	-	74		76		74		72		N/A	1606885
D14-Terphenyl	%	-	-	-	84		84		82		80		N/A	1606885
RDL = Reportable Detection Limit														
QC Batch = Quality Control Batch														
N/A = Not Applicable														

Maxxam Job #: B628299
Report Date: 2016/05/20

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LA PIERRE
Your P.O. #: 76203012

PAH BY GCMS (SOIL)

Maxxam ID					CI7338		CI7339		CI7339		CI7340			
Sampling Date					2016/05/10		2016/05/10		2016/05/10		2016/05/11			
COC Number					E911175		E911175		E911175		E911175			
	Units	A	B	C	F-01-CFE-3	CR	F-01-CFE-5	CR	F-01-CFE-5 Lab-Dup	CR	F-03-CFE-2	CR	RDL	QC Batch
D8-Acenaphthylene	%	-	-	-	86		86		82		82		N/A	1606885
D8-Naphthalene	%	-	-	-	78		78		74		74		N/A	1606885
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable														

Maxxam Job #: B628299
Report Date: 2016/05/20

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LA PIERRE
Your P.O. #: 76203012

PAH BY GCMS (SOIL)

Maxxam ID					CI7341			
Sampling Date					2016/05/11			
COC Number					E911175			
	Units	A	B	C	F-03-CFE-6-B	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	37		N/A	N/A
PAH								
Acenaphthene	mg/kg	0.1	10	100	<0.1		0.1	1606885
Acenaphthylene	mg/kg	0.1	10	100	<0.1		0.1	1606885
Anthracene	mg/kg	0.1	10	100	<0.1		0.1	1606885
Benzo(a)anthracene	mg/kg	0.1	1	10	<0.1		0.1	1606885
Benzo(a)pyrene	mg/kg	0.1	1	10	<0.1		0.1	1606885
Benzo(b)fluoranthene	mg/kg	0.1	1	10	<0.1		0.1	1606885
Benzo(j)fluoranthene	mg/kg	0.1	1	10	<0.1		0.1	1606885
Benzo(k)fluoranthene	mg/kg	0.1	1	10	<0.1		0.1	1606885
Benzo(b+j+k)fluoranthene	mg/kg	-	-	-	<0.1		0.1	1606885
Benzo(c)phenanthrene	mg/kg	0.1	1	10	<0.1		0.1	1606885
Benzo(ghi)perylene	mg/kg	0.1	1	10	<0.1		0.1	1606885
Chrysene	mg/kg	0.1	1	10	<0.1		0.1	1606885
Dibenz(a,h)anthracene	mg/kg	0.1	1	10	<0.1		0.1	1606885
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	<0.1		0.1	1606885
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	<0.1		0.1	1606885
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	<0.1		0.1	1606885
7,12-Dimethylbenzanthracene	mg/kg	0.1	1	10	<0.1		0.1	1606885
Fluoranthene	mg/kg	0.1	10	100	<0.1		0.1	1606885
Fluorene	mg/kg	0.1	10	100	<0.1		0.1	1606885
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	<0.1		0.1	1606885
3-Methylcholanthrene	mg/kg	0.1	1	10	<0.1		0.1	1606885
Naphthalene	mg/kg	0.1	5	50	<0.1		0.1	1606885
Phenanthrene	mg/kg	0.1	5	50	<0.1		0.1	1606885
Pyrene	mg/kg	0.1	10	100	<0.1		0.1	1606885
2-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		0.1	1606885
1-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		0.1	1606885
1,3-Dimethylnaphthalene	mg/kg	0.1	1	10	<0.1		0.1	1606885
2,3,5-Trimethylnaphthalene	mg/kg	0.1	1	10	<0.1		0.1	1606885
Surrogate Recovery (%)								
D10-Anthracene	%	-	-	-	82		N/A	1606885
D12-Benzo(a)pyrene	%	-	-	-	76		N/A	1606885
D14-Terphenyl	%	-	-	-	86		N/A	1606885
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable								

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PAH BY GCMS (SOIL)

Maxxam ID					CI7341			
Sampling Date					2016/05/11			
COC Number					E911175			
	Units	A	B	C	F-03-CFE-6-B	CR	RDL	QC Batch
D8-Acenaphthylene	%	-	-	-	86		N/A	1606885
D8-Naphthalene	%	-	-	-	80		N/A	1606885
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
N/A = Not Applicable								

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HYDROCARBONS BY GCFID (SOIL)

Maxxam ID					CI7338		CI7339		CI7339		CI7340			
Sampling Date					2016/05/10		2016/05/10		2016/05/10		2016/05/11			
COC Number					E911175		E911175		E911175		E911175			
	Units	A	B	C	F-01-CFE-3	CR	F-01-CFE-5	CR	F-01-CFE-5 Lab-Dup	CR	F-03-CFE-2	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	20		27		27		23		N/A	N/A
PETROLEUM HYDROCARBONS														
Petroleum Hydrocarbons (C10-C50)	mg/kg	300	700	3500	<100		130	<A	140	<A	<100		100	1606884
Surrogate Recovery (%)														
1-Chlorooctadecane	%	-	-	-	76		76		76		71		N/A	1606884
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable														

Maxxam ID					CI7341			
Sampling Date					2016/05/11			
COC Number					E911175			
	Units	A	B	C	F-03-CFE-6-B	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	37		N/A	N/A
PETROLEUM HYDROCARBONS								
Petroleum Hydrocarbons (C10-C50)	mg/kg	300	700	3500	<100		100	1606884
Surrogate Recovery (%)								
1-Chlorooctadecane	%	-	-	-	74		N/A	1606884
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable								

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TOTAL EXTRACTABLE METALS (SOIL)

Maxxam ID					CI7338		CI7339		CI7340		CI7341			
Sampling Date					2016/05/10		2016/05/10		2016/05/11		2016/05/11			
COC Number					E911175		E911175		E911175		E911175			
	Units	A	B	C	F-01-CFE-3	CR	F-01-CFE-5	CR	F-03-CFE-2	CR	F-03-CFE-6-B	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	20		27		23		37		N/A	N/A
METALS														
Silver (Ag)	mg/kg	2	20	40	<0.5		<0.5		<0.5		<0.5		0.5	1606823
Arsenic (As)	mg/kg	6	30	50	<5		<5		<5		<5		5	1606823
Barium (Ba)	mg/kg	200	500	2000	75	<A	220	A-B	170	<A	170	<A	5	1606823
Cadmium (Cd)	mg/kg	1.5	5	20	<0.5		<0.5		<0.5		<0.5		0.5	1606823
Chromium (Cr)	mg/kg	85	250	800	19	<A	50	<A	64	<A	50	<A	2	1606823
Cobalt (Co)	mg/kg	15	50	300	9	<A	12	<A	14	<A	11	<A	2	1606823
Copper (Cu)	mg/kg	40	100	500	12	<A	15	<A	31	<A	17	<A	2	1606823
Tin (Sn)	mg/kg	5	50	300	<4		<4		<4		<4		4	1606823
Manganese (Mn)	mg/kg	770	1000	2200	440	<A	280	<A	380	<A	270	<A	2	1606823
Molybdenum (Mo)	mg/kg	2	10	40	<1		<1		<1		<1		1	1606823
Nickel (Ni)	mg/kg	50	100	500	19	<A	26	<A	39	<A	26	<A	1	1606823
Lead (Pb)	mg/kg	50	500	1000	11	<A	6	<A	13	<A	6	<A	5	1606823
Zinc (Zn)	mg/kg	110	500	1500	43	<A	83	<A	73	<A	78	<A	10	1606823
RDL = Reportable Detection Limit														
QC Batch = Quality Control Batch														
N/A = Not Applicable														

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GENERAL COMMENTS

All results are calculated on a dry weight basis except where not applicable.

Condition of sample(s) upon receipt: GOOD

Rev: English report

A,B,C,CR: Criteria following appendix 2 of the " Soil Protection and Contaminated Sites Rehabilitation Policy " entitled " Generic criteria for soils and groundwater ". For all metals analyses in soil, the criterion A refers to " Background Level of St. Lawrence Lowlands Sector ".

For groundwaters:

The A and B criteria follow the appendix 2 of the " Soil Protection and Contaminated Sites Rehabilitation Policy " entitled " Generic criteria for soils and groundwater ". The criterion A refers to " Drinking Water " and the criterion B refers to "Seepage into Surface Water or Infiltration into Sewers ".

These criteria references are shown for visual aid only, and should not be interpreted otherwise.

- = This parameter is not part of the regulation.

PAH BY GCMS (SOIL)

Please note that the results have not been corrected for QC recoveries (spiked blank and method blank) nor for the surrogates.

Un-rounded results are used in the Benzo(b+j+k)fluoranthene calculation. This total result is then rounded to two significant figures.

HYDROCARBONS BY GCFID (SOIL)

Please note that the results have not been corrected for QC recoveries (spiked blank and surrogates). Please note that the results have not been corrected for the method blank.

TOTAL EXTRACTABLE METALS (SOIL)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
1606823	KV1	Spiked Blank	Silver (Ag)	2016/05/18		98	%	75 - 125
			Arsenic (As)	2016/05/18		104	%	75 - 125
			Barium (Ba)	2016/05/18		107	%	75 - 125
			Cadmium (Cd)	2016/05/18		101	%	75 - 125
			Chromium (Cr)	2016/05/18		100	%	75 - 125
			Cobalt (Co)	2016/05/18		99	%	75 - 125
			Copper (Cu)	2016/05/18		99	%	75 - 125
			Tin (Sn)	2016/05/18		103	%	75 - 125
			Manganese (Mn)	2016/05/18		99	%	75 - 125
			Molybdenum (Mo)	2016/05/18		99	%	75 - 125
			Nickel (Ni)	2016/05/18		99	%	75 - 125
			Lead (Pb)	2016/05/18		99	%	75 - 125
			Zinc (Zn)	2016/05/18		101	%	75 - 125
1606823	KV1	Method Blank	Silver (Ag)	2016/05/18	<0.5		mg/kg	
			Arsenic (As)	2016/05/18	<5		mg/kg	
			Barium (Ba)	2016/05/18	<5		mg/kg	
			Cadmium (Cd)	2016/05/18	<0.5		mg/kg	
			Chromium (Cr)	2016/05/18	<2		mg/kg	
			Cobalt (Co)	2016/05/18	<2		mg/kg	
			Copper (Cu)	2016/05/18	<2		mg/kg	
			Tin (Sn)	2016/05/18	<4		mg/kg	
			Manganese (Mn)	2016/05/18	<2		mg/kg	
			Molybdenum (Mo)	2016/05/18	<1		mg/kg	
			Nickel (Ni)	2016/05/18	<1		mg/kg	
			Lead (Pb)	2016/05/18	<5		mg/kg	
			Zinc (Zn)	2016/05/18	<10		mg/kg	
1606823	KV1	RPD	Silver (Ag)	2016/05/19	NC		%	30
			Arsenic (As)	2016/05/19	NC		%	30
			Barium (Ba)	2016/05/19	0.51		%	30
			Cadmium (Cd)	2016/05/19	NC		%	30
			Chromium (Cr)	2016/05/19	0.29		%	30
			Cobalt (Co)	2016/05/19	5.4		%	30
			Copper (Cu)	2016/05/19	5.2		%	30
			Tin (Sn)	2016/05/19	NC		%	30
			Manganese (Mn)	2016/05/19	1.4		%	30
			Molybdenum (Mo)	2016/05/19	NC		%	30
			Nickel (Ni)	2016/05/19	1.4		%	30
			Lead (Pb)	2016/05/19	NC		%	30
			Zinc (Zn)	2016/05/19	1.6		%	30
1606884	MP	Spiked Blank	1-Chlorooctadecane	2016/05/18		78	%	60 - 120
			Petroleum Hydrocarbons (C10-C50)	2016/05/18		87	%	70 - 130
1606884	MP	Spiked Blank DUP	1-Chlorooctadecane	2016/05/18		76	%	60 - 120
			Petroleum Hydrocarbons (C10-C50)	2016/05/18		92	%	70 - 130
1606884	MP	RPD	Petroleum Hydrocarbons (C10-C50)	2016/05/18	NC		%	50
			Petroleum Hydrocarbons (C10-C50)	2016/05/19	NC		%	50
1606884	MP	Method Blank	1-Chlorooctadecane	2016/05/18		74	%	60 - 120
			Petroleum Hydrocarbons (C10-C50)	2016/05/18	<100		mg/kg	
1606884	MP	RPD [CI7339-01]	Petroleum Hydrocarbons (C10-C50)	2016/05/18	NC		%	50
1606885	YW	Spiked Blank	D10-Anthracene	2016/05/18		84	%	50 - 130
			D12-Benzo(a)pyrene	2016/05/18		80	%	50 - 130
			D14-Terphenyl	2016/05/18		86	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
1606885	YW	Spiked Blank DUP	D8-Acenaphthylene	2016/05/18		86	%	50 - 130
			D8-Naphthalene	2016/05/18		78	%	50 - 130
			Acenaphthene	2016/05/18		86	%	50 - 130
			Acenaphthylene	2016/05/18		94	%	50 - 130
			Anthracene	2016/05/18		92	%	50 - 130
			Benzo(a)anthracene	2016/05/18		92	%	50 - 130
			Benzo(a)pyrene	2016/05/18		88	%	50 - 130
			Benzo(b)fluoranthene	2016/05/18		84	%	50 - 130
			Benzo(j)fluoranthene	2016/05/18		86	%	50 - 130
			Benzo(k)fluoranthene	2016/05/18		95	%	50 - 130
			Benzo(b+j+k)fluoranthene	2016/05/18		88	%	50 - 130
			Benzo(c)phenanthrene	2016/05/18		89	%	50 - 130
			Benzo(ghi)perylene	2016/05/18		91	%	50 - 130
			Chrysene	2016/05/18		93	%	50 - 130
			Dibenz(a,h)anthracene	2016/05/18		90	%	50 - 130
			Dibenzo(a,i)pyrene	2016/05/18		82	%	50 - 130
			Dibenzo(a,h)pyrene	2016/05/18		75	%	50 - 130
			Dibenzo(a,l)pyrene	2016/05/18		86	%	50 - 130
			7,12-Dimethylbenzanthracene	2016/05/18		77	%	50 - 130
			Fluoranthene	2016/05/18		91	%	50 - 130
			Fluorene	2016/05/18		92	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2016/05/18		85	%	50 - 130
			3-Methylcholanthrene	2016/05/18		86	%	50 - 130
			Naphthalene	2016/05/18		84	%	50 - 130
			Phenanthrene	2016/05/18		88	%	50 - 130
			Pyrene	2016/05/18		92	%	50 - 130
			2-Methylnaphthalene	2016/05/18		84	%	50 - 130
			1-Methylnaphthalene	2016/05/18		78	%	50 - 130
			1,3-Dimethylnaphthalene	2016/05/18		85	%	50 - 130
			2,3,5-Trimethylnaphthalene	2016/05/18		86	%	50 - 130
			D10-Anthracene	2016/05/18		84	%	50 - 130
			D12-Benzo(a)pyrene	2016/05/18		80	%	50 - 130
			D14-Terphenyl	2016/05/18		86	%	50 - 130
			D8-Acenaphthylene	2016/05/18		88	%	50 - 130
			D8-Naphthalene	2016/05/18		80	%	50 - 130
			Acenaphthene	2016/05/18		89	%	50 - 130
			Acenaphthylene	2016/05/18		95	%	50 - 130
			Anthracene	2016/05/18		91	%	50 - 130
			Benzo(a)anthracene	2016/05/18		92	%	50 - 130
			Benzo(a)pyrene	2016/05/18		91	%	50 - 130
			Benzo(b)fluoranthene	2016/05/18		89	%	50 - 130
			Benzo(j)fluoranthene	2016/05/18		88	%	50 - 130
			Benzo(k)fluoranthene	2016/05/18		91	%	50 - 130
			Benzo(b+j+k)fluoranthene	2016/05/18		89	%	50 - 130
			Benzo(c)phenanthrene	2016/05/18		88	%	50 - 130
			Benzo(ghi)perylene	2016/05/18		93	%	50 - 130
			Chrysene	2016/05/18		93	%	50 - 130
			Dibenz(a,h)anthracene	2016/05/18		91	%	50 - 130
			Dibenzo(a,i)pyrene	2016/05/18		83	%	50 - 130
			Dibenzo(a,h)pyrene	2016/05/18		74	%	50 - 130
			Dibenzo(a,l)pyrene	2016/05/18		87	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
1606885	YW	RPD	7,12-Dimethylbenzanthracene	2016/05/18		78	%	50 - 130
			Fluoranthene	2016/05/18		91	%	50 - 130
			Fluorene	2016/05/18		94	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2016/05/18		85	%	50 - 130
			3-Methylcholanthrene	2016/05/18		87	%	50 - 130
			Naphthalene	2016/05/18		87	%	50 - 130
			Phenanthrene	2016/05/18		88	%	50 - 130
			Pyrene	2016/05/18		92	%	50 - 130
			2-Methylnaphthalene	2016/05/18		85	%	50 - 130
			1-Methylnaphthalene	2016/05/18		80	%	50 - 130
			1,3-Dimethylnaphthalene	2016/05/18		87	%	50 - 130
			2,3,5-Trimethylnaphthalene	2016/05/18		87	%	50 - 130
			Acenaphthene	2016/05/18	3.4		%	50
			Acenaphthylene	2016/05/18	1.1		%	50
			Anthracene	2016/05/18	1.1		%	50
			Benzo(a)anthracene	2016/05/18	0		%	50
			Benzo(a)pyrene	2016/05/18	2.8		%	50
			Benzo(b)fluoranthene	2016/05/18	5.8		%	50
			Benzo(j)fluoranthene	2016/05/18	2.9		%	50
			Benzo(k)fluoranthene	2016/05/18	4.9		%	50
			Benzo(b+j+k)fluoranthene	2016/05/18	1.3		%	50
			Benzo(c)phenanthrene	2016/05/18	0.57		%	50
			Benzo(ghi)perylene	2016/05/18	2.2		%	50
			Chrysene	2016/05/18	0.54		%	50
			Dibenz(a,h)anthracene	2016/05/18	1.1		%	50
			Dibenzo(a,i)pyrene	2016/05/18	0.61		%	50
			Dibenzo(a,h)pyrene	2016/05/18	1.3		%	50
			Dibenzo(a,l)pyrene	2016/05/18	1.7		%	50
			7,12-Dimethylbenzanthracene	2016/05/18	1.3		%	50
			Fluoranthene	2016/05/18	0.55		%	50
			Fluorene	2016/05/18	1.6		%	50
			Indeno(1,2,3-cd)pyrene	2016/05/18	0		%	50
			3-Methylcholanthrene	2016/05/18	1.2		%	50
			Naphthalene	2016/05/18	2.9		%	50
			Phenanthrene	2016/05/18	0.57		%	50
			Pyrene	2016/05/18	0.54		%	50
			2-Methylnaphthalene	2016/05/18	1.2		%	50
			1-Methylnaphthalene	2016/05/18	2.5		%	50
			1,3-Dimethylnaphthalene	2016/05/18	2.3		%	50
			2,3,5-Trimethylnaphthalene	2016/05/18	0.58		%	50
			Acenaphthene	2016/05/19	NC		%	50
			Acenaphthylene	2016/05/19	NC		%	50
			Anthracene	2016/05/19	NC		%	50
			Benzo(a)anthracene	2016/05/19	NC		%	50
			Benzo(a)pyrene	2016/05/19	NC		%	50
			Benzo(b)fluoranthene	2016/05/19	NC		%	50
			Benzo(j)fluoranthene	2016/05/19	NC		%	50
			Benzo(k)fluoranthene	2016/05/19	NC		%	50
			Benzo(c)phenanthrene	2016/05/19	NC		%	50
			Benzo(ghi)perylene	2016/05/19	NC		%	50
			Chrysene	2016/05/19	NC		%	50

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
1606885	YW	Method Blank	Dibenz(a,h)anthracene	2016/05/19	NC		%	50
			Dibenzo(a,i)pyrene	2016/05/19	NC		%	50
			Dibenzo(a,h)pyrene	2016/05/19	NC		%	50
			Dibenzo(a,l)pyrene	2016/05/19	NC		%	50
			7,12-Dimethylbenzanthracene	2016/05/19	NC		%	50
			Fluoranthene	2016/05/19	NC		%	50
			Fluorene	2016/05/19	NC		%	50
			Indeno(1,2,3-cd)pyrene	2016/05/19	NC		%	50
			3-Methylcholanthrene	2016/05/19	NC		%	50
			Naphthalene	2016/05/19	NC		%	50
			Phenanthrene	2016/05/19	NC		%	50
			Pyrene	2016/05/19	NC		%	50
			2-Methylnaphthalene	2016/05/19	NC		%	50
			1-Methylnaphthalene	2016/05/19	NC		%	50
			1,3-Dimethylnaphthalene	2016/05/19	NC		%	50
			2,3,5-Trimethylnaphthalene	2016/05/19	NC		%	50
			D10-Anthracene	2016/05/18		86	%	50 - 130
			D12-Benzo(a)pyrene	2016/05/18		82	%	50 - 130
			D14-Terphenyl	2016/05/18		88	%	50 - 130
			D8-Acenaphthylene	2016/05/18		90	%	50 - 130
			D8-Naphthalene	2016/05/18		82	%	50 - 130
			Acenaphthene	2016/05/18	<0.1		mg/kg	
			Acenaphthylene	2016/05/18	<0.1		mg/kg	
			Anthracene	2016/05/18	<0.1		mg/kg	
			Benzo(a)anthracene	2016/05/18	<0.1		mg/kg	
			Benzo(a)pyrene	2016/05/18	<0.1		mg/kg	
			Benzo(b)fluoranthene	2016/05/18	<0.1		mg/kg	
			Benzo(j)fluoranthene	2016/05/18	<0.1		mg/kg	
			Benzo(k)fluoranthene	2016/05/18	<0.1		mg/kg	
			Benzo(b+j+k)fluoranthene	2016/05/18	<0.1		mg/kg	
			Benzo(c)phenanthrene	2016/05/18	<0.1		mg/kg	
			Benzo(ghi)perylene	2016/05/18	<0.1		mg/kg	
			Chrysene	2016/05/18	<0.1		mg/kg	
			Dibenz(a,h)anthracene	2016/05/18	<0.1		mg/kg	
			Dibenzo(a,i)pyrene	2016/05/18	<0.1		mg/kg	
			Dibenzo(a,h)pyrene	2016/05/18	<0.1		mg/kg	
			Dibenzo(a,l)pyrene	2016/05/18	<0.1		mg/kg	
			7,12-Dimethylbenzanthracene	2016/05/18	<0.1		mg/kg	
			Fluoranthene	2016/05/18	<0.1		mg/kg	
			Fluorene	2016/05/18	<0.1		mg/kg	
			Indeno(1,2,3-cd)pyrene	2016/05/18	<0.1		mg/kg	
			3-Methylcholanthrene	2016/05/18	<0.1		mg/kg	
			Naphthalene	2016/05/18	<0.1		mg/kg	
			Phenanthrene	2016/05/18	<0.1		mg/kg	
			Pyrene	2016/05/18	<0.1		mg/kg	
			2-Methylnaphthalene	2016/05/18	<0.1		mg/kg	
			1-Methylnaphthalene	2016/05/18	<0.1		mg/kg	
			1,3-Dimethylnaphthalene	2016/05/18	<0.1		mg/kg	
			2,3,5-Trimethylnaphthalene	2016/05/18	<0.1		mg/kg	
1606885	YW	RPD [CI7339-01]	Acenaphthene	2016/05/18	NC		%	50
			Acenaphthylene	2016/05/18	NC		%	50

Maxxam Job #: B628299
Report Date: 2016/05/20

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LA PIERRE
Your P.O. #: 76203012

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Anthracene	2016/05/18	NC		%	50
			Benzo(a)anthracene	2016/05/18	NC		%	50
			Benzo(a)pyrene	2016/05/18	NC		%	50
			Benzo(b)fluoranthene	2016/05/18	NC		%	50
			Benzo(j)fluoranthene	2016/05/18	NC		%	50
			Benzo(k)fluoranthene	2016/05/18	NC		%	50
			Benzo(b+j+k)fluoranthene	2016/05/18	NC		%	50
			Benzo(c)phenanthrene	2016/05/18	NC		%	50
			Benzo(ghi)perylene	2016/05/18	NC		%	50
			Chrysene	2016/05/18	NC		%	50
			Dibenz(a,h)anthracene	2016/05/18	NC		%	50
			Dibenzo(a,i)pyrene	2016/05/18	NC		%	50
			Dibenzo(a,h)pyrene	2016/05/18	NC		%	50
			Dibenzo(a,l)pyrene	2016/05/18	NC		%	50
			7,12-Dimethylbenzanthracene	2016/05/18	NC		%	50
			Fluoranthene	2016/05/18	NC		%	50
			Fluorene	2016/05/18	NC		%	50
			Indeno(1,2,3-cd)pyrene	2016/05/18	NC		%	50
			3-Methylcholanthrene	2016/05/18	NC		%	50
			Naphthalene	2016/05/18	NC		%	50
			Phenanthrene	2016/05/18	NC		%	50
			Pyrene	2016/05/18	NC		%	50
			2-Methylnaphthalene	2016/05/18	NC		%	50
			1-Methylnaphthalene	2016/05/18	NC		%	50
			1,3-Dimethylnaphthalene	2016/05/18	NC		%	50
			2,3,5-Trimethylnaphthalene	2016/05/18	NC		%	50

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

Maxxam Job #: B628299
Report Date: 2016/05/20

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LA PIERRE
Your P.O. #: 76203012

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).





Caroline Bougie, B.Sc. Chemist



Karyn Vaucher
Membre OCQ #2011-004

Karyn Vaucher



Michel Poulin, B.Sc., Chemist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Your P.O. #: 76203012
Your Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your C.O.C. #: e-911176

Attention: Alexandre Lemire

GHD Consultants Ltée
MONTRÉAL
4600 COTE VERTU
SUITE 200
VILLE ST-LAURENT, QC
H4S 1C7

Report Date: 2016/06/07
Report #: R2148509
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B628744

Received: 2016/05/16, 13:55

Sample Matrix: SOIL
Samples Received: 8

Analyses	Quantity	Date	Date	Laboratory Method	Primary Reference
		Extracted	Analyzed		
Petroleum Hydrocarbons (C10-C50)*	6	2016/05/19	2016/05/19	STL SOP-00172	MA.400-HYD. 1.1 R2 m
Petroleum Hydrocarbons (C10-C50)*	2	2016/05/19	2016/05/20	STL SOP-00172	MA.400-HYD. 1.1 R2 m
Total Extractable Metals by ICP*	8	2016/05/19	2016/05/20	STL SOP-00006	MA200-Mét 1.2 R5 m
Polycyclic Aromatic Hydrocarbons*	4	2016/05/19	2016/05/19	STL SOP-00178	MA400-HAP 1.1 R5 m
Polycyclic Aromatic Hydrocarbons*	4	2016/05/19	2016/05/20	STL SOP-00178	MA400-HAP 1.1 R5 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

* Maxxam is accredited as per the MDDELCC program.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Karima Dlimi, B.Sc., Chemist, Project Manager

Email: KDlimi@maxxam.ca

Phone# (514)448-9001 Ext:6270

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B628744
Report Date: 2016/06/07

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012

PAH BY GCMS (SOIL)

Maxxam ID					CI9375		CI9375		CI9376		CI9377			
Sampling Date					2016/05/11		2016/05/11		2016/05/11		2016/05/12			
COC Number					e-911176		e-911176		e-911176		e-911176			
	Units	A	B	C	F-02-CFE-1	CR	F-02-CFE-1 Lab-Dup	CR	F-02-CFE-4	CR	F-04-CFE-2	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	35		35		52		20		N/A	N/A
PAH														
Acenaphthene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Acenaphthylene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Anthracene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(a)anthracene	mg/kg	0.1	1	10	<0.1		0.1	A	<0.1		<0.1		0.1	1607512
Benzo(a)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(b)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(j)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(k)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(b+j+k)fluoranthene	mg/kg	-	-	-	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(c)phenanthrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(ghi)perylene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Chrysene	mg/kg	0.1	1	10	<0.1		0.1	A	<0.1		<0.1		0.1	1607512
Dibenz(a,h)anthracene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
7,12-Dimethylbenzanthracene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Fluoranthene	mg/kg	0.1	10	100	<0.1		0.3	A-B	<0.1		<0.1		0.1	1607512
Fluorene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
3-Methylcholanthrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Naphthalene	mg/kg	0.1	5	50	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Phenanthrene	mg/kg	0.1	5	50	<0.1		0.2	A-B	<0.1		<0.1		0.1	1607512
Pyrene	mg/kg	0.1	10	100	<0.1		0.2	A-B	<0.1		<0.1		0.1	1607512
2-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
1-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
1,3-Dimethylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
2,3,5-Trimethylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Surrogate Recovery (%)														
D10-Anthracene	%	-	-	-	82		86		86		86		N/A	1607512
D12-Benzo(a)pyrene	%	-	-	-	66		68		74		78		N/A	1607512
D14-Terphenyl	%	-	-	-	90		96		94		94		N/A	1607512
RDL = Reportable Detection Limit														
QC Batch = Quality Control Batch														
N/A = Not Applicable														

Maxxam Job #: B628744
Report Date: 2016/06/07

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012

PAH BY GCMS (SOIL)

Maxxam ID					CI9375		CI9375		CI9376		CI9377			
Sampling Date					2016/05/11		2016/05/11		2016/05/11		2016/05/12			
COC Number					e-911176		e-911176		e-911176		e-911176			
	Units	A	B	C	F-02-CFE-1	CR	F-02-CFE-1 Lab-Dup	CR	F-02-CFE-4	CR	F-04-CFE-2	CR	RDL	QC Batch
D8-Acenaphthylene	%	-	-	-	82		86		82		84		N/A	1607512
D8-Naphthalene	%	-	-	-	82		88		86		86		N/A	1607512
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable														

Maxxam Job #: B628744
Report Date: 2016/06/07

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012

PAH BY GCMS (SOIL)

Maxxam ID					CI9378		CI9379		CI9380		CI9381			
Sampling Date					2016/05/12		2016/05/13		2016/05/13		2016/05/13			
COC Number					e-911176		e-911176		e-911176		e-911176			
	Units	A	B	C	F-04-CFE-5	CR	F-05-CFE-2	CR	F-05-CFE-7	CR	F-07-CFE-5	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	20		9.7		25		18		N/A	N/A
PAH														
Acenaphthene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Acenaphthylene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Anthracene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(a)anthracene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(a)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(b)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(j)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(k)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(b+j+k)fluoranthene	mg/kg	-	-	-	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(c)phenanthrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Benzo(ghi)perylene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Chrysene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Dibenz(a,h)anthracene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
7,12-Dimethylbenzanthracene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Fluoranthene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Fluorene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
3-Methylcholanthrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Naphthalene	mg/kg	0.1	5	50	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Phenanthrene	mg/kg	0.1	5	50	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Pyrene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1607512
2-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
1-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
1,3-Dimethylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
2,3,5-Trimethylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1607512
Surrogate Recovery (%)														
D10-Anthracene	%	-	-	-	78		84		88		86		N/A	1607512
D12-Benzo(a)pyrene	%	-	-	-	66		76		80		78		N/A	1607512
D14-Terphenyl	%	-	-	-	90		90		94		92		N/A	1607512
RDL = Reportable Detection Limit														
QC Batch = Quality Control Batch														
N/A = Not Applicable														

Maxxam Job #: B628744
Report Date: 2016/06/07

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012

PAH BY GCMS (SOIL)

Maxxam ID					CI9378		CI9379		CI9380		CI9381			
Sampling Date					2016/05/12		2016/05/13		2016/05/13		2016/05/13			
COC Number					e-911176		e-911176		e-911176		e-911176			
	Units	A	B	C	F-04-CFE-5	CR	F-05-CFE-2	CR	F-05-CFE-7	CR	F-07-CFE-5	CR	RDL	QC Batch
D8-Acenaphthylene	%	-	-	-	80		84		88		88		N/A	1607512
D8-Naphthalene	%	-	-	-	80		84		82		84		N/A	1607512
RDL = Reportable Detection Limit														
QC Batch = Quality Control Batch														
N/A = Not Applicable														

Maxxam Job #: B628744
Report Date: 2016/06/07

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012

PAH BY GCMS (SOIL)

Maxxam ID					CI9382		CI9382			
Sampling Date					2016/05/13		2016/05/13			
COC Number					e-911176		e-911176			
	Units	A	B	C	F-07-CFE-7	CR	F-07-CFE-7 Lab-Dup	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	34		34		N/A	N/A
PAH										
Acenaphthene	mg/kg	0.1	10	100	<0.1		<0.1		0.1	1607512
Acenaphthylene	mg/kg	0.1	10	100	<0.1		<0.1		0.1	1607512
Anthracene	mg/kg	0.1	10	100	<0.1		<0.1		0.1	1607512
Benzo(a)anthracene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
Benzo(a)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
Benzo(b)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
Benzo(j)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
Benzo(k)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
Benzo(b+j+k)fluoranthene	mg/kg	-	-	-	<0.1		<0.1		0.1	1607512
Benzo(c)phenanthrene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
Benzo(ghi)perylene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
Chrysene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
Dibenz(a,h)anthracene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
7,12-Dimethylbenzanthracene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
Fluoranthene	mg/kg	0.1	10	100	<0.1		0.1	A	0.1	1607512
Fluorene	mg/kg	0.1	10	100	<0.1		<0.1		0.1	1607512
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
3-Methylcholanthrene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
Naphthalene	mg/kg	0.1	5	50	<0.1		<0.1		0.1	1607512
Phenanthrene	mg/kg	0.1	5	50	<0.1		0.1	A	0.1	1607512
Pyrene	mg/kg	0.1	10	100	<0.1		<0.1		0.1	1607512
2-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
1-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
1,3-Dimethylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
2,3,5-Trimethylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1607512
Surrogate Recovery (%)										
D10-Anthracene	%	-	-	-	90		84		N/A	1607512
D12-Benzo(a)pyrene	%	-	-	-	82		78		N/A	1607512
D14-Terphenyl	%	-	-	-	98		92		N/A	1607512
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
N/A = Not Applicable										

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PAH BY GCMS (SOIL)

Maxxam ID					CI9382		CI9382			
Sampling Date					2016/05/13		2016/05/13			
COC Number					e-911176		e-911176			
	Units	A	B	C	F-07-CFE-7	CR	F-07-CFE-7 Lab-Dup	CR	RDL	QC Batch
D8-Acenaphthylene	%	-	-	-	88		84		N/A	1607512
D8-Naphthalene	%	-	-	-	90		86		N/A	1607512
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable										

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Client Project #: 11117049-A2
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HYDROCARBONS BY GC/FID (SOIL)

Maxxam ID					CI9375		CI9375		CI9376		CI9377			
Sampling Date					2016/05/11		2016/05/11		2016/05/11		2016/05/12			
COC Number					e-911176		e-911176		e-911176		e-911176			
	Units	A	B	C	F-02-CFE-1	CR	F-02-CFE-1 Lab-Dup	CR	F-02-CFE-4	CR	F-04-CFE-2	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	35		35		52		20		N/A	N/A
PETROLEUM HYDROCARBONS														
Petroleum Hydrocarbons (C10-C50)	mg/kg	300	700	3500	100	<A	240	<A	170	<A	<100		100	1607511
Surrogate Recovery (%)														
1-Chlorooctadecane	%	-	-	-	87		86		81		83		N/A	1607511
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable														

Maxxam ID					CI9378		CI9379		CI9380		CI9381			
Sampling Date					2016/05/12		2016/05/13		2016/05/13		2016/05/13			
COC Number					e-911176		e-911176		e-911176		e-911176			
	Units	A	B	C	F-04-CFE-5	CR	F-05-CFE-2	CR	F-05-CFE-7	CR	F-07-CFE-5	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	20		9.7		25		18		N/A	N/A
PETROLEUM HYDROCARBONS														
Petroleum Hydrocarbons (C10-C50)	mg/kg	300	700	3500	<100		2200	B-C	<100		950	B-C	100	1607511
Surrogate Recovery (%)														
1-Chlorooctadecane	%	-	-	-	90		79		86		90		N/A	1607511
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable														

Maxxam ID					CI9382				
Sampling Date					2016/05/13				
COC Number					e-911176				
	Units	A	B	C	F-07-CFE-7	CR	RDL	QC Batch	
% MOISTURE	%	-	-	-	34		N/A	N/A	
PETROLEUM HYDROCARBONS									
Petroleum Hydrocarbons (C10-C50)	mg/kg	300	700	3500	<100		100	1607511	
Surrogate Recovery (%)									
1-Chlorooctadecane	%	-	-	-	87		N/A	1607511	
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable									

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TOTAL EXTRACTABLE METALS (SOIL)

Maxxam ID					CI9375		CI9376		CI9377		CI9378			
Sampling Date					2016/05/11		2016/05/11		2016/05/12		2016/05/12			
COC Number					e-911176		e-911176		e-911176		e-911176			
	Units	A	B	C	F-02-CFE-1	CR	F-02-CFE-4	CR	F-04-CFE-2	CR	F-04-CFE-5	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	35		52		20		20		N/A	N/A
METALS														
Silver (Ag)	mg/kg	2	20	40	<0.5		<0.5		<0.5		<0.5		0.5	1607561
Arsenic (As)	mg/kg	6	30	50	<5		<5		<5		<5		5	1607561
Barium (Ba)	mg/kg	200	500	2000	150	<A	140	<A	150	<A	140	<A	5	1607561
Cadmium (Cd)	mg/kg	1.5	5	20	<0.5		<0.5		<0.5		<0.5		0.5	1607561
Chromium (Cr)	mg/kg	85	250	800	61	<A	47	<A	56	<A	37	<A	2	1607561
Cobalt (Co)	mg/kg	15	50	300	14	<A	10	<A	15	A	10	<A	2	1607561
Copper (Cu)	mg/kg	40	100	500	35	<A	20	<A	30	<A	22	<A	2	1607561
Tin (Sn)	mg/kg	5	50	300	<4		<4		<4		<4		4	1607561
Manganese (Mn)	mg/kg	770	1000	2200	510	<A	260	<A	530	<A	300	<A	2	1607561
Molybdenum (Mo)	mg/kg	2	10	40	1	<A	<1		<1		<1		1	1607561
Nickel (Ni)	mg/kg	50	100	500	39	<A	25	<A	38	<A	28	<A	1	1607561
Lead (Pb)	mg/kg	50	500	1000	15	<A	33	<A	14	<A	13	<A	5	1607561
Zinc (Zn)	mg/kg	110	500	1500	94	<A	92	<A	73	<A	58	<A	10	1607561
RDL = Reportable Detection Limit														
QC Batch = Quality Control Batch														
N/A = Not Applicable														

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TOTAL EXTRACTABLE METALS (SOIL)

Maxxam ID					CI9379		CI9380		CI9381		CI9382			
Sampling Date					2016/05/13		2016/05/13		2016/05/13		2016/05/13			
COC Number					e-911176		e-911176		e-911176		e-911176			
	Units	A	B	C	F-05-CFE-2	CR	F-05-CFE-7	CR	F-07-CFE-5	CR	F-07-CFE-7	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	9.7		25		18		34		N/A	N/A
METALS														
Silver (Ag)	mg/kg	2	20	40	<0.5		<0.5		<0.5		<0.5		0.5	1607661
Arsenic (As)	mg/kg	6	30	50	<5		<5		<5		<5		5	1607661
Barium (Ba)	mg/kg	200	500	2000	82	<A	99	<A	95	<A	150	<A	5	1607661
Cadmium (Cd)	mg/kg	1.5	5	20	<0.5		<0.5		<0.5		<0.5		0.5	1607661
Chromium (Cr)	mg/kg	85	250	800	12	<A	28	<A	19	<A	48	<A	2	1607661
Cobalt (Co)	mg/kg	15	50	300	7	<A	7	<A	9	<A	11	<A	2	1607661
Copper (Cu)	mg/kg	40	100	500	18	<A	11	<A	17	<A	17	<A	2	1607661
Tin (Sn)	mg/kg	5	50	300	<4		<4		<4		<4		4	1607661
Manganese (Mn)	mg/kg	770	1000	2200	300	<A	160	<A	460	<A	290	<A	2	1607661
Molybdenum (Mo)	mg/kg	2	10	40	<1		<1		<1		<1		1	1607661
Nickel (Ni)	mg/kg	50	100	500	17	<A	17	<A	20	<A	26	<A	1	1607661
Lead (Pb)	mg/kg	50	500	1000	22	<A	<5		13	<A	8	<A	5	1607661
Zinc (Zn)	mg/kg	110	500	1500	44	<A	51	<A	42	<A	80	<A	10	1607661
RDL = Reportable Detection Limit														
QC Batch = Quality Control Batch														
N/A = Not Applicable														

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TOTAL EXTRACTABLE METALS (SOIL)

Maxxam ID					CI9382			
Sampling Date					2016/05/13			
COC Number					e-911176			
	Units	A	B	C	F-07-CFE-7 Lab-Dup	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	34		N/A	N/A
METALS								
Silver (Ag)	mg/kg	2	20	40	<0.5		0.5	1607661
Arsenic (As)	mg/kg	6	30	50	<5		5	1607661
Barium (Ba)	mg/kg	200	500	2000	150	<A	5	1607661
Cadmium (Cd)	mg/kg	1.5	5	20	<0.5		0.5	1607661
Chromium (Cr)	mg/kg	85	250	800	47	<A	2	1607661
Cobalt (Co)	mg/kg	15	50	300	10	<A	2	1607661
Copper (Cu)	mg/kg	40	100	500	16	<A	2	1607661
Tin (Sn)	mg/kg	5	50	300	<4		4	1607661
Manganese (Mn)	mg/kg	770	1000	2200	300	<A	2	1607661
Molybdenum (Mo)	mg/kg	2	10	40	<1		1	1607661
Nickel (Ni)	mg/kg	50	100	500	26	<A	1	1607661
Lead (Pb)	mg/kg	50	500	1000	9	<A	5	1607661
Zinc (Zn)	mg/kg	110	500	1500	78	<A	10	1607661
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
N/A = Not Applicable								

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GENERAL COMMENTS

All results are calculated on a dry weight basis except where not applicable.

Condition of sample(s) upon receipt: GOOD

Rev: English report

A,B,C,CR: Criteria following appendix 2 of the " Soil Protection and Contaminated Sites Rehabilitation Policy " entitled " Generic criteria for soils and groundwater ". For all metals analyses in soil, the criterion A refers to " Background Level of St. Lawrence Lowlands Sector ".

For groundwaters:

The A and B criteria follow the appendix 2 of the " Soil Protection and Contaminated Sites Rehabilitation Policy " entitled " Generic criteria for soils and groundwater ". The criterion A refers to " Drinking Water " and the criterion B refers to "Seepage into Surface Water or Infiltration into Sewers ".

These criteria references are shown for visual aid only, and should not be interpreted otherwise.

- = This parameter is not part of the regulation.

PAH BY GCMS (SOIL)

Please note that the results have not been corrected for QC recoveries (spiked blank and method blank) nor for the surrogates.

Un-rounded results are used in the Benzo(b+j+k)fluoranthene calculation. This total result is then rounded to two significant figures.

HYDROCARBONS BY GC/FID (SOIL)

Please note that the results have not been corrected for QC recoveries (spiked blank and surrogates). Please note that the results have not been corrected for the method blank.

C19379 and C19381:

C18 - C50+ : Same chromatographic region as asphalt and tar.

The reported hydrocarbon resemblance was obtained by visual comparison of the sample chromatogram with a library of reference product chromatograms. Since variables such as multiple products, the degree and type of weathering and the presence of non petrogenic hydrocarbons cannot be duplicated in reference spectra, the resemblance information must be regarded as qualitative and as such, Maxxam can assume no liability for any conclusions drawn from these data.

The chromatograms are provided for information purposes only. Any conclusion drawn by the data user from these chromatograms is their sole responsibility. Maxxam can assume no liability for any such 3rd party interpretations and is responsible only for the quality of the quantitative data provided.

TOTAL EXTRACTABLE METALS (SOIL)

Please note that the result have not been corrected for the QC recoveries nor for the method blank results.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
1607511	AS2	Spiked Blank	1-Chlorooctadecane	2016/05/19		85	%	60 - 120
			Petroleum Hydrocarbons (C10-C50)	2016/05/19		85	%	70 - 130
1607511	AS2	Method Blank	1-Chlorooctadecane	2016/05/19		79	%	60 - 120
			Petroleum Hydrocarbons (C10-C50)	2016/05/19	<100		mg/kg	
1607511	AS2	RPD	Petroleum Hydrocarbons (C10-C50)	2016/05/19	NC		%	50
1607511	AS2	RPD [C19375-01]	Petroleum Hydrocarbons (C10-C50)	2016/05/19	NC		%	50
1607512	CB5	Spiked Blank	D10-Anthracene	2016/05/19		90	%	50 - 130
			D12-Benzo(a)pyrene	2016/05/19		86	%	50 - 130
			D14-Terphenyl	2016/05/19		96	%	50 - 130
			D8-Acenaphthylene	2016/05/19		88	%	50 - 130
			D8-Naphthalene	2016/05/19		90	%	50 - 130
			Acenaphthene	2016/05/19		87	%	50 - 130
			Acenaphthylene	2016/05/19		83	%	50 - 130
			Anthracene	2016/05/19		86	%	50 - 130
			Benzo(a)anthracene	2016/05/19		85	%	50 - 130
			Benzo(a)pyrene	2016/05/19		83	%	50 - 130
			Benzo(b)fluoranthene	2016/05/19		87	%	50 - 130
			Benzo(j)fluoranthene	2016/05/19		81	%	50 - 130
			Benzo(k)fluoranthene	2016/05/19		82	%	50 - 130
			Benzo(b+j+k)fluoranthene	2016/05/19		83	%	50 - 130
			Benzo(c)phenanthrene	2016/05/19		80	%	50 - 130
			Benzo(ghi)perylene	2016/05/19		88	%	50 - 130
			Chrysene	2016/05/19		86	%	50 - 130
			Dibenz(a,h)anthracene	2016/05/19		86	%	50 - 130
			Dibenzo(a,i)pyrene	2016/05/19		78	%	50 - 130
			Dibenzo(a,h)pyrene	2016/05/19		69	%	50 - 130
			Dibenzo(a,l)pyrene	2016/05/19		81	%	50 - 130
			7,12-Dimethylbenzanthracene	2016/05/19		76	%	50 - 130
			Fluoranthene	2016/05/19		84	%	50 - 130
			Fluorene	2016/05/19		86	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2016/05/19		79	%	50 - 130
			3-Methylcholanthrene	2016/05/19		76	%	50 - 130
			Naphthalene	2016/05/19		89	%	50 - 130
			Phenanthrene	2016/05/19		80	%	50 - 130
			Pyrene	2016/05/19		82	%	50 - 130
			2-Methylnaphthalene	2016/05/19		86	%	50 - 130
			1-Methylnaphthalene	2016/05/19		71	%	50 - 130
			1,3-Dimethylnaphthalene	2016/05/19		81	%	50 - 130
			2,3,5-Trimethylnaphthalene	2016/05/19		76	%	50 - 130
1607512	CB5	Method Blank	D10-Anthracene	2016/05/19		90	%	50 - 130
			D12-Benzo(a)pyrene	2016/05/19		84	%	50 - 130
			D14-Terphenyl	2016/05/19		92	%	50 - 130
			D8-Acenaphthylene	2016/05/19		86	%	50 - 130
			D8-Naphthalene	2016/05/19		88	%	50 - 130
			Acenaphthene	2016/05/19	<0.1		mg/kg	
			Acenaphthylene	2016/05/19	<0.1		mg/kg	
			Anthracene	2016/05/19	<0.1		mg/kg	
			Benzo(a)anthracene	2016/05/19	<0.1		mg/kg	
			Benzo(a)pyrene	2016/05/19	<0.1		mg/kg	
			Benzo(b)fluoranthene	2016/05/19	<0.1		mg/kg	
			Benzo(j)fluoranthene	2016/05/19	<0.1		mg/kg	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
1607512	CB5	RPD [CI9375-01]	Benzo(k)fluoranthene	2016/05/19	<0.1		mg/kg	
			Benzo(b+j+k)fluoranthene	2016/05/19	<0.1		mg/kg	
			Benzo(c)phenanthrene	2016/05/19	<0.1		mg/kg	
			Benzo(ghi)perylene	2016/05/19	<0.1		mg/kg	
			Chrysene	2016/05/19	<0.1		mg/kg	
			Dibenz(a,h)anthracene	2016/05/19	<0.1		mg/kg	
			Dibenzo(a,i)pyrene	2016/05/19	<0.1		mg/kg	
			Dibenzo(a,h)pyrene	2016/05/19	<0.1		mg/kg	
			Dibenzo(a,l)pyrene	2016/05/19	<0.1		mg/kg	
			7,12-Dimethylbenzanthracene	2016/05/19	<0.1		mg/kg	
			Fluoranthene	2016/05/19	<0.1		mg/kg	
			Fluorene	2016/05/19	<0.1		mg/kg	
			Indeno(1,2,3-cd)pyrene	2016/05/19	<0.1		mg/kg	
			3-Methylcholanthrene	2016/05/19	<0.1		mg/kg	
			Naphthalene	2016/05/19	<0.1		mg/kg	
			Phenanthrene	2016/05/19	<0.1		mg/kg	
			Pyrene	2016/05/19	<0.1		mg/kg	
			2-Methylnaphthalene	2016/05/19	<0.1		mg/kg	
			1-Methylnaphthalene	2016/05/19	<0.1		mg/kg	
			1,3-Dimethylnaphthalene	2016/05/19	<0.1		mg/kg	
			2,3,5-Trimethylnaphthalene	2016/05/19	<0.1		mg/kg	
			Acenaphthene	2016/05/19	NC		%	50
			Acenaphthylene	2016/05/19	NC		%	50
			Anthracene	2016/05/19	NC		%	50
			Benzo(a)anthracene	2016/05/19	NC		%	50
			Benzo(a)pyrene	2016/05/19	NC		%	50
			Benzo(b)fluoranthene	2016/05/19	NC		%	50
			Benzo(j)fluoranthene	2016/05/19	NC		%	50
			Benzo(k)fluoranthene	2016/05/19	NC		%	50
			Benzo(b+j+k)fluoranthene	2016/05/19	NC		%	50
			Benzo(c)phenanthrene	2016/05/19	NC		%	50
			Benzo(ghi)perylene	2016/05/19	NC		%	50
			Chrysene	2016/05/19	NC		%	50
			Dibenz(a,h)anthracene	2016/05/19	NC		%	50
			Dibenzo(a,i)pyrene	2016/05/19	NC		%	50
			Dibenzo(a,h)pyrene	2016/05/19	NC		%	50
			Dibenzo(a,l)pyrene	2016/05/19	NC		%	50
			7,12-Dimethylbenzanthracene	2016/05/19	NC		%	50
			Fluoranthene	2016/05/19	NC		%	50
			Fluorene	2016/05/19	NC		%	50
			Indeno(1,2,3-cd)pyrene	2016/05/19	NC		%	50
			3-Methylcholanthrene	2016/05/19	NC		%	50
			Naphthalene	2016/05/19	NC		%	50
			Phenanthrene	2016/05/19	NC		%	50
			Pyrene	2016/05/19	NC		%	50
			2-Methylnaphthalene	2016/05/19	NC		%	50
			1-Methylnaphthalene	2016/05/19	NC		%	50
			1,3-Dimethylnaphthalene	2016/05/19	NC		%	50
			2,3,5-Trimethylnaphthalene	2016/05/19	NC		%	50
1607512	CB5	RPD [CI9382-01]	Acenaphthene	2016/05/20	NC		%	50
			Acenaphthylene	2016/05/20	NC		%	50

Maxxam Job #: B628744
Report Date: 2016/06/07

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Anthracene	2016/05/20	NC		%	50
			Benzo(a)anthracene	2016/05/20	NC		%	50
			Benzo(a)pyrene	2016/05/20	NC		%	50
			Benzo(b)fluoranthene	2016/05/20	NC		%	50
			Benzo(j)fluoranthene	2016/05/20	NC		%	50
			Benzo(k)fluoranthene	2016/05/20	NC		%	50
			Benzo(b+j+k)fluoranthene	2016/05/20	NC		%	50
			Benzo(c)phenanthrene	2016/05/20	NC		%	50
			Benzo(ghi)perylene	2016/05/20	NC		%	50
			Chrysene	2016/05/20	NC		%	50
			Dibenz(a,h)anthracene	2016/05/20	NC		%	50
			Dibenzo(a,i)pyrene	2016/05/20	NC		%	50
			Dibenzo(a,h)pyrene	2016/05/20	NC		%	50
			Dibenzo(a,l)pyrene	2016/05/20	NC		%	50
			7,12-Dimethylbenzanthracene	2016/05/20	NC		%	50
			Fluoranthene	2016/05/20	NC		%	50
			Fluorene	2016/05/20	NC		%	50
			Indeno(1,2,3-cd)pyrene	2016/05/20	NC		%	50
			3-Methylcholanthrene	2016/05/20	NC		%	50
			Naphthalene	2016/05/20	NC		%	50
			Phenanthrene	2016/05/20	NC		%	50
			Pyrene	2016/05/20	NC		%	50
			2-Methylnaphthalene	2016/05/20	NC		%	50
			1-Methylnaphthalene	2016/05/20	NC		%	50
			1,3-Dimethylnaphthalene	2016/05/20	NC		%	50
			2,3,5-Trimethylnaphthalene	2016/05/20	NC		%	50
1607561	KV	Spiked Blank	Silver (Ag)	2016/05/19		102	%	75 - 125
			Arsenic (As)	2016/05/19		100	%	75 - 125
			Barium (Ba)	2016/05/19		105	%	75 - 125
			Cadmium (Cd)	2016/05/19		103	%	75 - 125
			Chromium (Cr)	2016/05/19		97	%	75 - 125
			Cobalt (Co)	2016/05/19		96	%	75 - 125
			Copper (Cu)	2016/05/19		98	%	75 - 125
			Tin (Sn)	2016/05/19		106	%	75 - 125
			Manganese (Mn)	2016/05/19		95	%	75 - 125
			Molybdenum (Mo)	2016/05/19		99	%	75 - 125
			Nickel (Ni)	2016/05/19		97	%	75 - 125
			Lead (Pb)	2016/05/19		99	%	75 - 125
			Zinc (Zn)	2016/05/19		99	%	75 - 125
1607561	KV	Method Blank	Silver (Ag)	2016/05/19	<0.5		mg/kg	
			Arsenic (As)	2016/05/19	<5		mg/kg	
			Barium (Ba)	2016/05/19	<5		mg/kg	
			Cadmium (Cd)	2016/05/19	<0.5		mg/kg	
			Chromium (Cr)	2016/05/19	<2		mg/kg	
			Cobalt (Co)	2016/05/19	<2		mg/kg	
			Copper (Cu)	2016/05/19	<2		mg/kg	
			Tin (Sn)	2016/05/19	<4		mg/kg	
			Manganese (Mn)	2016/05/19	<2		mg/kg	
			Molybdenum (Mo)	2016/05/19	<1		mg/kg	
			Nickel (Ni)	2016/05/19	<1		mg/kg	
			Lead (Pb)	2016/05/19	<5		mg/kg	

Maxxam Job #: B628744
Report Date: 2016/06/07

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
1607561	KV	RPD	Zinc (Zn)	2016/05/19	<10		mg/kg	
			Silver (Ag)	2016/05/19	NC		%	30
			Arsenic (As)	2016/05/19	3.0		%	30
			Barium (Ba)	2016/05/19	3.9		%	30
			Cadmium (Cd)	2016/05/19	NC		%	30
			Chromium (Cr)	2016/05/19	1.6		%	30
			Cobalt (Co)	2016/05/19	NC		%	30
			Copper (Cu)	2016/05/19	9.1		%	30
			Tin (Sn)	2016/05/19	NC		%	30
			Manganese (Mn)	2016/05/19	8.6		%	30
			Molybdenum (Mo)	2016/05/19	3.1		%	30
			Nickel (Ni)	2016/05/19	3.3		%	30
			Lead (Pb)	2016/05/19	7.4		%	30
			Zinc (Zn)	2016/05/19	3.5		%	30
1607661	KV1	Spiked Blank	Silver (Ag)	2016/05/19		101	%	75 - 125
			Arsenic (As)	2016/05/19		101	%	75 - 125
			Barium (Ba)	2016/05/19		107	%	75 - 125
			Cadmium (Cd)	2016/05/19		106	%	75 - 125
			Chromium (Cr)	2016/05/19		98	%	75 - 125
			Cobalt (Co)	2016/05/19		98	%	75 - 125
			Copper (Cu)	2016/05/19		100	%	75 - 125
			Tin (Sn)	2016/05/19		109	%	75 - 125
			Manganese (Mn)	2016/05/19		96	%	75 - 125
			Molybdenum (Mo)	2016/05/19		101	%	75 - 125
			Nickel (Ni)	2016/05/19		99	%	75 - 125
			Lead (Pb)	2016/05/19		102	%	75 - 125
			Zinc (Zn)	2016/05/19		100	%	75 - 125
1607661	KV1	Method Blank	Silver (Ag)	2016/05/19	<0.5		mg/kg	
			Arsenic (As)	2016/05/19	<5		mg/kg	
			Barium (Ba)	2016/05/19	<5		mg/kg	
			Cadmium (Cd)	2016/05/19	<0.5		mg/kg	
			Chromium (Cr)	2016/05/19	<2		mg/kg	
			Cobalt (Co)	2016/05/19	<2		mg/kg	
			Copper (Cu)	2016/05/19	<2		mg/kg	
			Tin (Sn)	2016/05/19	<4		mg/kg	
			Manganese (Mn)	2016/05/19	<2		mg/kg	
			Molybdenum (Mo)	2016/05/19	<1		mg/kg	
			Nickel (Ni)	2016/05/19	<1		mg/kg	
			Lead (Pb)	2016/05/19	<5		mg/kg	
			Zinc (Zn)	2016/05/19	<10		mg/kg	
1607661	KV1	RPD [C19382-01]	Silver (Ag)	2016/05/20	NC		%	30
			Arsenic (As)	2016/05/20	NC		%	30
			Barium (Ba)	2016/05/20	0.84		%	30
			Cadmium (Cd)	2016/05/20	NC		%	30
			Chromium (Cr)	2016/05/20	2.0		%	30
			Cobalt (Co)	2016/05/20	0.65		%	30
			Copper (Cu)	2016/05/20	1.4		%	30
			Tin (Sn)	2016/05/20	NC		%	30
			Manganese (Mn)	2016/05/20	1.3		%	30
			Molybdenum (Mo)	2016/05/20	NC		%	30
			Nickel (Ni)	2016/05/20	0.76		%	30

Maxxam Job #: B628744
Report Date: 2016/06/07

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Lead (Pb)	2016/05/20	NC		%	30
			Zinc (Zn)	2016/05/20	1.8		%	30
<p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).</p>								

Maxxam Job #: B628744
Report Date: 2016/06/07

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).





Caroline Bougie, B.Sc. Chemist



Karyn Vaucher
Membre OCQ #2011-004

Karyn Vaucher

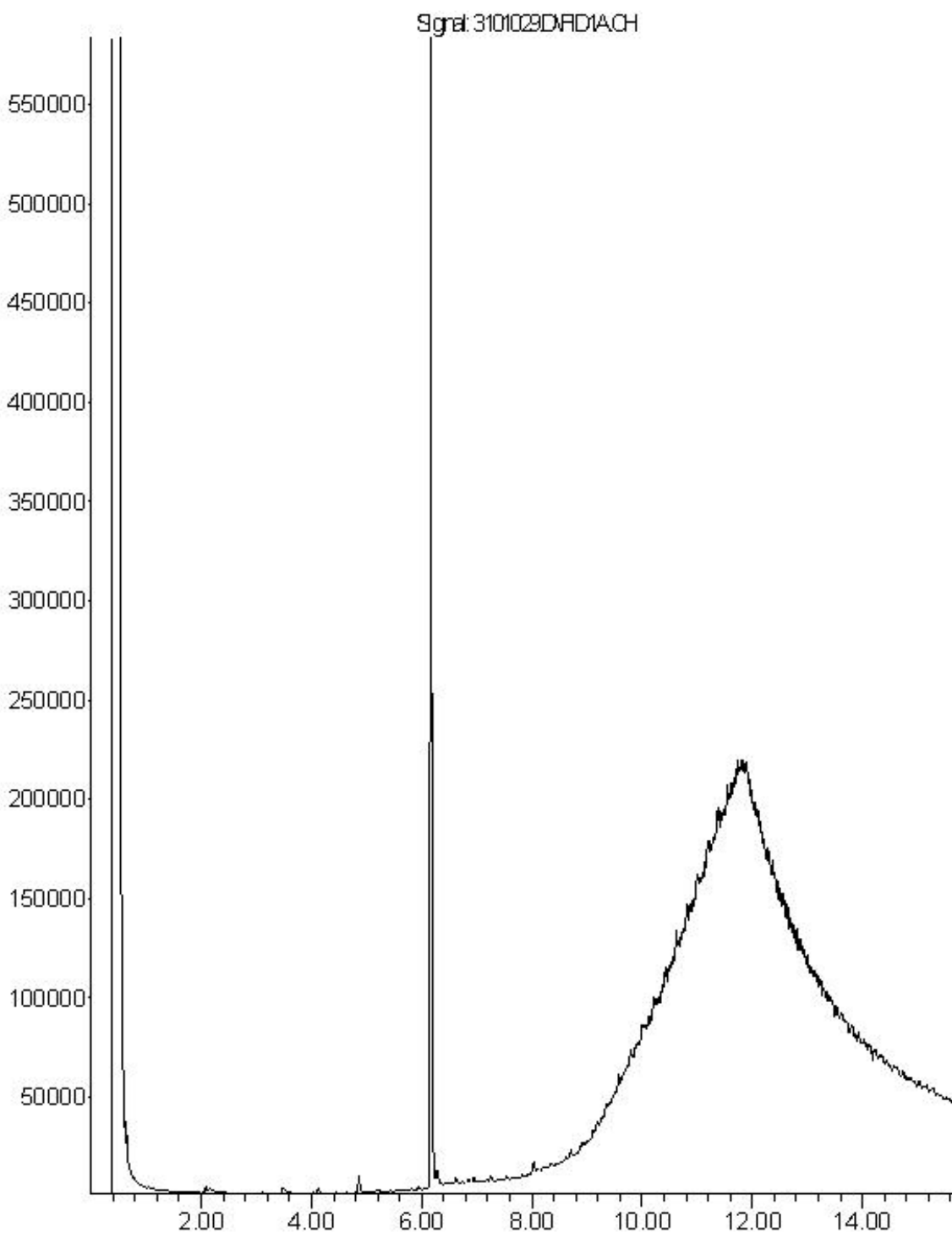


Michel Poulin, B.Sc., Chemist

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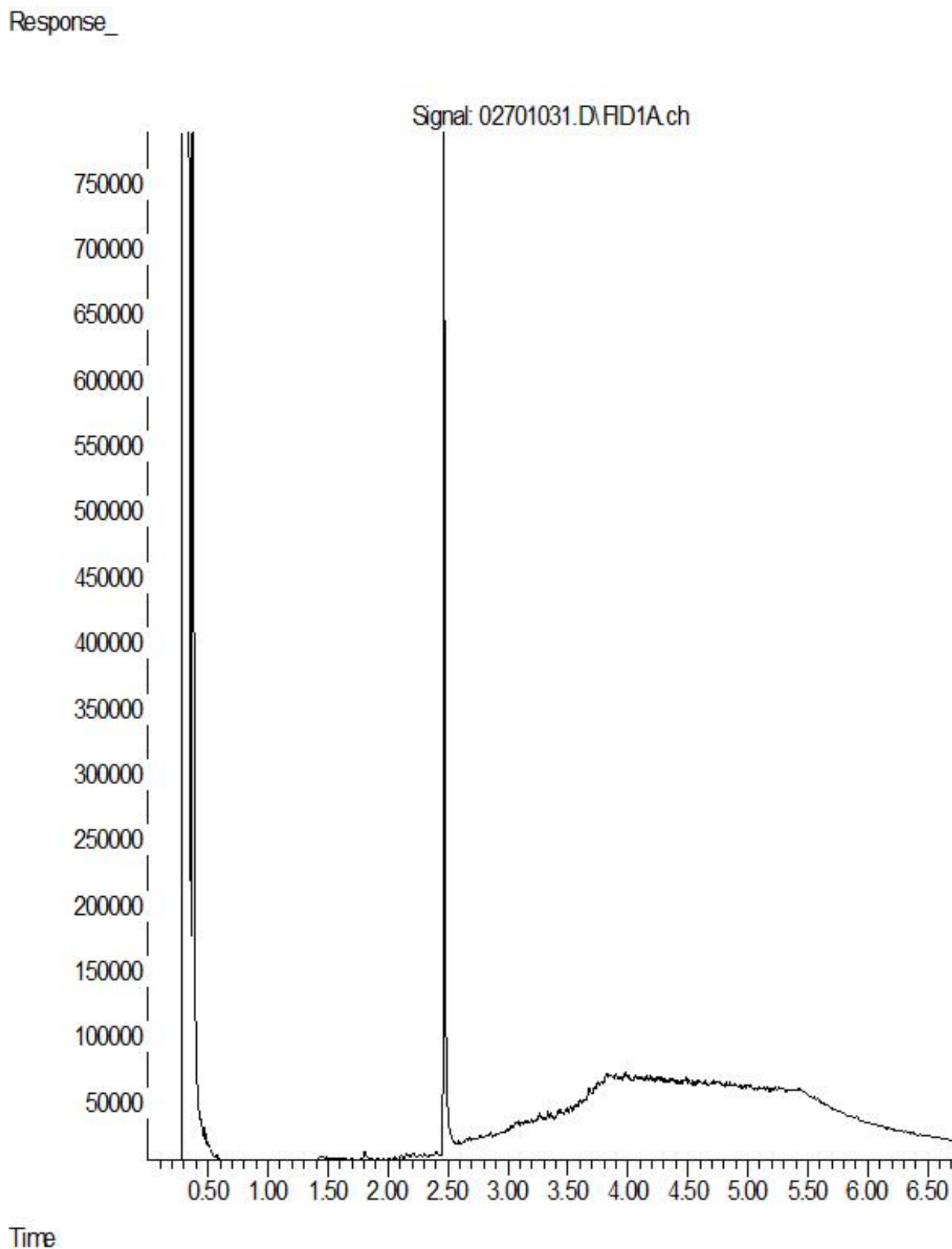
Petroleum Hydrocarbons (C10-C50) Chromatogram

Response_



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons (C10-C50) Chromatogram



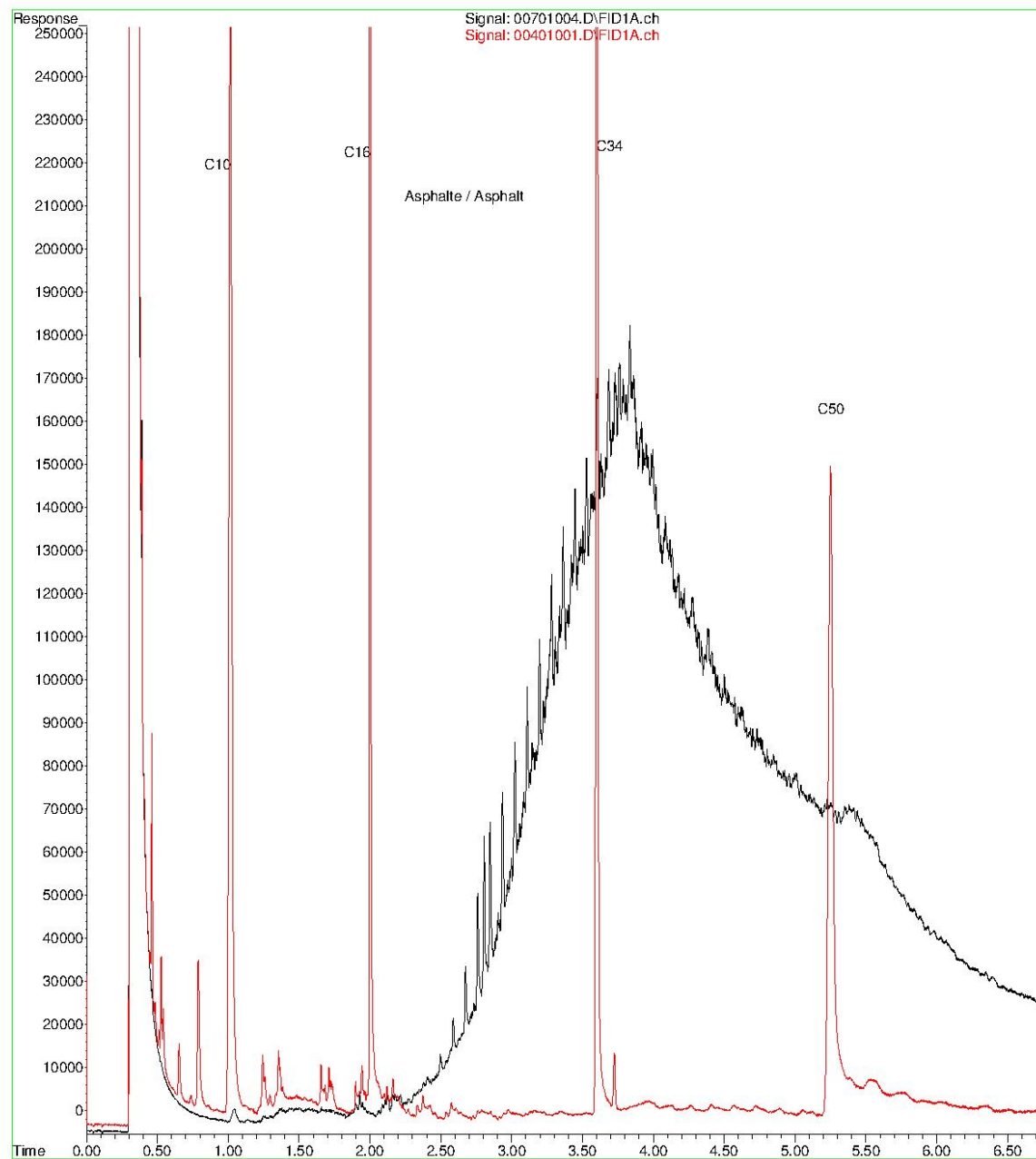
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B628744
Report Date: 2016/06/07
Maxxam Sample: CI9381

GHD Consultants Ltée
Client Project #: 11117049-A2
Project name: ILE LAPIERRE
Client ID: F-07-CFE-5

Petroleum Hydrocarbons (C10-C50) Asphalt

File :D:\DATA\GC_19\B6APR08\00701004.D
Operator :
Acquired : 8 Apr 2016 10:59 am using AcqMethod C10RFB31.M
Instrument : GC19
Sample Name: G784 Asphalte
Misc Info : s,1,1,100,0
Vial Number: 7

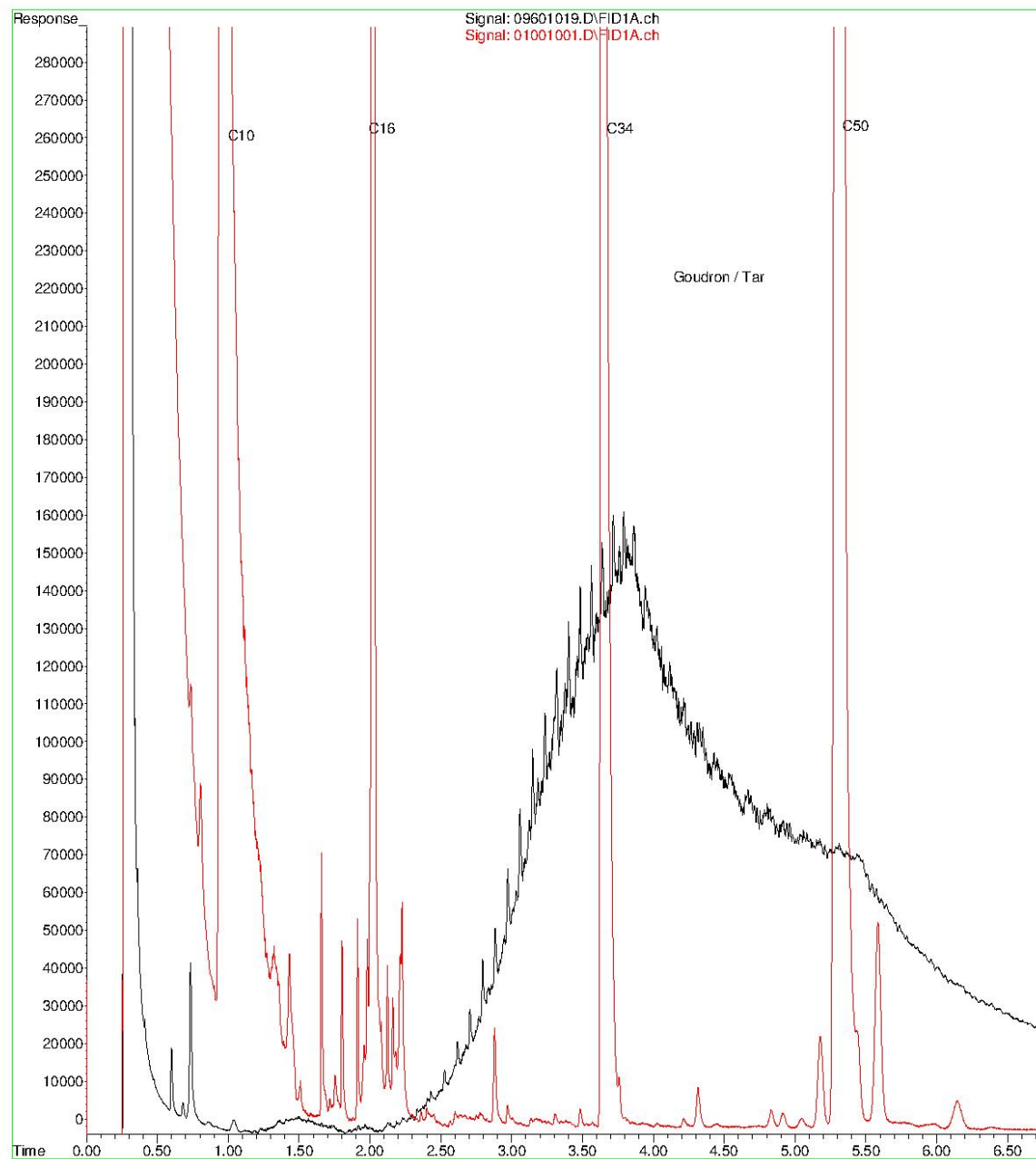


Maxxam Job #: B628744
Report Date: 2016/06/07
Maxxam Sample: CI9381

GHD Consultants Ltée
Client Project #: 11117049-A2
Project name: ILE LAPIERRE
Client ID: F-07-CFE-5

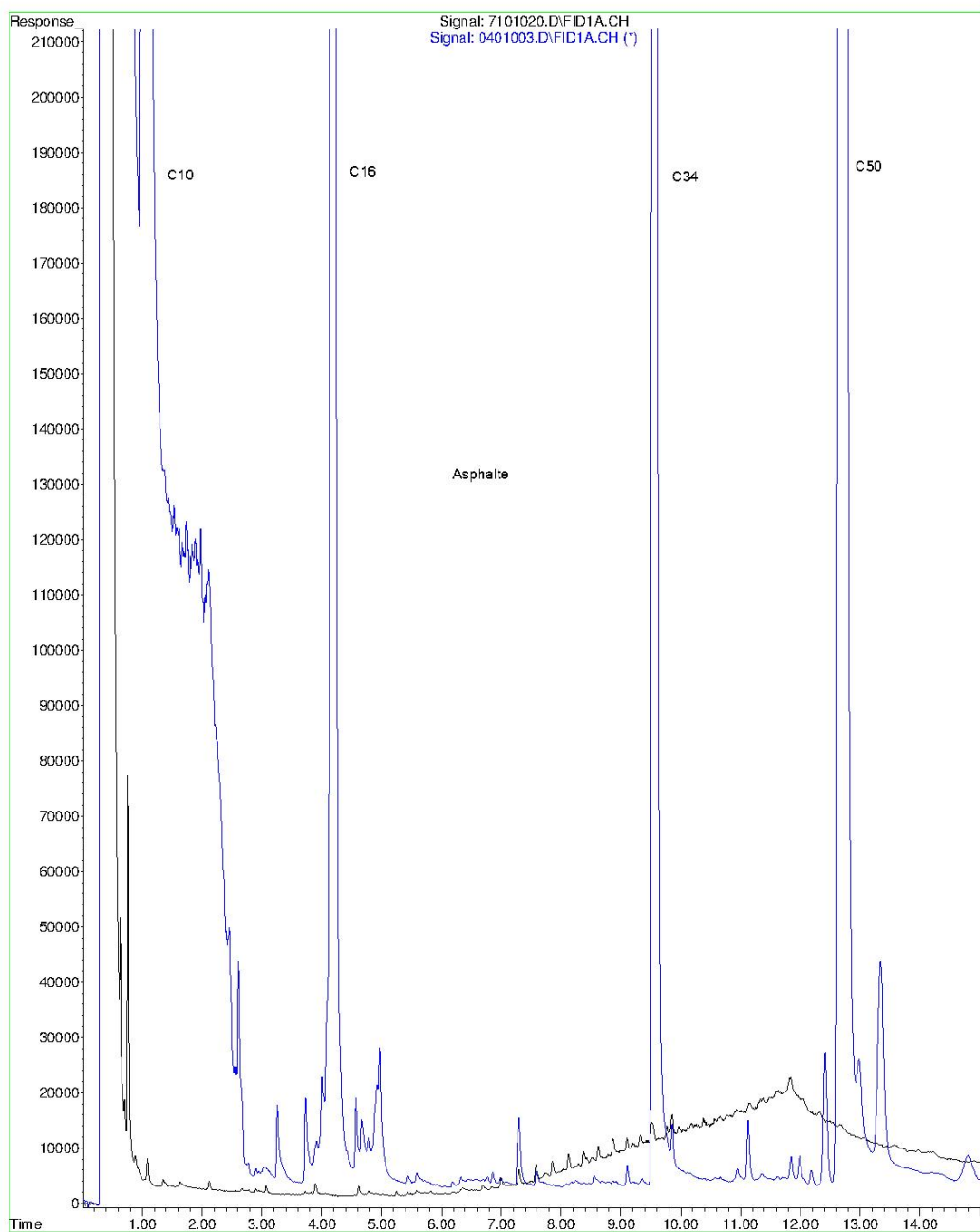
Petroleum Hydrocarbons (C10-C50) Tar

File :D:\DATA\GC_19\B6MAR04\09601019.D
Operator :
Acquired : 4 Mar 2016 9:37 pm using AcqMethod C10RFB31.M
Instrument : GC19
Sample Name: G793 GOUDRON
Misc Info : s,1,1,100,0
Vial Number: 96



Reference Chromatogram: Asphalt

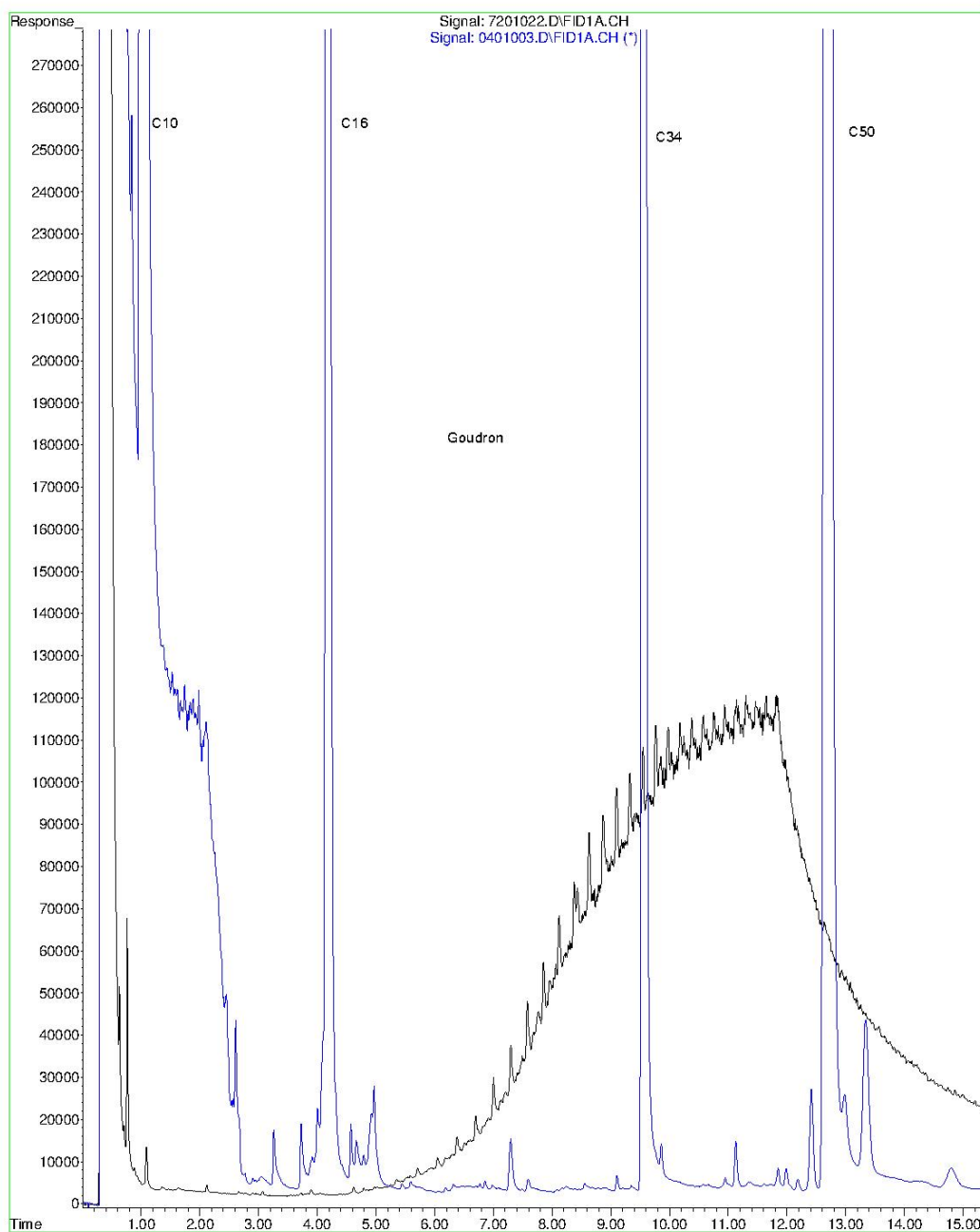
File :C:\GC_15\DATA\B6MAR08\7101020.D
Operator :
Acquired : 2016-03-08 06:35:16 PM using AcqMethod CA_FB3ED.M
Instrument : Instrumen
Sample Name: G784 Asphalte
Misc Info : S,1,1,100,0
Vial Number: 71



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Reference Chromatogram: Tar

File :C:\GC_15\DATA\B6MAR08\7201022.D
Operator :
Acquired : 2016-03-08 07:26:07 PM using AcqMethod CA_FB3ED.M
Instrument : Instrumen
Sample Name: G793 Goudron
Misc Info : S,1,1,100,0
Vial Number: 72



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your P.O. #: 76203012
Your Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your C.O.C. #: E911169

Attention: Anne Clarisse NDJOUOU

GHD Consultants Ltée
MONTRÉAL
4600 COTE VERTU
SUITE 200
VILLE ST-LAURENT, QC
H4S 1C7

Report Date: 2016/05/25
Report #: R2142816
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B629102

Received: 2016/05/17, 15:00

Sample Matrix: SOIL
Samples Received: 2

Analyses	Quantity	Date	Date	Laboratory Method	Primary Reference
		Extracted	Analyzed		
Petroleum Hydrocarbons (C10-C50)*	2	2016/05/20	2016/05/21	STL SOP-00172	MA.400-HYD. 1.1 R2 m
Total Extractable Metals by ICP*	2	2016/05/20	2016/05/21	STL SOP-00006	MA200-Mét 1.2 R5 m
Polycyclic Aromatic Hydrocarbons*	2	2016/05/20	2016/05/21	STL SOP-00178	MA400-HAP 1.1 R5 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

* Maxxam is accredited as per the MDDELCC program.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Karima Dlimi, B.Sc., Chemist, Project Manager

Email: KDlimi@maxxam.ca

Phone# (514)448-9001 Ext:6270

=====

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Maxxam Job #: B629102
Report Date: 2016/05/25

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012
Sampler Initials: FF

PAH BY GCMS (SOIL)

Maxxam ID					CJ0934		CJ0935			
Sampling Date					2016/05/16		2016/05/16			
COC Number					E911169		E911169			
	Units	A	B	C	F06-CFE-3	CR	F06-CFE-5	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	24		27		N/A	N/A
PAH										
Acenaphthene	mg/kg	0.1	10	100	<0.1		<0.1		0.1	1608048
Acenaphthylene	mg/kg	0.1	10	100	<0.1		<0.1		0.1	1608048
Anthracene	mg/kg	0.1	10	100	<0.1		<0.1		0.1	1608048
Benzo(a)anthracene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
Benzo(a)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
Benzo(b)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
Benzo(j)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
Benzo(k)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
Benzo(b+j+k)fluoranthene	mg/kg	-	-	-	<0.1		<0.1		0.1	1608048
Benzo(c)phenanthrene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
Benzo(ghi)perylene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
Chrysene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
Dibenz(a,h)anthracene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
7,12-Dimethylbenzanthracene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
Fluoranthene	mg/kg	0.1	10	100	<0.1		<0.1		0.1	1608048
Fluorene	mg/kg	0.1	10	100	<0.1		<0.1		0.1	1608048
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
3-Methylcholanthrene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
Naphthalene	mg/kg	0.1	5	50	<0.1		<0.1		0.1	1608048
Phenanthrene	mg/kg	0.1	5	50	<0.1		<0.1		0.1	1608048
Pyrene	mg/kg	0.1	10	100	<0.1		<0.1		0.1	1608048
2-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
1-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
1,3-Dimethylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
2,3,5-Trimethylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		0.1	1608048
Surrogate Recovery (%)										
D10-Anthracene	%	-	-	-	80		88		N/A	1608048
D12-Benzo(a)pyrene	%	-	-	-	76		80		N/A	1608048
D14-Terphenyl	%	-	-	-	82		90		N/A	1608048
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
N/A = Not Applicable										

Maxxam Job #: B629102
Report Date: 2016/05/25

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012
Sampler Initials: FF

PAH BY GCMS (SOIL)

Maxxam ID					CJ0934		CJ0935			
Sampling Date					2016/05/16		2016/05/16			
COC Number					E911169		E911169			
	Units	A	B	C	F06-CFE-3	CR	F06-CFE-5	CR	RDL	QC Batch
D8-Acenaphthylene	%	-	-	-	88		96		N/A	1608048
D8-Naphthalene	%	-	-	-	78		86		N/A	1608048
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable										

Maxxam Job #: B629102
Report Date: 2016/05/25

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012
Sampler Initials: FF

HYDROCARBONS BY GCFID (SOIL)

Maxxam ID					CJ0934		CJ0935			
Sampling Date					2016/05/16		2016/05/16			
COC Number					E911169		E911169			
	Units	A	B	C	F06-CFE-3	CR	F06-CFE-5	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	24		27		N/A	N/A
PETROLEUM HYDROCARBONS										
Petroleum Hydrocarbons (C10-C50)	mg/kg	300	700	3500	410	A-B	<100		100	1608046
Surrogate Recovery (%)										
1-Chlorooctadecane	%	-	-	-	78		76		N/A	1608046
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable										

Maxxam Job #: B629102
Report Date: 2016/05/25

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012
Sampler Initials: FF

TOTAL EXTRACTABLE METALS (SOIL)

Maxxam ID					CJ0934		CJ0935			
Sampling Date					2016/05/16		2016/05/16			
COC Number					E911169		E911169			
	Units	A	B	C	F06-CFE-3	CR	F06-CFE-5	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	24		27		N/A	N/A
METALS										
Silver (Ag)	mg/kg	2	20	40	<0.5		<0.5		0.5	1608085
Arsenic (As)	mg/kg	6	30	50	<5		<5		5	1608085
Barium (Ba)	mg/kg	200	500	2000	190	<A	120	<A	5	1608085
Cadmium (Cd)	mg/kg	1.5	5	20	<0.5		<0.5		0.5	1608085
Chromium (Cr)	mg/kg	85	250	800	74	<A	37	<A	2	1608085
Cobalt (Co)	mg/kg	15	50	300	16	A-B	9	<A	2	1608085
Copper (Cu)	mg/kg	40	100	500	34	<A	17	<A	2	1608085
Tin (Sn)	mg/kg	5	50	300	<4		<4		4	1608085
Manganese (Mn)	mg/kg	770	1000	2200	480	<A	230	<A	2	1608085
Molybdenum (Mo)	mg/kg	2	10	40	<1		<1		1	1608085
Nickel (Ni)	mg/kg	50	100	500	45	<A	21	<A	1	1608085
Lead (Pb)	mg/kg	50	500	1000	13	<A	30	<A	5	1608085
Zinc (Zn)	mg/kg	110	500	1500	76	<A	74	<A	10	1608085
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
N/A = Not Applicable										

Maxxam Job #: B629102
Report Date: 2016/05/25

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012
Sampler Initials: FF

GENERAL COMMENTS

All results are calculated on a dry weight basis except where not applicable.

Condition of sample(s) upon receipt: GOOD

Rev: English report

A,B,C,CR: Criteria following appendix 2 of the " Soil Protection and Contaminated Sites Rehabilitation Policy " entitled " Generic criteria for soils and groundwater ". For all metals analyses in soil, the criterion A refers to " Background Level of St. Lawrence Lowlands Sector ".

For groundwaters:

The A and B criteria follow the appendix 2 of the " Soil Protection and Contaminated Sites Rehabilitation Policy " entitled " Generic criteria for soils and groundwater ". The criterion A refers to " Drinking Water " and the criterion B refers to "Seepage into Surface Water or Infiltration into Sewers ".

These criteria references are shown for visual aid only, and should not be interpreted otherwise.

- = This parameter is not part of the regulation.

PAH BY GCMS (SOIL)

Please note that the results have not been corrected for QC recoveries (spiked blank and method blank) nor for the surrogates.

Un-rounded results are used in the Benzo(b+j+k)fluoranthene calculation. This total result is then rounded to two significant figures.

HYDROCARBONS BY GCFID (SOIL)

Please note that the results have not been corrected for QC recoveries (spiked blank and surrogates). Please note that the results have not been corrected for the method blank.

TOTAL EXTRACTABLE METALS (SOIL)

Please note that the result have not been corrected for the QC recoveries nor for the method blank results.

Results relate only to the items tested.

Maxxam Job #: B629102
Report Date: 2016/05/25

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012
Sampler Initials: FF

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
1608046	MP	Spiked Blank		1-Chlorooctadecane	2016/05/20		75	%	60 - 120
				Petroleum Hydrocarbons (C10-C50)	2016/05/20		87	%	70 - 130
1608046	MP	Method Blank		1-Chlorooctadecane	2016/05/20		75	%	60 - 120
				Petroleum Hydrocarbons (C10-C50)	2016/05/20	<100		mg/kg	
1608046	MP	RPD		Petroleum Hydrocarbons (C10-C50)	2016/05/20	NC		%	50
				Petroleum Hydrocarbons (C10-C50)	2016/05/20	14		%	50
				Petroleum Hydrocarbons (C10-C50)	2016/05/20	NC		%	50
				Petroleum Hydrocarbons (C10-C50)	2016/05/20	NC		%	50
1608048	CB5	Spiked Blank		D10-Anthracene	2016/05/20		86	%	50 - 130
				D12-Benzo(a)pyrene	2016/05/20		82	%	50 - 130
				D14-Terphenyl	2016/05/20		86	%	50 - 130
				D8-Acenaphthylene	2016/05/20		90	%	50 - 130
				D8-Naphthalene	2016/05/20		84	%	50 - 130
				Acenaphthene	2016/05/20		81	%	50 - 130
				Acenaphthylene	2016/05/20		90	%	50 - 130
				Anthracene	2016/05/20		88	%	50 - 130
				Benzo(a)anthracene	2016/05/20		84	%	50 - 130
				Benzo(a)pyrene	2016/05/20		85	%	50 - 130
				Benzo(b)fluoranthene	2016/05/20		76	%	50 - 130
				Benzo(j)fluoranthene	2016/05/20		87	%	50 - 130
				Benzo(k)fluoranthene	2016/05/20		90	%	50 - 130
				Benzo(b+j+k)fluoranthene	2016/05/20		84	%	50 - 130
				Benzo(c)phenanthrene	2016/05/20		81	%	50 - 130
				Benzo(ghi)perylene	2016/05/20		89	%	50 - 130
				Chrysene	2016/05/20		85	%	50 - 130
				Dibenz(a,h)anthracene	2016/05/20		85	%	50 - 130
				Dibenzo(a,i)pyrene	2016/05/20		71	%	50 - 130
				Dibenzo(a,h)pyrene	2016/05/20		69	%	50 - 130
				Dibenzo(a,l)pyrene	2016/05/20		82	%	50 - 130
				7,12-Dimethylbenzanthracene	2016/05/20		81	%	50 - 130
				Fluoranthene	2016/05/20		85	%	50 - 130
				Fluorene	2016/05/20		86	%	50 - 130
				Indeno(1,2,3-cd)pyrene	2016/05/20		85	%	50 - 130
				3-Methylcholanthrene	2016/05/20		84	%	50 - 130
				Naphthalene	2016/05/20		80	%	50 - 130
				Phenanthrene	2016/05/20		80	%	50 - 130
				Pyrene	2016/05/20		86	%	50 - 130
				2-Methylnaphthalene	2016/05/20		81	%	50 - 130
				1-Methylnaphthalene	2016/05/20		74	%	50 - 130
				1,3-Dimethylnaphthalene	2016/05/20		82	%	50 - 130
				2,3,5-Trimethylnaphthalene	2016/05/20		79	%	50 - 130
1608048	CB5	Method Blank		D10-Anthracene	2016/05/20		90	%	50 - 130
				D12-Benzo(a)pyrene	2016/05/20		86	%	50 - 130
				D14-Terphenyl	2016/05/20		92	%	50 - 130
				D8-Acenaphthylene	2016/05/20		98	%	50 - 130
				D8-Naphthalene	2016/05/20		88	%	50 - 130
				Acenaphthene	2016/05/20	<0.1		mg/kg	
				Acenaphthylene	2016/05/20	<0.1		mg/kg	
				Anthracene	2016/05/20	<0.1		mg/kg	
				Benzo(a)anthracene	2016/05/20	<0.1		mg/kg	
				Benzo(a)pyrene	2016/05/20	<0.1		mg/kg	
				Benzo(a)pyrene	2016/05/20	<0.1		mg/kg	
				Benzo(a)pyrene	2016/05/20	<0.1		mg/kg	

Maxxam Job #: B629102
Report Date: 2016/05/25

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012
Sampler Initials: FF

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
1608048	CB5	RPD		Benzo(b)fluoranthene	2016/05/20	<0.1		mg/kg	
				Benzo(j)fluoranthene	2016/05/20	<0.1		mg/kg	
				Benzo(k)fluoranthene	2016/05/20	<0.1		mg/kg	
				Benzo(b+j+k)fluoranthene	2016/05/20	<0.1		mg/kg	
				Benzo(c)phenanthrene	2016/05/20	<0.1		mg/kg	
				Benzo(ghi)perylene	2016/05/20	<0.1		mg/kg	
				Chrysene	2016/05/20	<0.1		mg/kg	
				Dibenz(a,h)anthracene	2016/05/20	<0.1		mg/kg	
				Dibenzo(a,i)pyrene	2016/05/20	<0.1		mg/kg	
				Dibenzo(a,h)pyrene	2016/05/20	<0.1		mg/kg	
				Dibenzo(a,l)pyrene	2016/05/20	<0.1		mg/kg	
				7,12-Dimethylbenzanthracene	2016/05/20	<0.1		mg/kg	
				Fluoranthene	2016/05/20	<0.1		mg/kg	
				Fluorene	2016/05/20	<0.1		mg/kg	
				Indeno(1,2,3-cd)pyrene	2016/05/20	<0.1		mg/kg	
				3-Methylcholanthrene	2016/05/20	<0.1		mg/kg	
				Naphthalene	2016/05/20	<0.1		mg/kg	
				Phenanthrene	2016/05/20	<0.1		mg/kg	
				Pyrene	2016/05/20	<0.1		mg/kg	
				2-Methylnaphthalene	2016/05/20	<0.1		mg/kg	
				1-Methylnaphthalene	2016/05/20	<0.1		mg/kg	
				1,3-Dimethylnaphthalene	2016/05/20	<0.1		mg/kg	
				2,3,5-Trimethylnaphthalene	2016/05/20	<0.1		mg/kg	
				Acenaphthene	2016/05/20	NC		%	50
				Acenaphthylene	2016/05/20	NC		%	50
				Anthracene	2016/05/20	NC		%	50
				Benzo(a)anthracene	2016/05/20	NC		%	50
				Benzo(a)pyrene	2016/05/20	NC		%	50
				Benzo(b)fluoranthene	2016/05/20	NC		%	50
				Benzo(j)fluoranthene	2016/05/20	NC		%	50
				Benzo(k)fluoranthene	2016/05/20	NC		%	50
				Benzo(b+j+k)fluoranthene	2016/05/20	NC		%	50
				Benzo(c)phenanthrene	2016/05/20	NC		%	50
				Benzo(ghi)perylene	2016/05/20	NC		%	50
				Chrysene	2016/05/20	NC		%	50
				Dibenz(a,h)anthracene	2016/05/20	NC		%	50
				Dibenzo(a,i)pyrene	2016/05/20	NC		%	50
				Dibenzo(a,h)pyrene	2016/05/20	NC		%	50
				Dibenzo(a,l)pyrene	2016/05/20	NC		%	50
				7,12-Dimethylbenzanthracene	2016/05/20	NC		%	50
				Fluoranthene	2016/05/20	NC		%	50
				Fluorene	2016/05/20	NC		%	50
				Indeno(1,2,3-cd)pyrene	2016/05/20	NC		%	50
				3-Methylcholanthrene	2016/05/20	NC		%	50
				Naphthalene	2016/05/20	NC		%	50
				Phenanthrene	2016/05/20	NC		%	50
				Pyrene	2016/05/20	NC		%	50
				2-Methylnaphthalene	2016/05/20	NC		%	50
				1-Methylnaphthalene	2016/05/20	NC		%	50
				1,3-Dimethylnaphthalene	2016/05/20	NC		%	50

Maxxam Job #: B629102
Report Date: 2016/05/25

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012
Sampler Initials: FF

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
				2,3,5-Trimethylnaphthalene	2016/05/20	NC		%	50
				Acenaphthene	2016/05/20	NC		%	50
				Acenaphthylene	2016/05/20	NC		%	50
				Anthracene	2016/05/20	NC		%	50
				Benzo(a)anthracene	2016/05/20	NC		%	50
				Benzo(a)pyrene	2016/05/20	NC		%	50
				Benzo(b)fluoranthene	2016/05/20	NC		%	50
				Benzo(j)fluoranthene	2016/05/20	NC		%	50
				Benzo(k)fluoranthene	2016/05/20	NC		%	50
				Benzo(c)phenanthrene	2016/05/20	NC		%	50
				Benzo(ghi)perylene	2016/05/20	NC		%	50
				Chrysene	2016/05/20	NC		%	50
				Dibenz(a,h)anthracene	2016/05/20	NC		%	50
				Dibenzo(a,i)pyrene	2016/05/20	NC		%	50
				Dibenzo(a,h)pyrene	2016/05/20	NC		%	50
				Dibenzo(a,l)pyrene	2016/05/20	NC		%	50
				7,12-Dimethylbenzanthracene	2016/05/20	NC		%	50
				Fluoranthene	2016/05/20	NC		%	50
				Fluorene	2016/05/20	NC		%	50
				Indeno(1,2,3-cd)pyrene	2016/05/20	NC		%	50
				3-Methylcholanthrene	2016/05/20	NC		%	50
				Naphthalene	2016/05/20	NC		%	50
				Phenanthrene	2016/05/20	NC		%	50
				Pyrene	2016/05/20	NC		%	50
				2-Methylnaphthalene	2016/05/20	NC		%	50
				1-Methylnaphthalene	2016/05/20	NC		%	50
				1,3-Dimethylnaphthalene	2016/05/20	NC		%	50
				2,3,5-Trimethylnaphthalene	2016/05/20	NC		%	50
				Acenaphthene	2016/05/21	NC		%	50
				Acenaphthylene	2016/05/21	NC		%	50
				Anthracene	2016/05/21	NC		%	50
				Benzo(a)anthracene	2016/05/21	3.1		%	50
				Benzo(a)pyrene	2016/05/21	8.2		%	50
				Benzo(b)fluoranthene	2016/05/21	NC		%	50
				Benzo(j)fluoranthene	2016/05/21	NC		%	50
				Benzo(k)fluoranthene	2016/05/21	NC		%	50
				Benzo(c)phenanthrene	2016/05/21	NC		%	50
				Benzo(ghi)perylene	2016/05/21	NC		%	50
				Chrysene	2016/05/21	2.8		%	50
				Dibenz(a,h)anthracene	2016/05/21	NC		%	50
				Dibenzo(a,i)pyrene	2016/05/21	NC		%	50
				Dibenzo(a,h)pyrene	2016/05/21	NC		%	50
				Dibenzo(a,l)pyrene	2016/05/21	NC		%	50
				7,12-Dimethylbenzanthracene	2016/05/21	NC		%	50
				Fluoranthene	2016/05/21	4.1		%	50
				Fluorene	2016/05/21	NC		%	50
				Indeno(1,2,3-cd)pyrene	2016/05/21	NC		%	50
				3-Methylcholanthrene	2016/05/21	NC		%	50
				Naphthalene	2016/05/21	NC		%	50
				Phenanthrene	2016/05/21	3.4		%	50

Maxxam Job #: B629102
Report Date: 2016/05/25

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012
Sampler Initials: FF

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
1608085	KV	Spiked Blank	Pyrene	2016/05/21	1.3		%	50
			2-Methylnaphthalene	2016/05/21	NC		%	50
			1-Methylnaphthalene	2016/05/21	NC		%	50
			1,3-Dimethylnaphthalene	2016/05/21	NC		%	50
			2,3,5-Trimethylnaphthalene	2016/05/21	NC		%	50
			Silver (Ag)	2016/05/20		97	%	75 - 125
			Arsenic (As)	2016/05/20		101	%	75 - 125
			Barium (Ba)	2016/05/20		101	%	75 - 125
			Cadmium (Cd)	2016/05/20		101	%	75 - 125
			Chromium (Cr)	2016/05/20		101	%	75 - 125
			Cobalt (Co)	2016/05/20		100	%	75 - 125
			Copper (Cu)	2016/05/20		102	%	75 - 125
			Tin (Sn)	2016/05/20		102	%	75 - 125
			Manganese (Mn)	2016/05/20		98	%	75 - 125
			Molybdenum (Mo)	2016/05/20		101	%	75 - 125
			Nickel (Ni)	2016/05/20		100	%	75 - 125
			Lead (Pb)	2016/05/20		101	%	75 - 125
			Zinc (Zn)	2016/05/20		101	%	75 - 125
1608085	KV	Method Blank	Silver (Ag)	2016/05/20	<0.5		mg/kg	
			Arsenic (As)	2016/05/20	<5		mg/kg	
			Barium (Ba)	2016/05/20	<5		mg/kg	
			Cadmium (Cd)	2016/05/20	<0.5		mg/kg	
			Chromium (Cr)	2016/05/20	<2		mg/kg	
			Cobalt (Co)	2016/05/20	<2		mg/kg	
			Copper (Cu)	2016/05/20	<2		mg/kg	
			Tin (Sn)	2016/05/20	<4		mg/kg	
			Manganese (Mn)	2016/05/20	<2		mg/kg	
			Molybdenum (Mo)	2016/05/20	<1		mg/kg	
			Nickel (Ni)	2016/05/20	<1		mg/kg	
			Lead (Pb)	2016/05/20	<5		mg/kg	
			Zinc (Zn)	2016/05/20	<10		mg/kg	
1608085	KV	RPD	Silver (Ag)	2016/05/20	NC		%	30
			Arsenic (As)	2016/05/20	NC		%	30
			Barium (Ba)	2016/05/20	2.4		%	30
			Cadmium (Cd)	2016/05/20	NC		%	30
			Chromium (Cr)	2016/05/20	0.47		%	30
			Cobalt (Co)	2016/05/20	0.39		%	30
			Copper (Cu)	2016/05/20	0.26		%	30
			Tin (Sn)	2016/05/20	NC		%	30
			Manganese (Mn)	2016/05/20	5.6		%	30
			Molybdenum (Mo)	2016/05/20	NC		%	30
			Nickel (Ni)	2016/05/20	1.3		%	30
			Lead (Pb)	2016/05/20	NC		%	30

Maxxam Job #: B629102
Report Date: 2016/05/25

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012
Sampler Initials: FF

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC		QC Type	Parameter	Date	Value	Recovery	Units	QC Limits
Batch	Init			Analyzed				
			Zinc (Zn)	2016/05/20	0.70		%	30
<p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).</p>								

Maxxam Job #: B629102
Report Date: 2016/05/25

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012
Sampler Initials: FF

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Caroline Bougie

Caroline Bougie, B.Sc. Chemist

Karyn Vaucher

Karyn Vaucher
Membre OCQ #2011-004

Karyn Vaucher

Michel Poulin



Michel Poulin, B.Sc., Chemist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Your P.O. #: 76203012
Your Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your C.O.C. #: e-911177

Attention: Alexandre Lemire

GHD Consultants Ltée
MONTRÉAL
4600 COTE VERTU
SUITE 200
VILLE ST-LAURENT, QC
H4S 1C7

Report Date: 2016/06/07
Report #: R2148530
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B629880

Received: 2016/05/19, 13:00

Sample Matrix: SOIL
Samples Received: 6

Analyses	Quantity	Date	Date	Laboratory Method	Primary Reference
		Extracted	Analyzed		
Petroleum Hydrocarbons (C10-C50)*	5	2016/05/24	2016/05/24	STL SOP-00172	MA.400-HYD. 1.1 R2 m
Petroleum Hydrocarbons (C10-C50)*	1	2016/05/24	2016/05/25	STL SOP-00172	MA.400-HYD. 1.1 R2 m
Total Extractable Metals by ICP*	6	2016/05/24	2016/05/24	STL SOP-00006	MA200-Mét 1.2 R5 m
Polycyclic Aromatic Hydrocarbons*	6	2016/05/24	2016/05/25	STL SOP-00178	MA400-HAP 1.1 R5 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

* Maxxam is accredited as per the MDDELCC program.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Karima Dlimi, B.Sc., Chemist, Project Manager

Email: KDlimi@maxxam.ca

Phone# (514)448-9001 Ext:6270

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B629880
Report Date: 2016/06/07

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012

PAH BY GCMS (SOIL)

Maxxam ID					CJ4272		CJ4273		CJ4273		CJ4274			
Sampling Date					2016/05/16		2016/05/16		2016/05/16		2016/05/17			
COC Number					e-911177		e-911177		e-911177		e-911177			
	Units	A	B	C	F-08-CFE-1	CR	F-08-CFE-7	CR	F-08-CFE-7 Lab-Dup	CR	F-09-CFE-3A	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	11		31		31		15		N/A	N/A
PAH														
Acenaphthene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Acenaphthylene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Anthracene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Benzo(a)anthracene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Benzo(a)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Benzo(b)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Benzo(j)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Benzo(k)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Benzo(b+j+k)fluoranthene	mg/kg	-	-	-	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Benzo(c)phenanthrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Benzo(ghi)perylene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Chrysene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Dibenz(a,h)anthracene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
7,12-Dimethylbenzanthracene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Fluoranthene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Fluorene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
3-Methylcholanthrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Naphthalene	mg/kg	0.1	5	50	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Phenanthrene	mg/kg	0.1	5	50	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Pyrene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		<0.1		0.1	1608892
2-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
1-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
1,3-Dimethylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
2,3,5-Trimethylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		<0.1		0.1	1608892
Surrogate Recovery (%)														
D10-Anthracene	%	-	-	-	80		80		80		82		N/A	1608892
D12-Benzo(a)pyrene	%	-	-	-	76		78		76		76		N/A	1608892
D14-Terphenyl	%	-	-	-	86		88		84		88		N/A	1608892
RDL = Reportable Detection Limit														
QC Batch = Quality Control Batch														
N/A = Not Applicable														

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PAH BY GCMS (SOIL)

Maxxam ID					CJ4272		CJ4273		CJ4273		CJ4274			
Sampling Date					2016/05/16		2016/05/16		2016/05/16		2016/05/17			
COC Number					e-911177		e-911177		e-911177		e-911177			
	Units	A	B	C	F-08-CFE-1	CR	F-08-CFE-7	CR	F-08-CFE-7	CR	F-09-CFE-3A	CR	RDL	QC Batch
D8-Acenaphthylene	%	-	-	-	88		88		86		90		N/A	1608892
D8-Naphthalene	%	-	-	-	78		78		78		80		N/A	1608892
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable														

Maxxam Job #: B629880
Report Date: 2016/06/07

GHD Consultants Ltée
Client Project #: 11117049-A2
Site Location: ILE LAPIERRE
Your P.O. #: 76203012

PAH BY GCMS (SOIL)

Maxxam ID					CJ4275		CJ4276		CJ4277			
Sampling Date					2016/05/17		2016/05/17		2016/05/17			
COC Number					e-911177		e-911177		e-911177			
	Units	A	B	C	F-09-CFE-7	CR	F-10-CFE-4	CR	F-10-CFE-6	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	36		18		31		N/A	N/A
PAH												
Acenaphthene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		0.1	1608892
Acenaphthylene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		0.1	1608892
Anthracene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		0.1	1608892
Benzo(a)anthracene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
Benzo(a)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
Benzo(b)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
Benzo(j)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
Benzo(k)fluoranthene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
Benzo(b+j+k)fluoranthene	mg/kg	-	-	-	<0.1		<0.1		<0.1		0.1	1608892
Benzo(c)phenanthrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
Benzo(ghi)perylene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
Chrysene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
Dibenz(a,h)anthracene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
Dibenzo(a,i)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
Dibenzo(a,h)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
Dibenzo(a,l)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
7,12-Dimethylbenzanthracene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
Fluoranthene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		0.1	1608892
Fluorene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		0.1	1608892
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
3-Methylcholanthrene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
Naphthalene	mg/kg	0.1	5	50	<0.1		<0.1		<0.1		0.1	1608892
Phenanthrene	mg/kg	0.1	5	50	<0.1		<0.1		<0.1		0.1	1608892
Pyrene	mg/kg	0.1	10	100	<0.1		<0.1		<0.1		0.1	1608892
2-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
1-Methylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
1,3-Dimethylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
2,3,5-Trimethylnaphthalene	mg/kg	0.1	1	10	<0.1		<0.1		<0.1		0.1	1608892
Surrogate Recovery (%)												
D10-Anthracene	%	-	-	-	80		82		82		N/A	1608892
D12-Benzo(a)pyrene	%	-	-	-	76		76		78		N/A	1608892
D14-Terphenyl	%	-	-	-	88		86		88		N/A	1608892
RDL = Reportable Detection Limit												
QC Batch = Quality Control Batch												
N/A = Not Applicable												

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PAH BY GCMS (SOIL)

Maxxam ID					CJ4275		CJ4276		CJ4277			
Sampling Date					2016/05/17		2016/05/17		2016/05/17			
COC Number					e-911177		e-911177		e-911177			
	Units	A	B	C	F-09-CFE-7	CR	F-10-CFE-4	CR	F-10-CFE-6	CR	RDL	QC Batch
D8-Acenaphthylene	%	-	-	-	90		88		90		N/A	1608892
D8-Naphthalene	%	-	-	-	80		78		80		N/A	1608892
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable												

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HYDROCARBONS BY GCFID (SOIL)

Maxxam ID					CJ4272		CJ4273		CJ4273		CJ4274			
Sampling Date					2016/05/16		2016/05/16		2016/05/16		2016/05/17			
COC Number					e-911177		e-911177		e-911177		e-911177			
	Units	A	B	C	F-08-CFE-1	CR	F-08-CFE-7	CR	F-08-CFE-7 Lab-Dup	CR	F-09-CFE-3A	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	11		31		31		15		N/A	N/A
PETROLEUM HYDROCARBONS														
Petroleum Hydrocarbons (C10-C50)	mg/kg	300	700	3500	3800	>C	<100		<100		<100		100	1608891
Surrogate Recovery (%)														
1-Chlorooctadecane	%	-	-	-	84		90		89		87		N/A	1608891
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable														

Maxxam ID					CJ4275		CJ4276		CJ4277					
Sampling Date					2016/05/17		2016/05/17		2016/05/17					
COC Number					e-911177		e-911177		e-911177					
	Units	A	B	C	F-09-CFE-7	CR	F-10-CFE-4	CR	F-10-CFE-6	CR	RDL	QC Batch		
% MOISTURE	%	-	-	-	36		18		31		N/A	N/A		
PETROLEUM HYDROCARBONS														
Petroleum Hydrocarbons (C10-C50)	mg/kg	300	700	3500	<100		<100		<100		100	1608891		
Surrogate Recovery (%)														
1-Chlorooctadecane	%	-	-	-	90		87		87		N/A	1608891		
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable														

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TOTAL EXTRACTABLE METALS (SOIL)

Maxxam ID					CJ4272		CJ4273		CJ4274		CJ4275			
Sampling Date					2016/05/16		2016/05/16		2016/05/17		2016/05/17			
COC Number					e-911177		e-911177		e-911177		e-911177			
	Units	A	B	C	F-08-CFE-1	CR	F-08-CFE-7	CR	F-09-CFE-3A	CR	F-09-CFE-7	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	11		31		15		36		N/A	N/A
METALS														
Silver (Ag)	mg/kg	2	20	40	<0.5		<0.5		<0.5		<0.5		0.5	1609081
Arsenic (As)	mg/kg	6	30	50	5	<A	<5		<5		<5		5	1609081
Barium (Ba)	mg/kg	200	500	2000	72	<A	160	<A	61	<A	170	<A	5	1609081
Cadmium (Cd)	mg/kg	1.5	5	20	<0.5		<0.5		<0.5		<0.5		0.5	1609081
Chromium (Cr)	mg/kg	85	250	800	21	<A	40	<A	16	<A	49	<A	2	1609081
Cobalt (Co)	mg/kg	15	50	300	8	<A	9	<A	7	<A	11	<A	2	1609081
Copper (Cu)	mg/kg	40	100	500	22	<A	15	<A	14	<A	16	<A	2	1609081
Tin (Sn)	mg/kg	5	50	300	<4		<4		<4		<4		4	1609081
Manganese (Mn)	mg/kg	770	1000	2200	500	<A	290	<A	380	<A	280	<A	2	1609081
Molybdenum (Mo)	mg/kg	2	10	40	<1		<1		<1		<1		1	1609081
Nickel (Ni)	mg/kg	50	100	500	22	<A	24	<A	18	<A	27	<A	1	1609081
Lead (Pb)	mg/kg	50	500	1000	16	<A	<5		11	<A	6	<A	5	1609081
Zinc (Zn)	mg/kg	110	500	1500	59	<A	80	<A	41	<A	85	<A	10	1609081
RDL = Reportable Detection Limit														
QC Batch = Quality Control Batch														
N/A = Not Applicable														

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TOTAL EXTRACTABLE METALS (SOIL)

Maxxam ID					CJ4276		CJ4277			
Sampling Date					2016/05/17		2016/05/17			
COC Number					e-911177		e-911177			
	Units	A	B	C	F-10-CFE-4	CR	F-10-CFE-6	CR	RDL	QC Batch
% MOISTURE	%	-	-	-	18		31		N/A	N/A
METALS										
Silver (Ag)	mg/kg	2	20	40	<0.5		<0.5		0.5	1609081
Arsenic (As)	mg/kg	6	30	50	5	<A	<5		5	1609081
Barium (Ba)	mg/kg	200	500	2000	79	<A	160	<A	5	1609081
Cadmium (Cd)	mg/kg	1.5	5	20	<0.5		<0.5		0.5	1609081
Chromium (Cr)	mg/kg	85	250	800	17	<A	50	<A	2	1609081
Cobalt (Co)	mg/kg	15	50	300	10	<A	11	<A	2	1609081
Copper (Cu)	mg/kg	40	100	500	21	<A	16	<A	2	1609081
Tin (Sn)	mg/kg	5	50	300	<4		<4		4	1609081
Manganese (Mn)	mg/kg	770	1000	2200	330	<A	340	<A	2	1609081
Molybdenum (Mo)	mg/kg	2	10	40	1	<A	<1		1	1609081
Nickel (Ni)	mg/kg	50	100	500	25	<A	27	<A	1	1609081
Lead (Pb)	mg/kg	50	500	1000	14	<A	5	<A	5	1609081
Zinc (Zn)	mg/kg	110	500	1500	63	<A	83	<A	10	1609081
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
N/A = Not Applicable										

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GENERAL COMMENTS

All results are calculated on a dry weight basis except where not applicable.

Condition of sample(s) upon receipt: GOOD

Rev: English report

A,B,C,CR: Criteria following appendix 2 of the " Soil Protection and Contaminated Sites Rehabilitation Policy " entitled " Generic criteria for soils and groundwater ". For all metals analyses in soil, the criterion A refers to " Background Level of St. Lawrence Lowlands Sector ".

For groundwaters:

The A and B criteria follow the appendix 2 of the " Soil Protection and Contaminated Sites Rehabilitation Policy " entitled " Generic criteria for soils and groundwater ". The criterion A refers to " Drinking Water " and the criterion B refers to "Seepage into Surface Water or Infiltration into Sewers ".

These criteria references are shown for visual aid only, and should not be interpreted otherwise.

- = This parameter is not part of the regulation.

PAH BY GCMS (SOIL)

Please note that the results have not been corrected for QC recoveries (spiked blank and method blank) nor for the surrogates.

Un-rounded results are used in the Benzo(b+j+k)fluoranthene calculation. This total result is then rounded to two significant figures.

HYDROCARBONS BY GC/FID (SOIL)

Please note that the results have not been corrected for QC recoveries (spiked blank and surrogates). Please note that the results have not been corrected for the method blank.

CJ4272:

C18 - C50+ : Same chromatographic region as asphalt and tar.

The reported hydrocarbon resemblance was obtained by visual comparison of the sample chromatogram with a library of reference product chromatograms. Since variables such as multiple products, the degree and type of weathering and the presence of non petrogenic hydrocarbons cannot be duplicated in reference spectra, the resemblance information must be regarded as qualitative and as such, Maxxam can assume no liability for any conclusions drawn from these data.

The chromatograms are provided for information purposes only. Any conclusion drawn by the data user from these chromatograms is their sole responsibility. Maxxam can assume no liability for any such 3rd party interpretations and is responsible only for the quality of the quantitative data provided.

TOTAL EXTRACTABLE METALS (SOIL)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
1608891	MP	Spiked Blank	1-Chlorooctadecane	2016/05/24		80	%	60 - 120
			Petroleum Hydrocarbons (C10-C50)	2016/05/24		86	%	70 - 130
1608891	MP	Method Blank	1-Chlorooctadecane	2016/05/24		73	%	60 - 120
			Petroleum Hydrocarbons (C10-C50)	2016/05/24	<100		mg/kg	
1608891	MP	RPD	Petroleum Hydrocarbons (C10-C50)	2016/05/24	NC		%	50
			Petroleum Hydrocarbons (C10-C50)	2016/05/24	13		%	50
1608891	MP	RPD [CJ4273-01]	Petroleum Hydrocarbons (C10-C50)	2016/05/24	NC		%	50
1608892	SS6	Spiked Blank	D10-Anthracene	2016/05/25		90	%	50 - 130
			D12-Benzo(a)pyrene	2016/05/25		88	%	50 - 130
			D14-Terphenyl	2016/05/25		90	%	50 - 130
			D8-Acenaphthylene	2016/05/25		96	%	50 - 130
			D8-Naphthalene	2016/05/25		84	%	50 - 130
			Acenaphthene	2016/05/25		86	%	50 - 130
			Acenaphthylene	2016/05/25		96	%	50 - 130
			Anthracene	2016/05/25		92	%	50 - 130
			Benzo(a)anthracene	2016/05/25		93	%	50 - 130
			Benzo(a)pyrene	2016/05/25		92	%	50 - 130
			Benzo(b)fluoranthene	2016/05/25		81	%	50 - 130
			Benzo(j)fluoranthene	2016/05/25		94	%	50 - 130
			Benzo(k)fluoranthene	2016/05/25		89	%	50 - 130
			Benzo(b+j+k)fluoranthene	2016/05/25		88	%	50 - 130
			Benzo(c)phenanthrene	2016/05/25		91	%	50 - 130
			Benzo(ghi)perylene	2016/05/25		92	%	50 - 130
			Chrysene	2016/05/25		91	%	50 - 130
			Dibenz(a,h)anthracene	2016/05/25		88	%	50 - 130
			Dibenzo(a,i)pyrene	2016/05/25		78	%	50 - 130
			Dibenzo(a,h)pyrene	2016/05/25		92	%	50 - 130
			Dibenzo(a,l)pyrene	2016/05/25		92	%	50 - 130
			7,12-Dimethylbenzanthracene	2016/05/25		76	%	50 - 130
			Fluoranthene	2016/05/25		91	%	50 - 130
			Fluorene	2016/05/25		94	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2016/05/25		93	%	50 - 130
			3-Methylcholanthrene	2016/05/25		85	%	50 - 130
			Naphthalene	2016/05/25		84	%	50 - 130
			Phenanthrene	2016/05/25		84	%	50 - 130
			Pyrene	2016/05/25		91	%	50 - 130
			2-Methylnaphthalene	2016/05/25		85	%	50 - 130
			1-Methylnaphthalene	2016/05/25		80	%	50 - 130
			1,3-Dimethylnaphthalene	2016/05/25		85	%	50 - 130
			2,3,5-Trimethylnaphthalene	2016/05/25		88	%	50 - 130
1608892	SS6	Method Blank	D10-Anthracene	2016/05/24		86	%	50 - 130
			D12-Benzo(a)pyrene	2016/05/24		80	%	50 - 130
			D14-Terphenyl	2016/05/24		90	%	50 - 130
			D8-Acenaphthylene	2016/05/24		90	%	50 - 130
			D8-Naphthalene	2016/05/24		80	%	50 - 130
			Acenaphthene	2016/05/24	<0.1		mg/kg	
			Acenaphthylene	2016/05/24	<0.1		mg/kg	
			Anthracene	2016/05/24	<0.1		mg/kg	
			Benzo(a)anthracene	2016/05/24	<0.1		mg/kg	
			Benzo(a)pyrene	2016/05/24	<0.1		mg/kg	
			Benzo(b)fluoranthene	2016/05/24	<0.1		mg/kg	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
1608892	SS6	RPD	Benzo(j)fluoranthene	2016/05/24	<0.1		mg/kg	
			Benzo(k)fluoranthene	2016/05/24	<0.1		mg/kg	
			Benzo(b+j+k)fluoranthene	2016/05/24	<0.1		mg/kg	
			Benzo(c)phenanthrene	2016/05/24	<0.1		mg/kg	
			Benzo(ghi)perylene	2016/05/24	<0.1		mg/kg	
			Chrysene	2016/05/24	<0.1		mg/kg	
			Dibenz(a,h)anthracene	2016/05/24	<0.1		mg/kg	
			Dibenzo(a,i)pyrene	2016/05/24	<0.1		mg/kg	
			Dibenzo(a,h)pyrene	2016/05/24	<0.1		mg/kg	
			Dibenzo(a,l)pyrene	2016/05/24	<0.1		mg/kg	
			7,12-Dimethylbenzanthracene	2016/05/24	<0.1		mg/kg	
			Fluoranthene	2016/05/24	<0.1		mg/kg	
			Fluorene	2016/05/24	<0.1		mg/kg	
			Indeno(1,2,3-cd)pyrene	2016/05/24	<0.1		mg/kg	
			3-Methylcholanthrene	2016/05/24	<0.1		mg/kg	
			Naphthalene	2016/05/24	<0.1		mg/kg	
			Phenanthrene	2016/05/24	<0.1		mg/kg	
			Pyrene	2016/05/24	<0.1		mg/kg	
			2-Methylnaphthalene	2016/05/24	<0.1		mg/kg	
			1-Methylnaphthalene	2016/05/24	<0.1		mg/kg	
			1,3-Dimethylnaphthalene	2016/05/24	<0.1		mg/kg	
			2,3,5-Trimethylnaphthalene	2016/05/24	<0.1		mg/kg	
			Acenaphthene	2016/05/25	NC		%	50
			Acenaphthylene	2016/05/25	NC		%	50
			Anthracene	2016/05/25	NC		%	50
			Benzo(a)anthracene	2016/05/25	NC		%	50
			Benzo(a)pyrene	2016/05/25	NC		%	50
			Benzo(b)fluoranthene	2016/05/25	NC		%	50
			Benzo(j)fluoranthene	2016/05/25	NC		%	50
			Benzo(k)fluoranthene	2016/05/25	NC		%	50
			Benzo(b+j+k)fluoranthene	2016/05/25	8.1		%	50
			Benzo(c)phenanthrene	2016/05/25	NC		%	50
			Benzo(ghi)perylene	2016/05/25	NC		%	50
			Chrysene	2016/05/25	NC		%	50
			Dibenz(a,h)anthracene	2016/05/25	NC		%	50
			Dibenzo(a,i)pyrene	2016/05/25	NC		%	50
			Dibenzo(a,h)pyrene	2016/05/25	NC		%	50
			Dibenzo(a,l)pyrene	2016/05/25	NC		%	50
			7,12-Dimethylbenzanthracene	2016/05/25	NC		%	50
			Fluoranthene	2016/05/25	14		%	50
			Fluorene	2016/05/25	NC		%	50
			Indeno(1,2,3-cd)pyrene	2016/05/25	NC		%	50
			3-Methylcholanthrene	2016/05/25	NC		%	50
			Naphthalene	2016/05/25	NC		%	50
			Phenanthrene	2016/05/25	NC		%	50
			Pyrene	2016/05/25	12		%	50
			2-Methylnaphthalene	2016/05/25	NC		%	50
			1-Methylnaphthalene	2016/05/25	NC		%	50
			1,3-Dimethylnaphthalene	2016/05/25	NC		%	50
			2,3,5-Trimethylnaphthalene	2016/05/25	NC		%	50
			Acenaphthene	2016/05/25	NC (1)		%	50

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
1608892	SS6	RPD [CJ4273-01]	Acenaphthylene	2016/05/25	NC (1)		%	50
			Anthracene	2016/05/25	10		%	50
			Benzo(a)anthracene	2016/05/25	21		%	50
			Benzo(a)pyrene	2016/05/25	22		%	50
			Benzo(b)fluoranthene	2016/05/25	20		%	50
			Benzo(j)fluoranthene	2016/05/25	NC		%	50
			Benzo(k)fluoranthene	2016/05/25	NC		%	50
			Benzo(c)phenanthrene	2016/05/25	1.7		%	50
			Benzo(ghi)perylene	2016/05/25	14		%	50
			Chrysene	2016/05/25	18		%	50
			Dibenz(a,h)anthracene	2016/05/25	NC		%	50
			Dibenzo(a,i)pyrene	2016/05/25	NC		%	50
			Dibenzo(a,h)pyrene	2016/05/25	NC		%	50
			Dibenzo(a,l)pyrene	2016/05/25	NC		%	50
			7,12-Dimethylbenzanthracene	2016/05/25	NC		%	50
			Fluoranthene	2016/05/25	17		%	50
			Fluorene	2016/05/25	17		%	50
			Indeno(1,2,3-cd)pyrene	2016/05/25	NC		%	50
			3-Methylcholanthrene	2016/05/25	26		%	50
			Naphthalene	2016/05/25	28		%	50
			Phenanthrene	2016/05/25	40		%	50
			Pyrene	2016/05/25	19		%	50
			2-Methylnaphthalene	2016/05/25	38		%	50
			1-Methylnaphthalene	2016/05/25	33		%	50
			1,3-Dimethylnaphthalene	2016/05/25	34		%	50
			2,3,5-Trimethylnaphthalene	2016/05/25	37		%	50
			Acenaphthene	2016/05/25	NC		%	50
			Acenaphthylene	2016/05/25	NC		%	50
			Anthracene	2016/05/25	NC		%	50
			Benzo(a)anthracene	2016/05/25	NC		%	50
			Benzo(a)pyrene	2016/05/25	NC		%	50
			Benzo(b)fluoranthene	2016/05/25	NC		%	50
			Benzo(j)fluoranthene	2016/05/25	NC		%	50
			Benzo(k)fluoranthene	2016/05/25	NC		%	50
			Benzo(b+j+k)fluoranthene	2016/05/25	NC		%	50
			Benzo(c)phenanthrene	2016/05/25	NC		%	50
			Benzo(ghi)perylene	2016/05/25	NC		%	50
			Chrysene	2016/05/25	NC		%	50
			Dibenz(a,h)anthracene	2016/05/25	NC		%	50
			Dibenzo(a,i)pyrene	2016/05/25	NC		%	50
			Dibenzo(a,h)pyrene	2016/05/25	NC		%	50
			Dibenzo(a,l)pyrene	2016/05/25	NC		%	50
			7,12-Dimethylbenzanthracene	2016/05/25	NC		%	50
			Fluoranthene	2016/05/25	NC		%	50
			Fluorene	2016/05/25	NC		%	50
			Indeno(1,2,3-cd)pyrene	2016/05/25	NC		%	50
			3-Methylcholanthrene	2016/05/25	NC		%	50
			Naphthalene	2016/05/25	NC		%	50
			Phenanthrene	2016/05/25	NC		%	50
			Pyrene	2016/05/25	NC		%	50
			2-Methylnaphthalene	2016/05/25	NC		%	50

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
1609081	KK	Spiked Blank	1-Methylnaphthalene	2016/05/25	NC		%	50
			1,3-Dimethylnaphthalene	2016/05/25	NC		%	50
			2,3,5-Trimethylnaphthalene	2016/05/25	NC		%	50
			Silver (Ag)	2016/05/24		98	%	75 - 125
			Arsenic (As)	2016/05/24		104	%	75 - 125
			Barium (Ba)	2016/05/24		102	%	75 - 125
			Cadmium (Cd)	2016/05/24		99	%	75 - 125
			Chromium (Cr)	2016/05/24		106	%	75 - 125
			Cobalt (Co)	2016/05/24		104	%	75 - 125
			Copper (Cu)	2016/05/24		102	%	75 - 125
			Tin (Sn)	2016/05/24		98	%	75 - 125
			Manganese (Mn)	2016/05/24		98	%	75 - 125
			Molybdenum (Mo)	2016/05/24		97	%	75 - 125
			Nickel (Ni)	2016/05/24		103	%	75 - 125
			Lead (Pb)	2016/05/24		102	%	75 - 125
			Zinc (Zn)	2016/05/24		103	%	75 - 125
1609081	KK	Method Blank	Silver (Ag)	2016/05/24	<0.5		mg/kg	
			Arsenic (As)	2016/05/24	<5		mg/kg	
			Barium (Ba)	2016/05/24	<5		mg/kg	
			Cadmium (Cd)	2016/05/24	<0.5		mg/kg	
			Chromium (Cr)	2016/05/24	<2		mg/kg	
			Cobalt (Co)	2016/05/24	<2		mg/kg	
			Copper (Cu)	2016/05/24	<2		mg/kg	
			Tin (Sn)	2016/05/24	<4		mg/kg	
			Manganese (Mn)	2016/05/24	<2		mg/kg	
			Molybdenum (Mo)	2016/05/24	<1		mg/kg	
			Nickel (Ni)	2016/05/24	<1		mg/kg	
			Lead (Pb)	2016/05/24	<5		mg/kg	
			Zinc (Zn)	2016/05/24	<10		mg/kg	
1609081	KK	RPD	Silver (Ag)	2016/05/24	NC		%	30
			Arsenic (As)	2016/05/24	NC		%	30
			Barium (Ba)	2016/05/24	4.5		%	30
			Cadmium (Cd)	2016/05/24	NC		%	30
			Chromium (Cr)	2016/05/24	1.2		%	30
			Cobalt (Co)	2016/05/24	11		%	30
			Copper (Cu)	2016/05/24	1.3		%	30
			Tin (Sn)	2016/05/24	NC		%	30
			Manganese (Mn)	2016/05/24	7.5		%	30
			Molybdenum (Mo)	2016/05/24	NC		%	30
			Nickel (Ni)	2016/05/24	2.2		%	30
			Lead (Pb)	2016/05/24	1.4		%	30

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC			Date		Value	Recovery	Units	QC Limits
Batch	Init	QC Type	Analyzed					
			Zinc (Zn)		2016/05/24	1.3	%	30
<p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).</p> <p>(1) Dû à l'interférence de la matrice, la limite de détection a été augmentée.</p>								

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Christian Guiang, B.Sc., Chemist



Dipali Patel

Karyn Vaucher
Membre OCQ #2011-004

Karyn Vaucher

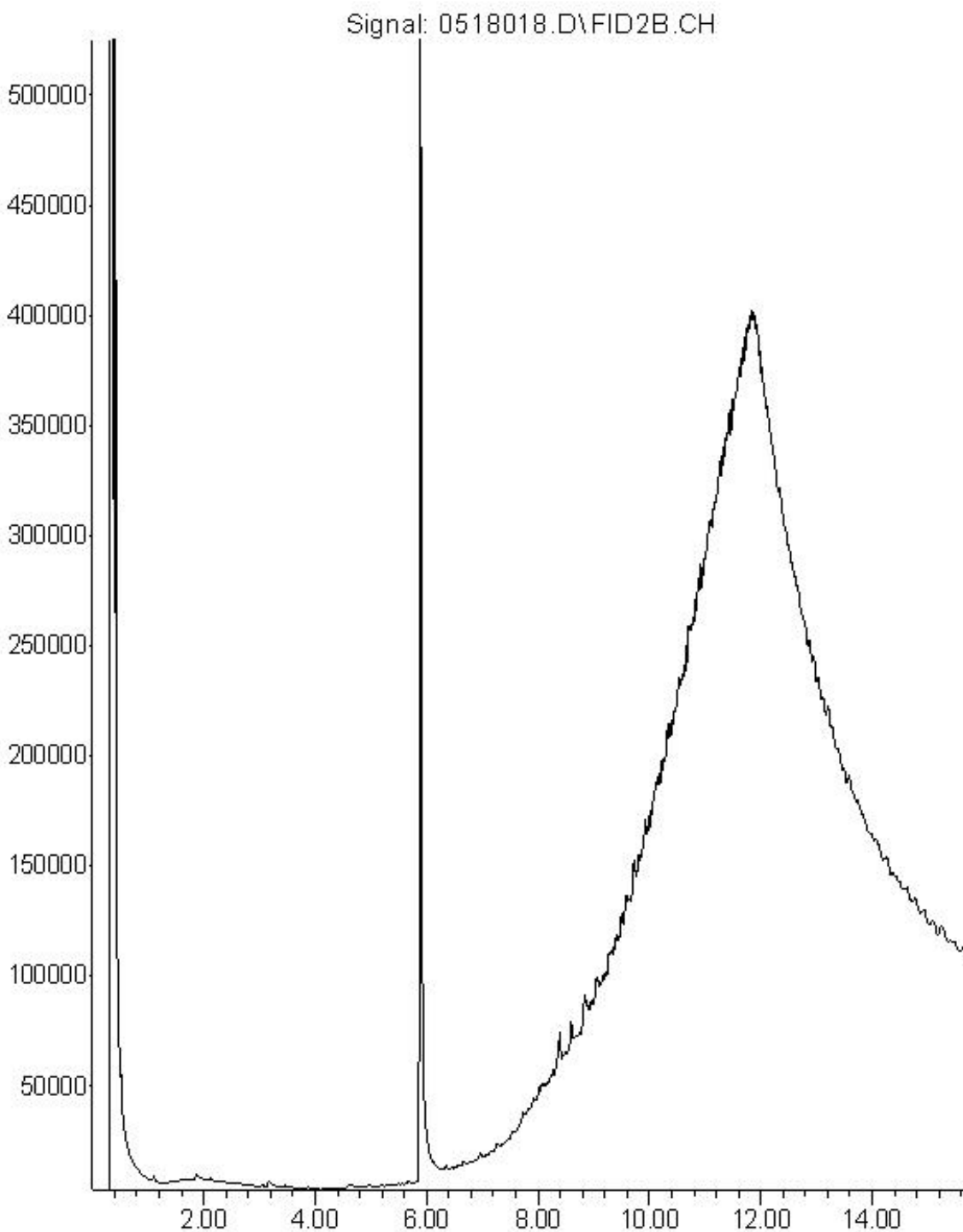


Sally Lee, B.Sc., Chimist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Petroleum Hydrocarbons (C10-C50) Chromatogram

Response_

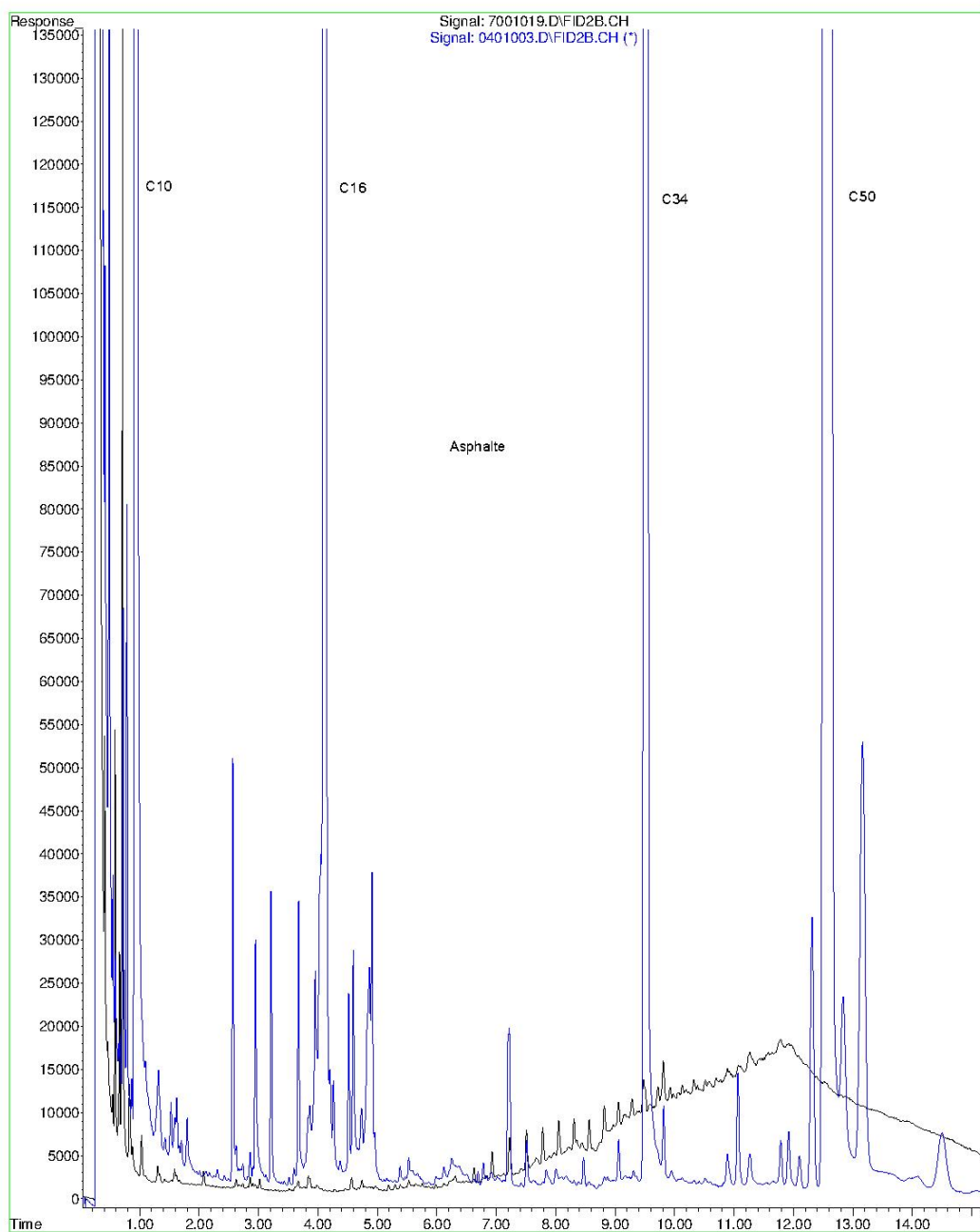


Time

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Reference Chromatogram: Asphalt

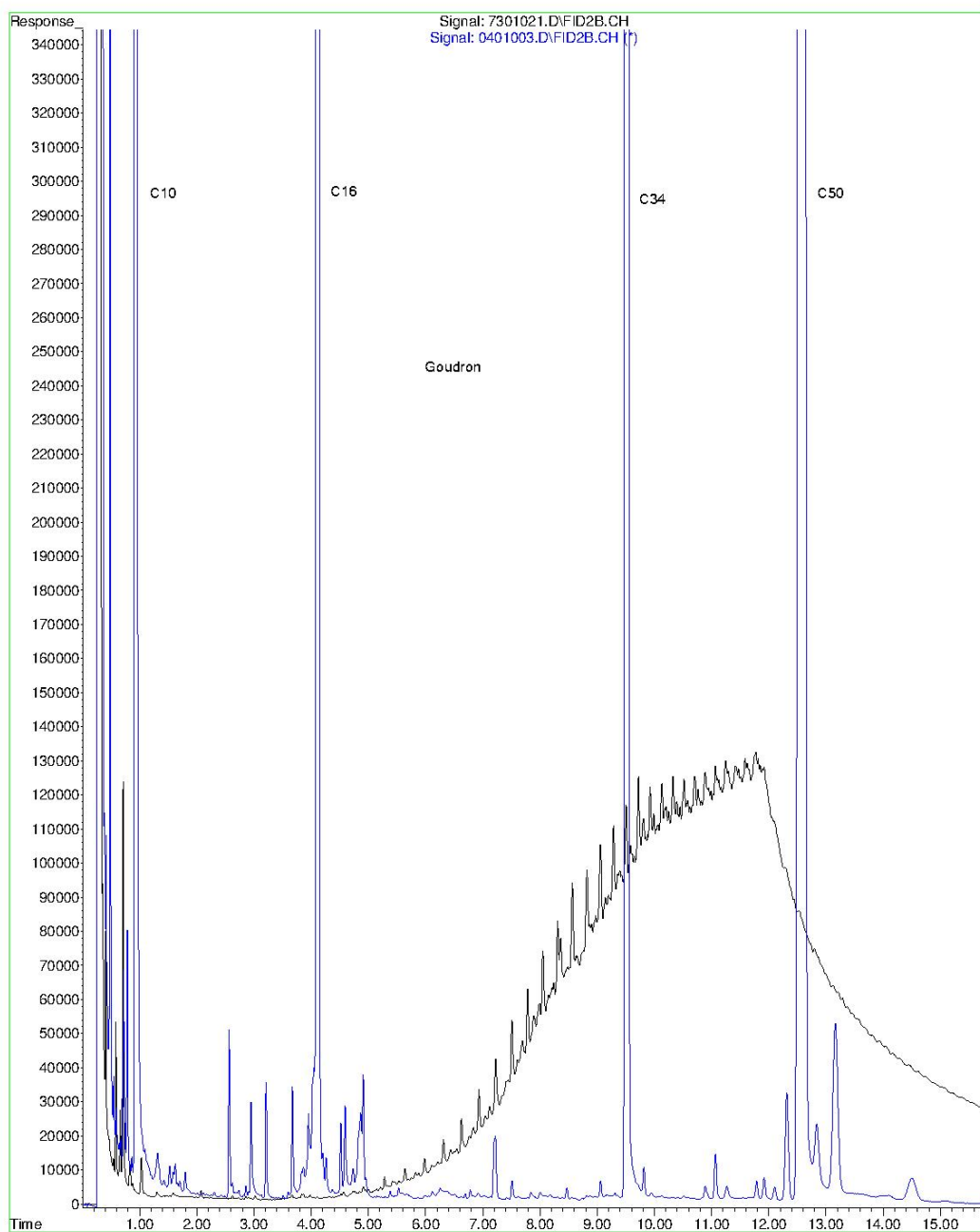
File : C:\GC_15\DATA\B6MAR08.SEC\7001019.D
Operator :
Acquired : 2016-03-08 06:09:56 PM using AcqMethod CA_FB3ED.M
Instrument : Instrumen
Sample Name: G784 Asphalte
Misc Info : S,1,1,100,0
Vial Number: 71



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Reference Chromatogram: Tar

File :C:\GC_15\DATA\B6MAR08.SEC\7301021.D
Operator :
Acquired : 2016-03-08 07:00:49 PM using AcqMethod CA_FB3ED.M
Instrument : Instrumen
Sample Name: G793 Goudron
Misc Info : S,1,1,100,0
Vial Number: 72



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

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Note d'instructions

Applicabilité de l'article 4 du Règlement sur le stockage et les centres de transfert de sols contaminés aux sols contenant des teneurs naturelles en métaux et métalloïdes inférieures à l'annexe I de ce règlement (Février 2015)

Cette note d'instructions est utilisée pour assister les analystes des directions régionales du Ministère dans le traitement des demandes d'autorisation.

Référence légale ou administrative :

Règlement sur le stockage et les centres de transfert de sols contaminés (chapitre Q-2, r. 46)

Lignes directrices sur l'évaluation des teneurs de fond naturelles dans les sols
Règlement sur l'enfouissement des sols contaminés

Contexte :

Le Règlement sur le stockage et les centres de transfert de sols contaminés (RSCTSC; chapitre Q-2, r. 46) précise notamment les exigences relatives au stockage des sols contaminés ailleurs que sur le terrain d'origine d'une contamination. Le RSCTSC s'applique aux sols dont les concentrations en contaminants sont égales ou supérieures aux valeurs limites de l'annexe I, à l'exception de l'article 4 qui s'applique aux sols dont les concentrations sont inférieures aux valeurs de l'annexe I.

La question à savoir si les sols qui contiennent des teneurs naturelles en métaux et métalloïdes inférieures aux valeurs limites de l'annexe I du RSCTSC sont visés par l'article 4 a été soulevée. Par sols contenant des teneurs naturelles, on entend des sols qui n'ont pas été contaminés par une activité humaine, mais qui contiennent des métaux ou métalloïdes au moment de leur formation, par exemple suite à l'érosion de roches mères riches en métaux ou métalloïdes ou à la suite de phénomènes pédologiques comme la concentration de manganèse dans certains horizons.

Par ailleurs, le fait de considérer les sols présentant des concentrations naturelles en métaux et métalloïdes comme des sols contaminés, en limite grandement leur réutilisation comme matériel de remblai notamment pour la réhabilitation de carrière ou d'autres lieux dégradés.

Instructions :

Il n'est pas dans l'intention du MDDELCC de viser les sols contenant des teneurs naturelles pour l'application de l'article 4 du RSCTSC.

✱ D'ici à ce qu'une modification réglementaire soit effectuée pour clarifier la situation, il convient de ne pas appliquer l'article 4 du RSCTSC aux sols contenant des teneurs naturelles inférieures à l'annexe I (sols « A-B »).

Il est à noter que la méthodologie présentée dans Lignes directrices sur l'évaluation des teneurs de fond naturelles dans les sols publiées par le MDDELCC doit être utilisée pour que les concentrations contenues dans un sol soient reconnues comme des teneurs naturelles. Ces lignes directrices sont disponibles sur le site Internet du MDDELCC.

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Section C – Site tree survey

Annex C-1

Site tree survey table

Espèce/species	Nom français/English name	Nom latin/Latin name	Diamètre/diameter (mm)	Élévation/Elevation (m)	Classe/class	Aménagement/planning
ERA	Érable argenté/Silver maple	Acer saccharinum	40,00	11,59	<150 mm	Bande terrestre
ERA	Érable argenté/Silver maple	Acer saccharinum	20,00	11,70	<150 mm	Bande terrestre
ERA	Érable argenté/Silver maple	Acer saccharinum	103,00	11,22	<150 mm	Bande terrestre
ERA	Érable argenté/Silver maple	Acer saccharinum	88,00	11,15	<150 mm	Bande terrestre
ERA	Érable argenté/Silver maple	Acer saccharinum	377,00	10,12	>150 mm	Bande terrestre
ERA	Érable argenté/Silver maple	Acer saccharinum	468,00	10,32	>150 mm	Bande terrestre
ERA	Érable argenté/Silver maple	Acer saccharinum	739,00	10,84	>150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	628,00	10,37	>150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	448,00	10,12	>150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	672,00	10,19	>150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	584,00	9,89	>150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	42,00	11,01	<150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	62,00	11,01	<150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	360,00	10,16	>150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	632,00	10,31	>150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	471,00	9,61	>150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	705,00	10,02	>150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	596,00	10,06	>150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	736,00	10,75	>150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	877,00	9,96	>150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	622,00	9,76	>150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	836,00	10,09	>150 mm	Marais
ERA	Érable argenté/Silver maple	Acer saccharinum	55,00	10,77	<150 mm	Eau profonde (fosse)
ERA	Érable argenté/Silver maple	Acer saccharinum	45,00	11,45	<150 mm	Eau profonde (fosse)
ERA	Érable argenté/Silver maple	Acer saccharinum	25,00	11,60	<150 mm	Eau profonde (fosse)
ERA	Érable argenté/Silver maple	Acer saccharinum	142,00	10,72	<150 mm	Eau profonde (fosse)
ERA	Érable argenté/Silver maple	Acer saccharinum	58,00	9,49	<150 mm	Eau profonde (fosse)
ERA	Érable argenté/Silver maple	Acer saccharinum	946,00	9,86	>150 mm	Eau profonde (fosse)
ERA	Érable argenté/Silver maple	Acer saccharinum	478,00	9,63	>150 mm	Eau profonde (fosse)
ERA	Érable argenté/Silver maple	Acer saccharinum	88,00	9,10	<150 mm	Marais (berme aquatique)
ERA	Érable argenté/Silver maple	Acer saccharinum	62,00	9,52	<150 mm	Marais (berme aquatique)
ERA	Érable argenté/Silver maple	Acer saccharinum	127,00	9,54	<150 mm	Marais (berme aquatique)
ERA	Érable argenté/Silver maple	Acer saccharinum	139,00	9,47	<150 mm	Marais (berme aquatique)

Espèce/species	Nom français/English name	Nom latin/Latin name	Diamètre/diameter (mm)	Élévation/Elevation (m)	Classe/class	Aménagement/planning
ERA	Érable argenté/Silver maple	Acer saccharinum	98,00	9,14	<150 mm	Marais (berme aquatique)
ERA	Érable argenté/Silver maple	Acer saccharinum	19,00	9,48	<150 mm	Marais (berme aquatique)
ERA	Érable argenté/Silver maple	Acer saccharinum	22,00	9,13	<150 mm	Marais (berme aquatique)
ERA	Érable argenté/Silver maple	Acer saccharinum	168,00	9,45	>150 mm	Marais (berme aquatique)
ERA	Érable argenté/Silver maple	Acer saccharinum	55,00	9,17	<150 mm	Marais (berme aquatique)
ERA	Érable argenté/Silver maple	Acer saccharinum	34,00	9,29	<150 mm	Marais (berme aquatique)
ERA	Érable argenté/Silver maple	Acer saccharinum	47,00	9,16	<150 mm	Marais (berme aquatique)
ERA	Érable argenté/Silver maple	Acer saccharinum	41,00	9,26	<150 mm	Marais (berme aquatique)
ERA	Érable argenté/Silver maple	Acer saccharinum	50,00	9,22	<150 mm	Marais (berme aquatique)
ERA	Érable argenté/Silver maple	Acer saccharinum	160,00	8,99	>150 mm	Marais (berme aquatique)
ERA	Érable argenté/Silver maple	Acer saccharinum	290,00	10,12	>150 mm	Marécage arbustif
ERG	Érable à Giguère/Boxelder maple	Acer negundo	40,00	11,28	<150 mm	Eau profonde (fosse)
ERG	Érable à Giguère/Boxelder maple	Acer negundo	60,00	11,36	<150 mm	Eau profonde (fosse)
ERR	Érable rouge/Red maple	Acer rubrum	371,00	10,24	>150 mm	Eau profonde (fosse)
ERR	Érable rouge/Red maple	Acer rubrum	322,00	10,21	>150 mm	Eau profonde (fosse)
ERR	Érable rouge/Red maple	Acer rubrum	353,00	10,01	>150 mm	Eau profonde (fosse)
ERR	Érable rouge/Red maple	Acer rubrum	392,00	10,09	>150 mm	Eau profonde (fosse)
ERR	Érable rouge/Red maple	Acer rubrum	410,00	9,85	>150 mm	Eau profonde (fosse)
ERR	Érable rouge/Red maple	Acer rubrum	405,00	9,78	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	23,00	10,78	<150 mm	Marais
ERS	Érable à sucre/Sugar maple	Acer saccharum	525,00	10,61	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	366,00	10,27	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	315,00	10,27	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	366,00	10,19	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	350,00	10,74	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	350,00	10,06	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	383,00	9,64	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	61,00	11,30	<150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	61,00	11,49	<150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	42,00	11,56	<150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	70,00	11,60	<150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	31,00	10,40	<150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	558,00	10,69	>150 mm	Eau profonde (fosse)

Espèce/species	Nom français/English name	Nom latin/Latin name	Diamètre/diameter (mm)	Élévation/Elevation (m)	Classe/class	Aménagement/planning
ERS	Érable à sucre/Sugar maple	Acer saccharum	415,00	10,52	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	321,00	10,63	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	333,00	10,62	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	308,00	10,60	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	306,00	10,65	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	376,00	10,47	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	390,00	9,98	>150 mm	Eau profonde (fosse)
ERS	Érable à sucre/Sugar maple	Acer saccharum	441,00	9,95	>150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	35,00	11,73	<150 mm	Bande terrestre
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	50,00	11,74	<150 mm	Bande terrestre
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	30,00	11,74	<150 mm	Bande terrestre
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	55,00	11,74	<150 mm	Bande terrestre
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	55,00	11,76	<150 mm	Bande terrestre
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	15,00	11,62	<150 mm	Bande terrestre
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	117,00	11,36	<150 mm	Bande terrestre
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	75,00	11,78	<150 mm	Plaine inondable
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	110,00	11,67	<150 mm	Plaine inondable
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	15,00	11,63	<150 mm	Plaine inondable
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	15,00	11,62	<150 mm	Plaine inondable
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	15,00	11,60	<150 mm	Plaine inondable
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	50,00	11,66	<150 mm	Marais
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	20,00	11,76	<150 mm	Marais
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	40,00	11,73	<150 mm	Marais
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	50,00	11,77	<150 mm	Marais
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	60,00	11,74	<150 mm	Marais
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	45,00	11,64	<150 mm	Marais
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	20,00	11,51	<150 mm	Marais
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	20,00	11,59	<150 mm	Marais
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	444,00	9,74	>150 mm	Marais
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	90,00	12,09	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	65,00	11,99	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	35,00	11,71	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	35,00	11,69	<150 mm	Eau profonde (fosse)

Espèce/species	Nom français/English name	Nom latin/Latin name	Diamètre/diameter (mm)	Élévation/Elevation (m)	Classe/class	Aménagement/planning
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	45,00	11,76	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	20,00	11,70	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	55,00	11,49	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	30,00	11,50	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	20,00	11,53	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	20,00	11,66	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	25,00	11,52	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	25,00	11,57	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	70,00	11,54	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	84,00	10,38	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	139,00	10,26	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	80,00	10,90	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	72,00	11,14	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	16,00	10,11	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	27,00	10,11	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	138,00	11,15	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	264,00	10,92	>150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	132,00	10,10	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	43,00	9,57	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	100,00	9,59	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	83,00	10,51	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	143,00	10,57	<150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	414,00	9,79	>150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	304,00	9,67	>150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	625,00	9,70	>150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	492,00	9,49	>150 mm	Eau profonde (fosse)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	111,00	11,13	<150 mm	Marais (berme aquatique)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	111,00	11,17	<150 mm	Marais (berme aquatique)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	31,00	10,18	<150 mm	Marais (berme aquatique)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	45,00	10,12	<150 mm	Marais (berme aquatique)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	22,00	9,34	<150 mm	Marais (berme aquatique)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	39,00	9,28	<150 mm	Marais (berme aquatique)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	47,00	9,26	<150 mm	Marais (berme aquatique)

Espèce/species	Nom français/English name	Nom latin/Latin name	Diamètre/diameter (mm)	Élévation/Elevation (m)	Classe/class	Aménagement/planning
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	39,00	9,35	<150 mm	Marais (berme aquatique)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	30,00	9,39	<150 mm	Marais (berme aquatique)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	24,00	9,09	<150 mm	Marais (berme aquatique)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	25,00	9,33	<150 mm	Marais (berme aquatique)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	24,00	9,19	<150 mm	Marais (berme aquatique)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	22,00	9,22	<150 mm	Marais (berme aquatique)
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	86,00	10,21	<150 mm	Marécage arbustif
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	25,00	11,75	<150 mm	Marais
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	67,00	10,16	<150 mm	Marais
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	48,00	10,28	<150 mm	Marais
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	35,00	11,74	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	20,00	11,63	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	35,00	11,51	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	35,00	11,44	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	35,00	11,43	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	40,00	11,32	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	25,00	11,15	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	15,00	10,42	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	35,00	11,29	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	10,00	11,35	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	20,00	11,79	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	45,00	11,30	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	30,00	10,91	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	20,00	10,82	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	20,00	11,47	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	25,00	11,54	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	26,00	10,51	<150 mm	Eau profonde (fosse)
NER	Nerprun cathartique/Common buckthorn	Rhamnus cathartica	43,00	9,96	<150 mm	Marais (berme aquatique)
ORA	Orme d'Amérique/Orme d'Amérique	Ulmus americana	139,00	9,41	<150 mm	Eau profonde (fosse)
ORA	Orme d'Amérique/Orme d'Amérique	Ulmus americana	317,00	9,21	>150 mm	Marais (berme aquatique)
ORA	Orme d'Amérique/Orme d'Amérique	Ulmus americana	137,00	9,46	<150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	66,00	11,88	<150 mm	Bande terrestre
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	40,00	11,86	<150 mm	Bande terrestre

Espèce/species	Nom français/English name	Nom latin/Latin name	Diamètre/diameter (mm)	Élévation/Elevation (m)	Classe/class	Aménagement/planning
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	45,00	11,94	<150 mm	Bande terrestre
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	25,00	11,82	<150 mm	Bande terrestre
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	20,00	11,80	<150 mm	Bande terrestre
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	71,00	11,77	<150 mm	Bande terrestre
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	20,00	11,79	<150 mm	Bande terrestre
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	80,00	11,85	<150 mm	Bande terrestre
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	40,00	11,87	<150 mm	Bande terrestre
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	35,00	11,81	<150 mm	Bande terrestre
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	50,00	11,79	<150 mm	Bande terrestre
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	50,00	11,86	<150 mm	Bande terrestre
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	80,00	11,81	<150 mm	Bande terrestre
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,84	<150 mm	Bande terrestre
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,73	<150 mm	Bande terrestre
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	210,00	11,73	>150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	163,00	11,87	>150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	178,00	11,82	>150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	152,00	11,88	>150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	45,00	12,09	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	20,00	11,93	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	20,00	11,93	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	20,00	11,93	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,99	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	30,00	12,00	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	40,00	11,73	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	40,00	11,75	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,87	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,67	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	40,00	11,75	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	40,00	11,72	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	10,00	11,72	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	30,00	11,78	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	30,00	11,75	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	25,00	11,75	<150 mm	Plaine inondable

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PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	25,00	11,75	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	15,00	11,76	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	25,00	11,76	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	75,00	11,76	<150 mm	Plaine inondable
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	167,00	11,80	>150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	174,00	11,43	>150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	222,00	11,46	>150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	73,00	11,88	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	35,00	11,76	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	70,00	11,72	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	70,00	11,66	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,74	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	30,00	12,04	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	40,00	11,96	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	70,00	11,95	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	10,00	12,01	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	120,00	11,72	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	40,00	11,76	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	20,00	11,67	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	20,00	11,73	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	30,00	11,70	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	10,00	11,70	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	10,00	11,75	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	30,00	11,74	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	30,00	11,70	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	40,00	11,72	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,73	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	20,00	11,72	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	45,00	11,74	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	45,00	11,76	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	30,00	11,76	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	40,00	11,72	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	30,00	11,70	<150 mm	Marais

Espèce/species	Nom français/English name	Nom latin/Latin name	Diamètre/diameter (mm)	Élévation/Elevation (m)	Classe/class	Aménagement/planning
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	40,00	11,77	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	80,00	11,67	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	100,00	11,81	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	118,00	11,80	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	100,00	11,66	<150 mm	Marais
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	167,00	11,62	>150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	178,00	11,59	>150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	160,00	11,66	>150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	200,00	11,80	>150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	265,00	10,79	>150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	280,00	11,52	>150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	178,00	11,02	>150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	157,00	11,23	>150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	316,00	11,13	>150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	208,00	11,48	>150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	200,00	11,41	>150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	274,00	11,47	>150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	315,00	11,46	>150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	45,00	11,33	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,49	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	127,00	11,40	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	110,00	11,43	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	83,00	11,97	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	36,00	11,91	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	65,00	10,84	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	66,00	10,11	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	142,00	10,12	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	124,00	10,18	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	50,00	10,17	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	20,00	10,18	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	35,00	10,15	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	25,00	10,10	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	25,00	10,10	<150 mm	Eau profonde (fosse)

Espèce/species	Nom français/English name	Nom latin/Latin name	Diamètre/diameter (mm)	Élévation/Elevation (m)	Classe/class	Aménagement/planning
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	25,00	10,21	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	25,00	10,21	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	80,00	10,16	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	15,00	10,45	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	15,00	10,17	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	15,00	10,28	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	90,00	11,80	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	85,00	12,03	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	50,00	12,03	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	70,00	12,05	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	50,00	11,80	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	50,00	11,80	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,67	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,74	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,59	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	45,00	11,56	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,57	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	122,00	11,47	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	135,00	11,49	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	135,00	11,53	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	135,00	11,34	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	135,00	11,28	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	35,00	11,03	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	55,00	10,89	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	100,00	11,02	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,32	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,47	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	70,00	11,41	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	95,00	11,53	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	145,00	11,79	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	25,00	11,70	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	25,00	11,72	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	90,00	11,64	<150 mm	Eau profonde (fosse)

Espèce/species	Nom français/English name	Nom latin/Latin name	Diamètre/diameter (mm)	Élévation/Elevation (m)	Classe/class	Aménagement/planning
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	90,00	11,59	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	108,00	11,63	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	115,00	11,73	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	95,00	11,72	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	40,00	11,75	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	45,00	11,73	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	70,00	11,78	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	30,00	11,74	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	90,00	11,73	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	130,00	11,67	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	90,00	11,62	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	90,00	11,60	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	70,00	11,70	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	95,00	11,67	<150 mm	Eau profonde (fosse)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	116,00	11,15	<150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	122,00	11,02	<150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	114,00	11,19	<150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	196,00	9,09	>150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	221,00	9,11	>150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	199,00	9,39	>150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	137,00	9,04	<150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	100,00	9,35	<150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	53,00	9,52	<150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	18,00	9,33	<150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	103,00	9,40	<150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	28,00	9,27	<150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	161,00	9,41	>150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	283,00	9,20	>150 mm	Marais (berme aquatique)
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	36,00	11,68	<150 mm	Marécage arbustif
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	64,00	11,87	<150 mm	Marécage arbustif
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	70,00	11,76	<150 mm	Marécage arbustif
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	60,00	11,79	<150 mm	Marécage arbustif
PET	Peuplier faux-tremble/Quaking aspen	Populus tremuloides	20,00	11,73	<150 mm	Plaine inondable

Espèce/species	Nom français/English name	Nom latin/Latin name	Diamètre/diameter (mm)	Élévation/Elevation (m)	Classe/class	Aménagement/planning
PET	Peuplier faux-tremble/Quaking aspen	Populus tremuloides	25,00	11,74	<150 mm	Plaine inondable
PET	Peuplier faux-tremble/Quaking aspen	Populus tremuloides	10,00	11,73	<150 mm	Plaine inondable
PET	Peuplier faux-tremble/Quaking aspen	Populus tremuloides	10,00	11,70	<150 mm	Plaine inondable
PET	Peuplier faux-tremble/Quaking aspen	Populus tremuloides	10,00	11,74	<150 mm	Plaine inondable
PET	Peuplier faux-tremble/Quaking aspen	Populus tremuloides	10,00	11,72	<150 mm	Plaine inondable
PET	Peuplier faux-tremble/Quaking aspen	Populus tremuloides	10,00	11,68	<150 mm	Plaine inondable
PET	Peuplier faux-tremble/Quaking aspen	Populus tremuloides	50,00	11,64	<150 mm	Plaine inondable
PET	Peuplier faux-tremble/Quaking aspen	Populus tremuloides	50,00	11,73	<150 mm	Plaine inondable
PET	Peuplier faux-tremble/Quaking aspen	Populus tremuloides	15,00	11,74	<150 mm	Marais
PET	Peuplier faux-tremble/Quaking aspen	Populus tremuloides	35,00	11,74	<150 mm	Marais
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	311,00	9,21	>150 mm	Eau profonde (fosse)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	528,00	10,10	>150 mm	Eau profonde (fosse)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	356,00	9,92	>150 mm	Eau profonde (fosse)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	321,00	10,12	>150 mm	Eau profonde (fosse)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	310,00	9,83	>150 mm	Eau profonde (fosse)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	392,00	9,73	>150 mm	Eau profonde (fosse)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	415,00	10,06	>150 mm	Eau profonde (fosse)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	368,00	9,92	>150 mm	Eau profonde (fosse)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	449,00	10,18	>150 mm	Eau profonde (fosse)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	328,00	9,89	>150 mm	Eau profonde (fosse)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	477,00	9,65	>150 mm	Marais (berme aquatique)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	241,00	9,19	>150 mm	Marais (berme aquatique)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	252,00	9,52	>150 mm	Marais (berme aquatique)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	302,00	9,24	>150 mm	Marais (berme aquatique)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	486,00	9,51	>150 mm	Marais (berme aquatique)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	446,00	9,11	>150 mm	Marais (berme aquatique)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	516,00	9,30	>150 mm	Marais (berme aquatique)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	282,00	8,99	>150 mm	Marais (berme aquatique)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	408,00	9,03	>150 mm	Marais (berme aquatique)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	260,00	9,22	>150 mm	Marais (berme aquatique)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	251,00	9,28	>150 mm	Marais (berme aquatique)
SAN	Saules noir et blanc/Black and white willows	Salix nigra/Salix alba	422,00	9,47	>150 mm	Marais (berme aquatique)
SASP	Saule sp./Willow sp.	Salix sp.	337,00	10,11	>150 mm	Eau profonde (fosse)

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SASP	Saule sp./Willow sp.	Salix sp.	345,00	9,96	>150 mm	Eau profonde (fosse)
SASP	Saule sp./Willow sp.	Salix sp.	333,00	10,88	>150 mm	Eau profonde (fosse)
SASP	Saule sp./Willow sp.	Salix sp.	375,00	10,81	>150 mm	Eau profonde (fosse)
SASP	Saule sp./Willow sp.	Salix sp.	375,00	10,88	>150 mm	Eau profonde (fosse)
SASP	Saule sp./Willow sp.	Salix sp.	10,00	9,32	<150 mm	Marais (berme aquatique)
SOA	Sorbier d'Amérique/American mountain ash	Sorbus americana	10,00	11,84	<150 mm	Bande terrestre
SOA	Sorbier d'Amérique/American mountain ash	Sorbus americana	10,00	11,85	<150 mm	Bande terrestre
SOA	Sorbier d'Amérique/American mountain ash	Sorbus americana	15,00	11,86	<150 mm	Bande terrestre
SOA	Sorbier d'Amérique/American mountain ash	Sorbus americana	10,00	11,82	<150 mm	Bande terrestre
SOA	Sorbier d'Amérique/American mountain ash	Sorbus americana	10,00	11,84	<150 mm	Bande terrestre
SOA	Sorbier d'Amérique/American mountain ash	Sorbus americana	15,00	11,85	<150 mm	Marécage arbustif
SP	Inconnu/Non identifiable		153,00	11,04	>150 mm	Marais
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	10,00	11,79	<150 mm	Marais
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	10,00	10,40	<150 mm	Marais
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	10,00	11,62	<150 mm	Eau profonde (fosse)
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	10,00	11,58	<150 mm	Eau profonde (fosse)
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	10,00	11,53	<150 mm	Eau profonde (fosse)
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	15,00	11,41	<150 mm	Eau profonde (fosse)
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	10,00	11,41	<150 mm	Eau profonde (fosse)
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	50,00	10,41	<150 mm	Marais (berme aquatique)
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	35,00	11,15	<150 mm	Marais (berme aquatique)
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	43,00	11,22	<150 mm	Marais (berme aquatique)
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	46,00	11,18	<150 mm	Marais (berme aquatique)
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	56,00	11,20	<150 mm	Marais (berme aquatique)
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	48,00	11,10	<150 mm	Marais (berme aquatique)
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	49,00	11,12	<150 mm	Marais (berme aquatique)
VIN	Vinaigrier/Staghorn sumac	Rhus typhina	20,00	10,21	<150 mm	Marais (berme aquatique)

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CEP	Cerisier de Pennsylvanie/Bird cherry	Prunus pensylvanica	79,00	< 150 mm	11,11	
ERA	Érable argenté/Silver maple	Acer saccharinum	60,00	< 150 mm	11,43	
ERA	Érable argenté/Silver maple	Acer saccharinum	67,00	< 150 mm	11,34	
ERA	Érable argenté/Silver maple	Acer saccharinum	52,00	< 150 mm	11,36	
ERA	Érable argenté/Silver maple	Acer saccharinum	36,00	< 150 mm	11,31	
ERA	Érable argenté/Silver maple	Acer saccharinum	72,00	< 150 mm	11,46	
ERA	Érable argenté/Silver maple	Acer saccharinum	60,00	< 150 mm	11,46	
ERA	Érable argenté/Silver maple	Acer saccharinum	44,00	< 150 mm	11,50	
ERA	Érable argenté/Silver maple	Acer saccharinum	46,00	< 150 mm	11,55	
ERA	Érable argenté/Silver maple	Acer saccharinum	30,00	< 150 mm	11,47	
ERR	Érable rouge/Red maple	Acer rubrum	20,00	< 150 mm	0,00	
ERR	Érable rouge/Red maple	Acer rubrum	54,00	< 150 mm	0,00	
ERR	Érable rouge/Red maple	Acer rubrum	81,00	< 150 mm	0,00	
ERR	Érable rouge/Red maple	Acer rubrum	35,00	< 150 mm	0,00	
ERR	Érable rouge/Red maple	Acer rubrum	40,00	< 150 mm	0,00	
ERR	Érable rouge/Red maple	Acer rubrum	35,00	< 150 mm	0,00	
ERR	Érable rouge/Red maple	Acer rubrum	25,00	< 150 mm	0,00	
ERR	Érable rouge/Red maple	Acer rubrum	12,00	< 150 mm	0,00	
ERR	Érable rouge/Red maple	Acer rubrum	12,00	< 150 mm	11,25	
ERR	Érable rouge/Red maple	Acer rubrum	75,00	< 150 mm	11,63	
ERS	Érable à sucre/Sugar maple	Acer saccharum	342,00	>150 mm	9,90	
ERS	Érable à sucre/Sugar maple	Acer saccharum	51,00	< 150 mm	11,39	
FEV	Robinier pseudo-acacia/Black locust	Robinia pseudoacacia	22,00	< 150 mm	0,00	
FEV	Robinier pseudo-acacia/Black locust	Robinia pseudoacacia	48,00	< 150 mm	0,00	
FEV	Robinier pseudo-acacia/Black locust	Robinia pseudoacacia	26,00	< 150 mm	0,00	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	35,00	< 150 mm	11,50	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	35,00	< 150 mm	11,46	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	65,00	< 150 mm	11,43	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	65,00	< 150 mm	11,45	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	61,00	< 150 mm	11,38	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	100,00	< 150 mm	11,40	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	75,00	< 150 mm	11,40	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	40,00	< 150 mm	11,56	

Espèce/species	Nom français/English name	Nom latin/Latin name	Diamètre/diameter (mm)	Classe/class	Élévation/Elevation (m)	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	72,00	< 150 mm	11,48	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	53,00	< 150 mm	11,45	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	33,00	< 150 mm	11,48	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	40,00	< 150 mm	11,46	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	47,00	< 150 mm	11,51	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	68,00	< 150 mm	11,46	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	61,00	< 150 mm	11,43	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	43,00	< 150 mm	11,43	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	35,00	< 150 mm	11,44	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	130,00	< 150 mm	11,36	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	34,00	< 150 mm	11,34	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	20,00	< 150 mm	11,43	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	20,00	< 150 mm	11,33	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	58,00	< 150 mm	11,02	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	50,00	< 150 mm	11,23	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	56,00	< 150 mm	11,47	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	44,00	< 150 mm	11,55	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	59,00	< 150 mm	11,34	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	51,00	< 150 mm	11,09	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	49,00	< 150 mm	11,01	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	22,00	< 150 mm	11,97	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	22,00	< 150 mm	10,97	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	63,00	< 150 mm	11,22	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	34,00	< 150 mm	10,97	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	43,00	< 150 mm	10,97	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	122,00	< 150 mm	11,02	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	33,00	< 150 mm	10,95	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	37,00	< 150 mm	10,97	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	23,00	< 150 mm	10,93	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	54,00	< 150 mm	10,96	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	73,00	< 150 mm	11,38	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	73,00	< 150 mm	11,17	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	73,00	< 150 mm	11,37	

Espèce/species	Nom français/English name	Nom latin/Latin name	Diamètre/diameter (mm)	Classe/class	Élévation/Elevation (m)	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	91,00	< 150 mm	11,12	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	68,00	< 150 mm	11,16	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	30,00	< 150 mm	11,11	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	19,00	< 150 mm	11,08	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	60,00	< 150 mm	11,78	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	80,00	< 150 mm	0,00	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	60,00	< 150 mm	0,00	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	75,00	< 150 mm	0,00	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	53,00	< 150 mm	0,00	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	15,00	< 150 mm	0,00	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	21,00	< 150 mm	0,00	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	108,00	< 150 mm	11,39	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	49,00	< 150 mm	11,28	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	49,00	< 150 mm	11,40	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	75,00	< 150 mm	11,52	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	70,00	< 150 mm	11,28	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	90,00	< 150 mm	11,31	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	92,00	< 150 mm	11,31	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	122,00	< 150 mm	11,25	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	108,00	< 150 mm	12,24	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	81,00	< 150 mm	11,39	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	66,00	< 150 mm	11,22	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	77,00	< 150 mm	10,99	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	297,00	>150 mm	0,00	
FRP	Frêne de Pennsylvanie/Green ash	Fraxinus pennsylvanica	17,00	< 150 mm	0,00	
PEB	Peuplier baumier/Balsam poplar	Populus balsamifera	55,00	< 150 mm	11,05	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	165,00	>150 mm	11,44	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	333,00	>150 mm	11,32	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	192,00	>150 mm	11,37	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	155,00	>150 mm	11,28	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	265,00	>150 mm	11,43	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	200,00	>150 mm	11,41	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	163,00	>150 mm	11,43	

Espèce/species	Nom français/English name	Nom latin/Latin name	Diamètre/diameter (mm)	Classe/class	Élévation/Elevation (m)	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	230,00	>150 mm	11,32	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	272,00	>150 mm	11,42	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	237,00	>150 mm	11,45	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	160,00	>150 mm	11,45	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	227,00	>150 mm	11,42	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	258,00	>150 mm	11,37	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	310,00	>150 mm	11,29	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	251,00	>150 mm	11,43	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	243,00	>150 mm	11,53	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	232,00	>150 mm	11,57	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	240,00	>150 mm	11,49	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	187,00	>150 mm	11,28	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	170,00	>150 mm	11,27	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	227,00	>150 mm	11,39	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	160,00	>150 mm	0,00	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	150,00	>150 mm	0,00	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	157,00	>150 mm	0,00	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	157,00	>150 mm	0,00	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	175,00	>150 mm	11,49	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	64,00	< 150 mm	0,00	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	140,00	< 150 mm	0,00	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	116,00	< 150 mm	0,00	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	98,00	< 150 mm	0,00	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	153,00	>150 mm	0,00	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	98,00	< 150 mm	0,00	
PED	Peuplier deltoïde/Eastern cottonwood	Populus deltoides	87,00	< 150 mm	0,00	

**Section D – Mitigation measures (from
preliminary authorization certificate
application)**

Annexe D-1

Mitigation measures table

1.1 Mitigation measures

1.1.1 Water quality

Several mitigation measures may be applied to reduce the consequences of machinery use during the work as a whole, the effects of excavation work, the management of seepage water, the potential effects of excavated material management, and the consequences the bridge refection work has on the water quality.

N°	Mitigation measures
Potential accidents	
1	Inspect the equipment and machinery before they're introduced on the site and in case of a leak, repair immediately or exclude from site.
2	Perform a general maintenance and fuel supply of the machinery in identified areas by site supervisor, at least 60m away from a watercourse.
3	Provide, on site, airtight containers well identified intended for petroleum products.
4	Use biodegradable oil in machinery that will be in contact with water. All machinery and equipment used on or within 20 m of the high water line shall use hydraulic oil with: biobased content of at least 80%, and biodegradability according to OECD certified B301 or equivalent standard ($\geq 60\%$ biodegradability in 28 days). The Contractor will take the necessary measures to fully drain the machinery before filling with vegetable oil or biodegradable; a maximum of 5% of residual oil will be tolerated. The Contractor shall submit documentation proving that the machinery complies.
5	Place recipients containing petroleum products and other dangerous products in receptacles or between berms that can receive up to 110% of the stored reserve.
6	Provide on site, at all times, an environmental emergency intervention kit, in case of oil spill.
7	Put in place a prevention and intervention plan in case of spill and identify responsible people and organisms as well as the procedures to follow in case of environmental emergency. The Contractor must also provide an environmental protection plan, as indicated in specifications.
8	Report all spills with environmental consequences to the following authorities : Emergency service at Environment Canada (1-866-283-2333) and et Urgence Environnement du Québec (1-866-694-5454); recuperate contaminated materials, and dispose of in certified MDDELCC company.
Wildlife management construction work	
9	The Contractor must make sure the temporary storage of sediments on site doesn't cause dispersion of fine sediments (and sediment water) outside (aquatic environment). Sediment barriers (silt fences) must be installed at the edge of the Rivière des Prairies where there is exposed ground or any other technique approved by the MDDELCC. This barrier must be periodically checked to ensure its proper functioning and avoid any increase of total suspended solids (TSS) more than 25 mg/L over background levels in the Rivière des Prairies.
10	The machinery that will be working in the water or over water must function to biodegradable oil. The Contractor must present documentation ensuring the machinery is compliant with requirements. All machinery and equipment used on or within 20 m of the high water line shall use hydraulic oil with: biobased content of at least 80%, and biodegradability according to OECD certified B301 or equivalent standard ($\geq 60\%$ biodegradability in 28 days). The Contractor will take the necessary measures to fully drain the machinery before filling with vegetable oil or biodegradable; a maximum of 5% of residual oil will be tolerated. The Contractor shall submit documentation proving that the machinery complies.
11	Snow deposit will not be allowed in area of work or in excavation area. The Contractor must use an elimination site authorised by the MDDELCC.

N°	Mitigation measures
12	The Contractor must present a management strategy for the umped water so that it is not returned to the river with suspended material with a concentration superior to 25mg/l higher than the background level of the Rivière des Prairies. Water quality surveillance will be performed during work and of the sedimentation pound before they are rejected will be necessary.
13	Do not use road salt on bridge.
14	<p>Monitor the suspended material in the Rivière des Prairies during excavation work in the river. The concentration of suspended material in a radius of 100m outside the excavation area or where any work in the river happens cannot increase of more than 25mg/l the level of the surrounding waters. In an area 300m away from the excavation zone, the increase cannot be higher than 5mg/l. The Contractor or promoter has the responsibility to measure the level of suspended material 50m and 200m downstream from the turbidity curtain as well as 200m upstream from the work to measure the level of suspended material of the surrounding waters during the excavation work in the river. These measures must be taken twice a day during the excavation period in the Rivière des Prairies. The Contractor can also measure the turbidity (in situ measure) as a substitute to suspended material (in laboratory). If that option is chosen, the Contractor must set a calibration curve of turbidity according to the level of suspended material before the beginning of work. The results must be compiled and transmitted to the worksite manager.</p> <p>1) For water works:</p> <p>The performance target for suspended solids is a concentration not exceeding 25mg / L above existing levels. The turbidity should be measured at 100 m downstream of the work from the place of work and 25 meters upstream of the same activities in order to obtain the concentration of the non-affected water. Measures will be taken to a single depth only once a day during the work or up to 4 hours depending on field observations, previous results, the intensity of the work, etc.</p> <p>The Contractor may also measure the turbidity (measured in situ) in place of suspended solids (calibrated only in laboratory). If this option is chosen, the Contractor shall establish a standard curve of turbidity based on the suspended solids before the work begins. The results will be compiled and forwarded to the person responsible for the site.</p> <p>2) discharge into the river:</p> <p>The performance target is to respect a concentration that does not exceed 25mg / L above existing levels. The turbidity should be measured directly in the effluent.</p>
	Refecation work on bridge
15	Imported material for refecation work on bridge deposited under high water mark must be clean when they arrive on site.
16	In the case of an accidental reject of materials or debris in the aquatic environment, they must be quickly recovered and disposed in authorised disposal sites.
17	The pumped water during the dewatering must respect suspended materials criteria when rejected in the river. Make sure not to pump sediments at the bottom of the river during dewatering of cofferdam.

1.1.2 Air quality

The application of current mitigation measures will help minimize the deterioration of ambient air.

N°	Mitigation measures
18	Use well maintained and in good condition machinery and heavy equipment, in accordance with operations characteristics by proceeding to an inspection before they're introduced on site.
19	Use air-tight dump trucks or standard according to the needs, covered with a tarp, so as to limit the dispersion of fine particles in the air.
20	Limit the number of trucks present on site at the same time, especially close to residences.

21	Dust suppressants made of hygroscopic chloride sodium cannot be used on site less than 50m away from the Rivière des Prairies (BNQ 2410-300). The surfaces inside that zone can only be treated with water. In the case of the excavation work during summertime, the Contractor must spray water regularly on bare surfaces (path, work area).
22	Equip vehicles with a functioning anti-pollution exhaust system.
23	Put in place reverse drive alarm of variable intensity.
24	Turn off all mechanical or electrical equipment when not in use.
25	Turn off motors of vehicles and gasoline equipment when not in use, if possible.
26	Clean Gouin boulevard when needed
27	If earth piles are kept more than 24 hours, they will need to be covered or sprayed with water.
28	An area to clean up the wheels of the truck will be planned near the exit of the work area to avoid getting the road network dirty. The Contractor will also have the responsibility to make sure the roads stay clean for the duration of the work.
29	The criteria for fines and total particulates emission shall meet: fine particles (2.5 microns): 3 hours (35 mg / m ³ ; Environment Canada), 24 hours (30µg / m ³ ; Appendix K of Regulations sanitation of the atmosphere) Total Particulate: 1 hour (300 mg / m ³ ; Regulation on clean air and replacing regulations 44 and 44-1 of the Community), 8 hours (190 mg / m ³ Regulations on sanitation air and replacing regulations 44 and 44-1 of the Community)

1.1.3 Quality of sediments and soil

The mitigation measures on water quality must be applied, on top of the following mitigation measures.

N°	Mitigation measures
30	Excavated contaminated soils (A-B, B-C and > C) will be immediately charged in the trucks, so they can be eliminated off-site, in a disposal site authorised by the MDDELCC, according to their level of contamination if they aren't too wet. Soils <A can be managed according to the Contractor's needs, outside the site.
31	If they cannot immediately be transported off-site, the contaminated excavated soils will be stored on site, and separated in distinctive piles, according to their level of contamination. An impermeable membrane will be placed underneath and over piles of contaminated soils of type >B according to the policy. Also, the storage area will be arranged so as to contain any liquid seeping out of the soil.
32	Any water in contact with the stored soil or any liquid that seeps out of it will be caught and stored in a tank or airtight basin. In the case of the basin, the bottom and sides will be made of an impermeable membrane and the perimeter will be equipped with airtight berms high enough to keep runoff water from penetrating.
33	At the request of the supervisor, a sample of the soil in the piles can be requested to confirm the level of contamination, in case of doubt.
34	The chemical analysis of the soil or water seeping from the contaminated piles of soil will be entrusted to a laboratory with accreditations from the Centre d'expertise en analyse environnementale du Québec for the parameters to analyse. A characterization report prepared by a professional with at least three (3) years of experience in environmental characterizations will be supplied to the site supervisor before the final management of the soil or water takes place. The report of characterisation will include, but is not limited to, the description of the employed methodology, the compilation of the analytical results compared to the applicable criteria and norms, the analytical certificates signed by a chemist member of the Ordre des chimistes du Québec, as well as his recommendations on the management to employ for the soils and water.
35	The transportation of the contaminated soils will take place in accordance with the Transportation of Dangerous Goods Regulations. In accordance with these regulations, the

N°	Mitigation measures
	contaminated soils \geq B from the policy will be moved in a tipper vehicle covered with an impermeable tarp so as to keep the soil inside the dumpster. The soils of type \geq C according to the policy will be moved in a truck with the top of its dumpster completely covered to keep the rain and snow from going in, and the contaminants from going out. In all cases, if a liquid can escape from the contaminated soils, the container or dumpster will be air-tight.
36	Once the cargo delivered, the Contractor must give the site supervisor all documents attesting that the owner of the authorised delivery disposal site takes charge of the contaminated soil (transport manifest, proof of electronic weighing, explaining their nature, the level of contamination and quantity) at the end of every work day.

1.1.4 Coastal vegetation and wetlands

Specific mitigation measures may be applied to reduce the effect of work on aquatic and riparian vegetation.

N°	Mitigation measures
37	The Contractor must limit circulation of material to paths and work areas indicated in the contract to avoid disruptions in zones exterior to work.
38	If disruption of the wetlands takes place (Riparian strip) outside of what was expected, the Contractor must submit a plan of rehabilitation of the site to PWGSC for approval.

1.1.5 Terrestrial vegetation

The following mitigation measures must be applied to reduce the impact of work on terrestrial vegetation.

N°	Mitigation measures
39	Rehabilitation and extension of the riparian strip in the area of the bridge, by elimination of the buckthorn population.
40	The Contractor must limit circulation of material to paths and work areas indicated in the contract.
41	The Contractor must avoid soil compaction, backfilling or storage of heavy material in the dripline of the trees.
42	Woody debris will not be buried on the island Lapierre. Woody debris will be disposed of on a site authorised by the MDDELCC, while wood logs must be valorised.
43	Considering the work is taking place in an area regulated in concerns to emerald ash borer by the Canadian Food Inspection Agency, it is forbidden to move cut down ash trees or sections of trees outside the restricted area. The Contractor will need to verify where the disposal sites are situated with the city of Montreal.

1.1.6 Invasive floristic species

To counter the introduction of invasive species in the work area, the following mitigation measures are mandatory.

N°	Mitigation measures
44	The stripped top soil containing the seeds from invasive species will be moved to a disposal site authorised by the MDDELCC.
45	All components of machinery must be exempt of any mud or fragment of common reed and Japanese knotweed before being brought to work site.

1.1.7 Ichtyofauna and its habitat

Several mitigation measures may be applied to reduce the effects of work on fish and fish habitats.

N°	Mitigation measures
46	Apply all of the mitigation measures aiming to avoid deterioration of the water quality.
47	Machinery cannot circulate in the water.
48	The excavation work or bridge refection work in the Rivière des Prairies will happen outside of these restricted periods : <ul style="list-style-type: none">- Do not carry out excavation work on the river or pumping of the river between April 1st and September 1st (suggested by AECOM).
49	The imported material used for the stabilization work of the bridge must be clean and exempt of contaminants.

1.1.8 Avian fauna and its habitat

Several mitigation measures must be applied to reduce the effects of work on avian fauna and its habitats.

N°	Mitigation measures
50	Carry out forest clearing work outside nesting period, which is between mid-April and end of August.
51	If the area is cleared, the Contractor is allowed to carry on his work.
52	Apply mitigation measures on water quality.

1.1.9 Herpetofauna and its habitats

Several mitigation measures must be applied to reduce the effects of work on herpetofauna and its habitats. Many of these mitigation measures are extracted from the management plan of the brown snake that was established as part of the wildlife project for the island Lapierre.

N°	Mitigation measures
53	If a turtle is seen on the work site, the Contractor must inform the site supervisor so it can be moved outside the area of work by the environmental representative of the ministry. All work in the area where the turtle is seen must be suspended until it is moved.
54	Before the work, there will be the installation of exclusion fences at the perimeter of the work area. There will also be the capture and intensive resettlement of brown snakes on site, towards an adjacent, non-perturbed habitat on the island Lapierre.
55	During the construction work, all exclusion fences must keep their integrity and their functionality. The brown snakes observed in the work area must be captured and relocated. The exclusion fences must be inspected every second week for the duration of work, and if it appears to be broken, it must be repaired immediately. The inspection must happen more often in case of heavy rains and before the construction work starts.
56	The Contractor will be responsible of capturing and resettling the brown snakes seen in the work area after the start of work. To do so, the Contractor will need a permit SEG from the MFFP. The Contractor must produce a report on the activities of capturing and resettling brown snakes annually. If any live snakes are seen in the work area, during hibernation season, the Contractor will need to capture them by hand and move them immediately in a heated place. (Ex: construction trailer) where they will be kept in a plastic container, provided for that specific use. The container will be supplied to the Contractor. The snakes must be kept at a temperature higher than 10 °C but lower than 30 °C at all times, until a specialist comes to retrieve them, or advises the Contractor on the steps to take. The specialist must be immediately notified when or more than one snake is captures so he can follow the necessary protocol. It is possible for the specialist to recommend the Contractor to move the snakes to one of the protected hibernacula on the island.

57	After the work, there will be a naturalisation of the temporary work areas to recreate habitats favourable to the brown snake (herbaceous vegetation).
58	During the fall/winter seasons of 2016-2017 prune the tree stratum in the zones identified in the drawings.

1.1.10 Quality of life (sound environment and traffic management)

The application of mitigation measures will minimize the deterioration of the quality of life of the residents. The mitigation measures relative to dust are presented at section 4.4.2.

N°	Mitigation measures
Sound environnement	
59	Plan work schedule with the borough (Rivière-des-Prairies-Pointe-aux-Trembles) to take into account busiest period (rush hour, touristic period). The work will take place between 7am and 7pm, and not during the weekends.
60	Comply with regulation B-3 and its addenda specific to the borough RCA06-30015 regarding noise.
61	Use well maintained and in good condition machinery and heavy equipment, in accordance with operations characteristics by proceeding to an inspection before they're introduced on site.
62	Avoid work on holidays.
63	Make sure the equipment is equipped with a good quality and well-functioning silencer.
64	Plan work so as to use as little loud equipment at the same time as possible.
65	Place loud equipment far away from sensitive zones (residences) when possible, as in the case of the shredding.
66	Put in place reverse drive alarm of variable intensity.
67	Avoid impact noise with back panels of dump trucks.
68	Limit the use of engine brake to emergency situations.
69	Turn off all mechanical or electrical equipment when not in use.
70	Adopt methods of discharge materials to limit impact noise.
71	Limit the number of chainsaws working at the same time on the side of the residences (south-east part of the island). The cutting work must happen inside a period of three (3) weeks and cannot exceed the sound criteria mentioned in section 4.1.12.
72	Minimize vehicle and gasoline equipment idling. Respect regulation RCA06-30011.
73	The Contractor must indicate on a sign, the length of work for each phase of the project.
74	The surrounding noise will be evaluated before the work starts. If any complaints are made about the noise, noise reduction measures will be taken. If noise measures indicate that the criteria are exceeded the work will be suspended to adjust the work methods to reduce sources of noise.
Traffic management	
75	The Contractor must establish a circulation plan for the trucks with the borough Rivière-des-Prairies-Pointe-aux-Trembles. The resource person at the borough is head of division Mr. Bernard Donato, who can be reached at (514)868-4283. As part of this circulation plan, it should be mentioned how many trucks are authorised on site at the same time, especially closer to the residences.
76	Confine machinery circulation on the preferred route inside the intervention area and prohibit heavy machinery circulation outside the designed areas.
77	Respect the speed limit as well as the permitted charges to maintain the quality of the road network, and to reduce noise and dust emission.

1.1.11 Public security

Public security could be affected by work, which will require the application of the following mitigation methods.

N°	Mitigation methods
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N°	Mitigation methods
78	Ensure the protection of the population at the outskirts of the construction site, by using protection fences, signalling, and adequate surveillance.
79	Delineate a security perimeter to restrict access to the site to non-authorised people.
80	Issue a notice to the population through the municipality on the nature of the work and length of duration.
81	Respect schedules and periods of work prescribed by the City.
82	Respect codes, norms, and general regulations relative to the health and security of the workers and the public.
83	Adopt preventive measures when heavy machinery is moved or driven on the dock, such as the ones presented by the Association paritaire pour la santé et sécurité du travail du secteur de la construction (ASP construction)
84	To make sure navigation is secure during work period, put in place the recommendations issued in their licence by the navigable waters protection division from Transport Canada.
85	Put in place signage informing road users of the presence of heavy vehicles.
86	Respect the speed limit as well as the permitted charges to reduce the risk of accidents happening.

